**The Contribution of Mentors to Startup Accelerators' Impact**

# ABSTRACT

The last decade has seen the development of a new support infrastructure in the entrepreneurial ecosystem: the startup accelerator. Accelerators offer a structured developmental process to novice entrepreneurs and their startups. Despite the central place of mentoring in most accelerators, current studies do not explicitly include mentors’ contribution to programs' impact. In this research, we suggest that accelerators provide value in six different aspects that are crucial for entrepreneurial success: Entrepreneurial human capita, network building, fundraising skills, legitimacy, psychological development and operational progress of the venture. We hypothesize that mentoring increases the effect of the accelerator program on the first five aspects, but not on operational tasks.

Data from fully-structured interviews with 779 accelerator graduates in Israel during the years 2011-2019 support our hypotheses, in that for the expected types of value, having a mentor has a positive and significant effect above other control variables. Our findings demonstrate the advantage of including mentoring processes as part of the accelerator design, and also highlight the scope of mentoring, what aspects it can promote, and what should not be expected from it.

# *Keywords: Accelerators, Entrepreneurship, Mentoring*1. INTRODUCTION

The last decade has seen the development of a new support infrastructure in the entrepreneurial ecosystem: the startup accelerator (Cohen & Hochberg, 2014; Cohen et al., 2019; Crișan et al., 2021; Hallen et al., 2020). Accelerators act as short-term “boot camps” for entrepreneurs (Dempwolf et al., 2014; Hochberg, 2016), typically admitting 1-2 yearly cohorts of 5-20 startups. They are rapidly growing globally, both in number and impact on the ecosystem, which makes them an important topic for investigation.

The support they provide to their startup portfolio and their founders includes five main elements: First, a formal educational component of expert lectures on various aspects of creating and scaling a new venture; Second, accelerators have wide business networks of experts and business partners that help the attending founders; Third, accelerators assist in fundraising, exposing the founders to investors, providing fundraising training, and culminating with a demo-day event; Fourth, accelerators act as signaling entities, enhancing the legitimacy of the participants.

Lastly, with the evolution of accelerator model, many programs added a fifth element: tens of volunteer expert mentors that guide the founders during the program, a function that was initially performed mainly by the accelerator’s manager and staff. Today, these external mentors are a significant element in the design of many accelerators (Avnimelech & Rechter, 2021; Bliemel et al., 2021; Pauwels et al., 2016; Wright & Drori, 2018; Yitshaki and Drori, 2018). Some researchers argue that mentorship became a defining characteristic of accelerators (Cohen & Hochberg, 2014; Dempwolf et al., 2014; Hallen et al., 2020; Radojevich-Kelley & Hoffman, 2012) and a key differentiating feature from incubators (Bliemel et al., 2021), although some accelerators still use the original model. According to the last estimate, in 2016 there were more than 3,000 accelerator programs (broadly defined) worldwide (Hochberg, 2016), implying tens of thousands of active mentors and mentoring processes each year.

Despite their abundance, in-depth scientific investigations of mentoring in accelerators are still relatively scarce; most studies of mentors within accelerators are either conceptual papers or qualitative works based on a few in-depth interviews. Moreover, current evaluation studies do not explicitly include mentors’ concrete contribution to programs’ impact, and the immerging empirical literature on accelerators is still mainly ignorant of the literature on mentoring. This paper aims to fill this gap in the accelerator literature by examining and empirically evaluating mentorship as an essential mechanism that affects the program’s impact on the participants, its scope, and its boundaries, in terms of what should be expected from mentors in accelerators, and what typically is beyond their scope.

We begin by reviewing the literatures on accelerators and mentoring in general. Next, building on accelerators’ design, we explain how they impact the participants and, applying insights from the mentoring literature to the context of accelerators, formulate hypotheses regarding their role in accelerators’ impact on their participating startups and founders. We follow by presenting empirical evidence on the role of mentors in accelerators based on data from structured interviews with 779 accelerator graduates in Israel’s high-tech sector from 2011 through 2019. In the final section, we discuss the implications of our study for practitioners, researchers in the field of entrepreneurship, startup accelerators, and policymakers; and suggest potential directions for future research.

# 2. LITERATURE REVIEW: ACCELERATORS AND MENTORING

## 2.1. Accelerators

Accelerators are short-term (3-9 months) cohort-based “boot camps” for entrepreneurs, offering a structured developmental process that includes an educational component, broad business networks, fundraising training, and mentoring services (Cohen, & Hochberg, 2014; Cohen et al., 2019; Hallen et al., 2020; Hochberg, 2016). In addition, accelerators act as signaling entities and provide reputation and legitimacy to entrepreneurs and startups (Avnimelech & Rechter, 2021; Beyhan et al., 2022).

1. *Educational component.* Participating founders often receive a shared formal educational program. This educational component provides knowledge on technical and managerial aspects of creating and running a high-growth business, such as need and value proposition validation processes, market analysis, marketing strategies and practices, financial planning, or business development.
2. *Wide network base.* Accelerators provide networks of high-quality professionals and potential partners. They assist the participants with access to pilots within large corporations, design partners, suppliers, valuable experts, and potential investors. In addition, accelerator managers and partners connect founders and their startups to the local and global innovation ecosystems (Bliemel et al., 2021; Hochberg, 2016; Yitshaki & Drori, 2018). Accelerators also offer their participants an effective community of practice, including other founders from the specific cohort, accelerator alumni, and other community members. This community of practice provides learning and further network opportunities (Simon & Miller, 2022; Wenger, 1999).
3. *Fundraising training*. The formal educational component of accelerators usually includes fundraising, storytelling, and pitching sessions, pitching events and hands-on fundraising training (Moritz et al., 2021). In addition, accelerators often connect the participants with potential investors as part of the network they provide. Programs usually conclude with a demo day, where founders present their startups to investors and other agents from the ecosystem (Cohen et al., 2019; Hallen et al., 2020). In a recent study, Avnimelech and Rechter (2021) found that founders entering accelerators indicate progress in raising capital as their most important pre-entry goal.
4. *Reputation and legitimacy.* In the journey of creation, survival, and growth of new ventures, legitimacy plays a key role (Delmar and Shane, 2004; Zimmerman & Zeitz, 2002). Signaling theory highlights the need for entrepreneurs to signal the viability of their new venture to capital providers and potential suppliers, customers, and partners (Busenitz et al., 2005; Fisher et al., 2017; Lounsbury & Glynn, 2001; Murphy et al., 2007; Singh et al., 1986). Amezcua et al. (2013) suggest that sponsoring organizations can provide legitimacy, and studies on incubators suggest that founders and their startups gain credibility from being backed by an incubator and interacting with its top management (Marlow & McAdam, 2015). A similar function is expected to characterize accelerators; thus, accelerators can act as such a signaling entity.
5. *Mentoring services.* Mentorship processes are essential to the support entrepreneurs receive in most accelerators (Bliemel et al., 2021; Yitshaki & Drori, 2018). In accelerators, entrepreneurs typically work with a wide array of mentors and experts that provide support for different aspects of the growing business. Each startup is usually assigned at least one mentor – an expert who provides the startup founder with guidance, feedback, and other developmental functions. In accelerators that do not offer mentoring, it is mainly the program managers and their staff that provide founders’ guidance. Often, the educational workshops and lectures of the accelerator are followed by practice with the mentors.

## 2.2. Mentoring

Mentoring is a one-to-one learning relationship between an experienced person (a mentor) and a less experienced one (a mentee) that provides various developmental functions (Mullen, 1998). Byrne and Keefe (2002) define a mentor as “a person who helps a more junior person develop professionally through a combination of advice on specific issues, skills development, and personal growth in an intense manner over an extended period of time”. Mentors perform the role of counselors, guides, and sponsors. In the context of entrepreneurship, mentors facilitate problem-solving for the entrepreneurs through learning by reflection on their actions (Cope & Watts, 2000; Sullivan, 2000). In accelerators, entrepreneurs work with a wide array of mentors that provide support for different aspects of the growing business (Yitshaki & Drori, 2018). They reinforce the formal learning in the accelerator by challenging founders’ assumptions, enhancing reflective learning, assisting in distillation of the knowledge and its adaptation to the specific context of the startup, and guiding its implementation (Miles et al., 2017). We argue that mentors should be an integral part of the value proposition of accelerators (Bliemel et al., 2021) and that their work amplifies the impact of accelerators on the participants.

### 2.2.1. Mentor functions

The overall support that mentors provide to their mentees is divided into two categories: psychosocial support and career-related functions (Kram, 1988). *Psychosocial support* includes building self-confidence and offering acceptance and counseling. It is based on sharing, listening, being accepted, and experiencing trust (Leck & Orser, 2013). A mentor allows the mentee to improve their mental models by adopting elements of the mentor's model (St-Jean & Audet, 2012). Mentors often serve as role models for mentees (Bosma et al., 2012), an essential function in developing entrepreneurial self-efficacy and the confidence of the mentee that they can be mentored toward success (Bliemel et al., 2021; Miles et al., 2017; St-Jean & Audet, 2012; St-Jean & Mathieu, 2015).

*Career-related functions* refer to the development of job-related skills (Kram, 1988; Leck & Orser, 2013; St-Jean, 2011; St-Jean & Audet, 2012) through questioning, feedback, support, and guidance (Bliemel et al., 2021; Miles et al., 2017; Noe, 1988), acquisition of knowledge about the business domain, and developing a proper cognitive schema to analyze new information and identify business opportunities (St-Jean and Audet, 2012). Research shows that mentors increase ability, develop knowledge and improve skills (Kempster & Cope, 2010; Ozgen & Baron, 2007; St. Jean et al., 2017; Sullivan, 2000).

### 2.3. Accelerators’ Impact and Mentoring Contribution

In this section, we consider the impact of accelerators on the participants and the expected effects of mentors. We suggest that accelerators promote the participants in six aspects essential to entrepreneurial success: entrepreneurial human capital, networks, fundraising skills, legitimacy, psychological development, and operational progress of the venture. Furthermore, we expect mentors to boost the progress of the participating founders in the first five aspects; that is, mentors will increase the progress achieved during the program. Conversely, we expect mentors will not contribute to the startup’s operational progress, including actual fundraising. In other words, considering the nature and length of mentoring in accelerators, they are expected to influence functional and emotional skills of the mentees, with less direct influence on operational progress of the startup.

***2.2.2.1. Entrepreneurial Knowledge and Skills – Human Capital***

Human capital consists of the skills and knowledge individuals acquire through schooling, on-the-job training, and other experiences (Adler & Kwon, 2002; Becker, 2009; Coleman, 1988; Portes, 1998). The literature distinguishes between general human capital—the overall educational level and work experience—and domain-specific human capital—education and experience in a particular domain (Becker, 2009).

Developing entrepreneurial human capital (i.e., human capital specific to entrepreneurship) is essential for young ventures and novice entrepreneurs (e.g., Bosma et al., 2004; Colombo & Grilli, 2005, 2010; Davidsson & Honig, 2003; Unger et al., 2011). It is important for opportunity identification (Bhagavatula et al., 2010; Hoang & Antoncic, 2003; Ucbasaran et al., 2008), entrepreneurial success (Unger et al., 2011), venture growth (Colombo & Grilli, 2005, 2010; Unger et al., 2011), and firm development and performance (Bosma et al., 2004).

Accelerators develop the entrepreneurial-specific human capital of the founders through the program’s formal educational component, which includes aspects such as need and opportunity identification, validation processes, sale and marketing practices, business and financial planning, and pitching and other fundraising skills. Participants’ entrepreneurial human capital further develops through their experiences in managing the startup during the program.

When educational workshops in the program are followed by reflective learning and practice with mentors, the impact on entrepreneurial human capital is leveraged (Bliemel et al., 2021; Yitshaki & Drori, 2018). For example, mentors can help set up strategy and priorities and structure the organizational process (Yitshaki and Drori, 2018). Mentors enable entrepreneurs to reflect and learn from their actions in critical situations and help them engage in reflective learning following significant events (Cope & Watts, 2000; Sullivan, 2000). Mentors were found to help in developing learning skills to analyze new information (Kempster & Cope, 2010; Ozgen & Baron, 2007; St. Jean et al., 2017; Sullivan, 2000). Finally, mentoring is related to knowledge and skills development (Kempster & Cope, 2010; Ozgen & Baron, 2007; St. Jean et al., 2017; Sullivan, 2000). Thus, mentors contribute to the development of entrepreneurial human capital and can help the founders make the abstract knowledge delivered in the program more concrete and personally relevant, building their practical skills. Hence, we expect that:

*H1: Mentoring enhances accelerators’ effect on the entrepreneurial human capital of the participants.*

***2.2.2.2. Social capital and networking***

Networks and social capital (Adler & Kwon, 2002; Becker, 2009; Coleman, 1988; Portes, 1998) are vital for entrepreneurial success (e.g., Bhagavatula et al., 2010; Elfring & Hulsink, 2003; Greve & Salaff, 2003; Hoang & Antoncic, 2003). A high-quality network is an essential asset providing access to knowledge, potential customers, suppliers, partners, and investors (Elfring & Hulsink, 2003; Florin et al., 2003; Hoang & Antoncic, 2003; Jones & Jayawarna, 2010). A founder’s network has a critical contribution to venture creation and development. First, it is an essential source of new ideas and identifying business opportunities (Bhagavatula et al., 2010; Hoang & Antoncic, 2003; Ucbasaran et al., 2008). Second, the social network in which entrepreneurs are embedded influences their ability to access scarce resources needed to operate (Elfring & Hulsink, 2003; Greve & Salaff, 2003; Hoang & Antoncic, 2003; Jones & Jayawarna, 2010).

Accelerators provide wide networks and offer networking opportunities to participants (Miles et al., 2017). Mentors’ guidance can help them effectively use the networks provided by the accelerator. Moreover, mentors can help the founders to develop their networks further since they often connect their mentees to their own network and are themselves embedded in their mentee’s network (Kram, 1988; St. Jean et al., 2017). Thus, we expect that:

*H2: Mentoring enhances accelerators’ impact on participants*’ *network development*.

***2.2.2.3. Access to capital and fundraising***

Financial resources are essential for new ventures (e.g., Song et al., 2008) and affect growth, performance, and firm survival (Hellmann & Puri, 2000). External financing is crucial for innovative startups that suffer from a long “valley of death” (a period with high expenditures without revenues before commercialization; Auerswald & Branscomb, 2003). Obtaining such resources, especially from VCs or reputable angels, also signals the startup’s quality to the labor market and potential customers and partners (Davila et al., 2003; Gompers and Lerner, 1999).

Accelerators often provide participants with business and financial planning support (Crisan et al., 2019), pitching and fundraising training (Moritz et al., 2021), and connect them with potential investors (Yitshaki & Drori, 2018). Most programs conclude with a demo day in which graduating founders present their startups to a large audience of investors and other agents from the ecosystem (Cohen et al., 2019; Hallen et al., 2020). Mentors can provide follow-up training in these skills and help founders prepare for meeting with investors. In addition, their impact on the founders’ confidence can make them more ready and attractive for investment, and their impact on founders’ legitimacy increases their likelihood of succeeding in obtaining external funds (Busenitz et al., 2005; Lounsbury & Glynn, 2001; McKevitt & Marshall, 2015).

Though fundraising skills (but not actual fundraising) can be considered part of the entrepreneurial human capital an entrepreneur posses, due to the centrality of fundraising for new ventures, we think it is important and interesting enough to be considered separately. Translating fundraising skills to actually raising capital, however, is a long and intensive hands-on operational process that requires approaching, preparing, and meeting investors. It requires time, so the imideate effect of the accelerator on fundraising skills will not be immediately translated to actual operational progress in fundraising. While mentors assist with developing the relevant skills, therefore they are not involved in this intensive hands-on operational process, and are not expected to effect actual fundraising. Thus, we expect that

*H3: Mentoring enhances accelerators’ effect on participants’ fundraising skills.*

***2.2.2.4. Credibility and Legitimacy***

Gaining legitimacy is a significant aspect of new firm formation, survival, and growth (e.g., Delmar & Shane, 2004; Lounsbury & Glynn, 2001; Zimmerman & Zietz, 2002). Entrepreneurs depend on resources and support from various external actors to successfully launch and develop a new venture. For such actors to provide a new venture with the necessary resources and support, they need to perceive the venture as legitimate (Busenitz et al., 2005; Fisher et al., 2017; Lounsbury & Glynn, 2001; Murphy et al., 2007; Singh et al., 1986). Thus, legitimacy is an essential means to overcome the liability of newness that contributes to the high percentage of new venture failure (Zimmerman & Zietz, 2002).

Mentoring is associated with increasing entrepreneurial legitimacy, thus assisting nascent entrepreneurs to overcome the “liability of newness” (Carter et al., 2003; Murphy et al., 2007; Williams Middleton, 2013). Previous studies suggest that a continuous relationship with a prestige mentor increases founders and startups’ legitimacy (Carter et al., 2003; McKevitt & Marshall, 2015; Williams Middleton, 2013). More specifically, finding an appropriate mentor emerged as pivotal in gaining entrepreneurial legitimacy, as mentors guide behaviors (which leads to legitimacy) in different business contexts and signal their legitimacy (Marlow & McAdam, 2015). Thus,

*H4: Mentoring enhances accelerators’ impact on participating founders and startups’ legitimacy.*

***2.2.2.5. Psychological Outcomes***

The literature recognizes some motivational or psychological aspects related to entrepreneurial success. Entrepreneurial self-efficacy and self-confidence (e.g., BarNir et al., 2001; Chen et al., 1998; Garaika et al., 2019), and intentions, commitment, and motivation (e.g., Boyd & Vozikis, 1994; Tasnim et al., 2014), have all been related to the propensity to start and remain in business and to entrepreneurial success (e.g., Miao et al., 2017; Newman et al., 2019; Zhao et al., 2010). Few current studies have begun to examine the effect of accelerators on these aspects directly (e.g., Goswami et al., 2018; Mansoori et al., 2019). Moreover, some findings suggest that the type of support accelerators provide affects these motivational or psychological aspects, directly or indirectly. For example, entrepreneurial human capital and networks were found to be related to entrepreneurial self-efficacy (Newman et al., 2019; Sequeira et al., 2007) and entrepreneurial intentions (Bosma et al., 2004; Florin et al., 2003). So, while they do not explicitly target these aspects, we expect accelerators’ impact to be extended to them as well.

The mentoring literature also suggests various psychological outcomes of mentoring that are relevant to entrepreneurial success. Mentoring is highly relevant to the personal development of entrepreneurs it increases self-confidence and entrepreneurial self-efficacy (Bliemel et al., 2021; Miles et al., 2017; Newman et al., 2019; St-Jean & Audet, 2012; St-Jean & Mathieu, 2015), which are associated with entrepreneurial commitment, motivation (Tasnim et al., 2014), tolerance to risk, growth aspirations (Ajzen et al., 2009; Boyd & Vozikis, 1994; Engle et al., 2010), and to actual revenue and firm growth (Baum & Locke, 2004; Miao et al., 2017). Hence, we expect that

*H5: Mentoring contributes to positive psychological outcomes of accelerators’ participants.*

***2.2.2.6 Operational Progress of the Venture***

As mentioned above, during the program, participants learn and work on various aspects related to the creation and management of a high-growth business. As a result, we should expect to observe progress of the venture in the course of the program.

As discussed above, mentors’ function is characterized mainly by assisting the founders in reflective learning (Cope & Watts, 2000; Sullivan, 2000) through questioning, feedback, support, and guidance (Bliemel et al., 2021; Miles et al., 2017; Noe, 1988). As Bliemel et al. (2021) argue, the impact of mentors in accelerators is more educational, reflective, and intangible and may be less instrumental or tangible. Mentoring is voluntary and consists of a few weekly or monthly hours (mentors in accelerators often have 2-4 hours monthly meetings with the founders over 3-6 months). Therefore, while we expect them to have a significant impact on knowledge, skills, and cognitive models development, we do not assume they should have a significant impact on intensive operational tasks such as product development, constructing strategic partnerships, and business development progress, similar to our expectation regarding actual fundraising.

# 3. METHOD

## 3.1. Data and Participants

The data for this study was collected as a part of a large research project on accelerators in Israel. The dataset was built in two stages. First, we constructed a macro-level dataset of 71 startup accelerators in Israel, including all active accelerators between 2011 and 2019 with at least five graduating startups as of December 2019. The dataset comprises 4,052 unique graduates and 1,842 unique startups, representing over 95% of accelerator-backed startups in Israel during that period. During that time, approximately 10,000 startups were created in Israel (see IVC, 2019, 2020); thus, our sample represents nearly 20% of Israeli startups founded in this period.

As a preliminary stage, we conducted in-depth open interviews with accelerator managers (N=45), mentors in accelerators (*N* = 10), startup founders that participated in accelerator programs (*N* = 10), and VC and CVC partners (*N* = 10, to hear their perspective on accelerators), to gain a deeper understanding of accelerators’ design, operations and goals.

*Participants and procedure.*We approached 2,566 founders (63% of the population) of 1,168 startups whose contact information we obtained and invited them to participate in the research. Our preference was to interview the CEO or the founder who was most involved in the accelerator. Participants (*N* = 779; an acceptable 30.4% response rate) represent approximately 67% of the startups in the sample.

Participants were interviewed by telephone by trained research assistants in a 45-minute fully-structured interview that we developed based on the initial open interviews. Founders reported their progress during the program, whether they had a personal mentor or not, their satisfaction with the accelerator (and their mentor) and with the overall progress of themselves and their startup, background variables, and other measures unrelated to the current study.

## 3.2 Measures

*Progress during the program*. Respondents reported up to three main aspects in which they achieved progress during the accelerator. Their responses were classified into 13 predefined progress types[[1]](#footnote-1). The list was developed through the initial open interviews phase described above. Participants then rated their progress on a Likert-type scale from 1 (very little) to 5 (very high), (progress types that were not mentioned were coded as 0). In addition, respondents rated how significant each aspect was for their success. We calculated the square root of the amount of progress multiplied by its importance, thus capturing the true value the accelerator provided for those founders.

*Additional aspects of program impact*. Participants were asked to rate six items on a 7-point scale ranging from -3 (decreased significantly) through 0 (did not change) to +3 (increased significantly), reflecting the changes they experienced through the program regarding their and their startup’s *legitimacy* in the eyes of venture capitalists, potential partners, and other ecosystem agents. The six ratings were combined in an aggregated measure of perceived change in legitimacy (Cronbach’s alpha = .85). This measure was added to the interview after data collection was already in progress, resulting in fewer observations (*N* = 452). In addition, participants rated the change they felt during the program on their *entrepreneurial confidence* (“my confidence that I can succeed as an entrepreneur”); such a one-item assessment of entrepreneurial confidence has been used previously (e.g., Arenius & Minniti, 2005) and interpreted as a proxy for entrepreneurial self-efficacy (e.g., Chowdhury & Endres, 2005; Tominc & Rebernik, 2007).

Participants also rated the program’s effect on eight skills and motivational/ psychological aspects, such as their skills in performing lean startup validation or business and financial planning (see details below). Responses were rated on a 7-point scale ranging from -3 (decreased significantly) through 0 (did not change) to +3 (increased significantly).

### Classification of aspects of progress according to the six categories of program impact:

We classified the various measures of progress described above into the six categories that match our hypotheses regarding mentors’ contribution to accelerators’ impact—entrepreneurial human capital, network building, fundraising skills, legitimacy, psychological development, and operational progress.Classification was done independently by the two authors, and cases of disagreement were resolved through discussion. Two types of progress – receiving public relations and integrating into an entrepreneurship community – were not classified, as they do not seem to belong to any of the categories; hence, we had no hypotheses regarding mentors’ effects on these two aspects.

*Entrepreneurial human capital.* Entrepreneurial knowledge, S&M implementation, validations progress[[2]](#footnote-2), validation skills, ability to acquire customers, market analysis skills, and business model design skills (three progress indicators and four skills indicators).

*Network expansion.* Rating of progress in network expansion (one progress indicator).

*Fundraising skills.* Fundraising skills, pitching skills, business plan writing (three indicators).

*Legitimacy.* Rating of change in legitimacy (one indicator; six-item scale).

*Psychological and motivational outcomes.* Entrepreneurial confidence, personal development, commitment, openness to change, and satisfaction from personal progress (five indicators).

*Operational progresses.* Product development, business development and strategic partnerships, actual fundraising progress, and team building (four progress indicators).

*Control variables*. We used control variables that affect the impact of the program on founders and their startups (based on Avnimelech & Rechter, 2021) to assess the unique contribution of mentoring: founder’s gender (female coded as 1, male, 0), level of education (obtaining a master’s degree or higher before the program was coded as 1, otherwise, 0), years of entrepreneurial experience before the program, prior accelerator participation experience (yes = 1, no = 0), and whether the founder entered the accelerator with a startup at the idea validation stage (coded as 1) or at a more advanced stage (coded as 0).

*Having a mentor*. Participants reported whether they worked with a personal mentor during the program (*N* = 597, 77%, coded as 1) or only with the accelerator manager and staff (*N* = 182, coded as 0).

## 3.3 Data Analysis

To assess the unique contribution of mentors to participants’ progress during the accelerator program, we conducted linear regression for each outcome measure, with having a mentor and the five control variables, to assess its unique contribution in explaining additional variance in the outcome.

# 4. RESULTS

Since most of our outcome variables are indicators of broader constructs, which are our concern, when constructs have multiple indicators, we do not discuss the specific indicators but summarize them and present the broad picture regarding each construct. The full regression results are in Table xx-xx.

**Entrepreneurial Human Capital**

For all seven indicators for entrepreneurial human capital, mentoring had a positive and significant effect above the controls, with Beta coefficients ranging from .317 to .475 (see Table 1).

Table 1: Linear regressions of Entrepreneurial Human Capital Indicators

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DV | Knowledge | S&M Implement | Validatio Progress | S&M Skill | Market Analysis | BM Design | Validation Skill |
| Has  mentor | .344\*  (.157) | .399\*\*  (.137) | .452\*\*  (.154) | .317\*\*  (.120) | .475\*\*\*  (.121) | .443\*\*\*  (.121) | .327\*\*  (.123) |
| Female | .516\*\*  (.179) | -.442\*\*  (.157) | -.206  (.175) | -.041  (.134) | .179  (.135) | .034  (.134) | .286\*  (.136) |
| MA  degree | -.333\*  (.134) | .001  (.118) | .199  (.132) | -.078  (.102) | -.132  (.102) | -.073  (.102) | -.165  (.104) |
| Entrep. exp. | -.022\*  (.010) | .004  (.009) | -.009  (.010) | -.019\*  (.008) | -.013  (.008) | -.019\*  (.008) | -.016\*  (.008) |
| Prev. Accelerator | -.692\*\*\*  (.169) | .507\*\*\*  (.148) | -.009  (.166) | .058  (.132) | -.023  (.133) | .129  (.132) | -.024  (.135) |
| Stage idea | .875\*\*\*  (.143) | -.620\*\*\*  (.125) | .151  (.140) | .286\*\*  (.107) | .525\*\*\*  (.108) | .524\*\*\*  (.107) | .371\*\*  (.109) |
| Constant | 1.05\*\*\*  (.177) | .762\*\*\*  (.155) | .728\*\*\*  (.173) | 2.35\*\*\*  (.138) | 2.34\*\*\*  (.139) | 2.37\*\*\*  (.139) | 2.57\*\*\*  (.141) |
| P value | .0000 | .0000 | .0478 | .0009 | .0000 | .0000 | .0000 |
| Adj. R2 | .1154 | .0718 | .0086 | .0249 | .0758 | .0613 | .0453 |
| N | 779 | 779 | 779 | 668 | 678 | 678 | 677 |

Notes: \*\*\* p < .001; \*\* p < .01; \* p < .05

**Network Expansion**

The single indicator for network expansion during the program showed a positive and significant effect of mentoring beyond the controls, *B* = .364, *p* = .026 (see Table 2).

**Fundraising Skills**

For all three indicators for fundraising skills, mentoring had a positive and significant effect above the controls, with Beta coefficients ranging from .498 to .518 (see Table 2).

**Legitimacy**

The single indicator for network expansion during the program showed a positive and significant effect of mentoring beyond the controls, *B* = .296, *p* = .007 (see Table 2).

Table 2: Linear regressions of Network, Fundraising skills and Legitimacy Indicators

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DV | Network | Fundraising  Skiil | BP Writing  Skill | Pitching  Skill | Legitimacy |
| Has  mentor | .364\*  (.163) | .498\*\*\*  (.118) | .508\*\*\*  (.099) | .518\*\*\*  (.118) | .296\*\*  (.109) |
| Female | .500\*\*  (.186) |  |  |  |  |
| MA  degree | -.075  (.140) |  |  |  |  |
| Entrep. exp. | .001  (.011) |  |  |  |  |
| Prev. Accelerator | .089  (.176) |  |  |  |  |
| Stage idea | .134  (.149) |  |  |  |  |
| Constant | 1.05\*\*\*  (.184) |  |  |  |  |
| P value | .0019 | .0003 | .0000 | .0000 | .0340 |
| Adj. R2 | .0117 | .0276 | .0461 | .0424 | .0170 |
| N | 779 | 689 | 689 | 689 | 452 |

Notes: \*\*\* p < .001; \*\* p < .01; \* p < .05

**Psychological Outcomes**

Four out of five indicators for the psychological and motivational outcomes, mentoring had a positive and significant effect above the controls, with Beta coefficients ranging from .317 to .475 (see Table 3).

Table 3: Linear regressions of Psychological and motivational outcomes Indicators

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DV | Entrepreneurial Confidence | Personal Development | Commitment | openness to change | satisfaction from personal progress |
| Has  mentor | .264\*  (.114) | .127  (.079) | .270\*  (.132) | .338\*\*  (.119) | .442\*\*\*  (.101) |
| Female |  |  |  |  |  |
| MA  degree |  |  |  |  |  |
| Entrep. exp. |  |  |  |  |  |
| Prev. Accelerator |  |  |  |  |  |
| Stage idea |  |  |  |  |  |
| Constant |  |  |  |  |  |
| P value | .0000 | .1584 | .0000 | .0000 | .0000 |
| Adj. R2 | .0605 | .0042 | .0335 | .0888 | .0622 |
| N | 767 | 779 | 767 | 726 | 755 |

Notes: \*\*\* p < .001; \*\* p < .01; \* p < .05

**Operational Progress**

For all four indicators for operational progress, mentoring had did not have a significant effect above the controls (see Table 4).

Table 4: Linear regressions of Operational Progress Indicators

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DV | Product  Development | Business Development | Fundraising  Progress | Team Building |
| Has  mentor | .181  (.156) | -.075  (.150) | .284  (.159) | .158  (.103) |
| Female |  |  |  |  |
| MA  degree |  |  |  |  |
| Entrep. exp. |  |  |  |  |
| Prev. Accelerator |  |  |  |  |
| Stage idea |  |  |  |  |
| Constant |  |  |  |  |
| P value | .0683 | .1909 | .0010 | .0047 |
| Adj. R2 | .0074 | .0035 | .0211 | .0163 |
| N | 779 | 779 | 779 | 779 |

Notes: \*\*\* p < .001; \*\* p < .01; \* p < .05

# 5. DISCUSSION AND FUTURE RESEARCH AGENDA

The immerging accelerator industry currently displays two competing design models. Both models share four elements of support: formal entrepreneurial education, business networks, fundraising training, and legitimacy provision. The models differ in the additional personal support and guidance startup founders receive in the program. In most current accelerators this is done by volunteer personal mentors who are assigned to the founders for the duration of the program, while in other accelerators, this is provided by the program manager, the accelerator’s staff, and other experts formally associated with the accelerator.

We suggest that the immediate contribution of accelerators to program participants is evident in six distinct aspects: They develop entrepreneurial human capital, expand business networks, increase legitimacy, improve fundraising skills, contribute to entrepreneurial-related psychological and motivational factors, and drive the operational progress of the startup. Considering the known impact of mentoring on entrepreneurs (e.g., Bliemel et al., 2021; Miles et al., 2017; St-Jean & Audet, 2012; Sullivan, 2000; Yitshaki & Drori, 2018), we hypothesize that mentoring can leverage the support provided by the accelerator to boost the effect of the program on the first five aspects. The extensive nature of operational progress, in contrast, combined with the role of mentors, led us to expect that mentoring will not increase the effect of the program on this aspect.

Data from fully-constructed interviews with 779 accelerator graduates in Israel provide strong and consistent support for our hypotheses. The seven indicators for entrepreneurial human capital; the single indicators for both network and legitimacy; the three indicators for fundraising skills; and four out of the five indicators for psychological outcomes – all indicated a positive and significant effect of mentoring to participants’ gains during the program. Findings regarding operational progress were mixed, which is also consistent with our argument that they are mainly out of the scope of mentors’ involvement. Thus, we can confidently claim that mentors have significant contribute to the impact of accelerators on participating founders.

Our findings contribute to the literature in several aspects. First, our work joins the growing body of research on accelerators, with rich and unique data regarding the experience of accelerator graduate and their perception of the program. In particular, our analysis races two competing design models of accelerators, demonstrating the superiority of programs that include mentoring services over those that do not. This finding is especially important considering that while the first accelerators were founded and operated by established entrepreneurs (such as Paul Graham at Y-combinator or David Cohen at Techstars, both serial entreprenerus and investors) that might possess the skills and knowledge necessary to provide the additional guidance, many accelerators today are built by government agencies, municipalities, corporates, and academic institutions, and are operated by non-entrepreneurs (often ambitious and talented young personnel, but with little hands-on entrepreneurial experience). For them, realizing the importance of mentoring is vital. Our data includes mentors of varying quality and experience, mentor-mentee mismatches, mentoring relationships that went sour, and a significant variance in the level of guidence and training accelerators provide to their mentors. Taking such variables into account is bound to show even stronger effects of mentoring when done properly. In fact, for accelerators that wish to increase their contribution and value, mentoring is probably the best starting point.

Second, important contribution of our study is related to an immerging literature on accelerator’s evaluation (e.g., ). Our findings shed more light on the the types of the immediate value that participants gain from accelerators and pointing to the mechanisms through with they advance entrepreneurs and push the entrepreneurial ecosystem forward.

Finally, a contribution to mentoring literatrure lies in showing that mentoring does not contribute to operational processes, thus pointing boundary conditions of mentoring, demonstrating not only what they do, but also what they do not do. This understanding is also important for startup founders to have more realistic expectations of the mentoring process, for mentors to better understand where they should focus and what are the main strengths in their position, and for accelerator managers to will realize which aspects are supported by the mentors and which they should support by other means. In some accelerators, in addition to the accelerator manager that focus mostly on program administration (coordinating the activities and resources such as selection process, syllabus, lectures, mentors and events), additional staff are responsible for assistance in various execution tasks such as product development, business development and go to market strategy. Such component of the accelerator design, that target the operational progress with which mentors are not involved, seems like an important complement to provide a full support suite by the accelerator.

Following this notion, we argue that the literature of the design and typologies of accelerators (e.g., Cohen et al., 2019; Kanbach & Stubner, 2016; Pauwels et al., 2016; Shankar& Shepherd, 2019), should give more focus the the balance between three main types of personnel in accelerators and their roles – accelerator managers, mentors, and the “operational accelerator staff”. The accelerator manager can in some cases act as project manager of the program and in other cases also as a mentor or the main mantor. Mentors and operational accelerator staff may or may not be part of the accelerator, and even when do exist, their importance varies between accelerators. These differences in accelerators design may lead to very different results and might be relevant to different types of founders and ventures, and should be further investigated in the future.

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1. The 15 pre-entry goals and progress variables that we collected included: 1) Gaining entrepreneurial knowledge and skills; 2) Expanding networks; 3) Enhancing entrepreneurial confidence/ESE; 4) Gaining legitimacy; 5) Fundraising; 6) Sales and marketing; 7) Validation processes; 8) Product development; 9) Improving pitching and presentation skills; 10) Business development; 11) Advancing the business plan; 12) Team building; 13) Personal development; 14) Gaining exposure; and, 15) Joining an entrepreneurial community (\*entrepreneurial confidence and legitimacy were added later as specific questions, see below). [↑](#footnote-ref-1)
2. We include validation progress under entrepreneurial human capital since in the lean startup method validation processes are small-scale experiments that do not require a long and intensive operational process but rather an internalization of the lean startup mindset, thus, the main barriers to implementing them are mental barriers. [↑](#footnote-ref-2)