Gimme shelter? Heterogeneous preferences for tangible and intangible resources when choosing an incubator

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Abstract

The rapidly growing and diversifying incubator population has led to increasing efforts to understand why entrepreneurs prefer one incubator over another. Scientific studies suggest that entrepreneurs should prefer incubators that provide startups with intangible resources, such as business knowledge or networks to enhance performance. Yet, studies show many entrepreneurs prefer incubators that provide tangible resources, such as funding and office space. The heterogeneity in preferences for resources from incubators is poorly understood. We do not know whether there are patterns in this heterogeneity nor what factors explain this heterogeneity. Thereby, we do not know the extent to which a one-size-fits-all model of incubation is sufficient to attract and support startups or whether incubators need to tailor themselves to the perceived resource needs of different groups of startups. Hence, this paper aims *to identify and explain the heterogeneity in preferences for resources offered by an incubator to startups.* We conducted a discrete choice experiment to determine how the attributes of an incubator influence incubator choice by different latent classes of entrepreneurs. The data comes from 935 entrepreneurs in North America and Western Europe. Our results reveal three latent classes of entrepreneurs: "ambitious, balanced spinoffs," who consider all the incubator's attributes when making a decision; "innovation-driven funding seekers," who base their choice on funding availability; and "self-made individualists," who disfavor networking, training, and coaching. The ambitious, balanced spinoffs class based their choice on the attributes highlighted in the literature, while the innovation-driven funding seekers and self-made individualists fit more with empirically observed preferences for tangible resources. The classes show that systematic heterogeneity exists in the preferences for resources provided by an incubator. We advise incubator managers how to better tailor their support to the preferences and needs of classes of startups.

Keywords Startup · Incubator · Resources · Entrepreneurship · Discrete choice experiment

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1 Introduction

Incubators have become one of the most prominent instruments for facilitating the survival and growth of innovative startups (Ahmad and Ingle 2013; Bergek and Norrman 2008). While measuring the effectiveness of incubators remains controversial, scholars agree that the success of an incubator is largely determined by the success of its startups (Bergek and Norrman 2008; Hackett and Dilts 2004). An incubator's ability to attract promising startups is a key prerequisite for its success (NESTA 2014; Patton et al. 2009; Vanderstraeten and Matthyssens 2012). Doing so, however, is becoming increasingly difficult since the number of incubators has grown rapidly worldwide (NESTA 2014). Europe, for example, saw a fivefold increase in the number of incubators from 2007 to 2013 (Salido et al. 2013). Worldwide, there are now over 7000 incubators (NBIA 2014). Still, "no two incubators are alike" (Allen and McCluskey 1990, p. 64). The concept of an "incubator" has become an umbrella term that captures a great range of support services provided to startups (Aernoudt 2004; Bøllingtoft and Ulhøi 2005; Pauwels et al. 2015). Accordingly, each incubator has its own unique attributes to further the growth of tenant startups. Following the emergence of a competitive and diverse incubator landscape, there is a growing desire to understand why startups prefer a particular incubator as well as how incubators can position themselves relative to their peers (Barbero et al. 2013; Grimaldi and Grandi 2005; Vanderstraeten and Matthyssens 2012).

Many studies indicate that intangible resources provided by the incubator, such as tailored business knowledge and networks, contribute more to the competitive advantage of startups than tangible resources, such as funding or office space (Bruneel et al. 2012; Eveleens et al. 2017; Hansen et al. 2000; Van Weele et al. 2017). In contrast, the scarce empirical evidence suggests that many entrepreneurs are attracted only to the tangible resources offered by an incubator (McAdam and McAdam 2008; Soetanto and Jack 2013; Van Weele et al. 2017) and that they take the intangible resources initially for granted. These findings demonstrate there is heterogeneity in preferences for resources from incubators among startups, even when they operate in the same regional or sectoral context.

The literature suggests numerous causes for this heterogeneity, such as the heterogeneity of the resource endowment of the startup upon entering the incubator, differences in environmental demands or development stage (Soetanto and Jack 2013; Van Weele et al. 2018), differences in ambitions and motivations (Baum and Locke 2004; Carsrud and Brännback 2011), differences in valuations of the importance of particular resources to achieve these ambitions, and differences in valuations of the incubator as a source for particular resources (Bruneel et al. 2012; Van Weele et al. 2017).

Until now, research has not explored how vast the heterogeneity in preferences for resources offered by incubators actually is, nor has it empirically explored whether there are homogenous subgroups of startups that can be identified based on preferences for resources from incubators. This is plausible since many startups face similar challenges, operate in the same institutional environment, and interact with each other (DiMaggio and Powell 1983; Haveman 1993). Second, we lack insight into the causes of this heterogeneity. Gaining these insights is important to incubation research. It informs us about the extent to which a one-size-fits-all model of incubation is sufficient to attract and support startups or whether incubators need to tailor themselves to the perceived resource needs of different groups of startups. Therefore, this paper aims *to identify and explain the heterogeneity in preferences for resources offered by an incubator to startups*.

To this end, we conducted a discrete choice experiment (DCE) among 935 early-stage entrepreneurs in Western Europe and North America. A DCE allows the exploration of individuals' decision-making processes as well as the estimation of the importance of particular attributes (in our case resources). We use the DCE to inductively cluster respondents that display similar choice behavior into homogeneous classes with similar preferences (Vermunt and Magidson 2002).

This leads to the identification of three distinct homogenous groups of entrepreneurs: (1) "ambitious, balanced spinoffs," who consider all the incubator's resources when making a decision; (2) "innovation-driven funding seekers," who primarily base their choice on the funding provided by the incubator; and (3) "self-made individualists," who disfavor networking, training, and coaching. The ambitious, balanced spinoffs class bases their choice on the intangible resources, while the innovation-driven funding seekers and the self-made individualists fit more with the empirically observed preferences for tangible resources. Thereby, our results support earlier claims that startups have subjective evaluations about their environment and resources (Bruneel et al. 2012; Foss et al. 2008; Van Weele et al. 2017). The existence of latent classes allows us to reconcile the observed differences in preferences for tangible and intangible resources among startups. This demonstrates that DCEs and inductive latent class analyses can be a useful tool to bridge theoretical differences.

We further find that optimizing business performance is not the only or most important motivation for most of our respondents. Motivations vary greatly among startups, but this topic has received little attention in entrepreneurship research (Carsrud and Brännback 2011). By linking different latent classes and their motivations to the preferences for resources, our study adds to this line of research.

Finally, by identifying classes of entrepreneurs with distinct preferences for resources offered by the incubator, this paper is the first study that provides a quantitative analysis of the "demand" or "client" side of incubation. Based on this we develop strategies for incubators to cater to the needs of each group.

2 Theory

We begin this section with a brief discussion of how incubators have developed over the past decades. We then outline the incubator's attributes that may play a role in entrepreneurs' decisions to choose an incubator. Next, we argue why there is heterogeneity among startup entrepreneurs.

2.1 Resources provided by incubators

Resources are the "stocks of available factors that are owned or controlled by the firm" (Amit and Schoemaker 1993, p. 35). In the literature it is not always clear what the difference between tangible and intangible resources entails exactly (Kristandl and Bontis 2007). We follow the view from accounting (IAS 2004; Murphy 2018), which is also used in the context of the resource-based view (RBV) (Kristandl and Bontis 2007) and startups (Heirman and Clarysse 2007). Tangible resources are assets that are physical by nature, such as cash, land, buildings, or equipment. Intangible assets are non-physical by nature and are often used over the long-term. Examples include patents, trademarks, copyright, experience, or brand. Incubators can provide both tangible and intangible resources directly to

the startup or enable it to access resources externally through the incubator's networks (Amezcua et al. 2013; Eveleens et al. 2017).

The resources provided by incubators developed over three different "generations" (Aerts et al. 2007; Bruneel et al. 2012). The first generation of incubators became widespread in the 1980 s and aimed to create economies of scale by providing shared office space and facilities (Bruneel et al. 2012). Although the provision of such tangible resources is still an important aspect of the modern incubator's value proposition, incubators have shifted their focus toward intangible resources and services. This began in the early 1990s, when incubators began supporting technology-based startups (Ahmad and Ingle 2013; Bruneel et al. 2012). Incubators realized that the founders of these startups lacked entrepreneurial experience and hence started expanding their services toward professional consultancy services, coaching, and training for entrepreneurs to enhance their business learning (Bruneel et al. 2012). In addition to these intangible resources, these second generation incubators also started to act as investors by providing funding in exchange for equity. The third generation of incubators emerged in the late 1990s and focused on providing startups with access to networks, with the aim of facilitating access to external resources and providing legitimacy (Bøllingtoft and Ulhøi 2005; Bruneel et al. 2012; Hansen et al. 2000), by being affiliated with other partners (Rao et al. 2008).

From the three generations we can derive resources that are consistently listed in the literature as the most important ones provided to startups by incubators (Amezcua et al. 2013; Bruneel et al. 2012; Eveleens et al. 2017; Van Weele et al. 2017):

1. physical resources (first generation, tangible);
2. financial capital (second generation, tangible);
3. business knowledge (second generation, intangible);
4. networks (third generation, intangible);
5. legitimacy (third generation, intangible).

The first two are tangible resources that entrepreneurs often seek in an incubator, while the latter three are intangible resources that are positively associated with startup performance.

We use these as the resources that incubators can supply in our choice experiment. The various possible combinations of these resources lead to a heterogeneous set of incubators from which startup entrepreneurs can choose (Grimaldi and Grandi 2005). We discuss each resource as well as the most common levels. To make the resources comprehensible to entrepreneurs, we decided to split legitimacy into three. This means we follow the view that legitimacy is a strategic resource that can have multiple sources (Dacin et al. 2007; Rao et al. 2008; van Rijnsoever et al. 2014; Zimmerman and Zeitz 2002).

2.1.1 Physical resources

The physical resources provided by incubators consist of office space and other tangible facilities, including a car park or meeting rooms. Incubators can also provide more specialized physical resources, such as the equipment necessary for technological development. Startups often struggle to find physical resources on a relatively small scale. Hence, most incubators provide either free or paid access to these physical resources. The incubator offers these resources to multiple startups at the same time, which is more efficient than each startup procuring the resources by itself. Hence, offering physical resources reduces

costs and allows tenants to focus their time and effort on developing or finding resources crucial to the business (Barrow 2001; Bruneel et al. 2012). However, some incubators ("virtual" incubators) do not provide physical resources (Barbero et al. 2013).

2.1.2 Financial capital: amount and form

Financial capital refers to the monetary resources that are available for the discovery and exploitation of the venture idea (Barney 1991). Startups often require substantial amounts of funding to finance costly research and development, but they struggle to obtain such funding. This is due to the complexity and uncertainty associated with their technology, which makes startups a high-risk investment (Carpenter and Petersen 2002; Westhead and Storey 1997). Incubators can offer support by providing direct access to funding. The literature reports a great variety in the amount of funding that incubators provide, with incubators providing anything from several thousand to several hundred thousand dollars (Pauwels et al. 2015; Rubin et al. 2015).

Financial capital can come in different forms. Many incubators are still supported by local or regional governments; such incubators may provide funding as a *subsidy* or *grant*. Incubators can provide funding as a *loan against commercial rates* or *in exchange for equity*. Providing funding in exchange for equity is often seen as a more appropriate finance mechanism for startups due to the lack of tangible assets to serve as collateral for loans (Carpenter and Petersen 2002; Gompers and Lerner 2001).

2.1.3 Business knowledge: coaching and training

Having sufficient business knowledge is seen as important to startup success (Bruneel et al. 2012; Schwartz and Hornych 2010), but it is lacking in many startups (Van Weele et al. 2017). Incubators may enable entrepreneurs to develop their business knowledge through training and coaching (Patton 2013; Rice 2002). Coaching refers to one-on-one sessions with incubator managers or mentors, who are often experienced entrepreneurs themselves. Coaches can share their knowledge by advising entrepreneurs or facilitating a more interactive process (Rice 2002). The incubator manager or mentor may expose the startup to an ongoing review, thereby facilitating a trial-and-error learning process as the startup and its business plan go through several iterations (Dean Patton and Marlow 2011). Training refers to collective sessions such as seminars or workshops (Dean Patton and Marlow 2011; Rice 2002). Such training sessions enable entrepreneurs to learn particular entrepreneurial skills, for example, pitching or accounting.

2.1.4 Networks: internal and external

Networks enable entrepreneurs to access resources controlled by others, and they can therefore compensate for resources that the entrepreneurs do not own themselves (Adler and Kwon 2002; Groen et al. 2008). Networks are hence seen as one of the key resources for entrepreneurs and modern-day incubators (Bøllingtoft and Ulhøi 2005; Eveleens et al. 2017; Hansen et al. 2000; Leyden et al. 2014; Stam et al. 2014; Van Rijnsoever et al. 2017a, b). A distinction can be made between the incubator's internal and external networks (Bøllingtoft and Ulhøi 2005; Eveleens et al. 2017; Dean Patton and Marlow 2011). Internal networks are those existing among startups that are part of the same incubator. Co-location in the incubator can create a strong internal network in which startups can quickly share

problems, knowledge, and networks (Tötterman and Sten 2005). The incubator's external network consists of outside actors, including venture capitalists, potential clients, service providers, and local governments. By creating a strong external network, the incubator can act as a mediator in connecting startups with external stakeholders (Bergek and Norrman 2008).

2.1.5 Legitimacy: track record

Track record is derived from legitimacy as a resource. It refers to a record of performance or accomplishment on the part of an individual or organization (Drover et al. 2013). Incubated startups do not yet have a track record. As a result, they lack legitimacy, which makes it difficult for startups to convince other stakeholders to commit resources (Bruton et al. 2010). Startups can overcome this deficit by associating themselves with other, more reputable organizations (Rao et al. 2008), such as an incubator with a track record of supporting successful startups (NESTA 2014; Patton 2013). Entrepreneurs may also prefer an incubator with a good track record since they might interpret it as a sign that the incubator provides high-quality services.

2.1.6 Legitimacy: incubator's affiliation

The incubator's affiliation is also derived from legitimacy as a resource. Incubators can have various organizations as their main or founding partners. This affiliation enables the incubator to provide additional (specialized) services, for example, by using the networks or knowledge of its partner. In addition, by affiliating themselves with a reputable organization, incubators enjoy stronger legitimacy, which also contributes to the perceived legitimacy of the startups in the incubator (Bøllingtoft and Ulhøi 2005; McAdam and McAdam 2008). Entrepreneurs may also attach a certain sentiment to the incubator's affiliation. For example, entrepreneurs may prefer incubators that are affiliated with investors when they expect (whether accurately or not) that these incubators will be better connected to other investors than incubators affiliated with governments. We identify the following six affiliations that are frequently mentioned in the literature (Barbero et al. 2013; Gassmann and Becker 2006; Pauwels et al. 2015; Rothaermel and Thursby 2005): startup investor, local university, multinational company active across global markets, internationally renowned university, and regional government. It is also possible that the incubator is a private initiative, and has no affiliations.

2.1.7 Legitimacy: industry focus

Incubators differ in terms of their specific industry focus. Most incubators support only startups that operate in one or a limited number of industries (Aerts et al. 2007), such as software or the life sciences. Others support startups that operate in a broad range of industries. Some studies argue that focused incubators can provide more valuable services since they can provide access to industry-specific resources or expertise (Schwartz and Hornych 2008; Vanderstraeten and Matthyssens 2012). Chan and Lau (2005) additionally suggest that specialized incubators have more relevant internal networks since they create synergies among startups. However, empirical evidence to support this claim is lacking (Schwartz and Hornych 2010). Hence, having an industry focus primarily influences the incubator's reputation and thus contributes to legitimacy.

2.2 Heterogeneity in preference for resources

There are several possible causes that explain the heterogeneity among startups with regard to preferred resources. First, prior to entering the incubator, entrepreneurs can bring a number of required resources to the business themselves or develop these internally over time (Bruneel et al. 2012; McAdam and McAdam 2008; Van Weele et al. 2017). These existing resources can substitute the resources offered by the incubator or be combined with them to solve problems and create new opportunities (Baker and Nelson 2005; Fisher 2012). Second, the resource needs of startups are contingent on factors such as industry (Soetanto and Jack 2013), country (Van Weele et al. 2018), or development stage of the startup (Chan and Lau 2005). For example, a startup in the life sciences has a higher need for tangible resources, such as a laboratory, than a software startup (Van Weele and Van Rijnsoever 2017). Further, the needs for tangible resources in the form of funding increases dramatically when a life sciences startup enters the clinical trial stage (Moors et al. 2014; Morgan et al. 2011). Third, motivation can play a role. One goal of the firm can be to strive for a sustainable competitive advantage (Barney 1991), but startups can also serve as a vehicle to realize the ambitions of their founding entrepreneurs (Baum and Locke 2004). This likely affects resources they perceive to be means to obtain that goal (Sarasvathy 2001). For example, startups that want to grow quickly have a much higher need for financial capital than startups that wish to remain small and independent (Wasserman 2008). Fourth, entrepreneurs differ in their awareness of what is important for their firm to achieve their ambitions, which leads to a different valuation of resources (Bruneel et al. 2012; Oakey 2003; Van Weele et al. 2017; Vohora et al. 2004). They can thus seek resources that they think are important but in reality do not contribute to their ambitions. In the most extreme cases, startups might collect resources with the hope of finding opportunities or goals later (Sarasvathy 2001). Finally, there is a large diversity in incubators (Vanderstraeten and Matthyssens 2012) with regard to the services and resources that they offer (Bruneel et al. 2012) and their perceived quality (Van Weele et al. 2017). Some startups might perceive that they can obtain a specific resource or service of higher quality outside the incubator, while others do not.

The possible causes could lead to a random distribution of preferences for resources provided by an incubator among startups. Yet, the scarce available -mostly qualitative-evidence indicates that patterns or distinct classes of startups exist. Studies mainly find a difference between startups that prefer intangible resources to enhance the performance of their startup (Grimaldi and Grandi 2005; Hansen et al. 2000; Isabelle 2013; Vanderstraeten and Matthyssens 2012) and startups that prefer tangible resources (McAdam and McAdam 2008; Soetanto and Jack 2013; Van Weele et al. 2017). The existence of distinct classes of startups with similar preferences is theoretically plausible as they often experience similar environmental pressures, such as resource scarcity (Hannan and Freeman 1989) and institutional demands (Jennings et al. 2013), which require similar responses and resources. Moreover, startups interact with each other in communities (Feld 2012; Van Weele et al. 2018), which can lead to imitative (isomorphic) behavior (DiMaggio and Powell 1983; Haveman 1993), giving them the perception that they have the same needs. Based on the qualitative empirical evidence and these theoretical arguments, we expect to find homogenous classes of startups that either prefer tangible resources, such as funding, or intangible resources, such as business knowledge, networks, or legitimacy.

3 Methods

3.1 Research design: discrete choice experiment

To model the influence of the incubator's attributes on the entrepreneur's choice of an incubator, we use a discrete choice experiment (DCE). DCEs are based on the random utility theory framework (McFadden 1974), which postulates that each individual *(i)* attaches a certain amount of utility (U) to an alternative *(j)*. U_{ij} consists of an observed component V_{ij} and an unobserved component ε_{ij}:

$$U_{ij} = V_{ij} + \epsilon_{ij}$$

For this study, the observed component V_{ij} consists of the attributes of the incubator alternative *j* and the characteristics of startup entrepreneur *i* that explain the choice. The error component ε_{ij} captures the unobserved factors that influence the choice, such as the latent classes. As ε_{ij} is stochastic in nature, the choice for alternative *j* is presented as a probability. While choice experiments (such as DCEs) were originally designed to measure the preferences of consumers for marketing purposes, there is now an increasing interest in applying these types of methods more broadly within the social sciences (Aguinis and Bradley 2014; Shepherd 2011; Shepherd and Zacharakis 1999). Choice experiments have proven useful for understanding entrepreneurs' preferences for innovation networks (Lefebvre et al. 2014); venture capitalists (Drover et al. 2013); investments in innovation (Van Rijnsoever et al. 2012); and the choice to make, buy, or ally strategies (van Rijnsoever et al. 2017a, b). DCEs present every respondent with a series of choice tasks in which the respondents have to choose between two alternatives (in our case, two hypothetical incubators). The respondents base their choice on the levels (values) of the attributes of each alternative (in our case, resources). The levels vary over the different choice tasks and questionnaire versions in such a manner that the overall survey represents an orthogonal design (i.e., there is zero correlation among the attributes). As each choice forces the respondent to make a trade-off between alternatives and their respective attributes, the DCE reveals the utility that is attached to each individual attribute.

We opted for a DCE for two main reasons. First, as the attribute levels are pre-given by the design, and do not correlate with each other, a DCE enables us to assess the relative importance of each attribute without any confounding factor. It can yield generalizable insights into entrepreneurs' decision making without the bias that can result from retrospective techniques. Second, respondents receive multiple-choice tasks during a DCE. This allows the identification of classes of respondents who display similar choice behavior, which enables us to inductively explore the heterogeneity in entrepreneurs' preferences. This heterogeneity is reflected in the parameters of each attribute, which can differ across the latent classes.

3.2 Sample and data collection

The entrepreneurs studied were members of a larger online panel of citizens of an established European marketing agency. Being part of a panel, they received a small reward for completing the survey. Respondents were surveyed in the United States, Canada, the United Kingdom, Ireland, France, Germany, Austria, Switzerland, the Netherlands, and

Belgium. These countries were selected because they have a high concentration of both startups and incubators (Aerts et al. 2007; WEF 2015).

A major challenge for any study seeking to collect data from the founders of startups is that the "incidence rate" is very low when relying on random sampling in a population of citizens. For the countries that we were targeting, the "Total Early-Stage Entrepreneurial Activity" (TEA), which measures the percentage of the adult population that is either a nascent entrepreneur or the owner-manager of a new business (Global Entrepreneurship Monitor 2015), is only 5 to 13% (Appendix 1). Of these entrepreneurs, only a fraction has founded a startup (Davidsson 2008). Therefore, scholars trying to sample the founders of startups are advised to increase the incidence rate by targeting those individuals who are more likely to found a startup, for example, by targeting individuals with a particular educational background (Davidsson 2008). Given that the founders of startups are more likely to be highly educated (Storey and Tether 1998; Wadhwa et al. 2008), we chose to direct our sample toward higher educated individuals (having a bachelor's degree or higher).

The respondents had to meet three criteria. First, to limit the sample to entrepreneurs, the respondents had to be actively starting a business that they would (partially) own. Second, the respondents had to be starting a technology-based startup, which was defined as a new firm whose business is based on the exploitation of technological know-how through the creation of new products and/or services. Third, as we targeted startups, the respondents were screened out if their business had been paying salaries for more than 2 years. To increase reliability, we based the screening questions on validated questions from the Global Entrepreneurship Monitor (2015) and the Panel Study on Entrepreneurial Dynamics, wherever possible (Davidsson 2008). Appendix 2 provides an overview of the screening questions.

Due to the low incidence rate and expected variations in response per country, we did not rely on random sampling. Instead, we used quota sampling, which is an efficient non-probabilistic form of sampling to obtain a representative sample. Based on the TEA, and on what was expected to be feasible, we preset quotas for each country that needed to be filled (Appendix 1). We continued to approach respondents in the panel until the preset number of desired respondents was met (Bryman 2013). Next, we weighted the respondents in our sample according to the TEA in 2015 (Global Entrepreneurship Monitor 2015). Despite having the largest number of respondents, the United States was underrepresented in our sample, while Ireland was the most overrepresented country. The case weights correct for these differences (see Appendix 1).

Because of the low incidence rate of entrepreneurs in the population, the screening questions for startups, the between-country variation in response, and the quota sampling method, we cannot report an overall meaningful response rate for our survey. This does not mean that the sample is not representative of the population (Visser et al. 1996). It does imply, however, that one needs to check for and correct potential bias. To this end we compared our descriptive statistics with previous studies targeting the founders of technology-based startups (see Global Entrepreneurship Monitor 2017; Kauffman Foundation 2017; Storey and Tether 1998, p. 938, Table 2; Wadhwa et al. 2008).

Filling out the questionnaire took, on average, approximately 20 min. The ages of our respondents ranged between 20 and 69 years (weighted average = 37.7). Our respondents were primarily male (75%), university educated (69.9%), first-time entrepreneurs (87.7%), and were not, or had not been, part of an incubator (75.7%). This is in line with earlier studies, which indicates that the sample is likely representative. Table 2 gives the full descriptive statistics of the sample.

3.3 Discrete choice experiment

Respondents who met the criteria of the screening questions were first introduced to the study's aim and design, after which they received an explanation of the choice tasks and their various attributes. In a DCE, these attributes should be selected based on their likelihood of affecting the choice of respondents (Hensher et al. 2005). We used the review of the literature as presented in Sect. 2 to identify seven attributes of the incubator. Further, as is common for choice modeling (Kløjgaard et al. 2012), we conducted qualitative interviews in Germany with entrepreneurs (12), incubator staff (6), and policymakers (2) to validate the list of attributes and the levels. Table 1 shows how the attributes and their levels were presented to the respondents. The attribute levels follow directly from Sect. 2.1, but we further specified the levels for funding amounts and equity percentages. We chose the following four levels for the funding amounts, which are in accordance with the ranges mentioned in the literature (Pauwels et al. 2015; Rubin et al. 2015): $0, $10,000, $25,000, and $100,000. As equity percentages we chose 6 or 15%. These percentages are of the order of magnitude mentioned in the interviews and in several online sources (Quora.com 2013; Reddit.com 2016).

After the introduction, we asked the respondents to imagine that they were looking for an incubator to support their business. Then, they received eight choice tasks that varied systematically according to an orthogonal experimental design (see Fig. 1 for an example task). For each choice task, we presented two incubator alternatives and asked: "which incubator would you most likely choose?" During the choice tasks, the respondents could re-access the explanation of the attributes and levels via a pop-up window. The respondents spent an average of 20 s per choice task.

3.4 Measurement of characteristics of entrepreneurs and their startups

After the choice tasks, the respondents were presented with additional questions designed to measure the characteristics of the entrepreneurs and their startups. These covariates measure the observed heterogeneity among the startups (Grimaldi and Grandi 2005). By relating them to class membership, the covariates help in understanding the causes of preferences for specific attributes by a latent class.

Among other things, we enquired about the following characteristics of the startups: which activities they had engaged in during the previous 12 months to develop their business (Dombrovsky et al. 2011; Liao and Welsch 2008), whether they had been paying salaries to employees or themselves, the amount of investments raised, and whether the startup was a spinoff from a larger organization. A gestation activity of special interest concerned whether the business had applied for a patent, copyright, or trademark. We can use this as a proxy for a high-technology startup. Further, because of the sensitive nature of the information, the question measuring the capital raised contained a "decline to answer" option, which was selected by 7.8% of the respondents. We estimated these missing values by applying multiple imputation (Donders et al. 2006) using the MICE package of the R-program.

We also posed questions about the entrepreneurs themselves: how many businesses they had founded in the past; the number of years' experience the entrepreneur had in the primary industry of the startup; whether the entrepreneur was or had been part of an incubator; what their ambitions were in terms of the business; and demographic variables such as

Table 1 Attributes and their respective explanations and levels, as presented to the respondents

Attribute	Explanation	Levels	
1. Incubator affiliation	The incubator may have various organizations as its core partner	1. None: independent, privately owned incubator 2. Startup investor 3. Local university 4. Multinational company active across global markets 5. Internationally renowned university 6 Regional government	
2. Physical resources	The incubator may provide your business with appropriate physical resources, which include office space and shared facilities or equipment	1. No access 2. Paid access 3 Free access	
3. Funding amount and funding form	The incubator may provide different amounts of funding to your business. The funding may be provided as a grant or as a loan, or the incubator may take a certain amount of equity and shares in the startup. This leads to different combinations of funding amounts and funding forms	Funding amount: 1 $ 0 (no funding) 2 $ 10,000 3. $ 25,000 4 $ 100,000	Funding form: 1. Grant or subsidy 2. Loan against commercial rates 3. 6% equity 4. 15% equity
4. Training and coaching	The incubator may provide coaching by experienced entrepreneurs who act as mentors or advisors The incubator may also provide training such as master-classes and workshops	1. None 2. Coaching only 3. Training only 4. Training and coaching	
5. Internal and external networks	The internal network refers to interactions with other entrepreneurs in the incubator. The external network includes access to experts, customers, and investors If networks are strong, members are well-connected, accessible, and willing to help each other	1. No strong networks 2. Strong external network only 3. Strong internal network only 4. Strong internal and external networks	
6. Track record	This refers to the startups that previously participated in the incubator. Incubators with a good track record have a history of incubating successful startups	1. No track record yet 2. Bad 3. Neutral 4. Good	
7. Industry focus	The incubator may only support startups in your specific industry, or the incubator may support startups from a broad range of industries	1. Focus on your industry 2. Broad range of industries	

Attributes	Incubator #1	Incubator #2
1. **Incubator affiliation**	Local university	Start-up investor
2. **Physical resources**	No access	Free access
3. **Funding**	$ 25,000 as a grant	$ 100,000 as a loan against commercial rates
4. **Training and coaching**	Coaching only	Training and coaching
5. **Networks**	Strong external network only	Strong internal network only
6. **Track record**	Good	No track record yet
7. **Industry focus**	Broad range of industries	Focus on your industry
Which incubator would you most likely choose? *Please select one of the two incubators*	☐	☐

Fig. 1 Example choice task. Imagine that you were to choose an incubator to help you establish your business. We ask you to choose between two hypothetical incubators. Each incubator has its own characteristics. You can find the table to help you understand these characteristics and their respective levels here. Characteristics that are not mentioned do not vary across incubators

age, gender, and education level. Table 2 presents the measurement of the characteristics of the entrepreneurs and their startups and the descriptive statistics.

3.5 Data analysis

We analyzed the data using the Latent Gold program, which is specifically designed to analyze choice models and latent classes (Haughton et al. 2009). The dependent variable in the choice models was the respondents' choice of an alternative. This choice was predicted by the levels of the seven attributes. We also included an "alternative specific constant" (ASC). A significant influence of the ASC implies that, after controlling for the attributes' effects, one alternative is still more likely to be chosen due to the influence of its position in the choice experiment (i.e., whether the alternative is displayed on the left or right) (Hensher 2007).

The latent classes were identified by categorizing the respondents based on similarities in their choice behavior. We explored models with between one and five latent classes, which emerged inductively from the data. We followed standard practice in choice modeling (Greene and Hensher 2003; Nylund et al. 2007; Roeder et al. 1999) and selected the model with the lowest Bayesian information criterion (BIC) (Schwarz 1978) as the model with the optimal number of classes. A lower BIC implies a better fitting model. The BIC penalizes the inclusion of additional parameters and therefore favors a parsimonious solution.

We also explored different scale classes. Scale classes need to be included because the respondents displayed different degrees of consistency in their choice behavior. Failing to take this difference in consistency into account may lead to bias in the model estimates. Scale classes capture these differences by clustering respondents with a similar degree of consistency (Magidson and Vermunt 2007). Again, the BIC functioned as a heuristic for identifying the optimal number of scale classes.

After selecting the optimal number of classes, we estimated a multinomial regression model (MNL) in which we used class membership as a dependent variable and the

Table 2 Measurement and weighted descriptive statistics of the characteristics of the entrepreneurs and their startups, and their potential inclusion in the multinomial logit (MNL) model

Category	Variables	Value	Measure	Included in MNL model
Gestation activities	Formally registering the business	36.3	%	No
	Organizing a startup team	45.4	%	No
	Devoting yourself full-time to the business	37.7	%	As dummy variable
	Hiring employees	28.5	%	As dummy variable
	Receiving money from the sale of goods or services	27.5	%	No
	Discussing the new business's product or service with potential customers	34.9	%	No
	Preparing a written business plan	36.3	%	As dummy variable
	Developing a proof of concept or working prototype	35.0	%	No
	Applying for a patent/copyright/trademark	24.3	%	As dummy variable
	Defining market opportunities	46.3	%	As dummy variable
	Asking financial institutions or other people for funds	30.7	%	No
	Purchasing materials, equipment, facilities, or other tangible goods for the business	34.3	%	As dummy variable
Salaries	Paid salaries to employees or self	39.1	%	As continuous variable
Investments raised	Less than $1000	5	%	As continuous variable
	$1000–$9999	11.1	%	
	$10,000–$49,999	19.4	%	
	$50,000–$99,000	22.7	%	
	$100,000–$249,999	23.3	%	
	$250,000–$499,999	13.1	%	
	More than $500,000	5.3	%	
Spinoff	No spinoff from a larger organization	86.5	%	As nominal variable
	Spinoff from a university or research lab	8.8	%	
	Spinoff from another company	4.7	%	
Startup experience	Number of previous businesses	0.23 (0.72)	Mean (SD)	No

Table 2 (continued)

Category	Variables	Value	Measure	Included in MNL model
Industry experience	Number of years working in the same industry as the business's current primary industry	8.97 (6.90)	Mean (SD)	As continuous variable
Incubator experience	Is or has been part of an incubator	24.3	%	As dummy variable
Ambitions: *Please rank the top three statements that best describe your ambitions for your business (I want the business to…). Items were reverse scored, and non-selected items were given a value of 0 (ref.).*				
Survive as long as possible as an independent firm	1	27.0	%	
	2	8.3	%	
	3	6.0	%	
Make me a lot of money	1	36.6	%	
	2	10.8	%	
	3	11.1	%	
Solve an important problem	1	11.3	%	
	2	25.6	%	
	3	6.2	%	
Improve the world	1	7.5	%	
	2	23.5	%	
	3	8.1	%	
Grow and become a large company	1	9.9	%	As continuous variable
	2	14.6	%	
	3	25.5	%	
Be acquired by a larger company for a good price	1	1.9	%	As continuous variable
	2	7.6	%	
	3	23.4	%	

Table 2 (continued)

Category	Variables	Value	Measure	Included in MNL model
Be in my control	1	3.7	%	As continuous variable
	2	6.7	%	
	3	10.4	%	
Expand into global markets	1	1.9	%	As continuous variable
	2	3.3	%	
	3	10.2	%	
Age	Years	37.7 (8.7)	Mean (SD)	No
Gender	Women	25.1	%	No
University degree	Yes	69.9	%	No
Country	See Appendix 1			No
Sector	See Appendix 3			As nominal variable

covariates as independent variables. This further characterizes the latent classes and helps to explain the preferences of each class, using the causes for heterogeneity described above. To avoid spurious correlations and to keep the model parsimonious, we used a backward elimination method. We first entered all the variables and then removed them one by one until all the remaining variables were significant at the 10% level or lower. The last column of Table 2 indicates which variables are included in our final model and in what manner.

4 Results

A one class model has a McFadden R^2 of 0.14 and a BIC of 10102, while the optimal class model has a McFadden R^2 of 0.28 and a BIC of 9887. This means that classes with distinct preferences for resources are indeed present. Table 3 presents the outcomes of the latent class analysis for the optimal class model. The BIC revealed that a model with three latent classes and two scale classes provides the best fit. The attributes' coefficients were effects coded: the effects are uncorrelated with the intercept, and the estimators add up to zero. The Wald (0) χ^2 column tests whether the attribute was significant as a whole, and the Wald (=) χ^2 column tests whether there are significant differences between the classes for an attribute.

Table 4 shows the relative importance of the attributes per class, which are based on the range in the size of the estimators per attribute (Orme 2010). Table 5 presents the results of the multinomial regression to predict class membership based on the respondents' characteristics. The Wald χ^2 column indicates if a characteristic significantly explains differences between the classes. This statistic was used as criterion for inclusion of a characteristic in the MNL. The β's are standardized estimators for the latent classes. A significant estimator indicates that a class significantly differs from the mean on that characteristic.

The Wald (=) χ^2 in Table 3 shows that the latent classes differ in their preferences for all the attributes except for financial capital. This means that although financial capital significantly influenced the entrepreneurs' choice of incubator, its influence did not differ across the classes.

Entrepreneurs were found to prefer receiving funding as a grant or subsidy. Further, they prefer to receive financial capital in exchange for equity rather than receiving the same amount as a loan. This is in line with the established theory, which argues that funding in exchange for equity is often seen as a better fitting finance mechanism for startups due to their high-risk nature (Carpenter and Petersen 2002; Gompers and Lerner 2001). We now use Tables 3, 4, and 5 to characterize and describe the three latent classes of entrepreneurs.

4.1 Class 1: ambitious, balanced spinoffs (n = 368; 39.4%)

Class 1 entrepreneurs attach the most importance to the incubator's track record, followed by its affiliations and funding. Although these are the most important attributes, Table 4 indicates that class 1 entrepreneurs do not base their decision on just one or two attributes. Rather, they make a balanced decision. All the attributes rank quite similarly, especially when compared to the other two classes. The one exception is the incubator's industry focus. Class 1 entrepreneurs prefer an incubator that focuses on their specific industry, although, like the other two classes, the industry focus plays only a very small role in their decision.

Table 3 Optimal class model

Attribute	Level	Wald χ²	Sig.	Class independent	
				Coef.	Sig.
Financial capital	€ 0 for free	88.64	***	− 0.05	***
	€ 0 for 6% equity			− 0.17	***
	€ 0 for 15% equity			− 0.14	***
	€ 10,000 as grant/subsidy			0.10	***
	€ 10,000 as loan			0.07	***
	€ 10,000 for 6% equity			0.16	***
	€ 10,000 for 15% equity			− 0.05	***
	€ 25,000 as grant/subsidy			0.08	***
	€ 25,000 as loan			− 0.24	***
	€ 25,000 for 6% equity			− 0.06	***
	€ 25,000 for 15% equity			0	
	€ 100,000 as grant/subsidy			0.18	***
	€ 100,000 as loan			0.01	
	€ 100,000 for 6% equity			0.07	***
	€ 100,000 for 15% equity			0.05	**

Attribute	Level	Wald χ²	Sig.	Wald χ² (=)	Sig.	Class 1		Class 2		Class 3	
						Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Physical capital	No access	91.6	***	91.05	***	− 0.02	***	− 0.09	***	− 0.04	***
	Paid access					− 0.17	***	0.11	***	− 0.04	***
	Free access					0.19	***	− 0.02	*	0.08	***
Knowledge	None	92.07	***	89.04	***	− 0.02	***	0.17	***	− 0.02	**
	Coaching only					− 0.08	***	0.17	***	− 0.05	***
	Training only					− 0.04	***	0.00		0.02	***
	Training and coaching					0.14	***	− 0.34	***	0.05	***
Social capital	No strong network	84.41	***	80.99	***	− 0.14	***	0.17	***	− 0.12	***
	Strong external network only					− 0.04	***	0.04	***	0.05	***
	Strong internal network only					− 0.01		− 0.11	***	0.00	
	Strong internal and external network					0.19	***	− 0.11	***	0.06	***
Legitimacy	No track record yet	90.46	***	74.41	***	0.07	***	0.09	***	− 0.01	
	Bad					− 0.34	***	− 0.09	***	− 0.17	***
	Neutral					0.10	***	0.08	***	0.05	***
	Good					0.17	***	− 0.08	***	0.13	***

Table 3 (continued)

Attribute	Level	Wald χ^2	Sig.	Wald χ^2 (=)	Sig.	Class 1		Class 2		Class 3	
						Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Incubator affiliation	None: independent, privately owned	91.41	***	90.59	***	0.05	***	−0.15	***	0.11	***
	Startup investor					−0.18	***	0.09	***	0.00	
	Local university					−0.05	***	0.10	***	−0.11	***
	Multinational company active across global markets					0.25	***	−0.08	***	0.03	***
	Internationally renowned university					−0.01		0.08	***	−0.04	***
	Regional government					−0.06	***	−0.04	*	0.01	*
Industry focus	Focus on your industry	81.13	***	78.1	***	0.03	***	0.09	***	−0.03	***
	Broad range of industries					−0.03	***	−0.09	***	0.03	***
Alternative specific constant	Left	90.96	***	90.95	***	−0.05	***	0.19	***	0.02	***
	Right					0.05	***	−0.19	***	−0.02	***

McFadden R^2: 0.28; Number of parameters: 72; Log Likelihood (LL): −4697; BIC (based on LL): 9887

Wald χ^2 indicates the attribute's importance; Wald χ^2 (=) indicates the attribute's difference between classes

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 4 Relative importance of the attributes for each class

Attribute	1	2	3	Total
Financial capital	0.17	0.29	0.17	0.63
Physical capital	0.15	0.09	0.08	0.32
Knowledge	0.09	0.07	0.21	0.37
Social capital	0.13	0.13	0.12	0.38
Legitimacy: track record	0.21	0.21	0.08	0.50
Legitimacy: Incubator affiliation	0.17	0.15	0.11	0.43
Legitimacy Industry focus	0.03	0.04	0.07	0.14
Alternative specific constant	0.04	0.03	0.16	0.23
Total	1.00	1.00	1.00	3.00

Table 5 Multinomial logit model

Covariate	Wald χ^2	Sig.	β class 1	Sig.	β class 2	Sig.	β class 3	Sig.
Intercept	0.05		−0.23		0.17		0.06	
Devoting yourself full-time to the business	8.66	*	−0.34	**	0.08		0.26	*
Hiring employees	4.75	a	0.00		−0.26	*	0.26	
Preparing a written business plan	11.97	**	0.20		0.23	*	−0.43	**
Applying for a patent/copyright/trademark	9.05	*	−0.20		0.40	**	−0.20	
Defining market opportunities	5.29	a	−0.21		−0.04		0.25	*
Purchasing materials, equipment, facilities, or other tangible goods for the business	11.05	**	0.40	***	−0.16		−0.24	
Paid salaries to employees or self	6.67	*	−0.25	*	0.24	*	0.01	
Investments raised	5.56	a	0.05		−0.09	*	0.05	
No spinoff	11.36	*	−0.10		0.29	**	−0.19	
Spinoff from university or research lab			0.30	*	−0.21		−0.09	
Spinoff from another company			−0.19		−0.08		0.28	
Industry experience	7.19	*	0.02	*	0.01		−0.02	**
Incubator experience	6.23	*	−0.33	*	0.08		0.24	
Grow and become a large company	10.09	**	0.16	**	−0.09		−0.07	
Be acquired by a larger company for a good price	5.87	a	0.17	*	−0.08		−0.09	
Be in my control	8.30	*	0.20	**	−0.07		−0.12	
Expand into global markets	8.23	*	0.25	**	−0.03		−0.22	*
Industry dummies	75.93	a						

McFadden R^2: 0.11; Number of parameters: 94; Log-likelihood (LL): −899.78; BIC (based on LL): 2440.95

[a]$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Class 1 entrepreneurs have a strong preference for an incubator affiliated with a multinational company that is active across global markets. This is in line with the importance that these entrepreneurs attach to the incubator's track record. A multinational company is perceived to be a particularly legitimate entity. Incubators can gain legitimacy by associating themselves with such a reputable organization, which in turn also benefits the legitimacy of the startups that are associated with that particular incubator. Compared to the other classes, entrepreneurs in class 1 attach the most importance to the incubator's training, coaching, and networks. They prefer incubators that provide both training and coaching as well as those with strong internal and external networks. Still, these two attributes are only the fifth and sixth most important, respectively, which means that they do not play a very large role in the decision making of these entrepreneurs.

Table 5 primarily indicates that class 1 entrepreneurs want their business to grow large and to operate in global markets. They are willing to sell their business for a good price,[1] although they would, if possible, still want to be in control of the business. This is similar to the arrangements that role model entrepreneurs such as Steve Jobs at Apple had and that

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[1] This characteristic was significant at 10% level.

Elon Musk at Tesla or Mark Zuckerberg at Facebook have. They sold the majority of their company, but still retained a significant amount of shares and remained in control. It is possible that these entrepreneurs understand that being acquired by a large company is a faster route to global success than going it alone since one can tap into the resources of the parent company. The ambition to be acquired fits perfectly with the preference for an incubator owned by a multinational company and an incubator that specializes in their own industry as well as the preference for training and coaching sessions and both types of networks. This combined evidence indicates that trust in the origin of the resources and the motivations of the entrepreneurs are cause for their specific preferences.

Table 5 further shows that these entrepreneurs are more likely to have experience in their industry compared to the other classes. This experience is probably earned in the university or research lab from which they are likely a spinoff. This can indicate that their businesses are technology based. It also explains why they are not interested in an incubator that is affiliated with a university. These startups probably already have the necessary technological capabilities and network contacts to make their business a success in the global market. This fits with the cause that startups take their existing resource stock into account when articulating their preferences.

Further, class 1 entrepreneurs are less likely to have paid any salaries since they probably instead invest their money in materials, goods, or services for the business. The decision to not pay salaries can also explain why these entrepreneurs are less likely to work on their business full-time. Table 5 additionally shows that class 1 entrepreneurs are the least likely to be currently or formerly incubated even though it could help them to achieve their ambitions. A possible reason for this is that they are not ready to devote themselves full-time to the business yet as there is no incubator available that meets all their criteria.

Overall, entrepreneurs in this class base their choice most on the intangible resources that, according to the literature, enhance performance (Grimaldi and Grandi 2005; Hansen et al. 2000; Isabelle 2013; Vanderstraeten and Matthyssens 2012).

4.2 Class 2: innovation-driven funding seekers (n = 347; 37.1%)

Of all the classes, the entrepreneurs in class 2 attach the highest relative importance to funding (see Table 4). The incubator's track record is the second most important attribute for these startups. Class 2 entrepreneurs prefer an incubator with a neutral or good track record, and they have an aversion to incubators with a negative track record. Being associated with an incubator that has a good track record could further help with convincing other stakeholders, including investors, to commit their resources. The incubator's affiliation is the third most important attribute. Closer inspection of Table 3 reveals that the importance of this attribute is due to the entrepreneurs' preference for an incubator that is either independent or affiliated with a multinational. Class 2 entrepreneurs prefer incubators that provide both training and coaching, that have strong internal and external networks, and that focus on supporting startups in a broad range of industries. However, the importance attached to these attributes is much lower than the importance assigned to the track record and funding attributes.

The co-variates shown in Table 5 help to explain the preferences of these entrepreneurs. The importance of funding may be due to class 2 entrepreneurs being cash poor: they are less likely to have raised funds. Further, they need funding for their own salaries, which they are more likely to pay than the other classes. These salaries are most likely for the startup team itself as they are less likely to hire employees. Further,

class 2 entrepreneurs are more likely to have applied for a patent, copyright, or trademark, which could indicate that these startups are more driven by innovation and hence require relatively high amounts of financial capital (Pisano 2006). As these startups are less likely to be spinoff companies, they need to raise funding for their products themselves. The innovative nature of these startups can also explain the preference for a good track record of the incubator since these types of startups in particular suffer from a lack of legitimacy (Carpenter and Petersen 2002). The innovative nature of class 2 entrepreneurs may seem surprising given that these entrepreneurs are less likely to choose an incubator that is affiliated with a (local or internationally renowned) university. However, since these entrepreneurs are more likely to have applied for a form of intellectual property, they have less need for the resources of a university. This explanation is in line with these entrepreneurs' preference for an incubator with an external network as well as one that is associated with a multinational. The entrepreneurs can use the multinational's network and distribution channels to bring their product to the market. Finally, the entrepreneurs in this class are likely to have developed a business plan.

Overall, the preferences of this class seem consistently driven by a combination of the existing resources stock and resource needs. This class fits with the empirically observed preferences for tangible resources by startups (McAdam and McAdam 2008; Soetanto and Jack 2013; Van Weele et al. 2017).

4.3 Class 3: self-made individualists (n = 220; 23.5%)

Typical for entrepreneurs in the self-made individualist class is the fact that they disfavor the incubator's training and coaching as well as their networks. Table 4 indicates that, next to funding, these two attributes play an important negative role in the choice of such entrepreneurs. Incubators with strong internal and external networks as well as those that provide both training and coaching are *less* likely to be chosen. It seems that class 3 entrepreneurs want to focus on developing their business with only a minimum level of intervention from the incubator. Class 3 entrepreneurs prefer an incubator that is affiliated with an investor or a (local or internationally renowned) university. The negative coefficients suggest that these startups do not believe that the incubator will add much value to their business through these resources.

Table 5 shows that class 3 entrepreneurs are most likely to work full-time on their business and to have defined a market in which they operate. Despite their dedication, they have less industry experience, and they are less likely to have a business plan. In light of the DCE results, this is surprising since it suggests that class 3 entrepreneurs have less industry knowledge and networks, or less of an idea how their business will operate. This discrepancy suggests that this class might have features of "unconscious incompetence" (Van Weele et al. 2017).

Class 3 entrepreneurs do not aspire to expand into global markets. This explains why they do not want an incubator that is affiliated with a multinational. The combined evidence suggests that these entrepreneurs are more interested in running a business on their own rather than becoming a thriving business or being supported by an incubator. This fits with the motivational cause for preference heterogeneity.

Overall, this class is also in line with the empirically observed preferences for tangible resources (McAdam and McAdam 2008; Soetanto and Jack 2013; Van Weele et al. 2017).

5 Conclusion and discussion

Through a discrete choice experiment, this study inductively *identified and explained the heterogeneity in preferences for resources offered by an incubator to startups* and confirmed that substantial heterogeneity exists in preferences for resources from an incubator. We also identified three classes with distinct choice profiles: (1) "ambitious, balanced spinoffs," who consider all of the incubator's attributes when making a decision; (2) "innovation-driven funding seekers," who base their choice primarily on the funding provided by the incubator; and (3) "self-made individualists," who disfavor networking, training, and coaching.

Our results largely fit with the expectation to find latent classes that prefer either tangible or intangible resources, but also reveal that the image is a little more nuanced. Of all the classes, the ambitious, balanced spinoffs class based their choice most on the intangible resources that should enhance performance according to the incubation literature (Bruneel et al. 2012; Eveleens et al. 2017; Hansen et al. 2000; Van Rijnsoever et al. 2017a, b). Yet, they are also aware of the importance of tangible resources. The innovation-driven funding seekers and the self-made individualists fit more with the empirically observed preferences for tangible resources (McAdam and McAdam 2008; Soetanto and Jack 2013; Van Weele et al. 2017). The difference between the innovation-driven funding seekers and the self-made individualists is that the preferences of the former were consistent with the needs that stem from the MNL. The choices made by the self-made individualists did not match their MNL-model profile. This class fits with the earlier findings that entrepreneurs are unaware of the resources needed for business success (Bruneel et al. 2012; Oakey 2003; Van Weele et al. 2017; Vohora et al. 2004).

5.1 Implications

Our study is the first to quantitatively identify the heterogeneity in preferences of entrepreneurs for resources from an incubator. Thereby it builds on earlier qualitative studies that identified this phenomenon (McAdam and McAdam 2008; Soetanto and Jack 2013; Van Weele et al. 2017) and that helped to identify the possible causes of this heterogeneity. Our study contributes to this line of research by showing that the heterogeneity in preferences was not evenly distributed but that three classes can be distinguished. Table 6 summarizes these classes and gives implications for incubators. About 40% of the entrepreneurs base their choice on what they theoretically should prefer to enhance performance, while 60% do not. Hence, all three classes fit with ideas derived from the earlier literature, but we now understand how large the differences are between the classes as well as what the profiles of these entrepreneurs are. We suggest further qualitative research to verify the existence of these classes and the motivations of their members. Future researchers can also use this framework when studying the effectiveness of incubation models for different types of entrepreneurs, or use the classes as point of departure for their sampling strategy. Moreover, it would be of great interest to study how the businesses of the three classes develop over time.

Capturing the heterogeneity among startups in latent classes allowed us to reconcile the observed differences in preferences for tangible and intangible resources. This demonstrates that DCEs and inductive latent class analysis can be useful tools to bridge theoretical differences, or differences between empirical observations and theoretical expectations.

Table 6 Summary of attributes (resources or services) that increase the choice for an incubator for each latent class and associated characteristics of the startup and the entrepreneur

	Class 1: Ambitious, balanced spinoffs (n=368, 39.4%)	Class 2: innovation-driven funding seekers (n=347; 37.1%)	Class 3: self-made individualists (n=220; 23.5%)
Preferred resources or services	Grants or subsidies Free access to physical capital Training and coaching Strong internal and external networks No bad track record Multinational company or independent incubator Focus on own industry	Grants or subsidies Free access to physical capital Training, possibly with coaching External network, possibly internal network Neutral or good track record Independent incubator, no university Broad range of industries	Grants or subsidies Paid physical capital No training, or only coaching No network, or only external network No track record, or neutral track record Investors or universities Focus on own industry
Characteristics of the startup/entrepreneur	Does not work full-time for the business Purchased materials, equipment, facilities Pays no salaries to employees or self Spinoff from university or research lab Industry experience Not incubated Wants to grow and become a large company Wants to be acquired by a larger company for a good price Wants to be in control Wants to expand into global markets	Did not hire employees Prepared a written business plan Applied for a patent/copyright/trademark Pays salaries to self Raised little investments No spin-off	Works full-time for the business Did not prepare a written business plan Defined market opportunities Less industry experience Does not want to expand into global markets
Strategy for incubators to attract and support this class	Be an independent organization or affiliate with a multinational company Can be in the same incubator as the innovation-driven funding seekers as long as the incubator tailors to the specific needs of each class Offer the full range of tangible and intangible resources Take a more laissez-faire approach	Be an independent organization Can be in the same incubator as the ambitious, balanced spinoffs as long as the incubator tailors to the specific needs of each class Offer the full range of tangible and intangible resources	Take an assertive approach Tenants are likely skeptical about the value of incubation; make tenants aware of the value of intangible resources Be conscious of the lower growth ambitions of the entrepreneur

Contradicting expectations or findings can all be true, but apply to different subgroups. Latent class analysis based on unobserved characteristics is commonly a more powerful statistical tool to identify subgroups than differentiating subgroups based on observed characteristics only (Bhat 2000; Hensher et al. 2005; Vilcassim and Jain 1991). Thereby, it has the potential to further refine theories in a parsimonious manner.

We also found that optimizing business performance was not the only or most important goal for the majority of our respondents. To future researchers, this demonstrates the importance of taking motivational factors into account when explaining the behavior or performance of startups (Baum and Locke 2004). Theoretically, this underlines the importance of taking into account motivational elements in entrepreneurship research (Carsrud and Brännback 2011).

The identification of the latent classes also presents an opportunity for incubators to profile and differentiate themselves from other incubators in their country or region as well as to attract a specific class of entrepreneurs. All classes are attracted by free money in the form of grants or subsidies (Table 6). Given its importance in the choice process, incubators can use free money, if available, as a resource to attract startups in general.

Innovation-driven funding seekers and ambitious balanced spinoffs seem to exhibit preferences for similar attributes although they attach different values to those attributes. They can probably be housed under the same roof, led by an independent organization or a multinational company. For both classes, incubators need to offer the full range of tangible and intangible resources. Incubators can differentiate between the two classes by tailoring their services and resources offered to the needs of the entrepreneur. Moreover, the ambitious, balanced spinoffs are likely more aware of their resource needs and are intrinsically motived to participate in the incubation program. This allows the incubator to adopt a more laissez-faire approach (Van Weele et al. 2017). Such a strategy is less evident for the innovation-driven funding seekers.

The preferences of the self-made individualists are less congruent with those of the other classes. The challenge is to make them aware of the value of the resources offered by the incubator. Studies suggest that assertive incubators with many mandatory activities can help to achieve this although the services offered must be of sufficient quality (Bergek and Norrman 2008; Van Weele et al. 2017). However, incubators must be aware that tenants from this class are likely more skeptical about the value of incubation than other classes, which makes it more difficult to offer effective support. Overall, our study shows that behavioral elements, such as the subjective valuation of resources and motivation, play an important role in the choice of an incubator, and that incubators need to take these behavioral elements into account when supporting startups.

5.2 Limitations

Our study has a number of limitations. First, a DCE explores an individual's stated preferences rather than their actual (or "revealed") preferences. Measuring stated preferences allows the gathering of data over multiple choices per individual and is therefore particularly valuable when exploring latent classes. It also allows for greater freedom than the alternatives since the researcher is not bound by the characteristics of real-world examples. However, the exploration of stated preferences may lead to biased results when hypothetical scenarios do not resemble the real world (Hensher et al. 2005). We tried to avoid this by carefully consulting both the literature and entrepreneurs through interviews so as to ensure that the alternatives in our experiment were plausible. Still, we encourage efforts

that complement our study by exploring entrepreneurs' revealed preferences, for example, by exploring the number of applications that incubators receive, whether the incubator they selected matched their preferences, and the extent to which entrepreneurs actually used the resources offered.

Second, it is important that future studies aim to replicate our findings with new data to arrive at a more robust theory (Eisenhardt and Graebner 2007). Moreover, our findings need further refinement and rigorous testing. To keep the choice tasks easy to understand for respondents, we limited ourselves to five resources represented by seven attributes that emerged from both the literature review and the interviews with entrepreneurs. Given that our model produced a good pseudo-R^2 according to the standards of DCEs (Hensher et al. 2005), we are confident that we included the most important attributes. Still, future research could test additional attributes that may play a role in entrepreneurs' preferences. Examples are shared facilities or the length of the incubation program. A less important attribute, such as industry focus, can be dropped. Moreover, although the profiles for each class are theoretically plausible, it is always possible that some of findings are based on a false positive result. A possible example is the apparent contradiction in the ambitious, balanced spinoffs between wanting to remain in control and selling the business for a good price. This further exemplifies the need for replication.

Third, our sample includes only entrepreneurs from North America and Western Europe. We did not find significant differences between countries, which makes our results generalizable across these regions. However, we advise caution when translating our results to other regions, such as Asia, South America, or even other parts of Europe, as these regions have different entrepreneurial ecosystems (Ács et al. 2014).

Finally, incubators can be highly selective in their choice of startups (Bergek and Norrman 2008). As, selection did not emerge in our interviews as an important attribute, thus we did not include it in the DCE. From the model, we can infer what would happen with respondents that did not get selected. Respondents of different classes will seek an alternative that is closest to their ideal alternative by compromising on the attributes that they find least important. This gives incubators the freedom to not offer resources that entrepreneurs find less important. We do acknowledge that selection is a powerful tool for incubators to choose entrepreneurs from the latent class right for their program, but there is no indication that this influenced our results.

Appendix 1: Quota and case weights

Country	TEA 2015	Country population	Population total early-stage entre-preneurs	Target Quota	Sample total early-stage entrepreneurs	Case weight
Austria	8.71	8,623,073	751,070	30	37	0.280
Canada	13.04	35,851,774	4,675,071	100	109	0.592
Belgium	5.4	11,267,581	608,449	30	38	0.221
France	5.34	67,107,000	3,583,514	100	125	0.395
Germany	5.27	81,197,500	4,279,108	100	125	0.472
Ireland	6.53	4,635,400	302,692	50	65	0.064
Netherlands	9.46	16,928,000	1,601,389	50	67	0.330
Switzerland	7.12	8,279,700	589,515	30	24	0.339
United King-dom	10.66	64,800,000	6,907,680	110	104	0.916
United States of America	13.81	322,210,000	44,497,201	400	241	2.546

Appendix 2: selection questions for respondents

1. Are you, either alone or with others, currently trying to start a new business? This includes any self-employment or selling of goods or services to others.

   - No **Not included in sample**
   - Yes

2. Would you consider the new business to be a technology-based start-up? *A technology-based start-up is a new firm whose business is based on the exploitation of technological know-how through the creation of new products and services. Examples include the development of a new drug or software service.*

   - No **Not included in sample**
   - Yes

3. In the past 12 months, in which of the following activities have you engaged during the development of your business? *Tick all that apply:*

   - Formally registering the business
   - Preparing a written business plan
   - Organizing a start-up team
   - Devoting yourself full-time to the business (more than 35 h per week)
   - Developing a proof of concept or working prototype
   - Applying for a patent/copyright/trademark
   - Defining market opportunities
   - Hiring employees
   - Asking financial institutions or other people for funds
   - Receiving money from the sales of goods or services

- Purchasing materials, equipment, facilities, or other tangible goods for the business
- Discussing the new business' product or service with potential customers
- None of the above: **Not included in sample**

4. Has the new business paid any salaries, wages, or payments in kind, including your own? *'Payments in kind' refers to goods or services provided as payments for work rather than cash. Payments in kind do not include stock options.*

- No
- Yes

5. **If the previous question was answered 'Yes':** For how long has the new business been paying salaries, wages, or payments in kind, including your own?

- For 0 to 3 months
- For 3 to 6 months
- For 6 to 12 months
- For 1 to 2 years **Not included in sample**
- For 3 to 5 years **Not included in sample**
- For more than 5 years **Not included in sample**

6. Do you, or will you, personally own all, part, or none of this business?

- All
- Part
- None **Not included in sample**

7. Is, or will, the new business be a subsidiary? *A subsidiary is a venture where another organization owns more than 50% of voting shares.*

- No, the new venture is not a subsidiary of another organization
- Yes, the new venture is a subsidiary of another organization **Not included in sample**

Appendix 3: Respondents by sector

Sector	Sample respondents
Aerospace	14
Artificial intelligence	47
Basic metals	26
Biotechnology and pharmaceuticals	20
Chemistry	30
Clean technology	69
Coke and petroleum products	6
Electrical engineering and equipment	45
Energy	33
Fabricated metal products	7
Functional or processed food	18
ICT and computers	87

Sector	Sample respondents
Information systems	157
Machinery	13
Medical & dental instruments	17
Motor vehicles	27
Nanotechnology	5
Optical products	8
Other non-metallic mineral products	1
Photonics	1
Repair and installation machinery	19
Reproduction recorded media	14
Robotics	15
Rubber and plastic products	7
Ships and boats	4
Tele-communications	44
Transport	37
Transport equipment	10
Water	13
Weapons and ammunition	17
Other, please specify:	124
Total	935

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