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A gendered look at entrepreneurship ecosystems

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Abstract Underlying entrepreneurship ecosystems is the implicit assumption that all entrepreneurs have equal access to resources, participation, and support, as well as an equal chance of a successful outcome (venture start-up). However in practice, this is not always the case. Research finds that when it comes to many aspects of the entrepreneurship ecosystem, women are at a disadvantage. In this paper, we offer a brief overview of current ecosystem frameworks pointing out where "gender" matters in ecosystems at the institutional, organizational, and individual levels. We go on to present a summary of the contributions to this special edition and conclude with suggestions for future research.

Keywords Entrepreneurship ecosystems · Gender · Institutional level · Organizational level · Individual level

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1 Introduction

Entrepreneurship ecosystems involve a number of interconnected elements that are mutually reinforcing, facilitating innovation and the growth of entrepreneurship (Aulet 2008; Brush 2014; Fetters et al. 2010; Isenberg 2010; Kantis and Federico 2012). Entrepreneurship ecosystems include a conducive culture, the availability of financing, the acquisition and development of human capital, new markets for products and services, and a range of institutional and infrastructural supports (Isenberg 2011; WEF 2013). Entrepreneurship ecosystems are by nature dynamic, and actors and institutions are interdependent in that they are influenced by, and in turn influence, their particular entrepreneurship ecosystem (Acs et al. 2017; Feld 2012; Spigel 2017).

Behind the concept of entrepreneurship ecosystems is a growing motivation to develop programs, policies, and initiatives to promote entrepreneurship and grow entrepreneurial activity across regions (Auerswald 2015; Isenberg 2014; World Economic Forum 2013). Along with policy and practical interest, a rising number of academic studies explore the theoretical foundations, conceptualizations, and lineages of entrepreneurship ecosystems (Mack and Mayer 2016; Spigel 2017; Stam and Spigel 2016), as appeared most recently in a special issue of this journal (Acs et al. 2017) and a forthcoming special issue in *Strategic Entrepreneurship Journal* (Autio et al. 2017; Spigel and Harrison 2017).

Underlying most entrepreneurship ecosystem frameworks is the assumption that all entrepreneurs have equal access to resources, participation, and support, as well as an equal chance of a successful outcome (venture start-up) within the entrepreneurship ecosystem. In theory, this is a reasonable assumption, but in practice, we find this is not always the case. There is substantial evidence that women entrepreneurs' participation, access to resources, and outcomes in ecosystems vary from those of men. For instance, if we consider the recent Global Entrepreneurship Monitor (GEM) Global Women's Report, we see substantial differences in start-up rates between men and women in 74 economies, with only five economies showing parity (GEM Global Report, 2016/2017). Similarly, across all levels of development, women are 20% more likely to cite necessity (rather than opportunity) motives for start-up, even though at individual level, women tend to have equivalent human capital (education). These differences are attributed to several different framework conditions, which are in essence, ecosystem attributes (institutions, cultural, political, economic, infrastructure, financial markets, policies and programs, etc. http://www.gemconsortium.org/wiki/1148). For example, ecosystem factors such as programs and economic support for child care may facilitate and encourage more women to participate in entrepreneurship across economies (Brush and Greene 2016; Elam and Terjesen 2010). There is also evidence that family support is particularly important for high-growth-oriented ventures (Thébaud 2015). In economies where women are participating equally with men in the labor force, achieving wage parity and where they are equally likely to serve as managers or executives and in technical and professional fields, they also are as likely to be starting businesses, including those started out of opportunity, as well as running established ones (Brush et al. 2017).

More specifically, there is continuing evidence that access to start-up capital is a challenge for women. The Survey of Small Business shows that nearly 65% of women-led firms start with less than $5000 while about 45% of men-led firms start with the same amount of capital (NWBC 2017). Another study shows that men launch their businesses with an average of $135,000 compared to $75,000 for women (Coleman and Robb 2012). While some of these differences might be explained by the increased prevalence of women in services and retail, this is not a comprehensive explanation. Other work shows that women are just as willing to use debt financing, but they receive less favorable treatment in terms of loan size, interest rates, and collateral requirements, and they are less satisfied with lending relationships (Coleman 2000; Treichel and Scott 2006; Coleman and Robb 2012).

The access to capital challenge increases when examining women's access to equity capital. There is a clear and pervasive gap in the venture capital funding rates between women- and men-led businesses. The most recent examination of all US venture capital funded businesses between 2011 and 2013 found that only 15% had one woman on the executive team and only 3% had a woman CEO (Brush et al. 2014a, 2018). Several theories are offered to explain the disparity, including social capital, human capital, strategic choice, and perceived risk (Carter et al. 2003), but these theories do not offer sufficient explanation for the rationale as to why venture capitalists would *not* invest in women-led ventures. In fact, many fundable women entrepreneurs had the requisite skills and experience to lead high-growth ventures (Brush et al. 2014a, b). Nonetheless, such women entrepreneurs have been consistently left out of the networks of growth capital finance and appeared to lack the contacts needed to "break through" to access this network and obtain the venture funding their ventures needed.

When we look at sectors where women entrepreneurs are creating jobs, in the USA they are expected to create over half of the 9.72 million new small business jobs by 2018,[1] although most of these jobs are lower-tech. Entrepreneurial sectors, such as STEM and advanced technologies, have fewer women entrepreneurs. Recent evidence from Crunchbase shows that there are fewer women starting technology businesses, and that hostile work environments encourage women to leave this sector (Hewlett 2014).[2] Statistics indicate that of 43,008 global technology companies with founders achieving initial funding between 2009 and 2017, about 16% had one female founder. For women operating in high technology incubators, research shows that stereotypical gendered expectations surrounding high technology venturing reproduces masculine norms for entrepreneurial behavior (Marlow and McAdam 2012).

Not only is there evidence that entrepreneurship ecosystem factors differentially influence men and women but also there is emerging data that show the effects of women on entrepreneurship ecosystems. A follow-up study of participants across 15 countries, in the Goldman Sachs *10,000 Women Project* indicated that 12–18 months after

[1] https://www.forbes.com/sites/work-in-progress/2012/06/08/entrepreneurship-is-the-new-womens-movement/#5aaa920f3b4c.

[2] https://techcrunch.com/2017/04/19/in-2017-only-17-of-startups-have-a-female-founder/.

completion of the program, 90% of the 3000 women entrepreneurs "paid it forward" by mentoring other women entrepreneurs in their ecosystems (Brush et al. 2014b). They became role models and helped to provide skills and coaching to other aspiring women entrepreneurs. Other studies show that women entrepreneurs tend to invest a higher proportion of their income back into their families and communities than men and allocate more money towards food and children's education (Siba 2016). Therefore, we see that women are not only impacted by ecosystems, but in return they impact others in their ecosystems.

Despite evidence that women are influenced by and, in turn, influence ecosystems, theory explaining how and when variation by gender might apply differentially is seemingly absent from most discussions of entrepreneurship ecosystems. Our review of recent articles finds that even though cultural and social attributes (e.g., networks, mentors, role models) are included, no mention of possible gender influences is considered (Acs et al. 2017). Diversity of ecosystems is generally concerned with variety of businesses and industries, and system participants (e.g., stakeholders) as well as business models support organizations and growth orientation of ventures (Roundy et al. 2017). Further, it is argued that founders with similar growth intentions will behave similarly in pursuing their outcomes (e.g., growth, innovation), with the presumption that all actors have the same access to support systems and resources within the ecosystem.

Therefore, we conceived the idea for this special issue, following the annual Diana International Conference[3] in 2015, held in Wellesley, Mass. at Babson College. We sought papers that broadly fit with the overarching theme of women entrepreneurs in ecosystems; specifically, papers that explored the *impact* of women's entrepreneurship on ecosystems, as well as the *influences* of ecosystem factors on women entrepreneurs. For this special issue, we received upwards of 50 submissions, all of which were triple blind reviewed.

The remainder of this article proceeds as follows: first, we offer a brief overview of current ecosystem frameworks; second, we point out where "gender" matters in ecosystem frameworks across institutional, organizational, and individual levels; third, we present a summary of the contributions to this issue. Finally, we offer suggestions for future research that may shed light on specific areas within ecosystem frameworks where gender matters and where women influence or are influenced in this regard.

2 Overview of entrepreneurial ecosystem frameworks

Early representations of entrepreneurship ecosystems proposed that interdependent actors within geographic regions influenced the formation and trajectory of the economy as a whole and that these components would eventually generate new venture creation over time (Spilling 1996; Van de Ven 1993). Neck et al. (2004) examined the components of an entrepreneurial ecosystem, formal and informal networks, physical infrastructure, and community culture, finding these collectively influenced the development of a technology cluster. More recently Isenberg (2010) suggested that the creation of a successful entrepreneurship ecosystem was dependent on conducive culture, enabling policies and leadership, availability of finance, quality human capital, venture-friendly markets for products, and a range of institutional and infrastructural supports. Isenberg, who tested his model in Manizales, Colombia and other locations, argues that there is no single formula, but it is a bottom up process that seeks inputs, engages individuals, activates stakeholders, creates a platform, and expands programs leading to an increasing number of companies that grow more and grow more rapidly (Isenberg and Onyemah 2016).

Similar to Isenberg's model, the World Economic Forum (WEF) (2013) identifies seven components: markets, culture, education and training, regulatory framework and infrastructure, funding and finance, and human capital. In these cases, regional or community efforts are involved to develop a vibrant ecosystem. New firms emerge and grow not only because talented and visionary individuals (entrepreneurs) created them and develop them but also because they are located in an environment or "ecosystem" made of private and public players, which nurture and sustain them, making the actions of entrepreneurs easier.

Stam and Spigel (2016), following more of an innovation systems perspective, suggest that ecosystems are

[3] The Diana Project was launched in 1999 by Professors Brush, Carter, Gatewood, Greene, and Hart, to study the phenomenon of women's entrepreneurship in the USA. The Diana Project team, in partnership with ESBRI (Entrepreneurship and Small Business Research Institute, Sweden), inaugurated the Diana International Project (DIP) in 2003. DIP currently involves researchers from 16 countries worldwide and aims to provide a platform from which to develop, conduct and share a global research agenda dedicated to answering questions about women entrepreneurs and growth oriented businesses.

regionally based and result from interactions and network connections among actors, defining entrepreneurial ecosystems as "a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship" (p. 1). They argue that start-ups are at the center of the ecosystem, that the entrepreneur is the core actor in building a sustaining ecosystem, and that knowledge, entrepreneurial, technical and market are essential. In contrast to Isenberg, they suggest that visible entrepreneurial leaders and networks of entrepreneurs are at the heart of the ecosystem. Following Stam (2015), they propose a three level model: key elements of which are systemic and framework conditions, outputs (entrepreneurial activity), and outcomes (aggregate value creation). While there is a feedback loop, the model is inherently linear.

Mason and Brown (2014), following economic geography and regional development theory, define entrepreneurial ecosystems as "(A) set of interconnected entrepreneurial actors, entrepreneurial organizations, institutions and entrepreneurial processes which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment"(p. 5). They argue that while every ecosystem is unique, spatial boundedness is common to all. Different from Stam and Spigel (2016), they note that the dynamics of ecosystems can be scale up or embryonic and propose a taxonomy that characterizes the key actors—connectors, resource providers and culture, interactions, and mindsets within ecosystems.

Other work suggests that ecosystems may either facilitate or hinder entrepreneurial activity. For example, the existence of prior ventures, the availability of start-up financing mechanisms, a patent system, and a culture tolerating failure all facilitate the creation of new firms through a supportive entrepreneurial ecosystem, while conversely, an ecosystem might hinder entrepreneurship as in corrupt societies or if an entrepreneur tries to introduce a radical innovation when no technical standard yet exists (Stam and Bosma 2015). As a result, countries, governments, communities, institutions, and cities are making efforts to deliberately develop local conditions, programs, and policies by involving a wide variety of stakeholders to become more entrepreneurial, in a way that is unique to their area, that is dynamic and self-sustaining (Isenberg 2010; Stam and Spigel 2016).

Generally, there is some consensus that ecosystems are regionally or spatially based, that entrepreneurial activity of some type is an outcome, and that there are a combination of institutional, sociocultural, and economic factors involved (Brown and Mason 2017). In addition, most research highlights the importance of community, in that there are various actors that in some way support entrepreneurs financially, socially, or emotionally (Spigel and Harrison 2017). However, there is no consensus on the actual attributes, the catalyst (the entrepreneur or policy-makers), or the outcomes (start-ups, productive businesses, wealth, or high growth) (Brown and Mason 2017; Spigel 2017; Stam and Spigel 2016). There also is little consensus on the actual measures and metrics for success (Acs et al. 2014, 2017; Stam and Spigel 2016). Notably, Brown and Mason note that "the initial conceptualizations of EE's appear to be somewhat under-socialized, lacking a time dimension and fail to incorporate the full complexities of the socio-spatial context mediating entrepreneurship" (2017, p. 15). Stangler and Bell-Masterson (2015) suggest that there are four major categories for measuring the vibrancy of a local entrepreneurial ecosystem and focus on density, fluidity, connectivity, and diversity, each having four measures.

Following on Brown and Mason's (2017) observation, we find that most current definitions presume objective factors and elements, more often rooted in economics. For example, the notion of "productive entrepreneurship" is anchored in Baumol's (1990) work, which argues that productive entrepreneurship is the result of ambitions entrepreneurs who explore opportunities to discover new opportunities and achieve growth or innovation exceeding that of the "average" entrepreneur (Stam and Spigel 2016). In this view, the entrepreneurial process involves risk-taking behavior, creating new goods and services, which are explored, evaluated, and exploited, and leading to innovative and high-growth entrepreneurship (Schumpeter 1934; Shane and Venkataraman 2000).

While current perspectives and frameworks for entrepreneurship ecosystems are on the surface relevant and appropriate for considering factors that facilitate or inhibit entrepreneurship, these discussions do not take into account that causes of variation may be due to gender. This apparent omission of gender is likely due to the current framing of ecosystems within economic geography, regional development, and information economic theories (Brown and Mason 2017; Feldman 2014; Stam and Spigel 2016). While gender may be implicit in definitions of culture (Isenberg 2010; WEF

2013), or diversity of ecosystem participants (Roundy et al. 2017), or what is meant by social status of self-employment, role models, or start-up communities (Mason and Brown 2014), we argue that explicit recognition of gender may enhance theory and elaborate our understanding of entrepreneurship ecosystems generally.

3 How gender matters in entrepreneurial ecosystems

Gender refers to the individual's state of possessing characteristics related to being masculine or feminine (Muehlenhard and Peterson 2011; Unger 1979), while sex refers to biological aspects of men and women. Gendered attributes may refer to individuals and their roles, organizations, or institutions (Acker 1990; Hanson 2009; Johnson and Repta 2013). More specifically, ambitious, bold, and risk-taking behavior suggested by these definitions are associated with masculinity and masculine behaviors of entrepreneurship (Ahl 2006; Baughn et al. 2006; Bird and Brush 2002). Further, the practice of pursuing high-growth entrepreneurship, in particular those with aggressive funding goals that are more likely to pursue venture capital funding, has been consistently considered a masculine behavior (Gupta et al. 2009). It has been noted that due to the masculine context of entrepreneurship, "the stereotype of 'think successful entrepreneur – think male'" continues to endure (Eddleston et al. 2016: 497; Marlow and Swail 2014). In addition to these differences in perceptions, there is evidence that men and women have different access and outcomes in ecosystems. For example, Hanson (2009) considers how women's entrepreneurship is influenced by habitualized patterns and interactions within institutions, while at the same time, influencing the dynamics of entrepreneurial places by virtue of creating greater heterogeneity in business ownership, shifting power over resources, and social relations and networks.

While gender encompasses both men and women, we focus on both gender as a concept (masculine and feminine aspects), as well as women and their businesses because they are less often included in studies of women's entrepreneurship (Jennings and Brush 2013). We therefore explore how and where gender matters for entrepreneurial ecosystems at three levels: institutional, organizational, and individual.

3.1 Institutional level

Institutions set constraining and enabling boundaries for individual behaviors and actions, by influencing the nature and extent of entrepreneurship, its development, and its outcomes (Welter and Smallbone 2011, 2012). As enabling forces, they can reduce transaction costs, uncertainty, and risks of individual behavior; as constraining forces, they can add to transaction costs for entering entrepreneurship and developing a business and they affect the returns from entrepreneurship. Institutional forces shape both individual interests and desires and opportunity structures, framing possibilities for action and influencing whether these behaviors result in persistence or change (Powell and Colyvas 2008).

Regulatory, normative, and cognitive institutions can all be of gendered nature. It is argued that gender aspects may often be in the "hidden" aspects, or informal practices, rules, and norms (Chappell and Waylen 2013). Gender may be manifested in institutions both nominally, the results of men's historical ongoing dominance of positions of power, and substantively, which is related to gender biases, which emerge from social norms founded on accepted ideas about masculinity or femininity. Regulatory, normative, and cultural-cognitive institutions influence, both direct and indirectly (Scott 2008), whether an individual perceives entrepreneurship as desirable and feasible (Shapero and Sokol 1982) and whether entrepreneurs channel their resources into productive and innovative activities (Baumol 1990).

Regulatory institutions refer to any rules which directly influence the costs of setting up a business, conducting business activity, and closing a venture and any policies that impact the desirability and feasibility of entrepreneurship. Further, the government designs, implements, and enforces regulatory institutions. Regulatory institutions can have a hidden gender dimension which reduces the feasibility and desirability of entrepreneurship for women. For example, in countries where women cannot own property (Hampel-Milagrosa 2010), they may face additional difficulties in acquiring external funding for setting up or growing a business. Alternatively, when women own a business, they may have to balance double responsibilities for family and work, while at the same time possibly experiencing disagreement and a lack of emotional support from their family, all of which can further affect business development. In her analysis of GEM data from 24 industrialized countries over the span of 8 years, Thébaud (2015)

finds that in countries where favorable institutional arrangements such as paid leave, subsidized childcare, and part-time employment opportunities mitigate work-family conflict, women are less likely to opt for business ownership as a fallback employment strategy, but are more well represented in growth-oriented forms of entrepreneurship. Estrin and Mickiewicz (2011) show the complex relations between regulatory and normative institutions and the outcomes of women's entrepreneurship: for example, if women cannot move freely from home, they are less likely to show high entrepreneurial aspirations in terms of employment growth even if business entry is not affected.

Normative institutions influence the desirability of entrepreneurship for women because they determine acceptable roles for individuals within a society and typical role behavior (Ahl 2006; Baughn et al. 2006; Martin et al. 2015). For example, whether or not a career as an entrepreneur is valued in society is measured in GEM studies and there is variation around the world on this attitude (GEM Global Report, 2016/2017. Many societies continue to ascribe housebound and family-related roles to women, thus implicitly marking entrepreneurship as a less-desirable career choice for women (Pfau-Effinger 2004). Where traditional gender roles persist, entrepreneurship also is typically characterized as masculine behavior and activity (Fagenson and Marcus 1991), which can further discourage women. Entry may be self-restricted to feminized professions, sectors, and business fields such as personal services or care professions (Marlow 2002). This contributes to horizontal and vertical gender segregation in entrepreneurship.

Cultural-cognitive institutions shape the cognitive legitimacy, or "taken-for-grantedness," (Suchman 1995) of entrepreneurial new ventures. If key social constituencies of the entrepreneurship ecosystem, such as suppliers, buyers, regulatory agencies, resource providers, or the media, are not sure what to make out of an organization or are reluctant to accept its outputs, the new venture's viability and survival chances will be seriously jeopardized. Gaining cognitive legitimacy is a difficult task for all new organizations (Stinchcombe 1965), but it may be particularly daunting for some types of women-led entrepreneurial ventures. In the context of venture financing, for example, Kanze et al. (2017) document that investors ask promotion-focused questions to male entrepreneurs and prevention-focused questions to female entrepreneurs. These gendered questions induce corresponding responses, so that the regulatory focus of the resultant system perpetuates disparities in funding outcomes.

Research has indicated quite a few regulatory, normative, and cultural-cognitive institutions with a potential gender impact. These include the constitution providing for gender equality in a society; labor market rules giving equal access to employment positions; family and tax policies, such as specific tax regulations and the overall infrastructure for childcare; and property rights that may allow or prevent female ownership of land, together with the predominant gender ideology and gender stereotypes in a particular society (e.g., Ahl and Nelson 2010; Elam and Terjesen 2010; Estrin and Mickiewicz 2011; Langevang et al. 2015; Lewellyn and Muller-Kahle 2015; Sjöberg 2004; Verheul et al. 2006; Welter et al. 2014; Welter and Smallbone 2008).

3.2 Organizational level

Gender is argued to be a constitutive element in organizational logic, manifested through underlying assumptions and practices that make up most work organizations (Acker 1990). There are three predominant views of how gender may be manifested in organizations: first, through "the advantage and disadvantage, exploitation and control, action and emotion, meaning and identity that are pattered through and in terms of a distinction between male and female, masculine and feminine" (Acker 1990: 146); second, the extent to which organizations and occupations are male or female dominated (Kanter 1977); and finally, the way in which occupations or organizations are gendered symbolically and ideologically, how they are described and conceived in terms of masculinities and femininities (Britton 2000).

Within an entrepreneurship ecosystem, there are a variety of participating organizations that provide support, training, and participate in the process of stimulating new venture creation (Feld 2012; Isenberg 2010; Stam and Spigel 2016). For example, professional service organizations—real estate, legal, accounting, insurance, and consulting companies all play a role in providing specialized support for start-ups. The presence of accelerators and incubators, co-working spaces, and other intermediaries that provide spaces and support are also considered essential for creating a vibrant entrepreneurial ecosystem. Gender may be manifested with these organizations in different ways that can differentially support or inhibit men and women. Following Acker (1990), we

note three areas where organizations may be gendered within entrepreneurship ecosystems.

1. Construction of divisions along lines of gender. Within organizations, this includes division of labor—for example, the horizontal or vertical segregation of work roles and opportunities for women may lead to gender differences within an entrepreneurial ecosystem. Horizontal occupational segregation may mean that women are less likely to pursue business ownership in certain sectors, because they have not had the opportunity to develop skills, competencies, and industry knowledge. For example, as noted earlier, women entrepreneurs are less likely to be present in STEM industries (Coleman and Robb 2016). Vertical occupational segregation may mean that women will have less opportunity to develop leadership and decision-making experience relevant to business ownership. There is evidence that women are less likely to be present in the senior leadership ranks of large companies or to serve on their boards of directors (http://www.catalyst.org/knowledge/women-ceos-sp-500). This may influence the human capital and experience levels in starting/growing businesses, which may impact the supply of entrepreneurial ventures (Nielsen and Huse 2010). Similarly, gender segregation may also influence income, whereby women may be paid less for the same work, therefore have lower funds with which to start businesses (Major and Forcey 1985). Spatial divisions along gender lines also exist. An extreme case is the spatial segregation driven by Shari'a laws in Muslim societies, which creates distinct and intricately interwoven "male," "female," and "mixed" public spaces and institutions in the entrepreneurship ecosystem (Le Renard 2008). Spatial gender "mismatch" may also result from differential commuting costs. Female entrepreneurs face greater domestic burdens and tend to locate their businesses closer to home; female entrepreneurial ventures are thus less likely to be found in highly interactive, innovative, and productive agglomerations of economic activity (Rosenthal and Strange 2012).

   Networks, both formal and informal, are the basis of social relations in which people are embedded. Networks are the mechanism through which resources (information and capital) are introduced by specific agents to a particular group and a mechanism by which individuals are connected and positioned within a social field (Granovetter 1985). Networks shape identity of entrepreneurs and institutions and are crucial for the exchange of information. Entrepreneurship research shows some evidence that the network structures may be gendered, where women may have more women in their networks than men or they might have less access to people in powerful positions (Aldrich et al. 1989; Foss 2010; Hanson and Blake 2009).

   Gender itself shapes patterns of social interactions (Ridgeway and Smith-Lovin 1999). Within networks, some environments may be perceived as more trusting than others, depending on legitimacy of the actors (Granovetter 1985). A person's legitimacy and trustworthiness may be signaled through the institutions to which she belongs which might include an industry sector, size, and type of new venture created. For resource providers, there may be perceptions that women are less legitimate or trustworthy in pursuing entrepreneurial activities and casting doubt over the legitimacy of the whole enterprise (Bruni et al. 2004; Mirchandani 1999). Other research shows that gender affects networking and bootstrapping behavior in early stages of business development (Carter et al. 2003). Specifically, gender differences are identified in the use of strong and weak ties to support bootstrapping activities. A number of variations are subject to gendered influences; in addition, men and women make differing use of brokers (Jayawarna et al. 2015).

2. Construction of symbols and images that express and reinforce gender divisions—language, ideology, and cultural aspects. Within organizations, cultural images of gender are invented and reproduced by organizations. In entrepreneurship ecosystems, the media, support organizations, and funders develop narratives and stories about successful entrepreneurs. Advertisements for events, lists of successful entrepreneurs, stories, and competitions that showcase entrepreneurs may inadvertently celebrate men more than women or they may celebrate masculinized or feminized images of successful entrepreneurs which may differentially influence entrepreneurs in ecosystems (Gupta et al. 2009). Research shows that when entrepreneurs perceive themselves to be more similar to males (high on male gender identification), they have higher

entrepreneurial intentions (Gupta et al. 2009). Some studies look into the media representation of women entrepreneurs, concluding that newspapers, for example, emphasize the sexuality and good looks of women, together with their double or triple role and burden as mother and career for the family and entrepreneur, but seeing business success as unfeminine (Achtenhagen and Welter 2011; Eikhof et al. 2013). Other work shows that the architectural design of spaces influences the social context and the design of structures. For instance, symbols of wealth, use of columns, angles, and lines may be construed as masculine and can be intimidating to women, while use of curved, slender, and delicate lines may be more feminine (Bondi 1992).

3. Gendered social structures including workplace interactions. Social structures and interactions within and across organizations may also be gendered. In the entrepreneurship ecosystem, accelerators, incubators, co-working spaces, and other spaces may have gendered norms for behaviors and interactions. It is estimated that there are more than 7000 accelerators worldwide with more than 1250 in the USA alone.[4] While the vast majority of these are male dominated, with the percentage of women being around 22%, there are emerging trends of female focused accelerators that are having some success because they providing women mentors and role models (Brush and Greene 2016).

Besides accelerators and incubators that house entrepreneurs, the interactions of entrepreneurs in the workplace, with vendors, business partners, suppliers, contractors, and other organizations may potentially be gendered. How organizations are structured in terms of hierarchies, who the decision-makers are, and the perceptions of gender roles in these hierarchies have the potential to influence men and women differentially (Acker 1990; Blake 2006). Social dominance theory argues that structural inequality can be manifested by group-based heuristics or consensus that may unfairly leave out certain groups but maintain the power of others (Sidanius et al. 2004). For instance, powerful financial institutions may allocate resources in such a way to create and maintain group dominance, either by focusing on certain populations or through routinized decision-processes that focus primarily on objective criteria (e.g., credit scoring).

Another area where male domination may influence the gendering of behaviors has to do with organizations providing financing for entrepreneurs in entrepreneurship ecosystems. Studies show that less than 8% of all partners in active venture capital firms are female, and that of the 101 active accelerators, fewer than 12% of the partners are female (Brush et al. 2014a; https://techcrunch.com/2016/04/19/the-first-comprehensive-study-on-women-in-venture-capital/). There is speculation that the lack of female partners and decision-makers may in part explain the disparity of venture capital funding. A recent analysis finds that less than 3% of the approximately 6500 companies that successfully raised venture capital during 2011–2013 had a female CEO (Brush et al. 2018).

3.3 Individual level

In most frameworks, the entrepreneur is a central player in entrepreneurship ecosystems, as either the catalyst for actions (Isenberg 2010) or creator of new ventures (Stam and Spigel 2016). This suggests that individual perception of gender identity and gender roles (masculine or feminine) and how these perceptions influence their behaviors is essential to understanding entrepreneurial ecosystems (Johnson and Repta 2013). More specifically, the stereotype of the entrepreneur is perceived to be "male" in many settings. Gender stereotypes can influence how an individual's performance is perceived; a negative bias could either be created because of the behavior directly or when individuals act in contrast to their genders' expected gendered-stereotype behavior (Balachandra et al. 2017; Rudman 1998; Rudman and Glick 1999, 2001). For individual entrepreneurs, how they see themselves in terms of their gender identity and/or how others see the gender identity of the individual entrepreneur may either facilitate or hinder entrepreneurial activity.

Role models are another crucial aspect of entrepreneurship ecosystems (Isenberg and Onyemah 2016; Stam and Spigel 2016). When entrepreneurs have role models, they are more likely to see themselves as entrepreneurs. In areas where the role models are male or have only masculine qualities, women may not perceive that venture creation is possible, and they may have a greater fear of failure or less confidence in their abilities

[4] International Business Innovation Association, 2013. 2012 state of the business incubation industry: INBIA publications.

to start a business (GEM Global Report 2016/2017). Women who become entrepreneurs transgress gender norms, while at the same time, becoming role models for other women entrepreneurs and inspiring more opportunities for self-employment (Hanson 2009).

Other individual actors in the entrepreneurship ecosystems also play an important role: investors, mentors, advisors, and other individuals. These actors are part of the resource supporting infrastructure in different places and generally considered routinized and habitualized in their patterns for resource allocation (Blake 2006). As such, they are gatekeepers who may prevent or encourage certain types of business formation and development. Status-expectations state that theory predicts how certain actors are expected to behave given certain roles in organizations—the extent to which the roles are "gendered" (perceived as masculine or feminine), this may differentially affect women and men entrepreneurs (Ridgeway and Correll 2004). Gender roles may be described as social norms, rules, or standards that dictate different interests, responsibilities, or opportunities. In addition, gender roles lead to leadership differences—which is relevant when considering who leads in ecosystems and who is driving political, corporate, or economic activity (Stam and Spigel 2016). In another example, if venture capitalists or bankers are expected to be male rather than female, or entrepreneurs are expected to be male, then when women are bankers, venture capitalists, or entrepreneurs, they may be perceived as less trustworthy (Saparito et al. 2013). In contrast, there is also evidence that homophily plays a role in access to capital, in that venture capital firms with women partners are more likely to invest in companies that have women CEOs (Brush et al. 2014a).

4 The papers in this special issue

The seven papers included in the Special Issue are all anchored in the concept of the entrepreneurship ecosystem and focus on a variety of its components, as well as their dynamic interaction. They use a variety of theoretical perspectives, both qualitative and quantitative research methodologies, different levels of analysis (individual, firm, and aggregated country level), and different sources of data, ranging from in-depth interviews to large multicountry panel datasets. Table 1 summarizes the research questions, theoretical perspectives, research methodologies, and major findings of the papers included in the Special Issue.

Spigel (2017) suggests that ecosystems are comprised of elements that can be broadly characterized as social, cultural, or material. Social elements refer to the role of social networks within the entrepreneurship ecosystem. Cultural elements reflect the attitudes (positive or negative) about entrepreneurship, which can encourage or discourage entrepreneurial activity. Finally, material elements refer to place-specific institutions and organizations, ranging from physical infrastructure to public policies and government-sponsored programs. The papers in this special issue engage in a thoughtful conversation about the gendered impact of all three broad elements of an entrepreneurship ecosystem (social, cultural, and material), and they add novel insights to the three levels we have identified above where gender matters in entrepreneurial ecosystems (institutional, organizational, individual).

With respect to the gendered effect of the social attributes of the entrepreneurship ecosystem, McAdam et al. (2018) and Neumeyer et al. (2018) both study social networking by men and women entrepreneurs in regional ecosystems. Both studies find significant gender differences in the way entrepreneurs construct and utilize their networks. Thus, Neumeyer et al. (2018) find that male entrepreneurs show comparatively higher scores of bridging social capital in aggressive- and managed-growth venture networks, while women entrepreneurs surpass their male counterparts' bridging capital scores in lifestyle- and survival-venture networks. Similarly, McAdam et al. (2018), who focus specifically on women-only networks, find that women participating in such networks are unable to generate gender capital and, instead, are restricted in their access to other types of capital, resulting in a their lower credibility. Both studies, however, find that experienced women entrepreneurs are better able to structure and utilize their networks. This last finding suggests that to better understand the gendered effects of social networks, we need to take a more nuanced perspective and explore differences within women entrepreneurs, in addition to comparing and contrasting male and female entrepreneurial experiences. Sperber and Linder (2018) also explore the social attributes of entrepreneurship ecosystems by focusing on the effect of the perceived level of social support from the ecosystem. These authors find significant differences in the perceived levels of ecosystem support and, consequently, significant

Table 1 The papers in this special issue

Authors	Research question(s)	Theoretical platform	Research design	Major findings
Foss et al. 2018	What are the policy implications of empirically based research on women's entrepreneurship?	Feminist theory within the context of an entrepreneurship ecosystem	SLR of empirical papers published between 1983 and 2015 in five top-tier entrepreneurship journals ($n = 165$)	About a third of the articles did not address policies explicitly. Those that did formulated mostly policy implications with unspecified targets, and focused mostly on education and training.
Hechavarría and Ingram 2018	Does the entrepreneurial ecosystem influence the prevalence rates of both men and women?	The Entrepreneurial Framework Conditions (EFC) of the Global Entrepreneurship Monitor (GEM) project	GMM analysis of 2001–2014 GEM data, coupled with World Bank Development Indicators ($n = 403$ cases and 75 countries)	The prevalence in entrepreneurship is highest for women when the entrepreneurial ecosystem features low barriers to entry, supportive government policy towards entrepreneurship, minimal commercial and legal infrastructure, and a normative culture that supports entrepreneurship. Conversely, prevalence rates for men are highest when there is supportive government policy but weak government programs aimed towards business creation.
McAdam et al. 2018	To what extent do formal women-only networks improve women's access to, and participation, in entrepreneurial ecosystems?	Bourdieu's (2005) theory of embedded practice	Reflexive critical analysis of interview data from a purposive sample of coordinators of women-only networks ($n = 6$) and mixed networks ($n = 5$) and 17 women entrepreneurs in a peripheral European region.	Challenges for women still remain in entrepreneurial ecosystems and women-only networks are particularly problematic. Rather than generating gender capital, entrepreneurs in women-only entrepreneurial networks are in a situation where they are unable to access sufficient economic, social, cultural, and symbolic capital, restricting their ability to establish credibility as field players.
Neumeyer et al. 2018	What are the effects of venture typology, race, ethnicity, and past venture experience on the social capital distribution of women entrepreneurs in entrepreneurial ecosystems?	Theories of social capital	Social network data from two municipal ecosystems in FL, USA (Gainesville and Jacksonville); $n = 120$ (60 in each ecosystem)	Network connectivity and the distribution of social capital are significantly different for men and women entrepreneurs. It depends on the type of venture and is additionally affected by the entrepreneur's experience and ethnicity.
Orser et al. 2018	What is the efficacy of certifications, specifically women-owned certifications, on the frequency with which SMEs bid on, and succeed in	Feminist empiricism and entrepreneurial feminism	Secondary analysis of survey data of active federal contractors ($n = 634$)	The frequency of bidding on and receiving contracts from the US federal government does not differ significantly between male and female business owners and neither does the frequency of

Table 1 (continued)

Authors	Research question(s)	Theoretical platform	Research design	Major findings
	obtaining, US federal procurement contracts?			bidding between certified and non-certified women-only businesses. Bidding success is not correlated with various US federal programs either individually or collectively.
Simmons et al. 2018	What are the gender differences in reentry decisions after failure?	Stigma theory (Goffman, 1963) augmented with an entrepreneurship ecosystem lens	HLM analysis of GEM data ($n = 8171$ entrepreneurs from 35 countries)	There are persisting gender gaps that vary across an ecosystem framework conditions of public stigma of business failure and public fear of business failure. Public stigma of business failure may amplify the gender gap by disproportionately deterring female entrepreneurs from trying again. However, the gap narrows under conditions of high fear of failure, because of the diminished reentry of male entrepreneurs relative to female entrepreneurs.
Sperber and Linder 2018	To what extent do female and male strategic choices in starting a new venture reflect gender-specific perceptions of ecosystem support, feasibility, and entrepreneurial goals?	Expectancy theory (Vroom, 1964, 2005) augmented with an entrepreneurship ecosystem support lens	Configurational analysis based on fuzzy-set qualitative comparative analysis (fsQCA) of PSED II data ($n = 987$)	Start-up strategies are a reflection of the perceived support from the ecosystem, the entrepreneurs' current life situation, and the intended goals. Female and male nascent entrepreneurs differ in their expectations of ecosystem support and, thus, apply gender-specific start-up strategies. While women tend to mobilize more resources than men to overcome support constraints, men are more confident of their capabilities.

differences in the ways men and women nascent entrepreneurs strategize about starting up their new ventures.

Simmons et al. (2018) explore the cultural attributes of entrepreneurship ecosystems. In particular, they look at how public stigma of business failure and public fear of business failure differentially affect the likelihood of reentry of men and women entrepreneurs. They find that the public stigma of business failure deters women entrepreneurs from trying again to a larger degree than men entrepreneurs. In contrast, men entrepreneurs are deterred by a high fear of failure.

Two of the studies included in the Special Issue look at the gendered effects of the material attributes of entrepreneurship ecosystems, more specifically, government policies. Both studies strongly suggest that there is a lot more to be done in this area. Interestingly, they do so from two very different perspectives. Orser et al.

(2018) study the effect of certifications on the bidding frequency and bidding success of women-owned small-and-medium sized businesses in obtaining US federal procurement contracts and find that none of the various certifications increase either bid frequency or bid success. The findings indicate that the efficacy of government procurement policies can be improved considerably. Foss et al. (2018), in turn, study how academics influence public policies in support of women's entrepreneurship by deriving public policy recommendations from empirical studies. The systematic literature review of 30 years of research published in the top entrepreneurship journals reveals that only two thirds of the studies include a public policy recommendation, and most of these recommendations are rather broad and focused on education and training, thus inadvertently reproducing the second-ordering of women as needing to be "fixed."

Finally, Hechavarría and Ingram (2018) test the impact of all aspects of the national entrepreneurship ecosystem on country levels of nascent entrepreneurship activity, utilizing 14 years of GEM data from 75 countries. They find significant gendered effects of the national entrepreneurship ecosystem, with women nascent entrepreneurs being significantly affected by a greater number of ecosystem components, compared to men. In addition to a supportive government policy, women's entrepreneurial start-up rates are also facilitated by minimal commercial and legal infrastructure, low barriers to entry, and a normative culture that supports entrepreneurship.

Collectively, the papers elucidate the gendered effects of the different ecosystem components and levels and document how women entrepreneurs, in turn, can affect the vitality of regional and national entrepreneurship ecosystems. Further, they demonstrate the value of a gendered perspective, by drawing attention to the agency of entrepreneurs within their contexts.

5 Directions for future research

This special issue was motivated by observations from current studies that women are influenced by and, in turn, influence ecosystems. Theory explaining how and when variation by gender might apply differentially is seemingly absent from most discussions of entrepreneurial ecosystem. We find that even though cultural and social attributes (e.g., networks, mentors, role models) are included, no possible gender influences are considered (Acs et al. 2017). We argue that while current depictions of entrepreneurship ecosystems offer opportunities for framing new research theoretically and empirically, due to the multilevel aspects and measurable outcome dimensions, gender as a construct and women's entrepreneurship are missing. Hence, the articles in this special issue are an important step in exploring both the role of gender across ecosystems and the ways that women entrepreneurs influence or are influenced by levels of ecosystems. However, there is significant work to be done. We offer ideas for future research below.

Women entrepreneurs and women's entrepreneurship

- What are the influences of ecosystem institutions, culture, and policies on women's entrepreneurship?
- In what ways do women entrepreneurs influence local ecosystems?
- How do network ties, interactions, and positioning influence women entrepreneurs in local ecosystems?
- What are the spill-over effects of ecosystem innovation on women's entrepreneurship?
- How do innovative women entrepreneurs influence entrepreneurial ecosystems?
- How does public policy vary across national ecosystems and with regard to influence on women's entrepreneurship?
- How do entrepreneurship ecosystems support or hinder start-up, growth, and sustainability of women's entrepreneurship?
- How do meso-environmental factors and spaces, such as incubators and accelerators influence women's entrepreneurship? How are they influenced by women entrepreneurs?
- To what extent does market cooperation and competition influence women's entrepreneurship in ecosystems?
- Do ecosystems reproduce gendered and spatial segregation patterns in entrepreneurship, and if so, in which ways? How can entrepreneurial ecosystems assist in overcoming spatial constraints for women entrepreneurs?

Gender and gender identity

- What is the role of gender in ecosystem institutions?
- How does gender identity influence performance of individuals in entrepreneurship ecosystems?

- What is the role of organizational gender identity in promoting or discouraging start-up in entrepreneurship ecosystems?
- How does gender influence legitimacy of entrepreneurs seeking resources in entrepreneurship ecosystems?
- To what degree does gender identity influence the perspective of resource providers in entrepreneurship ecosystems?

In sum, current perspectives and frameworks for entrepreneurship ecosystems are on the surface relevant and appropriate for considering factors that facilitate or inhibit entrepreneurship. However, explicit recognition of gender may enhance theory and elaborate our understanding of entrepreneurship ecosystems generally and provide a more comprehensive and holistic view of ways to facilitate and remove obstacles to entrepreneurship overall.

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