



## Institutional logics and founders' identity orientation: Why academic entrepreneurs aspire lower venture growth

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### ABSTRACT

This study examines how the identity orientation of founders, i.e., the extent to which they define themselves in terms of their relationships to others and to social groups, is imprinted by their professional logic and influences their ambitions for venture growth. We draw on existing insights regarding the Darwinian, Communitarian, and Missionary orientation of entrepreneurs and on interviews with 29 founders to develop our hypotheses, which we then test in a sample of 58 academic and 113 non-academic founders that participated in a venture competition. We argue that, compared to non-academic institutional logics, academic logics are tied to a stronger Communitarian and Missionary orientation and a weaker Darwinian orientation in founders. A stronger Darwinian orientation values venture growth, whereas a stronger Communitarian orientation appraises the benefit of the technology for a restricted set of people at the expense of such growth ambitions. A stronger Missionary orientation values welfare maximization for society which may to some degree entail higher growth aspirations. We argue and empirically confirm that these identity orientations explain why academic founders hold lower growth aspirations for their start-up than non-academic founders. Our findings can at least partially clarify why academic start-ups do not grow according to expectancies. They theoretically advance our insights in academic entrepreneurship and founders' growth aspirations while also extending the literature on founders' identity orientation.

### 1. Introduction

Over the last 30 years,<sup>1</sup> universities and research institutes have been increasingly motivating their researchers to commercialize research findings through start-up activities. However, although several successful university spin-offs have certainly emerged (Shane, 2004), it is becoming more and more evident that most academic start-ups, especially in Europe, remain small and have little economic impact (Garnsey and Heffernan, 2005; Pisano, 2006; Wright et al., 2007; Fini et al., 2017). Some scholars in the academic entrepreneurship literature even boldly state that they show such "limited economic impact that [it does] not justify the public support that they receive" (Mathisen and Rasmussen, 2019: 1892).

Studies have pointed to characteristics of the institutional environment in explaining the difficulties academic founders face to start and grow their venture (Klingbeil et al., 2018). Researchers have pointed out that institutional characteristics at the national level (e.g., intellectual

property rights legislation) and at the level of the university (e.g., whether entrepreneurial activities are being rewarded, and how technology-transfer and industry collaboration are being organized) can hinder the creation and economic performance of academic start-ups (Fini et al., 2017; Huyghe and Knockaert, 2015; Lacetera, 2009; Mindruta, 2013; Ziedonis, 2007). They have also advocated that the economic success of academic ventures can only be improved if institutional changes at the university level are consistent with the broader institutional environment to which start-ups are exposed (Eesley et al., 2016).

However, while these studies have generated important insights, we still have limited knowledge of the mechanisms that link these higher-level institutional characteristics to the individual-level ambitions and performance of academic entrepreneurs (Klingbeil et al., 2018). As Guo et al. (2019) explain, "little is known [...] about the cognitive and social-psychological processes associated with academics that reshape their career trajectories and pursue academic entrepreneurship." The current study addresses this gap by building on insights regarding socialization

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<sup>1</sup> MIT and Stanford, early players in academic spin-offs, launched their first entrepreneurship centers in 1990 and 1996 respectively.

(Van Maanen and Schein, 1979; Wanous, 1992), imprinting (Marquis and Tilcsik, 2013; McEvily et al., 2012), and founders' identity orientation, i.e., the extent to which they identify themselves in terms of their relationships to others and to social groups (Fauchart and Gruber, 2011; Brewer and Gardner, 1996). We propose that prior socialization into the academic institutional logic imprints an academic entrepreneur's identity orientation, and that this identity orientation in turn affects the growth aspirations he/she holds for his/her venture. We argue that these effects on identity orientation and growth aspirations are different from those of socialization into a business institutional logic.

Several studies (e.g., Balven et al., 2008; Jain et al., 2009; Hayter et al., 2022) have highlighted the need for academics to develop an entrepreneurial role identity (i.e. the need to start seeing themselves not only as a scientist, but also as an entrepreneur). But how they view themselves in relation to other social actors and groups has not received much attention in the academic entrepreneurship literature. This is surprising, as entrepreneurs, and academic entrepreneurs particularly, engage with many different stakeholders and external actors, making the concept of identity orientation highly pertinent (Fini et al., 2019). In this study, we build on the framework by Fauchart and Gruber (2011), who distinguish between "Darwinian", "Communitarian", and "Missionary" identity orientations.<sup>2</sup> Founders with a strong Darwinian orientation are motivated by self-interest, which is reflected in the drive to, for instance, make money, create personal wealth, and gain market share. Founders with a salient Communitarian orientation view themselves in relation to a specific community they want to support and be supported by. Lastly, founders with a strong Missionary orientation take society-at-large as their frame of reference. They want to advance a particular cause and value responsible behavior that contributes to a better world.

Building on existing literature and exploratory interviews with 29 entrepreneurs, we argue that, through their doctoral, postdoctoral and/or other academic work, academic founders have been socialized into the academic logic of peer recognition, feedback and the creation of societal benefits (Merton, 1973; Murray, 2010). We propose that this imprints their identity orientation as an entrepreneur, (a) making them less focused on pure financial merit than non-academic founders, which implies a weaker Darwinian orientation; and (b) making them more sensitive to peer comparison and societal impact than non-academic founders, which implies a stronger Communitarian and a stronger Missionary orientation. We further argue that given their weaker Darwinian orientation, academic entrepreneurs will pay less attention to the expected positive consequences of venture growth for themselves than non-academic founders. Given their stronger Communitarian orientation, they will give more weight to the expected negative consequences of venture growth on community intimacy than non-academic founders. Finally, their stronger Missionary orientation will lead them to value more the potential positive effect of venture growth on social impact. We propose that, overall, these tendencies will lead to lower growth aspirations in academic entrepreneurs than in non-academic founders. We test and largely confirm these hypotheses based on a structural equation model using survey and secondary data from 58 academic and 113 non-academic founders of early-stage technology ventures that participated over four months in a technology start-up competition in Switzerland in 2017.

This study makes several contributions to academic entrepreneurship literature, literature on founders' growth aspirations, and research on founders' identity orientation. First, our study enriches the current understanding of why academic start-ups typically have low economic impact. It advances our insight into the mechanisms that link higher-level institutional characteristics of the university to the individual-level ambitions and performance of academic entrepreneurs (cfr. Call by Klingbeil et al., 2018), by pointing to the mediating role of entrepreneurs' identity orientation. We show that the academic institutional logic imprints its entrepreneurs' identity orientation. And we demonstrate that this identity orientation in turn shapes the growth aspirations these entrepreneurs hold for their venture. As such, the study also answers the call by Fini et al. (2019) to investigate how academic entrepreneurs view themselves in reference to other social actors, an overlooked theme in the academic entrepreneurship literature. Second, our findings improve our understanding of founders' growth aspirations by clarifying that not all entrepreneurs value different consequences of growth equally. We explain that a founder's identity orientation will affect the value he/she attributes to specific expected consequences of growth (including consequences for personal wealth, relationships with lead users and partners, and societal impact) and therefore also his/her actual growth aspirations. Finally, we contribute to the existing literature on founders' identity orientation, which has typically ignored how an identity orientation is activated or becomes salient (Ramarajan, 2014). We advocate that the academic institutional logic, with its emphasis on peer recognition, feedback and the creation of societal benefits, shapes academic entrepreneurs' identity orientation. More in general, we propose that founders' identity orientations are not necessarily innate, but can be imprinted by their institutional environment. The findings of this study also have important consequences for technology transfer policies at university and societal level. Either one accepts that disruption and economic growth will not result from academic start-ups, or one must rethink the way in which scientists and engineers are trained, long before they engage in commercial activities, in order to embed financial performance into their reference frame and self-evaluation methods. Equally relevant may be stimulating business actors like venture capitalists and former researchers with a successful business career to engage in respectively financing and developing academic start-ups, thereby infusing a business logic into these ventures.

## 2. Theoretical framework and hypotheses

The importance of a founder's identity orientation was first introduced in the entrepreneurship literature by Fauchart and Gruber (2011). As explained in detail by Sieger et al. (2016), Fauchart and Gruber (2011) use a systematic assessment approach drawing on work by Brewer and Gardner (1996), who contrasted three types of identity orientation. According to Brewer and Gardner (1996), individuals can see themselves (a) as independent persons, differentiated from others by their unique traits, (b) as connected to significant others via role relationships, and (c) as members of a larger group (Brewer and Gardner, 1996; Brickson, 2000; Brickson and Brewer, 2001). At the basis of these three types of identity orientation lie different social motivations, reference frames, and sources of self-evaluation (Brewer and Gardner, 1996).

By systematically comparing the social motivations, reference frames, and sources of self-evaluation of a sample of entrepreneurs, Fauchart and Gruber (2011) identify three "pure" types of identity orientations – "Darwinian", "Communitarian", and "Missionary" – as well as hybrid forms that entail features of these primary types. Their framework posits that Darwinian founders are motivated by self-interest, which is reflected in the drive to for instance make money, create personal wealth, and gain market share. Communitarian founders, on the other hand, want to support and be supported by a community characterized by meaningful relationships. They want to bring useful solutions to community members. And they evaluate their

<sup>2</sup> Fauchart and Gruber (2011) and authors citing their work use the term "social identities" instead of "identity orientations". However, according to Brewer and Gardner (1996), on whose work the analysis by Fauchart and Gruber (2011) was based, only individuals who relate to social groups (such as Missionaries) can be said to have a "social identity". In this view, Darwinians or Communitarians cannot be classified as having a social identity. The current study therefore uses the term identity orientation, which was introduced by Brickson (2000) in order to improve conceptual clarity, and which is more appropriate to describe Darwinians, Communitarians, and Missionaries.

performance based on whether the solution truly satisfies a need and whether the company as such fulfills its role compared to a role standard determined by the founder him- or herself or by community members. Lastly, Missionary founders want to advance a particular cause and value responsible behavior that contributes to a better world. Their frame of reference is the society-at-large, and they evaluate organizations through intergroup comparisons (e.g. producers of renewable energy versus producers of fossil fuels).

The current study advances founders' identity orientation as an important mediating mechanism between their professional background and the growth aspirations they hold for their venture. We argue that the practices, values, and rules of a specific professional environment will affect the growth aspirations of entrepreneurs emerging from that professional environment because they imprint the extent to which these professionals take external actors' needs and views into account in their motivations, reference frames, and self-evaluation. Both in an academic and in a business environment, the social motivations, reference frames, and self-evaluation criteria of individuals have an important impact on their professional decisions and behavior. In an academic environment, employees have a lot of freedom to choose the topics or projects they want to work on (Merton, 1973; Sauermann and Stephan, 2013). As a result, how academics see themselves and what motivates them strongly affects their decisions and performance both as a researcher and as an entrepreneur (e.g., Bercovitz and Feldman, 2008; Balven et al., 2008). Also in a business environment, employees' identification with other actors and motivations have been shown to affect their creativity, commitment and work performance (Hirst et al., 2009; Kuvaas et al., 2013). And founders' Darwinian, Missionary, and Communitarian orientations have been demonstrated to affect their decision-making logic and actual decisions with respect to start-up and expansion (Fauchart and Gruber, 2011; Alsos et al., 2016; Powell and Baker, 2014, 2017). Overall, professionals' identity orientation hence is a relevant mechanism to investigate in the context of our study.

In the remainder of this paper, we will develop our hypotheses by building on the insights of Fauchart and Gruber (2011), on the rich underlying literature on identity orientation (Brewer and Gardner, 1996; Brickson, 2000, 2005; Ramarajan, 2014; Ramarajan et al., 2017), as well as on interviews with 29 founders which we conducted to fully understand (a) how founders' identity orientation is imprinted by socialization into their professional (i.e., academic or non-academic) logic, and (b) how it affects the growth aspirations they have for their venture. We interviewed a convenience sample of 14 academic and 15 non-academic founders in Switzerland using a semi-structured questionnaire with open ended questions, based upon the conceptual frameworks of Fauchart and Gruber (2011) and Brewer and Gardner (1996), to assess these founders' social motivations, reference groups and bases for self-evaluation. Interviews ranged from 28' to 102' and covered, in addition to identity orientation questions, general questions about their ideas and technologies, and about the history and development of their project. All interviews were fully transcribed and covered 25 h of interview materials.

While most work on founders' identity orientations describes founders as either having or not having a certain identity orientation, the current study takes a different stance. It starts from the premise that individuals can manifest the three identity orientations (Darwinian, Communitarian, and Missionary) to different degrees. This implies that founders can, for example, have a very weak, weak, medium, strong, or very strong Darwinian orientation. We prefer this conceptualization as recent evidence shows that academic entrepreneurs' identities do not develop overnight but through a complex, dynamic, and transitional process (Hayter et al., 2022). This process entails "iterative engagement in provisional trials of possible future selves" (Ibarra and Petriglieri, 2010, p. 11) and "identity work", whereby the individual must learn the practices and norms related to the identity he or she aspires (Farmer et al., 2011; Ibarra, 1999). Our conceptualization also fits with the broader literature which depicts an individual's identity orientation as

consisting of multiple orientations that may be salient (Brewer and Gardner, 1996; Ramarajan et al., 2017). As a result, we develop separate hypotheses regarding Darwinian, Missionary, and Communitarian orientations, and the degree to which each of them is salient in a founder.

## 2.1. Institutional logics and identity orientation

The institutional logics perspective posits that how individuals view themselves is embedded in institutional logics (Thornton et al., 2012: 87). Institutional logics have been defined as "the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality" (Thornton and Ocasio, 1999: 804). Logics are taken for granted assumptions and practices that are shared by members of a particular institution such as a nation, a family, a profession or a corporation and therefore provide legitimacy for an individual's beliefs, norms or values (Thornton et al., 2012). They become deeply engrained in a person's cognition and preferences via training and socialization (Van Maanen and Schein, 1979; Wanous, 1992).

The academic logic is characterized by four dimensions (Sauermann and Stephan, 2013). First, academic institutions have the mission to contribute to the public knowledge base through basic research, with the intent to advance societal goals. In academia, the focus is traditionally geared towards generating fundamental insights, with limited regard for immediate commercial applications. Second, researchers are ought to choose projects in line with their personal interest or based on the expected contribution to science. Third, the logic prescribes the open disclosure of research results. And finally, the most important rewards for academics are peer recognition and the person's status in the scientific community (Murray, 2010). The academic logic becomes strongly engrained in academics' cognition and preferences, as they undergo intensive training and lengthy socialization (Fisher et al., 2016; Hahn et al., 2019; Merton, 1973; Pratt et al., 2006). As Jain et al. (2009, p. 923) point out, academics "typically undergo a unique set of experiences related to these norms that become inextricably intertwined with their identity" (see also Colombo and Piva, 2012; Meek and Wood, 2016).

It can be expected that this specific set of experiences will imprint academics' later decision-making as entrepreneurs. Imprinting theory posits that individuals develop characteristics from experiences and persistently reflect these later on and in different environments (Marquis and Tilcsik, 2013). As explained by Hahn et al. (2019, p. 899), imprinting theory "suggests that individuals of the same occupation share common beliefs and cognition due to shared norms and experiences (Dokko et al., 2009) and that individuals carry these career imprints with them as they move across organizational boundaries and occupations (McEvily et al., 2012)." In the context of entrepreneurship, imprinting theory describes how the cognition, values and behaviors developed during prior career experiences, imprint later decisions as entrepreneur. For example, Mathias et al. (2015) find that entrepreneurs that are imprinted by different sources (e.g. family and friends versus professional environment) will pursue different types of opportunities. Related to academic entrepreneurship, Fini and Toschi (2016) observe that academic entrepreneurs mostly leverage cognitive dimensions that align with their role as researchers. They build more on their awareness of technical competencies and less on their entrepreneurial self-efficacy and awareness of managerial skills than non-academic entrepreneurs. Bercovitz and Feldman (2008) demonstrate that these effects carry over longer career paths. They observe that not only the experiences of an academic in his/her current research institute, but even those with his/her prior employer affect the decision to engage in technology commercialization. In line with literature on socialization and imprinting, we will hypothesize that the academic environment and its specific institutional logic influence the identity orientation of academic founders such that this identity orientation is different from that of non-academic founders.

We first argue that founders who start a venture based on their scientific work are imprinted with a lower drive to make money, create personal wealth, and gain market share – reflecting a less salient Darwinian orientation – than founders that come from a business environment. Their scientific work in the years prior to founding the company has socialized them into the academic profession. In this profession, individuals typically do not compete with each other within the same group or department but rather benchmark themselves to a more abstract role model of an idealized PhD representing a number of high impact publications (Visintin and Pittino, 2014). Researchers socialized into such academic beliefs, norms and values prioritize novel technical solutions which might lead to high impact publications over developing practical applications to maximize commercial success (Ambos et al., 2008; Jain et al., 2009). The latter are generally not valued as much as scientific contributions and therefore bring less status with them. As a consequence, the individual pursuit of commercial success, which is characteristic of a Darwinian orientation (Fauchart and Gruber, 2011), is a practice that deviates “from the social norms of conducting academically rigorous research” (Ambos et al., 2008: 1427) and is not imprinted in academic entrepreneurs' identity orientation.

A Darwinian orientation would imply that the individual founder or co-founder can pursue his self-interest such as making money or personal wealth by creating a company which outcompetes competitors in a proven market. This contrasts with what academics are typically trained in. Academic founders have some desire to benefit financially from their entrepreneurial pursuit. However, they clearly indicate non-economic factors, such as being the custodian of a novel technology or utilizing their invention for societal good, as the driving forces for their entrepreneurial endeavors (Jain et al., 2009). According to Hayter (2011), academic founders, unlike most other entrepreneurs, often regard economic success as a helpful side effect rather than the primary objective. They strive to be the first in offering a specific scientific solution, and as such get rewarded with recognition and status in the scientific community (Lam, 2011; Sauermann and Stephan, 2013). One of our interviewees, an academic entrepreneur who had developed a technology to detect microparticles explained what he wanted to achieve with the company:

*“The reason why I started this company with a focus on semi-conductors is because micro-particles are a huge problem in that industry... [...] many people say it's the number one problem, it's just killing the chips... And you know, we are not solving the entire problem of course, but to solve this problem, ... one of the very significant bottlenecks is ... optical metrology. Metrology means ... you measure, you detect something. And they couldn't detect these very small particles. And so, if you cannot detect them, you don't know where they're coming from. So, you cannot control. And I said, okay, this looks like this is a huge problem.”*

The respondent never mentioned personal returns as a reason for considering starting a company. Another interview was with two academic entrepreneurs who had developed a solution to monitor brains for early-stage Alzheimer disease. When asked why they wanted to start a company, they discussed their focus on technical aspects and the limited attention they had paid to the market potential of their idea:

*“We are physicists and were already working on this kind of technology when [...] a doctor from UniSpital talked to us about the need he had to follow up his patients. So, we sort of knew the problem and we also know we can solve it.... Compare us with a small VW, the big pharma make a Rolls Royce.”*

Compare these with quotes from non-academic founders we interviewed. Two students (one computer scientist and one mechanical engineer) conceptualized an App for refugees in Europe and told us the following:

*“We don't really care what we do, which product ... we had initially a very different idea [...]. For us there is a huge focus to be financially successful...”*

The prime founder of FaceYou, a tool and service set to produce your own profiling video and portraits, described himself as follows when asked for his motivation to start a company and frame of reference.

*“We started in HR, but we found out that there is less money there so we pivoted to profiling videos where we can be more unique...in three to five years, I will not be the CEO anymore...the exit will have happened...now it needs me, but I will have organized the exit by then...and have cashed in...”*

Based on our understanding of the academic profession as an institution with its own norms, beliefs and values (logics), which are imprinted on academic entrepreneurs, and based on the interviews we did to understand the identity orientation of the entrepreneurs, we conclude that academic entrepreneurs are much less oriented on “me-oriented” aspects of the self-concept (such as picturing themselves as successful entrepreneurs and making money) than non-academic entrepreneurs. Given that self-interest and strive for personal wealth are exactly the key basic social motivations that define a Darwinian orientation (Fauchart and Gruber, 2011; see also Brickson, 2007), we hypothesize that:

**H1a.** Academic founders display a weaker Darwinian orientation than non-academic founders.

Second, we propose that founders who start a venture based on their scientific work are imprinted to see themselves more as connected to significant others and will therefore display a more salient Communitarian orientation than non-academics founders. It is known that high impact researchers, defined as those who publish in leading journals and collect a high number of citations, tend to serve as role models for PhD students and postdocs (Merton, 1973). The peer evaluation by leading academics as key opinion leaders is often considered a core element of appreciation for which academics are willing to accept significantly lower salaries (Stern, 2004). Such comparison with significant others is typical for a Communitarian orientation (Fauchart and Gruber, 2011).

In our interviews, this imprinted Communitarian orientation was illustrated by different quotes. For instance, in our group of academic founders, a postdoctoral researcher, who wanted to start a company based upon a unique solution she had developed to make foam out of waste material, clearly valued this appreciation of significant others. More specifically, she stressed the importance of feedback from lead users on her technical solution:

*“my foam is currently a good enough solution for the packaging industry that is under pressure to become more sustainable. However, I need more than a year of further development time to bring it to the level of XX (a pioneering, disruptive innovator) in the sport shoe industry. They really want to be seen as the number one sustainable brand, but I need to do more development; I am afraid that my foam is not good enough yet. I don't dare to send them a sample yet...”*

An academic founder of a venture in dermatology stated that he liked his company because it allowed him to further develop his technological solution in close collaboration with lead surgeons and doctors. He experienced their approval and input as extremely rewarding:

*“...it's really interesting to work with surgeons and doctors. They appreciate my role as a technology entrepreneur helping them. These are the things that really motivate me.”*

Two academic founders who consider themselves still on the way from academia to industry mentioned how much they valued the feedback from mentors and advisors on their technology (something they could apparently not get from investors):

*"For us getting feedback on our technology and getting feedback on the commercialization path is what keeps us driving...investors are not interested in the technology, they just are driven by financials...getting positive feedback from mentors and advisors [...] is important for us..."*

In contrast, the non-academic founders gave us a completely different view on their motivation and reference frame. Their interactions with others were not seen to obtain feedback on their technological solution, but primarily served their financial goals. For instance, the founder of a medical equipment device company for the elderly home markets discussed participation in a business plan competition. He stressed that the goal was to win the competition. He did not mention feedback from lead users, potential partners or coaches on his technical solution as reasons for participating:

*"Participating in the business plan competition makes you focus as a founder [...]. As a founder you tend to be so much involved in administrative tasks that it is important to have the kind of goal to realize...after all, we are all participating to win the competition..."*

Along the same lines, a serial entrepreneur who had founded a company to use digital methods to teach science to children in High School focused on the financial rewards, but not on the feedback one can obtain in a business plan competition:

*"Business plan competitions [...] are good to bring in some early stage money...it helps us develop the product further."*

In both cases, the individual focusses on his or her own interests and has little orientation towards the interaction with others. On the contrary, the focus is on raising more money rather than getting feedback on the quality of the solution offered.

As such, we argue that, through socialization into and imprinting of the academic institutional logic, academic founders look much more for role models and feedback than non-academic founders. They are also more likely to compare themselves and their solutions to the expectations of these significant role models. Satisfying these peers motivates them and is part of themselves, which is in line with a salient Communitarian orientation (Fauchart and Gruber, 2011). Academic founders seem to be motivated much more than non-academic founders by getting feedback from lead users of their technology and from partners and advisors who help them improve their solution. We therefore hypothesize:

**H1b.** Academic founders display a stronger Communitarian orientation than non-academic founders.

Third, it can be argued that academic founders are imprinted with the basic motivation to advance collective welfare and contribute to a better world, thereby displaying a stronger Missionary orientation than their non-academics counterparts. Academic institutions see science commercialization primarily as a vehicle for creating impact by disseminating technology and making it available to companies and society-at-large (Fini et al., 2018). Given that scientists are trained and socialized in accordance with these objectives, they adopt the intention to generate knowledge and develop technology in the benefit of the society-at-large (Jain et al., 2009; Meek and Wood, 2016), and they often engage in science commercialization with the intent to leverage their innovation for a broader societal benefit, as described in the academic entrepreneurship literature (Hayter, 2011). This leaves an imprint on entrepreneurs emerging from an academic environment. In particular, the following quote gives an example of how academic entrepreneurs – along the lines of a Missionary orientation – describe their motivation for starting up a company:

*"I do a PhD in food science because I think for our generation it is important to advance our understanding of sustainability and contribute against climate change. That is also why me and my colleague are founding this company in which we will provide a label to food you can buy in the supermarket that will give you in a very easy-to-understand*

*way both the sustainability and nutritional value. We are part of that movement against climate change and want to contribute to it..."*

One of the important characteristics of an academic logic lies in the individual freedom of researchers to choose their projects (Merton, 1973; Sauermann and Stephan, 2013). Our exploratory interviews show that, unlike in companies where the selection of a project is based on the highest expected return on investment, scientists in the academic community typically pursue projects and start companies that advance collective welfare:

*"Our technology is a solution in the battle against antibiotics resistant antibacterial. I was the postdoc who joined the lab when he (the co-founder) was doing a PhD on this. I was immediately into it. It is important to solve this problem. Big pharma is not enough interested I think..."*

*"I think our project is about developing a therapy that can save a lot of lives. I think this is one of my driving motivators: to develop something that has an impact [...] All three of us, the core team, we are PhD students in that lab. And we concluded, also together with our professor, that the time is right now to stop the feasibility phase and start the product development, create something out of [the technology], and change something."*

In the non-academic founder population, founders may also have ideas with a missionary angle. However, our exploratory interviews suggest that contributing to these grand challenges is not the core goal of these non-academic founders, but much more a side effect or a means to reach economic success and financial objectives. For instance, the main founder of a medical equipment company which specialized in dialysis equipment for nursing homes said:

*"Yes, it is nice to think about the impact we can have. However, we all have 10+ years of experience. We are not like the typical PhD student solving a problem in the world. The financials, the efficiency, the cost, it all has to match..."*

Another non-academic entrepreneur told us:

*"This is our second start-up. From our previous one we already know that it is the money that counts. We develop a knowledge management system for customers who want to pay for it. In our previous one we wanted to improve the education system...but you know, German schools loved it but didn't want to pay for it..."*

Based on these insights from the literature and our preparatory interviews, we conclude that, compared to a non-academic environment, the academic environment imprints a more salient Missionary orientation onto academic entrepreneurs, which is characterized by the drive to realize a societal impact (Fauchart and Gruber, 2011; Brickson, 2007). We therefore hypothesize that:

**H1c.** Academic founders display a stronger Missionary orientation than non-academic founders.

In the following section, we will argue that these imprinted identity orientations will affect founders' growth aspirations.

## 2.2. Identity orientation and growth aspirations

Previous work has demonstrated that founders' growth aspirations are determined by their environment (e.g., their country's intellectual property rights and social security system, see Autio and Acs, 2010; Hessels et al., 2008) and socio-demographic characteristics such as gender, human and financial capital (see Puente et al., 2017; Autio and Acs, 2010), but also by what they expect to be the consequences of firm growth. Wiklund et al. (2003; Table 4, p. 259) find that entrepreneurs tend to think that a doubling of their firm's size (in terms of employees) would substantially increase their personal income, the time they could

spend on work tasks they like, and the independence of the firm vis-à-vis customers, suppliers, and lenders. They also expect a positive, although somewhat smaller effect of firm growth on their workload, control over operations, product/service quality, and employee well-being. Wiklund et al. (2003, Table 5, p. 260) further show that, for the average entrepreneur in their sample, only the expected consequences for employee well-being and, to a lesser extent, for personal income affect his/her actual growth aspirations. We argue below, however, that the expected consequences of growth do not affect all entrepreneurs' growth aspirations equally. Previous work has already shown that founders' personal values (Bolzani and Foo, 2018), time-perspective (Prasastyoga et al., 2021), regulatory focus and perceived competences (Prasastyoga et al., 2018) matter for their growth aspirations. We propose that founders' identity orientations will affect the value they attribute to different expected consequences of growth and will therefore also influence their actual growth aspirations.

First, it can be argued that founders with a more salient Darwinian orientation will pay more attention to the expected positive consequences of growth for themselves as an individual (such as, the expected consequences for their personal income) than founders with a weaker Darwinian orientation. Research on identity orientations has indeed posited that founders with a salient Darwinian orientation are driven by self-interest (Fauchart and Gruber, 2011). Based on qualitative data gathered from ventures in the sports industry, Fauchart and Gruber (2011) find that this self-interest is reflected by the intent to establish a strong and profitable firm, to make money, create personal wealth, and have a successful career. We expect that this stronger emphasis on the expected positive consequences of growth for themselves as an individual will in turn positively affect the founder's aspirations for venture growth. Cassar (2007), for instance, investigates career reasons of nascent entrepreneurs, and links these with the entrepreneurs' growth preferences. He shows that the importance an entrepreneur attaches to financial success is key in explaining the intended size of the venture. Similarly, Bolzani and Foo (2018) observe that founders' growth aspirations are typically linked to personal values related to power, achievement, and self-direction; values that fit very well with a salient Darwinian orientation as identified by Fauchart and Gruber (2011). Therefore, we hypothesize that:

**H2a.** A stronger Darwinian orientation relates to higher growth aspirations.

Second, we propose that founders with a stronger Communitarian orientation will give more weight to the expected negative effects of venture growth on the relationship with their community members, as compared to founders with a less salient Communitarian orientation. Wiklund et al. (2003) find that venture growth is expected to make the venture less dependent on customers, suppliers, and other partners. While a particular type of entrepreneurs may value this independence, we expect the opposite for individuals with a strong Communitarian orientation. In case a Communitarian orientation is salient, an individual cares about relationships with meaningful partners, and about supporting (and being supported by) a community. Founders that display a salient Communitarian orientation attach particular importance to building meaningful stakeholder relationships through strong dyadic ties. These relationships are characterized by trust and mutual concern, and are rooted in the motivation to understand and support each other (Brickson, 2007). The strong ties are typically embodied by frequent interactions, reciprocity, and emotional intensity and relate to prosocial rather than financially oriented behavior of an entrepreneur (Brickson, 2007; Ramarajan et al., 2017). As a result, the efforts of a founder with a stronger Communitarian orientation will be directed towards a particular set of people, limiting "the individual's sphere of concern to its valued constituencies" (Leavitt et al., 2012: 1319). Given this focus on a restricted group of people, founders with a more salient Communitarian orientation will pay more attention to the expected negative consequences of firm growth on community intimacy and will therefore

develop lower growth aspirations than founders with a weaker Communitarian orientation. Or in other words:

**H2b.** A stronger Communitarian orientation relates to lower growth aspirations.

Finally, it can be argued that founders with a stronger Missionary orientation will give more weight to the potential positive effects of venture growth in terms of societal impact than founders with a weaker Missionary orientation. In prior work, scholars have stated that growth is a key performance goal when the objective is to advance a social cause, because it supports the desire to achieve a societal impact (Dees et al., 2004; Moss et al., 2011). A salient Missionary orientation motivates a founder to promote the welfare of the society-at-large and to achieve a societal benefit that is as big as possible. Founders with a strong Missionary orientation thus strive to protect and foster societal welfare (Brickson, 2005; Fauchart and Gruber, 2011). This identity orientation entails a moral concern towards all humans, and "is associated with a perceived broad moral constituency base" (Leavitt et al., 2012: 1319). Fauchart and Gruber (2011: 946) for instance quote the founder of a sports equipment company, who said:

*"What I seek to accomplish is to reach as many people as possible and let them know the problems of modern consumption and offer them an alternative when it comes to their clothing."*

We therefore expect that, because of their stronger emphasis on the expected societal benefits resulting from growth, founders with a stronger Missionary orientation will have higher growth aspirations than founders with a weaker Missionary orientation. In fact, Bolzani and Foo (2018) observe that, apart from the more self-centered personal values mentioned above, also benevolence shows a clear link with founders' growth aspirations. We can thus expect that a stronger desire to grow the societal impact of the venture, reflected in a more salient Missionary orientation, will lead to a stronger desire to grow the company itself, because the founder will envision that a larger company would enable him or her to realize the envisioned societal impact. In other words, we hypothesize that:

**H2c.** A stronger Missionary orientation relates to higher growth aspirations.

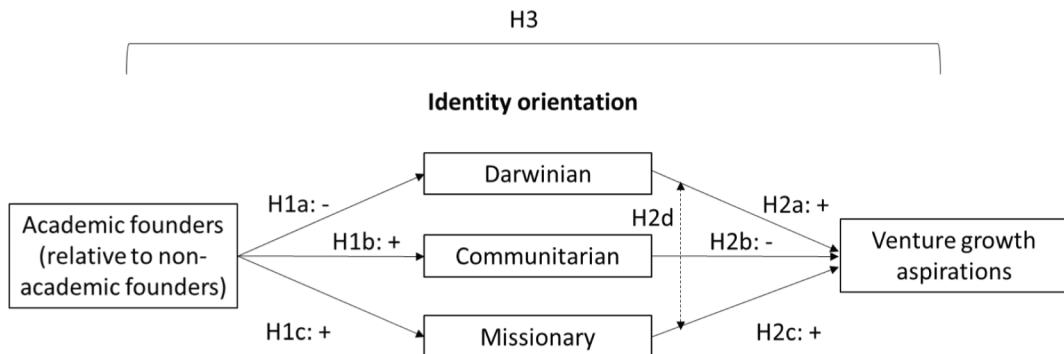
While we expect that both the extent to which a founder has a Darwinian orientation and the extent to which he/she has a Missionary orientation will have a positive effect on growth aspirations, we do not expect these effects to be equally large. We expect that the positive consequences of growth are valued more from a Darwinian orientation than from a Missionary orientation. Founders with a salient Darwinian orientation envision that the profitability created during their career will allow them to reap the benefits of their entrepreneurial endeavors (Fauchart and Gruber, 2011). Growing the size of the company is a crucial mechanism for these founders to make more money, to gain market share, and leverage the work of employees as much as possible, which in turn helps them realize their clear-cut goal of maximizing personal wealth. Founders with a salient Missionary orientation, on the other hand, have the goal to maximize societal impact and see different pathways to achieve this, apart from growing the venture itself. They can be expected to pursue the maximization of the societal impact not only by growing the company itself, but also through other mechanisms. For example, as outlined by Brickson (2007), they tend to create more non-profit ties and alliances with other organizations, because they are often convinced that no one organization has all the necessary capabilities to solve the societal problem at hand. We therefore hypothesize that:

**H2d.** A stronger Darwinian identity orientation relates more positively to growth aspirations than a stronger Missionary identity orientation.

As outlined above and graphically represented in Fig. 1, we theorize that academic founders will display a less salient Darwinian orientation

Notes: n = 171 entrepreneurs in 119 projects; method = delta;  $\beta$  = standardized coefficient.  
 GA = growth aspirations; IO = identity orientation.

### Conceptual Framework



**Fig. 1.** Conceptual framework.

and a more salient Communitarian orientation compared to non-academic founders (H1a and H1b). This is in turn expected to translate into lower growth aspirations for their venture (H2a and H2b). Furthermore, we expect that their adherence to the academic institutional logic will engender a more salient Missionary orientation (H1c), which is expected to positively relate to growth aspirations (H2c). We expect this increase in growth aspirations resulting from a more salient Missionary orientation to be less pronounced than the decrease in aspirations resulting from a less salient Darwinian orientation (H2d), which implies that, overall:

**H3.** Academic founders will display lower growth aspirations than founders from a non-academic environment because of the combined mediating effects of their identity orientations.

### 3. Method

#### 3.1. Data and sample

To test our hypotheses, we collected data in the context of a start-up competition in Switzerland in 2017. The contest was publicly known for its focus on technology and was endorsed by the leading Federal Institute of Technology with campuses in Zürich and Lausanne (better known as ETHZ and EPFL). However, it attracted academic as well as non-academic entrepreneurs. Founders and teams of founders were allowed to participate if at least one team member was a Swiss resident. Furthermore, if the start-up was already incorporated, the official founding date had to be within a period of two years before the submission deadline of the competition. All founders who registered for the competition (between February and April) could benefit from advice and support events between the moment of registration and the final award ceremony in June. The competition had a total of 252 registered projects. None of the projects had obtained funding prior to entering the competition.

We collected quantitative data on these projects and their founders from several sources and at different points in time. All founders who enrolled for the start-up competition were requested to complete two surveys: (1) a first survey upon registration, in which they provided us

with information about the independent variables and the mediators, and (2) a second survey at the end of the competition that contained questions that assessed their growth aspirations. Out of 252 ventures/projects that created a project on the contest website, 284 founders from 171 projects completed the first survey.<sup>3</sup> Out of these 284 founders, 171 individuals completed a second survey, on average 3.6 months later.<sup>4</sup> Furthermore, we obtained project related information (industry sector and whether the offer entailed a service) from the contest organizers and the contest website. And demographic data collected during the first survey (academic position, gender, degree level) were triangulated with data from LinkedIn profiles and CVs.

We did not observe significant differences between non-academic and academic founders with regards to (1) gender, (2) age, (3) whether the project represented their primary occupation, (4) whether they had asked external actors for advice, and (5) the number of co-founders. We also did not observe significant differences regarding (6) the importance attributed to the following goals: (a) attaining proof of concept, (b) identifying target markets, (c) attracting financing, (d) identifying a roadmap to commercialize the idea, and (e) starting or improving customer acquisition. We did find a significant difference regarding the importance attributed to starting a company based on the idea, with non-academic founders scoring lower on this goal than academic founders (3.1 and 3.6 out of 5 respectively, p-value of 0.03). The non-academic founders had on average more years of working experience (10.77 years) than the academics (7.85 years). Also, the non-academic founders had on average created more startups (0.50) than the academic founders (0.17); however their entrepreneurial experience was still rather limited.

<sup>3</sup> To assure that the data collection was not impacted by a non-response bias, we compared the 171 projects for which at least one founder completed the first survey with the 81 projects for which no one filled in the first survey. Both groups displayed comparable compositions in terms of being active in high-tech (versus low-tech) industries ( $\chi^2_{(1)} = 0.370$ ;  $p = 0.543$ ).

<sup>4</sup> We also compared the 171 individuals that completed both surveys with the 113 individuals that only completed the first survey. Mann-Whitney  $U$  tests did not reveal any significant difference in Darwinian identity orientation ( $p = 0.135$ ), Communitarian identity orientation ( $p = 0.745$ ), Missionary identity orientation ( $p = 0.063$ ), growth aspirations reported in the first survey ( $p = 0.871$ ), gender ( $p = 0.237$ ), or degree level ( $p = 0.182$ ).

### 3.2. Variables

#### 3.2.1. Growth aspirations

In the second survey, respondents provided us with their preference for the growth of their business by indicating how much they agreed with the statements “growing as rapidly as possible is the most important goal of my business” (Autio et al., 2000), and “I want my business to be as large as possible” (Gartner and Liao, 2012). The statements were displayed using a 7-point Likert scale, ranging from strongly disagree to strongly agree. Cronbach's alpha of the scale equals 0.753, which is acceptable (Hair et al., 2013).

#### 3.2.2. Founder identity orientations

We measured founder scores on all three identity orientations. We used the validated 15-item scale developed by Sieger et al. (2016). The scale comprises items that assess the three different dimensions of each orientation: the founder's basic social motivation, basis for self-evaluation, and frame of reference. The number of questions inquiring each sub dimension differs per identity orientation (see Sieger et al., 2016, for more information).

Each identity orientation was assessed by a total of five questions, measured on a 7-point Likert scale (strongly disagree - strongly agree). The level of Darwinian orientation (Cronbach's alpha = 0.691)<sup>5</sup> was gauged via statements such as “when managing this project or company, it is very important to me to establish a strong competitive advantage and significantly outperform other companies in my domain” (Sieger et al., 2016). Furthermore, respondents indicated their level of Communitarian orientation (Cronbach's alpha = 0.886) through for example “I create this project or company in order to solve a specific problem for a group of people that I strongly identify with (e.g., friends, colleagues, club, community)” (Sieger et al., 2016). Lastly, to ask respondents about their Missionary orientation (Cronbach's alpha = 0.858), the scale included statements such as “as a founder of this project or company, it is very important to me to make the world a ‘better place’ (e.g., by pursuing social justice, protecting the environment)” (Sieger et al., 2016).

Sieger et al. (2016) recode the scores on these Likert scales into six dummy variables, representing (1) Pure Darwinians, (2) Pure Communitarians, (3) Pure Missionaries, (4) Darwinian/Communitarian Hybrids, (5) Darwinian/Missionary Hybrids, and (6) Darwinian/Communitarian/Missionary Hybrids. However, we use the continuous items in our analysis. This decision was driven by conceptual reasons explained above (see *Theoretical framework and hypotheses* section). We did run a robustness test with the operationalization of Sieger et al. (2016) (see below).

#### 3.2.3. Academic founder

This variable was set to 1 if the respondent indicated to be a professor (3 cases), a postdoctoral researcher (13 cases), a doctoral student (12 cases), a teaching assistant (3 cases), a scientific assistant (11 cases), and/or to have another academic role (24 cases, including research fellows, project managers, research engineers, etc.). In all other cases, it was set to 0. We gathered this information via the first survey and crosschecked the answers with the business plan/idea submission and CVs afterwards. Several respondents indicated to have multiple academic roles, leading to 58 (or 33.9 %) of the respondents being classified as academic founders.

#### 3.2.4. Control variables

First, we included the founder's *gender* in all equations of the model. Extant research argues that women would for instance see themselves more as connected to significant others via role relationships than men (Gabriel and Gardner, 1999), which would correspond, in an entrepreneurship context, to a more salient Communitarian orientation. The variable gender equals 0 for men, and 1 for women. 24.6 % of the respondents were female.

Second, we controlled for the individual's *degree level* in the model, as it may influence a founder's growth aspirations (Delmar and Wiklund, 2008). Respondents indicated their highest obtained degree level: preschool (0 %), primary school (0.6 %), high school (5.8 %), bachelor's degree (23.4 %), master's degree (39.8 %), or PhD (30.4 %). Answers were translated into scores between 1 and 6, which were treated in a continuous way.

Third, we added four venture level control variables. First, we made a distinction between a service versus a product offer. The variable *service offer* was coded based on short project descriptions written by the project founders. We gave the variable a value of 1 if the project offered services and 0 otherwise. 97 out of 171 respondents were active in a service project. Furthermore, founders chose their project's industry from a dropdown list upon registration for the contest. Based on this information, which we received from the contest organizers, we coded whether the project was operating in a high-tech industry or not (Delmar and Wiklund, 2008). We adhered to the definition of high-tech sector outlined by the British Venture Capital Association (BVCA) to divide the sample between high-tech and low-tech projects. As such, we assigned the value 1 to the variable *high-tech sector* if a project operated in “Health Care Equipment & Services”, “Pharmaceuticals, Biotechnology & Life Sciences”, “Software & Services”, “Technology Hardware & Equipment”, or “Telecommunication Services”, and 0 otherwise. 102 out of 171 individuals founded a high-tech project. Finally, we added *venture size* and *project age* i.e. the number of team members collaborating on the project and the difference between the date of survey completion and the moment of project initiation at the moment of application. The median venture size was three team members. The average project age was 1 year and 8 months.

Fourth, in the equation estimating individual growth aspirations, we added *entrepreneurial self-efficacy* as a predictor. Following Zhao et al. (2005), entrepreneurial self-efficacy was measured using a 4-item scale (Cronbach's alpha = 0.774), with questions such as “How confident are you in your ability to successfully identify new business opportunities?” and “How confident are you in your ability to commercialize an idea?” Answers were measured on a 7-point Likert scale (extremely unconfident – extremely confident). Finally, similar as in prior research, we controlled for *start-up experience* in the equation estimating growth aspirations (Davis & Shaver, 2012). This variable was set to 1 if the entrepreneur had founded at least one company before, and 0 otherwise. 25.7 % of the respondents had start-up experience. Table 1 provides an overview of the descriptive statistics.

### 3.3. Measurement model

In order to test the construct validity of the multi-item variables, we conducted a confirmatory factor analysis (CFA). Our theoretical interest is situated at the individual level. However, our data are clustered in nature, as for several projects we have multiple respondents. We therefore decided to execute a CFA with cluster-robust standard errors (McNeish et al., 2017). The model includes eleven first order and three second-order latent constructs. Besides the first-order latent constructs growth aspirations and entrepreneurial self-efficacy, there are nine first-order constructs for measuring a founder's identity orientations, because there are three orientations (Darwinian, Communitarian, Missionary), and three dimensions per identity orientation (A: basic social motivation, B: basis for self-evaluation, and C: frame of reference) (Sieger et al., 2016). Given that for each orientation, the three dimensions collapse

<sup>5</sup> Even though the Cronbach's alpha of this sub dimension marginally fails to reach the threshold of 0.7 advanced by Hair et al. (2013), we decide to retain the construct in the analyses for theoretical reasons. Furthermore, some scholars deem a Cronbach's alpha acceptable once it exceeds a level of 0.6 (Hair et al., 2013).

**Table 1**  
Descriptive statistics and correlations<sup>a</sup>.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Growth aspirations	4.35	1.23	1.00												
2. Darwinian orientation	5.76	0.81	0.25** <sup>b</sup>	1.00											
3. Communitarian orientation	5.56	1.13	0.17*	0.30** <sup>b</sup>	1.00										
4. Missionary orientation	5.86	0.99	0.19*	0.13†	0.52**	1.00									
5. Academic founder <sup>b</sup>	0.34	0.47	-0.09	-0.09	0.04	0.03	1.00								
6. Self-efficacy	5.94	0.81	0.21** <sup>b</sup>	0.42*	0.30** <sup>b</sup>	0.29** <sup>b</sup>	-0.07	1.00							
7. Start-up experience <sup>b</sup>	0.26	0.44	0.06	0.07	0.00	0.13	-0.22** <sup>b</sup>	0.22** <sup>b</sup>	1.00						
8. Gender <sup>b</sup>	0.25	0.43	-0.17*	-0.01	0.15†	0.15*	-0.04	-0.04	-0.12	1.00					
9. Degree level	4.94	0.91	-0.09	0.07	-0.15*	-0.15*	-0.11	-0.24** <sup>b</sup>	-0.03	1.00					
10. Venture age	1.70	1.32	-0.08	0.03	-0.03	0.05	0.09	0.13	0.05	0.13†	1.00				
11. Service offer <sup>b</sup>	0.57	0.50	0.08	-0.10	0.06	0.01	-0.20** <sup>b</sup>	-0.03	0.08	0.01	-0.32** <sup>b</sup>	-0.20** <sup>b</sup>	1.00		
12. High-tech sector <sup>b</sup>	0.60	0.49	0.07	-0.03	-0.03	-0.07	-0.17*	-0.06	-0.03	-0.01	-0.04	0.04	0.10	1.00	
13. Current venture size	3.12	2.09	0.11	0.14†	0.09	0.02	-0.10	0.12	0.18*	-0.13	-0.06	0.06	-0.04	0.16*	1.00

<sup>a</sup> Pearson correlation coefficients (2-tailed); n = 171 founders.

<sup>b</sup> Correlations with binary variables should be interpreted with care.

† p ≤ 0.10.

\* p ≤ 0.05.

\*\* p ≤ 0.01.

into one overarching construct, we included three second-order latent factors. The model returned a satisfactory fit to the data<sup>6</sup> ( $\chi^2_{(174)} = 249.528$ ; p < 0.001; CFI = 0.939; TLI = 0.927; RMSEA = 0.050; SRMR = 0.064) (Geldhof et al., 2014). Table 2 provides a summary of the measurement model. First, all factor loadings in the model are highly significant (p ≤ 0.005), and surpass the threshold of 0.4 (Floyd and Widaman, 1995). Second, all average variances extracted (AVEs) are higher than 0.5, with an exception for the AVEs of self-efficacy (0.492) and Darwinian orientation (0.474) (Hair et al., 2013). Given that these AVEs are close to the threshold, we decide to retain the constructs in order to remain consistent with the theory. Third, all constructs show acceptable reliability, as the composite reliabilities (CRs) exceed 0.6, and most of them are 0.7 or higher (Hair et al., 2013). In short, the results allow us to approve the convergent validity among item measures. As for discriminant validity, the model returns satisfactory results, because the Fornell and Larcker criterion is satisfied, i.e. for each pair of constructs, both average variance extracted values (cfr. italics on the diagonal in Table 2) are greater than the squared correlation estimate (cfr. below the diagonal in Table 2) (Grewal et al., 2004; Hair et al., 2013). This test also immediately indicates that it is very unlikely that our data are subject to multicollinearity, because the constructs would lack discriminant validity if they were too highly correlated (Grewal et al., 2004).

We tested our hypotheses in a structural equation model (SEM) using the lavaan package in R (Rosseel, 2012). We estimated the model with robust (Huber-White) standard errors to account for the clustered nature of our individual responses within projects (McNeish et al., 2017), and for multivariate non-normality in the data (Finney and DiStefano, 2013). Our data namely violate the assumption of multivariate non-normality, as becomes clear in the Mardia skewness test (MS = 6799.040, p < 0.001) and kurtosis test (MK = 15.418, p < 0.001) (Korkmaz et al., 2014). The fit indices of the SEM model demonstrate that the model adequately fits the data ( $\chi^2_{(313)} = 416.152$ ; p < 0.001; CFI = 0.928; TLI = 0.913; RMSEA = 0.044; SRMR = 0.061) (Hair et al., 2013; West et al., 2012).

#### 4. Findings

Table 3 reports the standardized coefficients, standard errors and p-values of the structural relationships in the model. Given our directional hypotheses, we evaluate one-tailed tests at a 95 % confidence interval (Cho and Abe, 2013; see also Gamache et al., 2015, for a likewise approach). The results show that an academic logic induces a significantly weaker Darwinian orientation ( $\beta = -0.198$ ; p = 0.020) and a significantly stronger Communitarian orientation ( $\beta = 0.142$ ; p = 0.046), supporting Hypotheses 1a and 1b, respectively. At the same time, founders in academia display a more salient Missionary orientation, yet the difference with the non-academic founders is insignificant ( $\beta = 0.102$ ; p = 0.114). Hypothesis 1c is therefore not supported.<sup>7</sup>

Furthermore, having a stronger Darwinian orientation positively relates to higher growth aspirations ( $\beta = 0.621$ ; p = 0.001), supporting Hypothesis 2a. Additionally, a more salient Communitarian orientation relates to lower growth aspirations ( $\beta = -0.245$ ; p = 0.036), whereas a more salient Missionary orientation positively relates to growth aspirations ( $\beta = 0.202$ ; p = 0.031), supporting Hypotheses 2b and 2c,

<sup>6</sup> Given that the initial standardized residual variance of Communitarian A was negative, but highly insignificant ( $\sigma^2(e) = -0.072$ , p = 0.574), we decided to set the residual variance to zero to avoid a Heywood case (Kolenikov and Bollen, 2012). This intervention did not alter the conclusions that can be drawn from the model, and only brought negligible changes in fit indices and factor loadings.

<sup>7</sup> We further investigated heterogeneity among academic founders. We found no statistical differences in identity orientations depending on their position in academia.

**Table 2**

Summary of confirmatory factor analysis with cluster-robust standard errors.

Latent construct	Item	Standardized factor loading	AVE	CR	Discriminant validity								
					1.	2.	3.	4.	5.				
1. Growth aspirations	GA 1	0.71	0.61	0.76	<i>0.61</i>								
	GA 2	0.84											
2. Darwinian IO (2nd order)	DAR A	0.47	0.47	0.62	0.33	<i>0.47</i>							
	DAR B	0.58											
3. Communitarian IO (2nd order)	DAR C	0.93	0.77	0.84	0.01	0.11	<i>0.77</i>						
	COM A	1.00											
4. Missionary IO (2nd order)	COM B	0.78	0.73	0.84	0.04	0.04	0.35	<i>0.73</i>		0.49			
	COM C	0.84											
5. Entrepreneurial self-efficacy	MIS A	0.72	0.49	0.79	0.10	0.24	0.12	0.14	0.49	0.49			
	MIS B	0.85											
6. Darwinian A	MIS C	0.98	0.49	0.79	0.10	0.24	0.12	0.14	0.49	0.49			
	ESE 1	0.87											
7. Darwinian B	ESE 2	0.72	0.49	0.79	0.10	0.24	0.12	0.14	0.49	0.49			
	ESE 3	0.59											
8. Darwinian C	ESE 4	0.62	0.49	0.79	0.10	0.24	0.12	0.14	0.49	0.49			
	Dar-A	1.00											
9. Communitarian A	Dar-B1	0.79	1.00	1.00	0.57	0.73							
	Dar-B2	0.80											
10. Communitarian B	Dar-C1	0.63	0.54	0.70						0.49			
	Dar-C2	0.82											
11. Communitarian C	Com-A1	0.82	0.52	0.68						0.49			
	Com-A2	0.60											
12. Missionary A	Com-B	1.00	0.52	0.68						0.49			
	Com-C1	0.91											
13. Missionary B	Com-C2	0.94	0.52	0.68						0.49			
	Mis-A	1.00	0.52	0.68									
14. Missionary C	Mis-B1	0.71	0.52	0.68						0.49			
	Mis-B2	0.84											
15. Basic motivation	Mis-C1	0.89	0.52	0.68						0.49			
	Mis-C2	0.75											

Notes: n = 171 founders in 119 projects;  $\chi^2_{(174)} = 249.53$ ; p < 0.001; CFI = 0.94; TLI = 0.93; RMSEA = 0.05; SRMR = 0.06.

IO = identity orientation; DAR = Darwinian; COM = Communitarian; MIS = Missionary; GA = growth aspirations; ESE = entrepreneurial self-efficacy; A = basic motivation; B = basis for self-evaluation; C = frame of reference.

AVE = average variance extracted; CR = composite reliability.

Discriminant validity: square of correlation estimates below diagonal, AVEs on diagonal (in italics).

respectively. Additional tests show that a Darwinian orientation relates more positively to growth aspiration than a Missionary orientation ( $\Delta\beta = 0.419$ ; se = 0.299; p = 0.010; 95 % C.I. [0.197, +∞]), confirming [Hypothesis 2d](#).

Finally, [Table 4](#) gives an overview of the indirect effects. Overall, academic founders display lower growth aspirations through their identity orientations ( $\beta = -0.137$ ; p = 0.067), confirming [Hypothesis 3](#).

#### 4.1. Additional analyses and robustness checks

##### 4.1.1. Common method bias

First, to avoid common method bias, we took several measures upon designing the study ([Podsakoff et al., 2003](#)). Participants were promised confidentiality and were guaranteed that their answers would not impact their participation or performance in the competition. Furthermore, we ensured temporal separation between the collection of the dependent variable and all other variables. We inquired the dependent variable at the end of the competition while collecting all other data upon registration for the competition. On top of that, we were able to crosscheck several of the variables collected in the first survey with secondary information. Second, we statistically assessed the presence of common method variance through partial correlation analysis using a marker variable. In the first survey, respondents indicated the extent to which they wanted to learn about intellectual property in the course of the competition, on a 5-point Likert scale ranging from not at all important to extremely important. We used this measure as the marker variable. All previously significant zero-order correlations remained significant when adjusting for partial correlation, indicating that our analyses are not affected by a common method bias ([Lindell and](#)

[Whitney, 2001](#)).

##### 4.1.2. Endogeneity

We were also alert for potential endogeneity in our model that may be caused by reverse causality ([Kline, 2015](#)), in particular between the institutional environment of a founder and his or her identity orientations. One could question whether a person has a different identity orientation because (s)he works in academia, or whether (s)he works in academia as a result of his or her founder identity orientations. We are comfortable that our results are not driven by reverse causality, as this study focuses on identity orientations in the context of founding a venture. Given that academic founders start their venture as a result of their scientific work, socialization into the academic institution inevitably precedes their identity orientation as a founder. However, we should not only consider the possibility of reverse causality, but also the possibility that an unobserved or omitted variable is driving the observed relationship between our independent and dependent variable. Our descriptive analyses above show no differences between the group of non-academic and the group of academic founders which could provide an alternative explanation for the observed relationship between founder background, founder identity orientations, and growth aspirations. However, we should not rule out this possibility entirely. Therefore, we statistically examined potential misspecifications in our model by conducting an instrumental variable analysis. To execute this analysis, we applied the Model Implied Instrumental Variable, Two Stage Least Squares (MIV-2SLS) estimator, using the recently developed MIVsem package in R ([Fisher et al., 2017](#)). We decided to use this estimator over other instrumental variable techniques, because we tested our hypotheses through a latent variable SEM model, and MIV-

**Table 3**  
Results of structural model.

Path between variables		Mediation model		
From	To	$\beta$	se	p-value
Darwinian <sup>(1)</sup>	→ Growth aspirations	0.62	0.30	0.00
Communitarian <sup>(2)</sup>	→ Growth aspirations	-0.24	0.12	0.04
Missionary <sup>(3)</sup>	→ Growth aspirations	0.20	0.13	0.03
Academic founder	→ Growth aspirations	0.06	0.18	0.42
Self-efficacy	→ Growth aspirations	0.01	0.12	0.91
Start-up experience	→ Growth aspirations	-0.08	0.18	0.31
Gender	→ Growth aspirations	-0.08	0.19	0.29
Degree level	→ Growth aspirations	-0.17	0.11	0.08
Venture age	→ Growth aspirations	-0.05	0.06	0.52
Service offer	→ Growth aspirations	0.27	0.16	0.00
High-tech sector	→ Growth aspirations	-0.01	0.16	0.89
Current venture size	→ Growth aspirations	-0.01	0.03	0.87
Academic founder	→ Darwinian orientation	-0.20	0.14	0.02
Gender	→ Darwinian orientation	0.01	0.14	0.91
Degree level	→ Darwinian orientation	0.20	0.09	0.07
Venture age	→ Darwinian orientation	-0.05	0.04	0.53
Service offer	→ Darwinian orientation	-0.12	0.11	0.15
High-tech sector	→ Darwinian orientation	-0.06	0.12	0.44
Current venture size	→ Darwinian orientation	0.16	0.03	0.05
Academic founder	→ Communitarian orientation	0.14	0.21	0.05
Gender	→ Communitarian orientation	0.17	0.22	0.04
Degree level	→ Communitarian orientation	-0.15	0.11	0.07
Venture age	→ Communitarian orientation	-0.04	0.08	0.64
Service offer	→ Communitarian orientation	0.07	0.22	0.41
High-tech sector	→ Communitarian orientation	-0.06	0.22	0.46
Current venture size	→ Communitarian orientation	0.10	0.05	0.24
Academic founder	→ Missionary orientation	0.10	0.16	0.11
Gender	→ Missionary orientation	0.18	0.14	0.01
Degree level	→ Missionary orientation	-0.13	0.10	0.17
Venture age	→ Missionary orientation	0.03	0.05	0.68
Service offer	→ Missionary orientation	0.03	0.16	0.76
High-tech sector	→ Missionary orientation	-0.17	0.16	0.05
Current venture size	→ Missionary orientation	0.05	0.03	0.43

Notes: n = 171 founders in 119 projects;

$\beta$  = standardized coefficient; one-tailed tests for hypothesized relationships, two-tailed tests otherwise (see also Gamache et al., 2015 for a likewise approach);  $\chi^2_{(313)} = 416.15$ ; p < 0.001; CFI = 0.93; TLI = 0.91; RMSEA = 0.04; SRMR = 0.06.

(1) – (2):  $\Delta\beta = 0.87$ ; se = 0.37; p<sub>(1-tailed)</sub> = 0.001; 95 % C.I. [0.41, 1.87].

(1) – (3):  $\Delta\beta = 0.42$ ; se = 0.30; p<sub>(1-tailed)</sub> = 0.010; 95 % C.I. [0.20, +∞].

(2) – (3):  $\Delta\beta = -0.45$ ; se = 0.23; p<sub>(1-tailed)</sub> = 0.024; 95 % C.I. [-0.89, -0.01].

**Table 4**  
Indirect effects.

Indirect relationship	$\beta$	se	p	95 % confidence interval
Academic founder → Darwinian IO → GA	-0.12	0.15	0.07	-0.56 0.02
Academic founder → Communitarian IO → GA	-0.03	0.06	0.21	-0.20 0.04
Academic founder → Missionary IO → GA	0.02	0.04	0.26	-0.03 0.12
Total indirect effect from academic founder to GA	-0.14	0.17	0.07	-0.63 0.02

Notes: n = 171 entrepreneurs in 119 projects; method = delta;  $\beta$  = standardized coefficient.

GA = growth aspirations; IO = identity orientation.

2SLS is able to handle latent variables with multiple indicators (Bollen, 2019). The MIIV-2SLS approach consists of five steps to test for potential misspecifications. First, the model is specified as if it were a *normal* SEM

model. Second, all latent variables in the model are replaced by their respective indicators minus their errors. This so-called latent to observed variable (L2O) transformation allows us to retain the intercepts, regression coefficients and factor loadings from the initial SEM model. This is an advantage over other instrumental variable techniques which use observed variables, ignoring the presence of measurement error (Kline, 2015). Third, the model implied instrumental variables are specified. Unlike the usual practice to search for instruments outside of the model, the MIIV-2SLS approach finds the instruments among the observed variables that are already part of the model (Bollen, 1996). An observed variable can serve as a MIIV if it is uncorrelated with the error term of the equation concerned (we refer to Bollen, 2019, for more information). Fourth, the equations are estimated using a Two Stage Least Squares estimator, and fifth, the Sargan-statistic is calculated for each equation in the model that contains more MIIVs than explanatory variables (i.e. overidentified equation). For each equation, this test verifies the null hypothesis that all MIIVs are uncorrelated with the equation's composite error. Rejection of this null hypothesis would provide evidence of structural misspecifications. When performing the MIIV-2SLS approach on our model and data, we did not find any evidence of endogeneity between the institutional environment of a founder (i.e. whether or not the individual is an academic founder) and his or her identity orientations, indicating that our model should not be subject to reverse causality nor omitted variable bias ( $T_{s,DAR}(1) = 0.014$ , p = 0.904;  $T_{s,COM}(1) = 0.002$ , p = 0.966;  $T_{s,MIS}(1) = 2.874$ , p = 0.090).

#### 4.1.3. Robustness checks

To assure that our model provides us with the correct insights, we conducted additional analyses as robustness checks. First, we followed the procedure by Sieger et al. (2016) and recoded the respondents' scores for items measuring Darwinian, Communitarian, and Missionary orientation into seven dummy variables, three representing "pure" Darwinians, Communitarians, or Missionaries (43 cases or 25 % of respondents) and four representing mixed or hybrid identity orientations (104 cases or 61 % of respondents). 24 (or 14 %) of the 171 founders in our sample could not be classified as any of these seven types (i.e., received a value of 0 for all seven dummy variables), as they scored low on Darwinian, Communitarian, as well as Missionary orientation.<sup>8</sup> We find that academic founders are significantly less likely to develop a pure Darwinian orientation as well as a hybrid Darwinian/Missionary orientation compared to non-academic founders. We find no relationship between founder background and other pure or hybrid identity orientations. Moreover, we find a positive significant relationship between a pure Darwinian, a hybrid Darwinian/Communitarian, and a hybrid Darwinian/Communitarian/Missionary orientation on the one hand, and growth aspirations on the other hand. We also find a positive relationship between a hybrid Communitarian/Missionary orientation and growth aspirations. This alternative model at first sight appears to confirm the role of a Darwinian orientation, especially in a "pure" form, as a mediator between the founder's academic versus non-academic background and his/her growth aspirations. However, the indirect effect proves to be insignificant. These results should be interpreted with utmost caution, as model fit for this alternative operationalization is really bad ( $\chi^2_{(26)} = 175.630$ ; p < 0.000; CFI = 0.428; TLI = -1.199; RMSEA = 0.183; SRMR = 0.066).

Moreover, in order to assure that the project-level control variables did not alter our conclusions, we computed a SEM model that only included the individual-level variables. This downsized model returned equally good fit measures and similar results as our reported model ( $\chi^2_{(245)} = 325.576$ ; p < 0.001; CFI = 0.940; TLI = 0.928; RMSEA = 0.044; SRMR = 0.064). Second, the reported model includes a two-item scale

<sup>8</sup> This percentage of unclassified cases is relatively low compared to that of the Sieger et al. (2016) study, which ranges between 7 % and 42 % depending on country.

for growth aspirations to ensure a satisfactory Cronbach's alpha and AVE. The initial data collection contained an additional reverse-coded item stating "aiming for rapid growth is not what drives my business" (Autio et al., 2000). We excluded this item from the reported results, as the item had a relatively low standardized factor loading of 0.437, and negatively impacted the Cronbach's alpha (0.673) and the AVE (0.492) of the scale. As a robustness check, we calculated the reported model again, including this reverse-coded item. The model provided the same conclusions, but with slightly worse fit measures ( $\chi^2_{(341)} = 481.818$ ;  $p < 0.001$ ; CFI = 0.905; TLI = 0.887; RMSEA = 0.049; SRMR = 0.065).

#### 4.1.4. Post hoc test

Even though prior research has already demonstrated that growth aspirations are a necessary condition for actual growth and performance (Wiklund and Shepherd, 2003; McKelvie et al., 2017), we nevertheless decided to verify the relevance of our dependent variable. As financial performance or employment data was not publicly available for most of the projects in our sample, we searched the worldwide web to collect information on the financing that projects obtained between the time of the competition and March 2021, and on whether or not they were still active in March 2021. We were able to retrieve information on 122 of the 171 projects in our sample. 33 of these 122 had been able to raise financing. The minimum amount raised was 10,000 CHF or 10,423 US dollar. The maximum amount raised was 16,1 million CHF or 16,8 million US dollar. The average amount of financing raised was 2,3 million CHF or 2,4 million US dollar. Of the 123 projects for which we retrieved information, 45 were still active in March 2021. Our analyses confirm that founders of projects that obtained financing to commercialize their idea had statistically higher growth aspirations at the time of the survey than founders of projects that were unable to obtain such financing (one-tailed t-test p-value of 0,09)<sup>9</sup> and that founders of projects that were still active in 2021 had statistically higher growth aspirations at the time of the survey than founders whose companies had become inactive by 2021 (one-tailed t-test p-value of 0,06). This clearly suggest, in line with previous research, that founders' growth aspirations are predictive of later venture performance and hence a relevant outcome variable to include in our model.

## 5. Discussion

Building on insights regarding socialization (Van Maanen and Schein, 1979; Wanous, 1992), imprinting (Marquis and Tilcsik, 2013; McEvily et al., 2012), and founders' identity orientation, i.e., the extent to which they identify themselves in terms of their relationships to others and to social groups (Fauchart and Gruber, 2011; Brewer and Gardner, 1996), this study advances our understanding of how a founder's identity orientation acts as a mediator between the institutional logic of the professional community to which a founder belongs and his/her growth aspirations. We find that academic founders have a less salient Darwinian and a more salient Communitarian orientation than non-academic founders. This is consistent with the institutional logic of the academic profession, which emphasizes scientific contributions, technology development, and peer evaluation over commercial aspects. Furthermore, we find that both this less salient Darwinian and more salient Communitarian orientation lead to lower growth aspirations for the venture. A more salient Missionary orientation also positively impacts a founder's growth aspirations, but contrary to our expectation, we

find no differences between academic founders and non-academic founders in terms of Missionary orientation. Overall, we identify the less salient Darwinian and more salient Communitarian orientations of academic founders as a core reason for having lower growth aspirations than non-academic founders. It must be noted that a lower growth orientation does not imply that those ventures are less valuable to society. A higher Communitarian orientation could replace growth with more sustainable goals in line with the founders' pro-social behavior (Ramarajan et al., 2017), a potential effect that falls out of the scope of the current study. Our insights contribute to the literature on academic entrepreneurship, to research on growth aspirations, and to our understanding of founder identity orientations.

### 5.1. Science commercialization and academic entrepreneurship

In the last fifteen years, the literature on science commercialization and academic entrepreneurship in particular has repeatedly reported low growth rates among academic spin-offs (Garnsey & Heffernan, 2005; Wright et al., 2007). Many ventures keep hovering around break-even for extended periods of time, being labelled as technology zombies by some observers (Pisano, 2006). Researchers have identified institutional factors at the level of nations, regions, and universities that hinder academic founders in starting and growing their venture (Eesley et al., 2016; Fini et al., 2017; Huyghe and Knockaert, 2015; Klingbeil et al., 2018; Lacetera, 2009; Mindruta, 2013; Ziedonis, 2007). However, the decision to start and grow an academic spin-off is an individual decision (Balven et al., 2008). As Guo et al. (2019, p. 930) point out, "Individuals play important roles in academic entrepreneurship and impact the extent to which academic entrepreneurship behavior materializes. As such, the study of academic entrepreneurship from the individual level is important in order to obtain a deeper understanding of this type of entrepreneurship."

The current study advances our insights in this matter by identifying an important mechanism that links the university's institutional characteristics to the individual-level ambitions and performance of academic entrepreneurs. We introduce the academic entrepreneur's identity orientation as an important social-psychological factor that "translates" the university's institutional logic into lower growth aspirations at the level of the individual entrepreneur. We explain that researchers are socialized into the university's institutional logic, which imprints on their later identity orientation as academic entrepreneurs. The university's logic of peer recognition, feedback and the creation of societal benefits imprints the importance that academic entrepreneurs attribute to financial merit and community ties. This imprinted orientation in turn affects the growth aspirations they hold for their venture. Compared to non-academic founders, academic entrepreneurs pay less attention to the expected positive consequences of firm growth for themselves as an individual and more attention to the expected negative consequences of firm growth on community intimacy. We show that, overall, these orientations cause academic entrepreneurs to develop lower growth aspirations than non-academic founders. However, we do not claim this is per se negative as academic founders' lower growth orientation might be set off by for instance a higher focus on sustainability, in line with their more salient Communitarian identity. As such, our study, as far as we know, is the first to demonstrate the importance of academic entrepreneurs' identity orientation, and thereby answers the call of Fini et al. (2019) to start paying attention to how academic entrepreneurs view themselves in reference to other social actors.

### 5.2. Founders' growth aspirations

With these insights, we also extend the literature on founders' growth aspirations. We know that firm growth is expected to result in a wide range of consequences, including effects on the entrepreneur's personal income, workload, task division, control over operations, the employees' well-being, and the venture's relationship with external actors. But only

<sup>9</sup> Fundamental research grants were disregarded, as they did not pertain to the commercialization of the idea or technology. Moreover, as growth aspirations were not a fundamental criterion for the competition's jury evaluation and price money, and as most ventures that obtained financing received other grants or investment and not (just) price money from the competition, we feel assured that the competition's evaluation process does not drive the results of our post hoc test.

a few of these expected consequences are thought to affect entrepreneur growth aspirations. Wiklund et al. (2003, Table 5, p. 260) show that only the expected consequences for employee well-being and, to a lesser extent, for personal income affect the average entrepreneur's growth aspirations. Our study nuances these findings by proposing that different expected consequences of growth may appeal to different entrepreneurs. In particular, we propose that founders' identity orientations will affect the value they attribute to different expected consequences of growth and will therefore also influence their actual growth aspirations. When deciding whether and how much to grow their venture, founders with a salient Darwinian orientation will pay particular attention to the expected positive consequences of growth for themselves (such as, the expected consequences for their personal income). On the other hand, potential effects on the relationship with the venture's close community weigh heavily on the growth aspirations of founders with a salient Communitarian orientation. More generally, our findings suggest that growth aspirations do not only depend on the expected consequences of growth, but also on whether these consequences are relevant for an entrepreneur given his/her specific identity orientation. While prior research has demonstrated that founders' personal characteristics affect the consequences they expect from firm growth (e.g., Prasastyoga et al., 2018), we propose that personal characteristics, and in particular founders' identity orientations, also affect the importance founders attribute to these expected consequences. Understanding an individual founder's growth orientation and actions requires us to investigate (a) the specific consequences the founder expects from firm growth and (b) the specific importance the founder places on those consequences to the growth decision. We propose that a founder's identity orientation is crucial for understanding point b above.

### 5.3. Founders' identity orientations

Finally, our study extends the literature on founder identity orientations, which has suggested identity orientations to be a relevant construct to understand decisions of entrepreneurs that cannot be explained by an economic rationale (Gruber and MacMillan, 2017). Previous studies have demonstrated the effect of identity orientations on the entrepreneur's (a) use of effectual and causal decision-making logics (Alsos et al., 2016), (b) choice for specific firm types (Fauchart and Gruber, 2011; Pan et al., 2018), (c) hiring decisions (Powell and Baker, 2017), and (d) strategic responses against the backdrop of adverse circumstances (Powell and Baker, 2014). We show that their impact also extends to the growth aspirations that entrepreneurs develop for their venture.

Our study also sheds light on the origin of founders' identity orientations. The entrepreneurship literature tends to conceptualize founder identity orientations as being almost innate (Fauchart and Gruber, 2011; Foy and Gruber, 2022). However, we follow up on Brewer and Gardner (1996) and Ramarajan et al. (2017) who propose that individuals' identity orientations might become more salient in certain contexts. We demonstrate that founders' identity orientations are imprinted by socialization into their professional logic. In particular, the academic institutional logic, with its low emphasis on commercial success and its high emphasis on peer recognition and feedback, imprints a weaker Darwinian and stronger Communitarian in its entrepreneurs (as compared to a business logic). More in general, we clearly suggest that founders' identity orientations are not necessarily innate but can be imprinted by their professional/institutional environment.

By building on the broader identity orientation literature, we also challenge the use of Social Identity theory as the foundation for the distinction between Darwinian, Communitarian and Missionary founders as advanced by Fauchart and Gruber's (2011) (and followed by authors citing their work). As explained by Brickson (2000), only individuals who define themselves in relation to social groups (such as Missionaries) can be said to have a "social identity". Therefore, understanding the origins and implications of a salient Darwinian or

Communitarian identity orientation cannot come from Social Identity Theory, but requires a broader theoretical framework. We hope future entrepreneurship studies will follow us and go back to the theoretically grounded work of Brewer and Gardner (1996), Brickson's extension of that framework in 2000 and 2005, and more recent, theoretically grounded work by Ramarajan et al. (2017), in order to thoroughly understand the origins of different identity orientations and their implications for founder behavior.

### 6. Limitations and suggestions for further research

Despite the careful design of this study, it is not without its limitations. In this section, we elaborate on these limitations, and provide advice for future research. First, even though we introduced a time lag in our data collection and performed a reassuring instrumental variable analysis that strongly suggest a causal impact of professional logics on founders' identity orientations and growth aspirations, future studies could perform additional analyses, for example with longitudinal data, to investigate these relationships. Qualitative work by Jain et al. (2009) and Hayter et al. (2022) unravels the process through which academics develop an entrepreneurial role identity, and a study by Fisher et al. (2016) shows that the organizational identity of a venture is adapted over time to meet the expectations of critical resource providers at each stage of the venture's life. Along the same lines, a longitudinal view on entrepreneurs' identity orientations is needed. Both qualitative and quantitative longitudinal research should allow us to better understand how founders' identity orientations evolve over time, not only in preparation for their entrepreneurial activities, but also after venture start-up. Both changes in the academic and non-academic environment, as well as academic achievements and performance of the venture could play a role here. A founder who starts his or her business with a salient Missionary orientation, striving to advance society-at-large, may for instance increasingly display a Darwinian orientation once (s)he has managed to raise funds from investors.

Second, given that many start-ups are founded and run by a team of entrepreneurs rather than solo entrepreneurs (see e.g., Powell and Baker, 2017), we encourage researchers to broaden the scope of analysis, and to shed light on compositions of identity orientations at the individual level as well as on the interplay between different identity orientations at the team level. Integration of team members with a business background may lead to changes in academic founders' identity orientations, something the current study does not consider. Also here, a longitudinal perspective would be valuable. We already know that founders' identity orientations affect their hiring decisions (Powell and Baker, 2017). But it is likely that the hiring of certain profiles in turn also affects founders' identity orientations.

Third, research should investigate the role of other types of institutional environments. Our findings clearly suggest, in line with institutional theory, that individual preferences and actions are formed by a person's professional environment. But a founder's identity is also shaped by other institutions such as, for example, her/his family, which our study does not consider (Mathias et al., 2015). As Eesley et al. (2016) point out, changes in different institutional contexts may reinforce or counteract each other. It could be relevant to investigate how the identity orientation of (academic) entrepreneurs is affected by similar or contrasting forces in their private and professional environment. Here, it would be wise to consider individual differences, as certain institutional logics may influence some entrepreneurs more than others.

Fourth, while we look at the implications of a founder's professional background and identity orientation on one's aspirations, it would be interesting to investigate other dependent variables. Prior research has pointed to the potential trade-off between growth and profitability (Davidsson et al., 2009). Therefore, it would be interesting to investigate the relationship between professional logics, founder identity orientations, and venture profitability. Against the backdrop of contemporary discussions, one could also bring sustainability into the picture, as

several authors claim there is a potential trade-off between economic, social and environmental goals (e.g., Battilana and Lee, 2014; Pache and Santos, 2013; Stevens et al., 2015). Also founders' well-being is an interesting outcome variable to study in this respect (Hahn, 2020).

Finally, we call for research that validates the generalizability of our findings. Most of the academic founders in our sample are early-stage researchers. This could be (a) because senior researchers were not very likely to start up a company, or (b) because senior researchers who started a company were not very likely to enter the competition. However, this bias does not invalidate our results and conclusions. Instead, our data suggest that the academic founders who decide to participate in the competition are quite similar to non-academic founders with respect to their goals and whether or not the project represents their primary occupation. This implies that, if we would have included a representative sample of academic founders in our study (instead of only those in the competition), our results probably would have been even more pronounced. Nevertheless, even though we do not observe differences in identity orientation depending on academic founders' position in academia, future research may want to investigate, preferably with bigger samples, whether our results are the same for founders who have been socialized in the academic institutional logic for a longer versus a shorter time. Moreover, all ventures in our study were technology-oriented, very early-stage, and subject to the same regulatory environment. Future studies should verify our results for other type of ventures.

In addition, the academic context in this study is restricted to the research institutions in Switzerland. The Swiss federal system is particularly generous, in the sense that PhDs and postdocs can receive between 100,000 and 150,000 CHF in non-dilutive funding from the university. After obtaining their degree, they can keep using the university's lab for free for a period of two years. In addition, there are specific grants for postdocs who want to try and commercialize technology. This abundance of funding allows researchers to stay in academia for an extended period. It may be that in other countries, researchers are forced to leave the academic context sooner. This could result in a lower degree of socialization into the academic institutional logic, and in more pressure to become socialized into a business logic. Future research should therefore verify our results in other research institutions in other countries.

## 7. Implications for practice

This study offers several practical contributions. Commercializing technology through stimulating academic entrepreneurship and the formation of spin-offs has been center stage in most European countries since the early 90s (Wright et al., 2007). While this has led to a mushrooming of entrepreneurial activity, spin-offs that commercialize technology from academic institutions rarely evolve into commercial heavy weights (Fini et al., 2017). We attribute this to the fact that professional logics, in this case academic logics, are translated into academic entrepreneurs' lower growth ambitions. More specifically, we identify a crucial role of entrepreneurs' identity orientation, which is imprinted by the academic logic of the university.

The observation that the logic into which academics are socialized determines their identity orientation and growth aspirations has consequences for the technology transfer policy at university and societal level. Either one accepts that disruption and economic growth will not result from these academic ventures (which could be a deliberate choice in favor of sustainable development goals), or one must rethink the way in which scientists are trained, long before they engage in commercial activities, in order to embed financial performance into their reference frame and self-evaluation methods. Since academic logics are so deeply ingrained through socialization mechanisms, it is unlikely that elective entrepreneurship education or coaching will be able to change academic entrepreneurs' identity orientations. Our findings suggest that a much more intensive socialization process is needed. We suggest developing policies to facilitate PhD student and postdocs to get involved with

executives on a long and intensive base. For instance, in most executive business schools, young researchers would fit into a full-time MBA or part-time MBA, whereas executives with 10+ years' experience would fit into an executive (global) MBA. These cohorts can meet in joint courses where they work together on joint projects and learn to appreciate values that may be different than their own. Unfortunately for PhD students and postdocs, such programs are typically too expensive and certainly do not fit into a narrowly focused PhD program. Policy makers at the national and at the university level should carefully reconsider their programs to enable a much deeper dive of academic researchers into the business logic.

An important point of attention hereby is the involvement of external actors. Doctoral students and postdocs who after their research were socialized into the investor and/or corporate worlds will enact those logics into their social identities and might hence form ideal boundary spanners between the academic and the business world. Those research alumni may be ideally positioned to bring in new goals into the academic environment. However, since the socialization into a new profession takes many years, it is unlikely that they will present themselves as co-founders to younger researchers and if they do, a significant age and tenure gap needs to be overcome. This raises the question whether, policy makers, instead of (or in addition to) incentivizing research institutes and universities to commercialize their research, should not focus more on stimulating external actors from the business environment to engage in research commercialization. For instance, Pahnke et al. (2015) show how private venture capital funds and corporate venture capitalists both belong to professional communities governed by their own logics and how these strongly imprint the behavior of the companies they invest in. In other words, both public support for private technology investors as well as for improving the access of these investors to universities and research institutes could be very fruitful. While technology-enthusiast researchers are crucial in the (pre-)founding phase, early in the venture's lifetime there will be a need for executive members who can bring different, growth-oriented goals into the company (Ambos and Birkinshaw, 2010). Equity investors typically have a network and governance mechanisms such as board of director seats, ESOP schemes, seniority rights to attract such people. This is not the case for purely public funds (see Pahnke et al., 2015) or non-dilutive sources of capital such as technology subsidies, innovation grants or indirect subsidies via the universities. Our results suggest thus that, if we want academic spin-offs to grow, we need policies that incentivize private investors to specialize in deep tech, and which stimulate former researchers with a successful business career to engage in the management of academic start-ups, thereby infusing a more commercial institutional logic into these ventures.

## CRediT authorship contribution statement

Bart Clarysse: writing of manuscript, conceptualization, data collection, data analysis

Petra Andries: writing of manuscript, conceptualization, data analysis

Sarah Boone: writing of manuscript, data collection, data analysis

Jolien Roelandt: data analysis.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

Data will be made available on request.

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