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Entrepreneurial experiences of women in Canadian high technology

Souha R. Ezzedeen and Jelena Zikic
School of Human Resource Management, York University, Toronto, Canada

Abstract

Purpose – The purpose of this paper is to explore how women entrepreneurs experience entrepreneurship in the Canadian technology sector and the types of obstacles posed by the field's male-dominated character.

Design/methodology/approach – The authors' research purpose called for an inductive approach. Interviews with a sample of women technology entrepreneurs allowed for in-depth exploration of their subjective experiences and the contexts in which these were situated.

Findings – The research subjects encountered persistent gender stereotypes, a paucity of female role models, resistance from associates within and outside of their organizations, and societal pressures to maintain appropriate levels of work-family balance.

Research limitations/implications – Although exploratory and preliminary in nature, the findings indicate that women entrepreneurs do not experience "glass ceilings" as much as they experience "labyrinth walls" and what the authors identify as "thorny floors", meaning opposition and sabotage from male subordinates.

Social implications – Women considering entrepreneurship should expect to encounter resistance to their leadership, albeit manifested in different forms than in corporate settings. Male-dominated fields such as technology involve industry-level resistance as well as opposition from within the organization. Nevertheless, women perceived the field as merit-driven whereby they gained acceptance once they had established themselves as credible competitors.

Originality/value – This study is one of few to elucidate the multiple levels of opposition to women's entrepreneurship in male-dominated settings and introduces the concept of "thorny floors" to research on women's advancement and entrepreneurship.

Keywords Canada, Women, Gender, Entrepreneurialism, Entrepreneurship, High technology, Leadership

Paper type Research paper

I. Introduction

Interest in entrepreneurship as a socio-economic phenomenon has generated a voluminous and interdisciplinary body of research (Ireland *et al.*, 2007). Recently, the number of women entrepreneurs has swelled across the globe, and in the Canadian context of our study, women's entrepreneurship has increased by an estimated 200 percent in the last two decades (Carrington, 2006). This partly reflects the frustration of North American women with the corporate glass ceiling (Jennings and McDougald, 2007; Loscocco and Leicht, 1993). At the same time, women are increasingly considering entrepreneurship as a legitimate career option, not one chosen for lack of alternatives (Buttner and Moore, 1997). Many of these "intentionalist" entrepreneurs

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(Buttner and Moore, 1997) have made inroads into male-dominated industries such as technology, construction, and manufacturing (Foo *et al.*, 2006; Gatewood *et al.*, 2004; Mayer, 2008). There is some research on the challenges that they experience therein (Tan, 2008), however, much remains to be understood about gender relations in entrepreneurship generally and in technology specifically (Ahl, 2006).

Our goal in this study was to explore qualitatively the barriers faced by women entrepreneurs in the Canadian high technology sector. Barriers experienced by women entrepreneurs remain different than those experienced by corporate women (Kephart and Schumacher, 2005; Mattis, 2004; Moore and Buttner, 1997). We were particularly interested in the women's subjective accounts, thus, we adopted an interpretive, phenomenological lens to explore, schematize, and describe the experience of entrepreneurship in the dynamic and male-dominated technology sector. In the next sections, we describe the distinct yet overlapping spaces of entrepreneurship, gender, and technology that surround these experiences (de Bruin *et al.*, 2006).

II. Literature review

Given the importance of understanding the "lived-world" of our subjects (Cope, 2005), we summarize research at the intersection of the symbolic spaces of entrepreneurship, gender, and technology in which their experiences reside (Bruni *et al.*, 2004; Simmel, 2007).

A. The entrepreneurship space

Entrepreneurs are understood as individuals who "innovate new products/services, create new processes, open new markets, or organize new industries" (Brush, 2008, p. 21). Entrepreneurship is a broad socio-economic phenomenon, an endeavor "undertaken by an enterprising individual, firm, or small business" (Brush, 2008, p. 22). Much has been said about how entrepreneurs conceive of and create successful ventures (Brush, 2008), their entrepreneurial motivations (Fairlie, 2010; Mattis, 2004; Wilson *et al.*, 2007), and opportunity recognition (DeTienne and Chandler, 2007; Morrison *et al.*, 2003). Studies indicate that entrepreneurs experience a wide range of challenges and threats to their organizations' survival, including finding qualified labor, navigating the legal and regulatory environment, managing unstable levels of product or service demand, planning and executing strategy amidst unpredictable financing environments, and accessing the managerial skills necessary to weather these challenges (Carrington, 2006). More recently, and with the unprecedented entry of women into entrepreneurship, research has begun exploring the challenges associated with the gendered character of entrepreneurship (Bruni *et al.*, 2005; Brush *et al.*, 2009; Marlow and Patton, 2005; Minniti and Nardone, 2007). Our study makes a contribution to this emerging body of work.

B. The women's entrepreneurship space

Indeed, one defining characteristic of the evolution of the field of entrepreneurship has been the focus on the growing trend of women's entrepreneurship, with research exploring women's motivations (Buttner and Moore, 1997; Langowitz and Minniti, 2007), financing (Carrington, 2006; Carter *et al.*, 2007; Harrison and Mason, 2007; Marlow and Patton, 2005; Orser *et al.*, 2006; Verheul and Thurik, 2001), success determinants (Cohoon *et al.*, 2010; Gudmunson *et al.*, 2009), human and social capital (Gatewood *et al.*, 2004; Klyver and Terjesen, 2007; Manolova *et al.*, 2007; Marlow and Patton, 2005; Robinson and Stubberud, 2009; Terjesen, 2005), and coping with work

and family obligations (Jennings and McDougald, 2007; Mueller and Dato-on, 2008; Shelton, 2006).

Although a review of this literature is beyond the scope of the study (for a special issue, see de Bruin *et al.*, 2006), it is worth mentioning the "push" and "pull" factors experienced by women entrepreneurs (Buttner and Moore, 1997; Orhan and Scott, 2001). Namely, glass ceilings, male-dominated workplace cultures, and work-life conflicts typical of careers within traditional organizations often push women into self-employment (Fairlie, 2010; Mattis, 2004; Orhan and Scott, 2001; Walker *et al.*, 2008). Increasingly, however, women are attracted to entrepreneurship for its intrinsic rewards of independent work, the opportunity to work in fields of interest, and the chance to create and work within environments that mesh with their values (Buttner, 2001). Nevertheless, entrepreneurial careers entail their own challenges.

On the business front, women entrepreneurs shift from experiencing a glass ceiling on their advancement to barriers on their ability to found and manage their ventures (Marlow and Patton, 2005). Women entrepreneurs are generally perceived as "riskier" prospects than men when it comes to financing (Gatewood *et al.*, 2004), although evidence of discriminatory lending remains mixed (deBruin *et al.*, 2007; Marlow and Patton, 2005). There is some evidence that men and women run different businesses, and therefore rely on different sources of financing (Orser *et al.*, 2006). Venture capital, while critical to growth in the technology field, remains notoriously difficult for women to access (Gatewood *et al.*, 2004; Harrison *et al.*, 2004; Kaplan and Perry, 1998).

Social norms also continue to pressure women to conform to socially prescribed gender-appropriate behaviors, undermining their ability to be fully devoted to their venture (Jennings and McDougald, 2007). Role congruity theory (Eagly and Karau, 2002) indicates that women entrepreneurs will experience prejudice stemming from the communal requirements of being woman and the agentic requirements of being a successful entrepreneur. Thus:

> [...] a woman entrepreneur within a male-dominated industry or culture may carry the invisible-yet-cumbersome baggage of sex-based stereotypes when she attempts to secure resources, develop business networks, and gain legitimacy for her business venture (Godwin *et al.*, 2006, p. 624).

Taken together, these challenges can pull women off the entrepreneurial path.

The consensus among these diverse studies is that entrepreneurship is still construed as a largely masculine endeavor, one situated in a cultural space dominated by masculine norms and values (Bruni *et al.*, 2005; Lewis, 2006; Menzies *et al.*, 2006). Popular depictions involve predominantly masculine characterizations of entrepreneurs as "pioneers," "conquerors," and "businessmen" (Ahl, 2006; Bird and Brush, 2002). This emphasis predicts a generally "sequential, profit maximizing, and strategically and competitively focused" (Bird and Brush, 2002, p. 42) process of venture creation with potentially limited applicability to women (de Bruin *et al.*, 2006). As a result, scholars have called for a comprehensive rethinking of research on women's entrepreneurship (Ahl, 2006; Bird and Brush, 2002; Brush *et al.*, 2009; de Bruin *et al.*, 2006, 2007).

C. Women entrepreneurs in Canada

Canada is a leading industrialized nation and a country generally known for its emphasis on human rights, social justice, and gender equality. Canadian women record high rates of participation in higher education and in the labor force (Government of Canada, 2011a, b).

In the recent years, Canada has witnessed strong growth in entrepreneurship in general and in women's entrepreneurship in particular. This has been attributed to the enhanced opportunity to balance work and family afforded by self-employment, as well as Canada's emerging enterprising culture, its regard for small business, and favorable tax and regulatory policies (Carrington, 2006; Mallett, 2008). By 2001, almost 50 percent of all small and medium Canadian enterprises had at least one female owner (Carrington, 2006). By 2003, women entrepreneurs had become the fastest growing workforce segment in the Canadian economy, standing at more than 30 percent of businesses (Brush *et al.*, 2006).

Similar to other industrialized nations (Alsos *et al.*, 2006), women's businesses in Canada tend to be concentrated in the service sector, specifically wholesale, retail, professional services, and real estate (Carrington, 2006; Orser *et al.*, 2006). Few women found and manage ventures in the technology field. Available data indicate that only 6 percent of all women entrepreneurs in Canada operate knowledge-driven or manufacturing businesses (Carrington, 2006). A 2003 report published by the Prime Minister's Task Force on Women Entrepreneurs found that women entrepreneurs in Canada faced challenges accessing all types of venture support, including financing, employment benefits, networking and mentoring, skills training, information, and government procurement (Bulte *et al.*, 2003), these possibly explaining differences in performance of men- versus women-owned businesses (Jennings and McDougald, 2007; Shelton, 2006). Evidence indicates that businesses lead by Canadian women involve a smaller scale of operations, and grow at a slower pace, than businesses lead by men (Jennings and Cash, 2006).

D. The technology space

Technological advances have defined the social, cultural, and economic progress of the last few decades. The Canadian technology industry specifically is dynamic, multifaceted, and inclusive of large and small firms. Information technology in particular, a technology sector that is well represented in our sample, includes hardware, software, and infrastructure (Wong, 2008). Canada counts about 315,000 information and communication technology companies. Predominant among these are small to medium enterprises while large organizations comprise the bulk of the manufacturing sector of the industry (Industry Canada, 2009). In 2008, this innovative sector of the Canadian economy generated over CDN $155 billion in revenues in 2008 and contributed almost 5 percent of Canada's GDP (Industry Canada, 2009).

Despite its dynamism and emphasis on forward thinking, the technology field remains heavily male-dominated. Research indicates that the participation of women in science, technology, engineering, and mathematics is on the decline despite public support (Fouad *et al.*, 2010; McCrea, 2010). This begs the questions: why are the science and technology sectors still male-dominated? What accounts for high numbers of women in entry-level jobs and their subsequently high dropout rates, or the so-called "leaky pipeline" (Bilimoria *et al.*, 2008; Hewlett *et al.*, 2008b)?

Primarily, cultural norms and values in science and technology remain hostile to women, and that is true of both the technology industry and science academia (Bilimoria *et al.*, 2008). As eloquently described by Hewlett *et al.* (2008b, p. 23), "If machismo is on the run in most US corporate settings, then [technology] is its Alamo – a last holdout of redoubled intensity." The technology world lags sharply

behind other sectors in terms of gender diversity and in attitudes towards personal family obligations (Walker *et al.*, 2008). A study of mid-level women in technology indicated that they perceived the field as deeply competitive and political (Simard *et al.*, 2008).

Second, women in science and technology experience the extreme isolation and tokenism associated with being a demographic minority (Evetts, 1993; Kanter, 1977; King *et al.*, 2010). This isolation mystifies their understanding of what it takes to advance (Gilbert, 2009; Hewlett *et al.*, 2008b; Simard *et al.*, 2008). Additionally, many jobs in science and technology can be characterized as "extreme" (Hewlett and Luce, 2006), in that they require physical strain and risk, long hours, and travel that women, still primarily responsible for the family and household, cannot always sustain (Hewlett *et al.*, 2008a, b; Simard *et al.*, 2008). Indeed, a male-dominated industry is male-dominated "not only in the historical and contemporary, demographic composition of its employees, but in its assumptions, values and everyday practices" (Miller, 2004, p. 48).

Lastly, the broader society can also be faulted for continuing to subtly discourage girls from science and technology pursuits (Scouts, 2001). An Information and Communications Technology Council study of enrollments and retention of young men and women in Canada's IT sector finds that the entry of women is critical to sustaining adequate levels of labor supply, however, they remain heavily underrepresented in the student and working populations (Ticoll, 2008). The study indicates that young women are "socially conditioned to believe that they don't have what it takes to succeed in this field" and that they are "probably better than men at the competencies needed for the jobs of today in this field. But no one is telling them this important fact" (Ticoll, 2008, p. 1).

The challenges encountered by entrepreneurs in this field are also noteworthy. The establishment of a technology firm is said to be extraordinarily demanding, for both men and women, and involves dealing with technological uncertainties, obtaining regulatory approval, and coping with the scarcity of all types of capital (Elfring and Hulsink, 2003). Challenges also exist on the work-life front. A Canadian Women in Technology survey found that work-life balance was mentioned as a primary challenge for technology entrepreneurs (Orser *et al.*, 2007). The demands of venture creation and management in this dynamic and fast-paced environment seem to dash any expectations of work-life balance preconceived at the onset (Parasuraman *et al.*, 1996; Winn, 2004). Overall, these forces cause a significant number of women to exit the field (Hewlett *et al.*, 2008a; Walker *et al.*, 2008).

III. Research methods

Interpretive research designs have become prevalent in entrepreneurship research (Bruni *et al.*, 2004; Clare and Holt, 2010). An interpretive approach is uniquely suited to understanding entrepreneurship as a subjective and intensely personal phenomenon and to exploring the meaning that entrepreneurs attach to their experiences (Stevenson, 1990). Entrepreneurship is also a culturally situated practice where gender is a contested and negotiated identity (Ahl, 2006; Bruni *et al.*, 2005; Brush *et al.*, 2009). This renders a qualitative design particularly appropriate to our aim of understanding women's experiences of the challenges encountered in male-dominated entrepreneurial work environments, specifically the Canadian technology sector.

A. Research design

We adopt a phenomenological perspective to discovering challenges to venture creation and management felt by women in the Canadian technology sector. Phenomenology refers to the description of phenomena as personally experienced by individuals (Burrell and Morgan, 1979). As stated by Cope (2005, p. 166):

> [. . .] it is impossible to divide one's experience from what it is that is being experienced [. . .] For the phenomenologist, the only "real" world that can be described with adequacy is that which is prescientifically and subjectively experienced.

Further, understanding the *Lebenswelt*, or the concrete context of the experiences of interest, is central to phenomenological research (Cope, 2005; Guba and Lincoln, 1994). Here, we explicitly recognized the subjectivity and uniqueness of challenges experienced by women and endeavored to describe the intersecting contexts of these experiences.

B. Data collection

Phenomenological research requires in-depth study of individuals who have direct experience with the phenomenon of interest (Patton, 1990). Our phenomenological approach adopted in-depth interviews as the vehicle of data collection whereby conversations allowed subjects to describe in detail the context, content, and meaning of their experiences (Gubrium and Holstein, 1997). We tried to strike a balance between allowing subjects free expression and making sure that certain points were addressed (Cope, 2005). Interviews were conducted either via telephone or in person and lasted about an hour.

We adopted theoretical sampling to recruit subjects where each case was selected because it made a significant contribution towards exploring the research questions (Strauss and Corbin, 1990). We defined entrepreneurs as individuals who have founded or co-founded a technology-based business, who own a significant stake in the business, and who have a significant leadership role in the business (Buttner, 2001; Buttner and Moore, 1997). Our subjects were identified and contacted through referral. We created an initial pool of subjects from personal and professional contacts; these subjects subsequently recommended similar others (Welch, 1975). We targeted entrepreneurs at various stages of venture maturity given evidence that entrepreneurial challenges vary by venture lifecycle (Hansen and Bird, 1998; Klyver and Terjesen, 2007; Zinger *et al.*, 2007). In addition, we included entrepreneurs from various fields given that practice differences among subsectors shape cultural norms differently, in particular *vis-à-vis* gender (Miller, 2004). For example, in her study of academic technology departments, Gilbert (2009) found that materials science valued individuality and plurality while mechanical engineering valued individual subordination to group norms. These differences in culture, she found, shaped the gender climate of these units. Similarly, McQuaid and Smith-Doerr (2010) found that the networked design of biotechnology firms promoted flexibility and collectivity, which in turn fostered women's advancement.

Our final sample comprised 12 women (Table I). Age ranged from the mid-20s to mid-50s and educational achievement spanned high school to graduate studies. Organizations included startup, stabilizing, and mature firms. Industries comprised software, consulting, media, web applications, and alternative energy among others. We also conducted archival research on each subject, studying résumés,

Participant	Title	Age	Education	Business cycle	Industry
1. Farah	Co-founder/president	Late 40s	Graduate	Mature	Consulting
2. Callie	Founder/president	Mid 50s	University	Mature	Internet
3. Sarah	Co-founder /president	Mid 40s	University	Startup	Software/consulting
4. Katie	Co-founder/VP	Mid 50s	High School	Startup	Alternative energy
5. Caroline	Founder/CEO	Early 40s	University	Stabilizing	Speech pathology
6. Alba	Co-founder/VP	Early 30s	Graduate	Startup	Media/advertising
7. Maggie	Founder/CEO	Mid 40s	University	Mature	IT consulting
8. Deena	Founder/CEO	Mid 40s	Graduate	Mature	Media/software
9. Angela	Co-founder/CEO	Mid 30s	University	Stabilizing	Internet
10. Kara	Co-founder/CEO	Mid 20s	University	Startup	Software
11. Veronica	Founder/CEO	Early 40s	Graduate	Stabilizing	(12)Software
13. Mona	Co-founder/CEO	Mid 30s	University	Startup	Software

Table I.
Sample demographic and venture profile

profiles on social networking sites, entries on sites such as Wikipedia, and books or articles that they had published. We also familiarized ourselves with each company through web sites and the press.

C. Data analysis

All interviews were transcribed verbatim into software NVivo (v.8, QSR International). Using qualitative research software allows for better organization of the data and clearer analysis of the hierarchical code structure (Atherton and Elsmore, 2007). Template analysis (King, 1998) was used to code the data. First-level content analysis allowed us initial familiarity with the subjects and helped form a starter template (Cope, 2005). We then produced a list of hierarchically organized codes, based on themes arising in the transcripts. Subsequent coding iterations modified the initial code structure by adding, moving, merging, renaming, or deleting codes until a stable thematic tree could be produced (Figure 1).

To enhance the validity of our findings, we tried to suspend judgment surrounding gender roles, entrepreneurship, and the nature of the technology field (Cope, 2005), while recognizing that we were likely to entertain unconscious biases. Second, we aimed to convey the findings through detailed descriptions relying to the extent possible on the words of the subjects. Lastly, NVivo permitted easy coding, decoding, and recoding of data units, providing another means of enhancing the dependability of our findings.

IV. Findings

Content analysis produced several themes surrounding women's experiences of entrepreneurship within the technology field (Figure 1). All names were disguised to preserve participant anonymity.

A. A heavily male-dominated technology sector

Although women are said to choose entrepreneurship as a means of circumventing the glass ceiling (Kephart and Schumacher, 2005; Moore and Buttner, 1997), our findings suggests that women entrepreneurs in male-dominated environments such as technology also face obstacles stemming from prescriptive gender expectations in industry and society. Our subjects interpreted and made sense of these obstacles

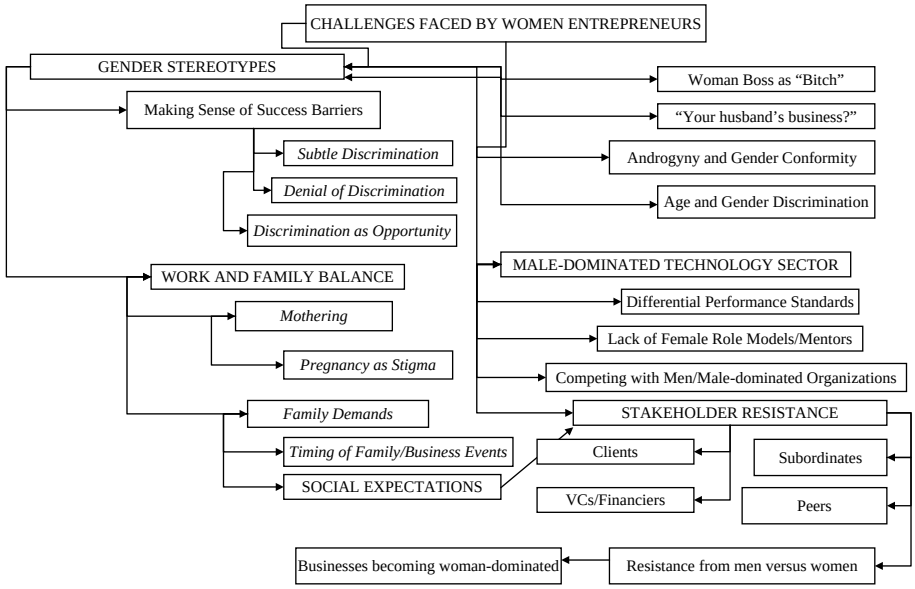

Figure 1.
Thematic tree of challenges faced by women entrepreneurs in the Canadian high-technology sector

in different ways but one strong unifier among their experiences was the deep passion they felt for their field of work, a passion that allowed them to counter its pressures and to persist in their entrepreneurial path. Mona, a 35-year-old Co-founder of a software development firm describes discovering her passion for technology while working in the food business, realizing that the consistency required of good food service did not quite mesh with her adventurous proclivities. The pace, dynamism, and unpredictability of technology were features that a few of our entrepreneurs found extremely appealing. Similarly, Katie, Founder of a promising alternative energy startup, enthusiastically shared that her business was on the verge of a breakthrough comparable to the advent of refrigeration. Citing her "tree hugger" background, she felt genuine exhilaration at being part of an effort to "change the world."

Nevertheless, the male character of the technology world rendered it to inhospitable to women such that our subjects mentioned colliding with numerous assumptions about who they were and about the kinds of organizations they ran. Callie, in her mid-50s and President of a thriving web design company, describes that others have often assumed she ran her business "out of her house" and having few to no employees, never suspecting that she was the founder of a 55-people strong, multimillion dollar organization. Deena, a corporate executive turned serial entrepreneur, and currently Founder and CEO of a successful media business, explained how for the duration of a decade-long relationship with her bank, and despite her company being a VIP customer, her bankers assumed that her husband owned the business. She recalls being asked about the privileges of being married to such a successful individual.

Another consequence of the industry's male-dominated character is the scarcity of female role models, strongly felt by Alba, a young VP/Co-founder of a media startup

who was thirsty for mentorship and guidance. She describes rarely encountering women who could serve as role models. She also explained that women entrepreneurs are given a much smaller window of opportunity to "prove themselves" in the business and that she had to work harder than her male peers despite being handicapped by the lack of mentoring. Clearly the need to outperform male peers experienced by corporate women (Ezzedeen and Ritchey, 2009; Ragins *et al.*, 1998) is echoed here.

B. Resistance from stakeholders

Although our subjects were self-employed and did not need to contend with male-dominated corporate cultures, they still dealt with a "male" industry, with predominantly male peers in professional associations, predominantly male financiers, predominantly male clients, and predominantly male subordinates.

Resistance from financiers. The women in our study reported significant barriers to financing resulting from stereotypes held on the part of banks and VCs. Callie explains that the assumptions about women's managerial competencies impacted their access to financing, which in turn impacted their ability to manage their venture, an already well recognized phenomenon (Orser *et al.*, 2006; Verheul and Thurik, 2001). Callie further specified that it was particularly difficult for "a woman by herself" to obtain financing, which could explain why partnering with males has been suggested as a means of coping with male-dominated fields (Godwin *et al.*, 2006).

In a similar vein, Veronica, a social entrepreneur, recounts participating in a high-profile eight-week program for technology entrepreneurs, one heavily attended by influential industry members. The program included educating participants on creating winning business plans and other success formulas, including the need to avoid references to one's family in the business pitch. She noted the masculine nature of these recommendations and how, as a result, the field was set up to become receptive to predominantly "male" business ideas and models.

Resistance from clients. Our participants reported that it was more difficult for women to compete for clients with larger and male-dominated competitors. However, women mentioned that the field was fundamentally merit-driven in that gender barriers dissipated once the women proved the quality of their product:

> I do think in the first few years of being a female entrepreneur it is definitely more difficult than later on. But once you come to the client where you've prove[n] yourself to people who are in your peer group [. . .] I just think it takes some hard work to get the respect that maybe a male would get more immediately (Alba).

This emphasis on merit could indeed be a redeeming feature for women, given its potential to counteract the powerful effects of homophily prevalent in the technology field.

Resistance from subordinates. Finally, our participants mentioned encountering resistance from within their organizations, in particular from male subordinates. The women explained that it was inevitable to supervise men in this field because virtually all technology jobs are predominantly held by men. These men often viewed their female bosses, our subjects, as incompetent and as outsiders to the field. The women reported experiencing resistance, open opposition, and even sabotage on the part of these male subordinates. They reported having to fire these insubordinate workers, and sometimes intentionally hiring women to replace them. A few reported that that was how their organizations had evolved into women-dominated, women-managed

organizations. Sarah, a corporate executive turned entrepreneur who had to frequently "release" men from her employment argued that there were characteristics to how women worked that made them ideal to entrepreneurial firms, particularly their multitasking and critical thinking abilities:

> My senior team is entirely female. It has its moments. Sometimes you can't stop the conversation [. . .] As women we have a tendency of having to go around the issue. Like we have to see it from every side, and we keep going around it from every side, which in some ways is good because you're getting the whole story (Sarah).

Deena further describes mothers returning to work as an ideal pool of employees:

> We have more females in management than we probably should. But that's actually because we've had very good success hiring moms that are just going back into the workforce and those are the people who, traditionally, come to us and stay forever. I have a harder time with males that are very career-oriented but I find that a lot of them [. . .] they don't really want to work hard (Deena).

So although mothers returning to work often experience hardships rejoining the ranks of the paid labor force (Hewlett and Luce, 2005), they found new career opportunities working for women-owned businesses.

Further, how did the women respond to these multiple layers of resistance and stereotyping? Indeed, the women made sense of these obstacles in different ways; a few made light of their severity while for others, discrimination was felt so strongly that it spurred radical action in the woman's behalf. For example, Maggie found that there was opportunity in these experiences of discrimination. She described that a denigrating comment by a colleague was one of the most positive things that she had experienced in her career:

> Well, actually, that jerk who told me that I wasn't V.P. material. It was very ironic because although you would think that that was a negative, it was actually the most positive thing. It was the biggest gift he could ever give me. Because if he hadn't done that [. . .] I might not ever have started this company. Then [. . .] I had the supreme satisfaction of employing him a few years later when he lost his job (Maggie).

For others, there was a conscious effort not to dwell on these experiences. Kara, Chief Operating Officer of her company, and in her mid-20s, was the youngest entrepreneur in our sample. In addition to gender barriers, she also experienced age-based stereotyping and describes having to work harder to overcome her peers' skepticism of her competence. Regardless of the type of prejudice she faced, however, she feared that focusing on these negative experiences could turn them into self-fulfilling prophecies. She felt strongly that women needed to concentrate on the people who were supportive of them as opposed to those who were not. In a similar vein, discrimination was a fuel for excellence for other women, a way to develop mastery and self-discipline similar to that developed by Olympic athletes. Competitive pressures can try the most determined entrepreneurs, and women are challenged to demonstrate qualities that they have not necessarily been socialized into, namely steadfastness, single-mindedness, and a strong self-concept. Maggie believes that a woman entrepreneur's failure to develop these competencies can doom her venture.

C. Societal work-family balance expectations

Often, stereotypes about women and their capabilities are prevalent in the technology industry, but they often mirror the broader social and cultural environment. Mona spoke eloquently about the survival of archaic notions of male and female responsibilities in her otherwise progressive marriage. There is evident resentment in her tone as she laments "this thing in society today that as long as a man makes the money, the rest can be a woman's job." The industry's culture also exerts pressure on women when they try to raise a child and run their businesses concurrently. This began as early as pregnancy for Angela:

> Now there is stuff that's very abstract, I think it's very hard to put your finger on. I was pregnant during the first year [. . .] before we launched and we went to some high-profile meetings. And I hid my pregnancy as well as I could because I was really afraid [of] affecting people's trust (Angela).

Clearly her experiences resemble those of working women for whom pregnancy is a stigma to be concealed (Gatrell, 2011; Masser *et al.*, 2007). Mona described similar challenges once she attempted to balance her business with looking after her newborn:

> I've been attacked a lot in the last two years by friends, family, everyone about how I'm trying to do too much and that something is going to have to give. And that I won't be able to be a good wife. I'm not going to be able to be the good mother and everyone around me perceives me as my career is number one when I'm very consciously trying to put my son first and then my career. Maybe my husband doesn't get the same treatment as my son, but I'm very offended (Mona).

Though Mona's sense of injustice is palpable, her experiences are in line with socio-cultural assumptions about work and mothering, construed as "competing devotions" that cannot be adequately performed in conjunction with other responsibilities (Blair-Loy, 2003). Further, one is inclined to imagine that men are the primary purveyors of the social criticisms and judgments that pressure working mothers. However, several of our subjects held other women responsible for not respecting their choices. Some women judged women for not being committed enough to their work; others for not being committed enough to their families. Angela did not just have to conceal her pregnancy from her associates but she also had to navigate her female business partner's impatience and lack of empathy towards Angela's new parenting responsibilities. Similarly, Mona mentions experiencing pressure from other women, associates and friends alike, to devote more time to family and less to work:

> The girls that criticize me because I don't have my son in five different activities every night [. . .] But I firmly believe that my son doesn't necessarily need to be in five different activities every night [. . .] Maybe in two activities, then he can spend quality time with me [. . .] I feel that if I spent eight hours a day with my son he'll hate me, because it's not my personality (Mona).

Mona is fighting what some have described as the new ideology of "intensive mothering" which seems to have captured Western societies in recent years (Hays, 1995). These pressures in both the personal and professional domains imposed on women a delicate dance around the ideals of masculinity and femininity where they had to juggle social expectations of womanly behavior with the professional expectations of being an organizational leader in a male-dominated sector:

> You have to go outside of the norm of what is considered to be "womanly" behavior. But people don't want to hear a woman yell or get upset or demand fairer treatment or just call someone an

> a–hole. Because a man is expected to speak like that. A man is expected to demand respect. A man is expected to get upset [. . .] So there are different expectations for women and men entrepreneurs for sure. And that's hard because a lot of young people will consider you to be their sort of mother figure, and I'm not a mother figure, I'm a boss [. . .]. You have to realize that people look at you that way, and try to figure out that it's a game of trying to understand how people are looking at you, and how you can work with the stereotype (Callie).

Sarah explained how her female mentors had managed to walk that fine line between the feminine and masculine, and developed an androgynous style that she now strove to emulate, meaning a managerial approach that successfully combined masculine and feminine elements:

> They are wonderful examples of how a woman can be in business. And they're stubborn, they're plowing through, they're doing things, but they're still well respected by those around them [. . .] I see these women as they're strong, they know what they want, or they know how to articulate it well. They're solid on the financial side [. . .] They have a good presence, but they're not pretending to be men. It is important because that doesn't work either (Sarah).

Taken together, these differential gender role expectations create significant challenges for women to balance entrepreneurial work with a personal life. Being an entrepreneur does not necessarily mean that women have more time to devote to their families or that they necessarily have greater balance and flexibility. Alba, for example, knew that she did not have the maternity benefits available to employed mothers and even if so, the pressure of managing the business and generating revenue did not end with the arrival of a child. For other women, the timing of critical events in their personal lives and in the cycle of their ventures sometimes called for difficult compromises. Mona, for example, struggled as her transition from food executive to technology entrepreneur coincided with the birth of her first child:

> The getting the opportunity to start my business in my life came at the worst timing possible I think, because it came right when my son was a year old. I think the experience of new motherhood for someone who didn't think was motherly [and] to have that opportunity at that timing was probably the most challenging thing I ever had to face in my life (Mona).

She sums it up by explaining that the tug-of-war between career and family was made more, not less, difficult by virtue of owning the business:

> In my head I've always put work at such a big importance, and I've always worked long hours. But there's something about when it's your own business it's even more important. It's even harder to say I should just stop at five and go home to my family (Mona).

The dynamism of technology coupled with its male-dominated character together challenge the common wisdom that "being your own boss" is a way for women to strike a better balance between career and family. Mona indicated that balance miht even be harder when a mother owns her business because the business holds such value. Society and family, however, exercise the opposite effect on Mona, reminding her of her primary responsibility as a mother.

V. Discussion and conclusion

The purpose of this study was to explore the barriers faced by women entrepreneurs in the Canadian high technology sector. We found that women entrepreneurs experienced multi-layered challenged, originating from several sources in their

environment, and stemming from implicit gender associations that equate entrepreneurship and technology with men and masculinity. At the organizational level, women experienced opposition from male subordinates and conflicts with male and female business partners. At the industry level, women were challenged by differentials in male-female performance standards, a lack of female role models, and stiff competition with male-owned businesses. They also experienced resistance on the part of various industry stakeholders including clients, financiers, and peers. At the societal level, they struggled with pressures to conform to their gender identity and to devote themselves to either work or family.

A. Research implications and avenues

Four emerging findings warrant further discussion. First, we find that while corporate careers entail glass ceilings, entrepreneurial careers in the technology sector involve other types of obstacles. Indeed, studies suggest that women often choose entrepreneurship to become leaders without compromising their other life priorities (Jennings and McDougald, 2007; Langowitz and Minniti, 2007; Mattis, 2004; Moore and Buttner, 1997). However, we find that women in certain fields will continue to experience organizational, industrial, and societal obstacles, even though they are technically their "own boss." Thus, they may not experience traditional glass ceilings but rather "labyrinth walls" (Eagly and Carli, 2007) in the form of all-around resistance to their leadership. In our study, we find that such resistance can originate from within their organizations in the form of male subordinate opposition and sabotage. We term this phenomenon "thorny floors," and add this metaphor to others commonly used to describe challenges faced by women, including "glass cliffs" (Ryan and Haslam, 2007) and "firewalls" (Bendl and Schmidt, 2010). We encourage researchers to continue exploring the thorny floors' phenomenon, to examine how it manifests in corporate versus entrepreneurial settings, and to elucidate how women deal with such resistance from within.

Some scholars, in particular feminist writers, have argued that entrepreneurship with its powerful connotations of creativity, adventurousness, and risk-taking is in effect construed as a masculine endeavor (Bruni *et al.*, 2004). As a result, entrepreneurship becomes culturally produced and reproduced through specific social practices, and results in the frustration of other entrepreneurial expressions. It is important for future research on women's entrepreneurship to give careful consideration to how methods, assumptions, and research questions might inadvertently reinforce a particular view of entrepreneurship (Ahl, 2006). This is in line with calls for entrepreneurship research guided by "family embedded" (Aldrich and Cliff, 2003) or "gender aware" perspectives (Brush *et al.*, 2009).

The second important finding revolves around the notion of how our subjects made sense of the barriers that they encountered, which alludes powerfully to the importance of taking the perspectives of the actors in studying phenomena and to the potential of continued qualitative research in this area. For some women, the experiences of discrimination were associated with a sense of challenge, a call to excel and to overcome. These women found that once they had expended the extra effort needed to demonstrate their competence, they were eventually rewarded by what they felt was a fundamentally merit-driven industry. Yet, for other women, undermining episodes were windows of opportunity into presently enjoyed success and thus, "blessings in disguise" similar to Zikic and Richardson's (2007) findings around job loss. These findings reinforce the need

to understand such sense-making mechanisms and call upon researchers to continue examining women's coping strategies in entrepreneurial contexts.

Third, and when we think and theorize about the barriers to advancement experienced by women and the pressures to conform to their gender, we often imagine men as the senders of these messages to conform. However, our study indicated that women, colleagues and friends, pressured other women to conform just as well. Through the emotional tenor of our interviews, we sensed that the lack of support that women experienced from other women was particularly painful. This is understudied in research on women's advancement and we encourage scholars to investigate the differential support and undermining effects of an entrepreneur's male versus female connections.

Finally, while women can undermine other women's efforts to succeed, women can also be the reason why women succeed. Indeed, and in response to thorny floors, we found that some women shifted their organizations to gradually become women-lead and eventually women-dominated. With entrepreneurship increasingly becoming a feature of the contemporary boundaryless careers (Arthur *et al.*, 2005), and entrepreneurial ventures becoming increasingly prevalent organizational forms, the finding that women business owners are less inclined to hire men bears implications for equity and diversity. It is also conceivable that women-dominated environments will eventually change the managerial dynamics of the technology field (Ross-Smith and Huppatz, 2010). This line of research carries the potential of exploring how "social orders are gendered" and therefore, "the mechanisms by which this gendering is reconstructed" (Ahl, 2006, p. 611).

B. Practical and social implications

From this study emerge a number of practical considerations for women entrepreneurs. First, entrepreneurship remains a legitimate way for women to assume control of their destinies outside of the corporate realm. This, however, should be tempered by considerations surrounding the specific field of work in which women choose to be entrepreneurs, and some fields such as technology remain significantly male-dominated. Although this should not hold women back from venturing into these fields, they should still be prepared as entrepreneurs to wage gender wars all the same. The women in our study lacked female role models, were faced with assumptions about their status and their business, were held to different standards of performance than their male counterparts, and had to work harder for funding and to win over clients. Nevertheless, the passion they felt towards their work was palpable and there was recognition that the field was merit-driven once initial barriers were overcome.

Another finding was the resistance women encountered from within their businesses, in particular from subordinates and partners. Instead of the metaphor of a glass ceiling blocking women's advancement to the top, the "thorny floors" metaphor represents resistance from male subordinates, ranging from open disagreements to direct sabotage. The women we studied resorted to firing a number of these rebellious male subordinates and eventually replaced them with women, often working mothers, transforming their organizations from male- to female-dominated. The women also learned to develop a productive and yet authentic leadership style that reconciled the conflicting gender role expectations of "boss" versus "mother figure."

C. Limitations

The present study is an exploratory investigation of the challenges experienced by a sample of Canadian women technology entrepreneurs. The findings are pertinent only to this sample and care is urged in generalizing to other individuals, even in comparable contexts. Further, the women's accounts were retrospective and not necessarily reflective of the daily stress and coping that longitudinal observations might yield. Second, the researchers explicitly recognize that any explanations, descriptions, and interpretations of phenomena are "here and now" accounts representative of specific time and space parameters. Indeed, and individual's perspective on an event or experience can change over time (Bogdan and Taylor, 1975). Thus, our entrepreneurs may well interpret things differently at different times and in different contexts. Lastly, interpretations of the data are the personal interpretation of the interpretations of the researched (Guba and Lincoln, 1994). We sought to balance the personal descriptions of our subjects with our own analyses, these reflecting both the observed and the observer(s) (Moran, 2000). As researchers interested in women and committed to all forms of women's professional success, we strove to articulate our biases at the onset while acknowledging that gendered assumptions operate implicitly.

In conclusion, this exploratory study revealed a number of challenges experienced by women entrepreneurs in a male-dominated sector of the Canadian economy, specifically high technology. The findings are cause for concern, in that they reveal enduring obstacles to women's advancement even when women are their own boss. They are also cause for optimism in that our subjects adopted mechanisms to successfully overcome these obstacles, and experienced the field as ultimately merit-driven once initial hurdles had been overcome. We hope these findings sustain interest in women's entrepreneurship in male-dominated industries.

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About the authors

Souha R. Ezzedeen holds a PhD in Human Resource Management and Organizational Behavior from the George Washington University School of Business. Her research interests include gender, work-life balance, and the career advancement and work-life balance of executive women. Souha R. Ezzedeen is the corresponding author and can be contacted at: souha@yorku.ca

Jelena Zikic holds a PhD from the Joseph L. Rotman School of Management at the University of Toronto. Her research interests include careers, career transitions, generational career issues, and career issues facing global workers, immigrants, and the unemployed.