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Re-Evaluating the Examination of Minoritized Social Identities among I-Corps Hub Program Participants

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Abstract

Members of historically disenfranchised social identity groups, including women, immigrants, and people of color, face structural barriers to success in entrepreneurship as well as STEM careers (Carter et al., 2015). These barriers include institutional biases, the persistence of ability-based stereotype beliefs, and lack of role models that restrict access to the "human capital" experience needed to succeed (McAdam, 2015). A substantial body of literature has analyzed barriers to participation in entrepreneurship activities broadly, however, research related to disparities in the specific field of academic entrepreneurship is more limited (Poggesi et al., 2020). Further, the idea of intersectionality refers to the combination of minoritized race and gender identities as a unique social experience above and beyond the influence of each identity separately (Essers et al., 2010). Therefore, this approach acknowledges that forms of exclusion based on a variety of social identities are deeply interconnected (Healy et al., 2011). Existing research applying this model to entrepreneurship has called for further study of these patterns (Knight, 2016). In light of the need to apply an intersectional approach to the study of these disparities in the types of capital needed for successful technology commercialization, this paper will describe the pilot-testing of novel open-ended and multiple-choice questions related to minoritized social identities in the context of the Great Lakes I-Corps Hub "Regional" and "Local" I-Corps courses. Our findings support frequent calls in the literature for "mixed-methods" combinations of quantitative and qualitative approaches to the assessment and categorization of social identities, and point to types of such identities that are often excluded from quantitative multiple-choice measures.

NSF Innovation-Corps ("I-Corps")

The popularity of entrepreneurship education has led to growth in the variety of teaching models, approaches, and objectives (Hahn et al. 2017; Nabi et al. 2017; O'Connor 2013; Rideout and Gray 2013). However, measuring the effects of entrepreneurship education on learning and behavior, particularly across programs or institutions, requires consensus on learning objectives, instructional strategies, and assessment of impact (e.g. Finardi, 2013; Fayolle & Gailly, 2015; Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017; Nabi, Walmsley. Liñán, Akhtar & Neame, 2018). To date, there are few examples of large-scale programs that allow for comparisons across populations or pedagogical approaches that would lead us to generalizable conclusions. Therefore, the selective national I-Corps program presents a unique opportunity to explore the impact of entrepreneurship education at a large scale and to respond to calls for greater research into the role of academic researchers, including graduate students in technology commercialization and entrepreneurship (Astebro et al. 2012; Hayter et al. 2017; Shah and Pahnke 2014).

Launched in 2011, the nationwide or "Teams" program originated from the Lean LaunchPad approach to entrepreneurship education and startups developed at Stanford University (Nnakwe et al., 2018). The I-Corps curriculum centers around a market research and validation process known as "customer discovery", which requires participants to interview 100 potential customers and stakeholders (Nnakwe et al., 2018) to assess the product-market fit of their technologies (National Science Foundation, 2019; VentureWell, 2019). Participants apply to the program in teams of three (VentureWell, 2019) where the Technical Lead (TL), usually a faculty member, provides the technical expertise necessary for the project; the Entrepreneurial Lead (EL), usually a graduate student or postdoctoral researcher, is the full-time leader of the project; and an I-Corps Mentor (IM), a volunteer business advisor, consults on the project (Blank & Engel, 2016; National Science Foundation, 2019; VentureWell, 2019).

During the time period we studied, the I-Corps Teams program involved seven weeks of online instruction, and in-person classes at the beginning and end, when cohorts of teams assembled in different regions of the country (current and future classes are expected to be exclusively remote). Teams accepted into the program received $50,000 grants to use for travel associated with these interviews and some "short-term, modest" salary support for the EL (National Science Foundation, 2021). I-Corps is centered on active learning, which is a recommended practice in entrepreneurship education (Brook & Pedler, 2020; Ferreira et al., 2018; Neck & Corbett, 2018; Kassean, Vanevenhoven, Liguori, and Winkel, 2015). The ultimate objective of the program is to catalyze ongoing involvement in technology commercialization through activities such as founding a company and seeking external venture funding. Another outcome is "pivoting" the technology or business model development if the proposed technology commercialization plan was found to not be realistic based on interviews with potential customers.

In addition to this nationwide I-Corps Teams program, "I-Corps Hubs" have been established in 10 regions of the United States (https://beta.nsf.gov/funding/initiatives/i-corps/view-hubs) consisting of networks of influential academic research institutions in these regions. These Hubs are funded to support their local innovation ecosystems in regionally-specific ways, including conducting abbreviated versions of the nationwide I-Corps Teams curriculum. Participation in these shorter "Regional I-Corps" programs is now a prerequisite for application to the nationwide Teams program, with recommendations required from the Regional program instructors. Regional I-Corps programs vary in structure between Hubs based on local needs. These usually do not include grants to teams, are shorter, require fewer customer discovery interviews, have lower requirements for course attendance by team members, and are less stringent in requiring an I-Corps Mentor team member. However, participation in these Regional programs resembles the national Teams program in focusing on a particular commercialization project, enrolling teams with both a faculty and graduate student member, and in using the "customer discovery" methodology. A third type of I-Corps program, known as "Local I-Corps" classes, is also conducted by the I-Corps Hubs. As distinguished from the Regional programs, which recruit from across the Hub region and use a standardized curriculum and format across the Hub, these Local programs are specific to member institutions and are not standardized with other Hub programs. Although they also introduce participants to the application of "customer discovery"

to commercialization projects, they use a further abbreviated curriculum, vary more widely in structure and requirements, and do not qualify a team to participate in the national Teams program. The present study, conducted at the Great Lakes I-Corps Hub, takes advantage of pre-course survey data from both the Regional programs and the Local programs conducted within the Hub. While the Local programs, being less standardized, are less generalizable to academic entrepreneurship education curricula, they are included in the present study to more broadly characterize the potential target population for all I-Corps courses.

Gender Effects in Technology Entrepreneurship

Not only do women remain underrepresented in STEM faculty positions, but women in academia also engage at a lower rate than their male peers in many academic entrepreneurship activities such as patenting, licensing, consulting, and developing social connections with private industry (Abreu & Grinevich, 2017; Goel, Göktepe-Hultén, & Ram, 2015). Recent reviews of the literature about gender differences in academic entrepreneurship document a variety of possible contributing factors to this trend, including inequalities in family time constraints, experiences of institutional bias, lack of previous experience and familiarity with the topic, and lower access to resources such as incubators (Karataş-Özkan & Chell, 2015; Parker et al., 2017; Poggesi et al., 2020). More recently, Wheadon and Duval-Couetil (2018) created a "capital framework" that outlines categories of barriers that control access, participation, and persistence in technology entrepreneurship. This framework moves beyond social and financial capital, to explore how human capital (e.g. education) and cognitive capital (e.g., self-efficacy) are also factors in viewing oneself as a technology entrepreneur.

Women currently face negative stereotypes about their competence in STEM fields as well as similar stereotypes about their entrepreneurial abilities (Gupta et al., 2009), leading scholars to describe technology entrepreneurship as "doubly masculine stereotyped" (Cohoon, 2011, p. 23). For example, the view that feminine traits are incompatible with entrepreneurial traits can be found among both genders (Ahl & Marlow, 2012). Risk taking, in particular, is stereotyped as an ability that is lesser among women and also as important for success as an entrepreneur (Patterson et al., 2012). Research has shown that repeated experiences with negative stereotypes such as these can lower women's confidence in their abilities and eventually lead to disengagement from these fields (Marlow & McAdam, 2012).

The use of technology entrepreneurship training and professional development courses could represent an avenue for academic institutions to address challenges that are unique to women in the field, for example, by highlighting counter-stereotypic examples and providing networking opportunities (Liñán et al., 2011). However, scholars note that inattention to the existence of gender-based structural biases and negative stereotypes could lead to program designs that perpetuate existing disparities (Westhead & Solesvik, 2016). At worst, educational programs in entrepreneurship (Achtenhagen & Welter, 2011) or in STEM disciplines (Snyder, 2014) that portray the abilities needed for success as incompatible with stereotypically feminine gender roles or inadvertently exaggerate the lack of women in the field could discourage women from participation.

Indeed, existing studies in the entrepreneurship education literature suggest that men and women may respond differently to the same curriculum. However, these effects are mixed, for example with some studies finding stronger positive effects of entrepreneurship education on entrepreneurial self-efficacy for female students (Wilson et al., 2007), other studies reporting that female students benefit less (Westhead & Solesvik, 2016) and others finding no significant gender difference (Bae et al., 2014). Due to these inconsistent results, researchers have pointed to the need for further research to identify the traits of educational programs that are particularly effective among women (Harrison, 2011; Martin et al., 2013).

Racial and Ethnic Identity in Technology Entrepreneurship

Racial/ethnic identity groups in the United States other than "White/European American" and "Asian/Asian American" are currently "minoritized" in the field of technology entrepreneurship, or under-represented because of historical and contemporary institutional biases. For example, minoritized racial/ethnic groups participate at disproportionately low rates in innovation activities such as patenting (Cook, 2020), a difference that is greater in academia than in industry (Sugimoto et al., 2015). With technology entrepreneurship requiring advanced STEM education, one significant challenge to broadening the participation of minoritized racial/ethnic groups is the lower enrollment by these groups in STEM doctoral programs. A wide range of documented barriers continue to make higher education in STEM, as well as in its entrepreneurial applications, challenging for minoritized racial/ethnic communities (Grossman & Porche, 2014; Whittaker & Montgomery, 2012) including: experiences of institutional discrimination, lack of supportive mentors and peers, racial microaggressions, and higher reported levels of stress (Burt et al., 2019). Compared to other academic disciplines, researchers describe STEM fields as more characterized by beliefs that success depends on innate ability, leading to the reinforcement of stereotypes that members of minoritized racial/ethnic group lack competence (Brown et al., 2016).

As in the case of gender disparities, education and professional development programs are therefore positioned to either mitigate or exaggerate these existing stereotypes and biases associated with minoritized racial/ethnic identities. Classes that help participants develop a scientific identity, for example, could encourage interest in STEM career paths (Maton et al., 2016). Similarly, educational programs could improve the level of social support available to STEM academics from minoritized racial/ethnic groups. When experiencing conflict between racial/ethnic and science identity (McCoy et al., 2015), the need for social support becomes particularly important (Harper, 2012; Ong et al., 2018).

The Need for an Intersectional Approach

An "intersectional" approach to the study of social identities reflects the need to explore in-depth the experiences of individuals who identify with more than one historically disenfranchised group simultaneously (Crenshaw, 1991, 2015; May, 2015). For example, rather than assume that the implications of identifying with a minoritized racial/ethnic group in a particular context will be similar for both men and women, an intersectional approach starts from the assumption that individuals with each combination of gender and racial/ethnic identity will have unique experiences (Essers et al., 2010). Research in entrepreneurship has considered the influence of

intersecting racial/ethnic, gender, social class and religious identities (Romero & Valdez, 2016), with a limited number of studies focusing on academic entrepreneurship specifically (Jackson et al., 2022; Mickey & Smith-Doerr 2022; Nelson, 2020). A recent study demonstrated that the experience of structural and institutional barriers, negative interpersonal interactions during instruction, and challenges to the sense of entrepreneurial identity represent barriers to the effectiveness of the I-Corps program among women of color (Jackson et al., 2022).

Both racial/ethnic identity and gender identity exert an influence on every professional step needed to engage in technology entrepreneurship, such as initial choice to study a STEM discipline, becoming a professor, creating social networks with private industry, and completing the patenting process (Mickey & Smith-Doerr 2022). In the growing body of research on women of color in academic STEM roles, studies have shown that both graduate student (Ong et al., 2011) and faculty (Hurtado et al., 2012) women of color in STEM report frequent experiences of gender and racial/ethnic bias. For example, Black/African American women face the stereotype of being "aggressive" (McGee, 2016) and express low levels of feelings of belonging within STEM fields (Ong, 2005), factors that ultimately negatively impact mental health (McGee, 2020). However, insight into disparities based on intersectional identities in STEM entrepreneurship requires research designs that integrate these broader contexts of entrepreneurship and STEM higher education. Further, scholars have called for additional quantitative studies that address intersecting social identities in entrepreneurship participation to complement the primarily qualitative existing body of research (Dy & Agwunobi, 2018).

Research Questions

Research question 1: Which social identity groups other than gender identity and racial/ethnic identity will previous student and postdoctoral participants in I-Corps Hub programs describe in a fully open-ended format?

    In addition to female gender identity and minoritized racial/ethnic identity, we hypothesized that participants will perceive themselves to be part of "any demographic or social identity group that has been historically under-represented in your current professional field" if they identify as LGBTQ+, identify as a person with a disability, have a lower-income family background, or have a rural family background. However, in an exploratory fashion, we did not specifically hypothesize additional categories or the proportion of participants who would report at least one of these identities.

Research question 2: To what extent will current participants in I-Corps Hub programs indicate under-represented or minoritized social identities other than gender and race/ethnicity in a novel check all that apply format?

    Based on a "check all that apply" categorical question that was developed on the basis of the previously developed fully open-ended question described above, we also hypothesize that the most frequently reported under-represented or minoritized identities will be LGBTQ+, lower-income family background, and rural family background. Further, we hypothesize that social identity groups listed in response to "Group not listed above" will correspond to the responses to the previously developed fully open-ended question.

Research question 3: To what extent do both current and previous participants in I-Corps Hub programs correspond to expected rates of participation based on gender and racial/ethnic identity?

Given that research in the fields of entrepreneurship broadly as well as STEM higher education broadly has documented the existence of barriers to participation for women and minoritized racial/ethnic groups, we expect that the intersection of these two academic disciplines in a STEM entrepreneurship program might pose additive challenges for these underserved groups. Therefore, we hypothesize that participation rates of women and minoritized racial/ethnic groups in the I-Corps Hub program will be lower than the overall population of STEM Ph.D. students and faculty that are eligible to be recruited into the program. The NSF reports (2021), using the latest available data from 2018, that out of the total number of science and engineering doctoral degrees awarded, 41.2% were awarded to women and 13.6% to students from minoritized racial/ethnic groups. Further, 7.6% of such degrees were received by women from minoritized racial/ethnic groups, while 5.9% were received by men from minoritized racial/ethnic groups. When examining the discipline of engineering specifically, women earned 24.5% of doctoral degrees. Further focusing on one of the largest institutions in the I-Corps Hub involved in the present study, 29.1% of engineering doctorates were earned by women and 7.3% by minoritized racial/ethnic groups. In contrast, the overall demographics of the state in which this academic institution is located consist of: 5.6% Hispanic or Latino, 14.1% Black or African American, 3.4% Asian, and 74.2% White, with the total population in all minoritized racial/ethnic groups representing 22.4% of the state.

Method

Dataset 1, Entrepreneurial Lead ("EL") Followup Survey

Participants were contacted in 2021 who had participated in any program conducted by the I-Corps Hub in the previous 5 years and were students or postdocs while they were enrolled in the program. Surveys were administered within Qualtrics and distributed over email between September and December 2021, with $30 provided as compensation for the participants' time. With a sample size of 160 (female = 43; male = 117), participants were asked the open-ended question "Do you consider yourself to be part of any demographic or social identity group that has been historically under-represented in your current professional field? If so, please describe:" (n = 57). Of participants who recalled their academic level at the time of participation, 27 indicated "Undergraduate", 22 indicated "Master's degree student", 48 indicated "Ph.D. student", and 22 indicated "Postdoctoral Researcher".

Dataset 2, Great Lakes I-Corps Hub Program Surveys

The Hub survey data includes internally developed surveys administered by the Great Lakes I-Corps Hub in the year 2022. Both pre-course and post-course surveys are administered, with the data from the present analysis drawn from pre-course surveys only. The surveys are administered within Qualtrics, and distributed through the Learning Management System for the Regional programs and through email for the Local programs. Instructors are encouraged to allow time during the first and last class sessions for survey completion, although implementation of this practice is not always feasible. For the Hub Regional pre-course surveys, out of a total of 218 participants who responded to the question about professional role, 110 indicated "Student or postdoctoral researcher", 49 indicated "Faculty", 12 indicated "Other University position", and 47 indicated "Non-University position". For the Hub Local pre-course surveys, out of a total of 364 participants who responded to the question about professional role, 166 indicated "Student or postdoctoral researcher", 77 indicated "Faculty", 29 indicated "Other University position", and 92 indicated "Non-University position".

Results

Under-Represented Groups Open-Ended

EL Followup Survey Under-Represented Groups Open-Ended Question
"Do you consider yourself to be part of any demographic or social identity group that has been historically under-represented in your current professional field? If so, please describe:"

	Number	Percent (out of 169)
Minoritized R/E	29	17.2
Female	24	14.2
SES/First generation student	6	3.6
Immigrant/international/nationality/first gen immigrant/non-citizen	5	3.0
LGBTQ+	5	3.0
Disability	3	1.8
"First generation" ambiguous	2	1.2
Young	2	1.2
Children, single parent	2	1.2
Rural	2	1.2
Tattoos	1	0.6
Age above 50	1	0.6
Total indicating 1 or more	57	33.7

Note: Reference sample is from the preceding multiple choice question (Work Values)

Uses of the Phrase "First Generation" in Open-Ended Question

Student	Immigration	Ambiguous
-First-generation college student -First generation college graduate -I am a first generation college grad	-I am a first generation child of Arab dispora [sic] from Africa -First-generation immigrants	-1st Gen -First-Generation

Under-Represented Groups Check All That Apply

Regional and Local Pre-Surveys Under-Represented Group Check All That Apply Question
"Below are some groups that have been identified in previous I-Corps research as historically under-represented or minoritized in technology entrepreneurship. If you are comfortable sharing information about your background, please select those with which you identify."

	Regional		Local	
	n	% of sample	n	% of sample
Neither of my parents were born in the United States	86	40.57%	97	37.31%
I was not born in the United States	89	41.98%	87	33.46%
Neither of my parents finished a 4-year college degree	39	18.40%	72	27.69%
None of the above	37	17.45%	55	21.15%
Prefer not to answer	27	12.74%	29	11.15%
I identify as a person with a disability	23	10.85%	11	4.23%
Group(s) not listed above:	21	9.91%	7	2.69%
I identify as LGBTQ+	7	3.30%	8	3.08%
Total sample n	212		260	

Note: Reference sample for check all that apply is the preceding multiple choice question (gender)

Group(s) not listed above:

Hub Regional Pre-Survey	Hub Local Pre-Survey
-Black -Veteran	-Jewish -One parent not born in the United States -One of my parents was not born in the United States -Female -US Veteran

Gender

All Surveys Gender Identity
"What is your current gender identity?"

	EL Followup		Hub Regional		Hub Local	
	n	%	n	%	n	%
Man	117	71.34%	149	70.28%	177	68.08%
Woman	43	26.22%	56	26.42%	70	26.92%
Prefer not to answer	3	1.83%	7	3.30%	12	4.62%
Non-binary / gender non-conforming	1	0.61%	0	0.00%	1	0.38%
Prefer to self-describe:	0	0.00%	0	0.00%	0	0.00%
	164		212		260	

Note: On Followup, the "Prefer to self-describe:" option was worded as "I use the following language to describe myself:", which was edited to be more concise.

Race/Ethnicity

Hub Local and Regional Pre-Surveys Check All That Apply Race/Ethnicity
"With which of the following United States demographic groups do you most identify? (Check all that apply)"

	Hub Local		Hub Regional	
	N	% of sample	N	% of sample
White or European American	108	41.54%	85	40.09%
Asian or Asian American	87	33.46%	79	37.26%
Middle Eastern or North African	15	5.77%	19	8.96%
Prefer not to answer	28	10.77%	18	8.49%
Black or African American	18	6.92%	11	5.19%
Hispanic or Latin American	7	2.69%	7	3.30%
American Indian, Native American, or Alaska Native	0	0.00%	4	1.89%
Prefer to self-describe:	4	1.54%	1	0.47%
Native Hawaiian or Pacific Islander	0	0.00%	1	0.47%
Total sample n	260		212	

Note: Reference sample for check all that apply is the preceding multiple-choice question (gender)

Hub Local and Regional Pre-Surveys Multiple Race/Ethnicity Followup Question

"You selected multiple United States demographic groups. If a summary of this data was needed using mutually-exclusive categories, which of the following single options would you prefer?"

	Hub Local		Hub Regional	
	N	%	N	%
Multiple group identity	4	50.00%	3	33.33%
White or European American	2	25.00%	3	33.33%
Hispanic or Latin American	1	12.50%	2	22.22%
Middle Eastern or North African	1	12.50%	0	0.00%
None of the below or prefer not to answer	0	0.00%	1	11.11%
American Indian, Native American, or Alaska Native	0	0.00%	0	0.00%
Asian or Asian American	0	0.00%	0	0.00%
Black or African American	0	0.00%	0	0.00%
Native Hawaiian or Pacific Islander	0	0.00%	0	0.00%
Total n	8		9	

EL Followup Survey Race/Ethnicity Questions

"With which of the following United States demographic groups do you most identify? Check all that apply."

"If a summary was needed using mutually-exclusive categories for United States demographic groups, which of the following single options would you prefer?"

Response option	Check All that Apply		Mutually Exclusive	
	n	% of sample	n	% of sample
White or European American	79	48.17%	56	35.90%
Asian or Asian American	63	38.41%	54	34.62%
Hispanic or Latino/a/x	16	9.76%	14	8.97%
Middle Eastern or North African	11	6.71%	10	6.41%
Black or African American	5	3.05%	5	3.21%
I use the following language to describe myself:	3	1.83%	4	2.56%
Prefer not to answer	2	1.22%	6	3.85%
Native American, American Indian, or Alaska Native	1	0.61%	0	0.00%
Native Hawaiian or Pacific Islander	0	0.00%	0	0.00%
Multiple group identification	N/A	N/A	7	4.49%
Total sample n	164		156	

Note: Reference sample for check all that apply is the preceding multiple choice question (gender)

All Surveys Race/Ethnicity "Other" responses

EL Followup	Hub Local	Hub Regional
-Indian -Jewish -Multiracial	-Non immigrant Asian -Asian -Indian (x2) -Chinese	-Immigrant female from Switzerland

Gender and Minoritized Race/Ethnicity Combination

EL Followup

	Non-minoritized		Minoritized		Row Total
	n	% of sample	n	% of sample	
Man	94	58.39%	21	13.04%	115
Woman	35	21.74%	8	4.97%	43
Non-binary / gender non-conforming	1	0.62%	0	0.00%	1
I use the following language to describe myself:	0	0.00%	0	0.00%	0
Prefer not to answer	1	0.62%	1	0.62%	2
Column total	131		30		161

Hub Regional Program Pre-Survey

	Non-minoritized		Minoritized		Row Total
	n	% of sample	n	% of sample	
Man	114	60.32%	22	11.64%	136
Woman	42	22.22%	10	5.29%	52
Non-binary or gender non-conforming	0	0.00%	0	0.00%	0
Prefer to self-describe:	0	0.00%	0	0.00%	0
Prefer not to answer	1	0.53%	0	0.00%	1
Column total	157		32		189

Hub Local Program Pre-Survey

	Non-minoritized		Minoritized		Row Total
	n	% of sample	n	% of sample	
Man	133	59.64%	24	10.76%	157
Woman	51	22.87%	13	5.83%	64
Non-binary or gender non-conforming	1	0.45%	0	0.00%	1
Prefer to self-describe:	0	0.00%	0	0.00%	0
Prefer not to answer	1	0.45%	0	0.00%	1
Column total	186		37		223

Socio-economic Status (SES)

All Surveys Number of First Generation College Students
Number of participants selecting "yes" to the question "Were you a first-generation college student?" (EL Followup) or checking the box indicating "Neither of my parents completed a 4 year degree." (Regional and Local)

	EL followup		Hub Regional		Hub Local	
	N	% of sample	N	% of sample	N	% of sample
Citizen	19	11.5%	23	10.9%	54	20.6%
Permanent Resident	5	3.0%	8	3.7%	6	2.3%
International	8	4.8%	8	3.7%	10	3.8%
Total	32	19.3%	39	18.3%	70	26.7%
Total sample n	164		211		261	

Note: Reference sample for check all that apply is the preceding multiple choice question (Residency)

Discussion

Acknowledging calls by researchers for more detailed measures of minoritized social group identities as well as further research combining both quantitative and qualitative measures (Fraser, 2018), the present study uses the context of Great Lakes I-Corps Hub program participants to describe the development and pilot testing of an expanded survey measure of under-represented and minoritized identities. Further, we characterize the participants in these programs based on gender identity, racial/ethnic identity, the intersection of gender with race/ethnicity, socio-economic status (SES) as indicated by first-generation college student status. We examined three research questions: 1) Which social identity groups other than gender identity and racial/ethnic identity will previous student and postdoctoral participants in I-Corps

Hub programs describe in a fully open-ended format?; 2) To what extent will current participants in I-Corps Hub programs indicate under-represented or minoritized social identities other than gender and race/ethnicity in a novel check all that apply format?; 3) To what extent do both current and previous participants in I-Corps Hub programs correspond to expected rates of participation based on gender and racial/ethnic identity?

In relation to the first research question, we used a fully open-ended survey question distributed to a sample of previous student and postdoctoral participants in Great Lakes I-Corps Hub programs. Using a format that allows participants to interpret the terms "under-represented" and "minoritized", the specific question asked was: "Do you consider yourself to be part of any demographic or social identity group that has been historically under-represented in your current professional field? If so, please describe:". This question was placed before the multiple-choice measures of gender and racial/ethnic identity in order not to influence participants based on the categories provided as response options to those questions. The proportion of participants who reported at least one perceived under-represented or minoritized identity was substantial, 33.7% of the sample. In addition to gender and racial/ethnic identity, we expected that other identities perceived as under-represented would include LGBTQ+, lower-income family background, rural family background, and disability or ability difference. Indeed, these three categories emerged from the coded open-ended responses. Indicators of socioeconomic status were mentioned the most frequently after race/ethnicity and gender, with the unexpected category of immigration status or immigration background being reported as the fourth most common category. Further examples of unanticipated responses include younger age, older age, having children, and being a single parent, each reported by one participant. A methodological concern revealed by the use of this question was the ambiguous use of the term "first generation". Among the seven participants including this term in their self-description, three were clearly described as referring to educational status, two were clearly described as referring to immigration background, and two were unspecified. This concern is an example of the benefits of using categorical, multiple-choice questions, and was taken into account in our own development of a categorical under-represented groups question.

In our second research question, we used the results of the fully open-ended question described above to develop a categorical check-all-that-apply assessment of identities other than race and gender. Confirming our hypotheses that the results of this question would mirror responses to the open-ended version, immigration background again emerged as the most frequently reported. The third most frequently indicated category was first-generation student status, which was reported by 18.4% of Regional I-Corps program participants and 27.9% of Local I-Corps program participants. In order to take into account international differences in education systems, when participants reporting "International" or "Permanent Resident" status are removed from these responses, first-generation student status was reported by 10.9% of Regional program participants and 20.6% of Local program participants. These substantial fractions of participants from lower socio-economic status backgrounds support the calls for further research focusing on barriers specific to this population in STEM higher education and entrepreneurship (Martin et al., 2020). In relation to LGBTQ+ identity, approximately 3% of participants in each of the dataset

described themselves as belonging to this group, implying the need for large sample sizes in future research to allow for quantitative analyses with this population. In an unexpected finding, and in contrast to the data from the initial open-ended question, rural family background was not mentioned by any participant within the "Group not mentioned above" response option.

With respect to the third research question, we examined the combined categories of gender identity and racial/ethnic identity in Great Lakes I-Corps Hub Regional and Local programs with respect to baseline proportions of these identity groups in STEM doctoral degree recipients nationwide, engineering doctoral recipients at a major institution within the Great Lakes I-Corps Hub, and the population of the state containing this institution. In all three samples, the population of non-minoritized racial/ethnic group men was approximately 60% of the sample, non-minoritized racial/ethnic group women was approximately 22%, minoritized group men was approximately 12%, and minoritized group women was approximately 6%. These proportions roughly corresponded to those of engineering Ph.D. recipients of a representative Hub institution (29.1% of engineering doctorates earned by women, 7.3% by minoritized racial/ethnic groups), but were substantially lower than the state population of this institution. These results have implications for ongoing discussions within the field of academic entrepreneurship as well as STEM education relating to the most appropriate metrics for the goals of broadening participation. Although achieving similar proportions of women and minoritized racial/ethnic groups in these programs as overall nationwide or regional demographics is a starting point for the definition of "equity", these results could imply that academic entrepreneurship education programs such as I-Corps do not represent substantial barriers to the participation of groups above and beyond those required to proceed through the "pipeline" of doctoral enrollment in STEM fields generally and engineering in particular. Therefore, efforts to broaden participation in these programs must consider whether over-representation of these groups relative to institutional population is a desirable goal, as well as examining factors relevant to the initial institutional recruitment of students into Ph.D. programs.

As a result of documented structural and societal barriers, the pipeline leading to successful academic entrepreneurship projects may limit the target audience of women and minoritized racial/ethnic group members to exceptionally high performers, a pattern similar to the "overqualification" effect (Campbell & Hahl, 2020). For example, women's qualifications are discounted and their capability to perform a particular job are questioned as compared to men, leading to gender disparities in evaluations and hiring outcomes (Sarsons et al., 2021). As a result, women often have more qualifications and take longer to ascend the organizational hierarchy compared with their male peers (Hultin, 2003), further underlining the persistent inequality that women and minorities face in the labor market. In a related trend, some research within STEM workplaces demonstrates that women can come to view their gender as a distraction and work to minimize the salience of gender in workplace experiences (Britton, 2017).

Similarly, researchers from minoritized racial/ethnic groups who participate in entrepreneurship, are likely to represent a highly selected group of top academic and professional achievers who have continually been required to resist and disprove negative assumptions about their

intelligence. Research shows that students who feel that their abilities are doubted may feel pressure to be perceived as smarter than average (Bonner, 2001; Fries-Britt & Turner, 2002), an effect described as the *resistance through achievement* strategy (Portnoi & Kwong, 2019). This effect includes responding to experiences of bias with a desire to work harder and prove to others that they can succeed (Kumi-Yeboah, 2016; Wong, 2018). Therefore, research often presents high-achieving Black students as resilient because they use coping strategies to sustain academic performance and avoid negative evaluations by others, despite facing racial stereotypes, stigma, prejudice, and structural racism in their educational environments (McGee, 2016; Museus et al., 2011).

Conclusion

Particularly at a time when significant national and institutional resources are being invested in infrastructure and training programs to catalyze and incentivize the transformation of basic research into technologies and products that have an impact on society (Neves & Briot, 2020), more research is needed to understand why women and minoritized racial/ethnic groups participate in technology entrepreneurship at lower rates than men (Wheadon & Duval-Couetil, 2019; Fleisher & Marquez, 2020). However, programs and datasets are rare with sufficient size and diversity to allow researchers to examine group differences across key variables that impact participation and outcomes. The I-Corps program affords a unique opportunity to explore intersectionality and group differences among faculty and graduate students participating in academic entrepreneurship training. Future research related to the topics of broadening participation in academic entrepreneurship, or examining the effectiveness of entrepreneurship training targeting academic researchers, must include careful attention to the development and validation of measures able to detect potential bias, and account for issues of self-selection when making conclusions about academic entrepreneurs.

References

Abebe, M. A., & Angriawan, A. (2014). Organizational and competitive influences of exploration and exploitation activities in small firms. *Journal of Business Research*, *67*(3), 339-345.

Abreu, M., & Grinevich, V. (2017). Gender patterns in academic entrepreneurship. *The Journal of Technology Transfer*, *42*, 763-794.

Aggarwal, I., Woolley, A. W., Chabris, C. F., & Malone, T. W. (2019). The impact of cognitive style diversity on implicit learning in teams. *Frontiers in psychology*, *10*, 112.

Ahl, H., & Nelson, T. (2015). How policy positions women entrepreneurs: A comparative analysis of state discourse in Sweden and the United States. *Journal of Business Venturing*, *30*(2), 273-291.

Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior* (pp. 11-39). Springer Berlin Heidelberg.

Ajzen, I., & Fishbein, M. (2000). Attitudes and the attitude-behavior relation: Reasoned and automatic processes. *European review of social psychology*, *11*(1), 1-33.

Alfrey, L., & Twine, F. W. (2017). Gender-fluid geek girls: Negotiating inequality regimes in the tech industry. *Gender & Society*, *31*(1), 28-50.

Allen, T. D., Herst, D. E., Bruck, C. S., & Sutton, M. (2000). Consequences associated with work-to-family conflict: a review and agenda for future research. *Journal of occupational health psychology*, *5*(2), 278.

Ammeer, M. A., Haddoud, M. Y., & Onjewu, A. K. E. (2021). A personal values view of international entrepreneurial intention. *International Journal of Entrepreneurial Behavior & Research*, *28*(3), 577-601.

Anggadwita, G., Ramadani, V., Alamanda, D. T., Ratten, V., & Hashani, M. (2017). Entrepreneurial intentions from an Islamic perspective: a study of Muslim entrepreneurs in Indonesia. *International Journal of Entrepreneurship and Small Business*, *31*(2), 165-179.

Åstebro, T., Braguinsky, S., Braunerhjelm, P., & Broström, A. (2019). Academic entrepreneurship: The Bayh-Dole Act versus the professor's privilege. *ILR Review*, *72*(5), 1094-1122.

Baron, R. A., & Markman, G. D. (2000). Beyond social capital: How social skills can enhance entrepreneurs' success. *Academy of Management Perspectives*, *14*(1), 106-116.

Becker, G. S. (1994). Human capital revisited. In *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education, Third Edition* (pp. 15-28). The University of Chicago Press.

Bell, A., Chetty, R., Jaravel, X., Petkova, N., & Van Reenen, J. (2018). *Lost Einsteins: who becomes an inventor in America?* (No. 522). Centre for Economic Performance, LSE.

Benard, S., & Correll, S. J. (2010). Normative discrimination and the motherhood penalty. *Gender & Society*, *24*(5), 616-646.

Benner, A. D., Wang, Y., Shen, Y., Boyle, A. E., Polk, R., & Cheng, Y. P. (2018). Racial/ethnic discrimination and well-being during adolescence: A meta-analytic review. *American Psychologist*, *73*(7), 855.

Bernal, D. D., & Villalpando, O. (2002). An apartheid of knowledge in academia: The struggle over the" legitimate" knowledge of faculty of color. *Equity & excellence in education*, *35*(2), 169-180.

Beyer, S. (2008). Predictors of Female and Male Computer Science Students' Grades. *Journal of Women and Minorities in Science and Engineering*, *14*(4), 377-409.

Beyer, S. (2014). Why are women underrepresented in Computer Science? Gender differences in stereotypes, self-efficacy, values, and interests and predictors of future CS course-taking and grades. *Computer Science Education*, *24*(2-3), 153-192.

Bilge, S., & Collins, P. H. (2016). Intersectionality. *Cambridge, UK: Polity*.

Blincoe, K., Springer, O., & Wrobel, M. R. (2019). Perceptions of gender diversity's impact on mood in software development teams. *Ieee Software*, *36*(5), 51-56.

Boh, W. F., De-Haan, U., & Strom, R. (2016). University technology transfer through entrepreneurship: Faculty and students in spinoffs. *The Journal of Technology Transfer*, *41*, 661-669.

Bosma, N., & Kelley, D. (2019). Global entrepreneurship monitor: 2018/19 global report. *Global Entrepreneurship Research Association, London Business School: London*.

Botelho, T. L., & Abraham, M. (2017). Pursuing quality: How search costs and uncertainty magnify gender-based double standards in a multistage evaluation process. *Administrative Science Quarterly*, *62*(4), 698-730.

Britton, D. M. (2017). Beyond the chilly climate: The salience of gender in women's academic careers. *Gender & society*, *31*(1), 5-27.

Brown, T. M., Smith, T. R., Gabbard, J. L., & Gilbert, J. E. (2016, July). Augmenting Mathematical Education for Minority Students. In *2016 IEEE 16th International Conference on Advanced Learning Technologies (ICALT)* (pp. 260-264). IEEE.

Brush, C. G., & Brush, C. G. (2006). Growth-oriented women entrepreneurs and their businesses: A global research perspective.

Brush, C. G., Carter, N. M., Gatewood, E. J., Greene, P. G., & Hart, M. M. (2006). The use of bootstrapping by women entrepreneurs in positioning for growth. *Venture Capital*, *8*(1), 15-31.

Brush, C. G., Greene, P. G., & Hart, M. M. (2001). From initial idea to unique advantage: The entrepreneurial challenge of constructing a resource base. *Academy of Management Perspectives*, *15*(1), 64-78.

Brush, C., De Bruin, A., & Welter, F. (2009). A Gender-Aware Framework for Women's Entrepreneurship. *International Journal of Gender and Entrepreneurship*, *1*(1), 8-24.

Busolt, U., & Kugele, K. (2009). The gender innovation and research productivity gap in Europe. *International Journal of Innovation and Sustainable Development*, *4*(2-3), 109-122.

Byrne, J., Fattoum, S., & Diaz Garcia, M. C. (2019). Role models and women entrepreneurs: Entrepreneurial superwoman has her say. *Journal of Small Business Management*, *57*(1), 154-184.

Cabrera, E. M., & Mauricio, D. (2017). Factors affecting the success of women's entrepreneurship: a review of literature. *International Journal of Gender and Entrepreneurship*.

Campbell, E., & Hahl, O. (2020). He's Overqualified, She's Highly Committed: Gender, Qualifications, and Perceptions of Commitment. In *Academy of Management Proceedings* (Vol. 2020, No. 1, p. 12628). Briarcliff Manor, NY 10510: Academy of Management.

Carbin, M., & Edenheim, S. (2013). The intersectional turn in feminist theory: A dream of a common language?. *European Journal of Women's Studies*, *20*(3), 233-248.

Carlone, H. B., & Johnson, A. (2007). Understanding the science experiences of successful women of color: Science identity as an analytic lens. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, *44*(8), 1187-1218.

Carnahan, S., Agarwal, R., & Campbell, B. A. (2012). Heterogeneity in turnover: The effect of relative compensation dispersion of firms on the mobility and entrepreneurship of extreme performers. *Strategic Management Journal*, *33*(12), 1411-1430.

Carpenter, C. W., & Loveridge, S. (2018). Differences between Latino-owned businesses and white-, black-, or Asian-owned businesses: evidence from Census microdata. *Economic Development Quarterly*, *32*(3), 225-241.

Carter, R. G., Mundorff, K., Risien, J., Bouwma-Gearhart, J., Bratsch-Prince, D., Brown, S. A., ... & Van Egeren, L. (2021). Innovation, entrepreneurship, promotion, and tenure. *Science*, *373*(6561), 1312-1314.

Cech, E. A., & Pham, M. V. (2017). Queer in STEM organizations: Workplace disadvantages for LGBT employees in STEM related federal agencies. *Social Sciences*, *6*(1), 12.

Cha, Y., & Weeden, K. A. (2014). Overwork and the slow convergence in the gender gap in wages. *American Sociological Review*, *79*(3), 457-484.

Chowdhury, S., Endres, M. L., & Frye, C. (2019). The influence of knowledge, experience, and education on gender disparity in entrepreneurial self-efficacy. *Journal of Small Business & Entrepreneurship*, *31*(5), 371-389.

Cobb, F., & Russell, N. M. (2015). Meritocracy or complexity: Problematizing racial disparities in mathematics assessment within the context of curricular structures, practices, and discourse. *Journal of Education Policy*, *30*(5), 631-649.

Cole, D., & Espinoza, A. (2008). Examining the academic success of Latino students in science technology engineering and mathematics (STEM) majors. *Journal of College Student Development*, *49*(4), 285-300.

Coleman, S., & Robb, A. (2009). A comparison of new firm financing by gender: evidence from the Kauffman Firm Survey data. *Small Business Economics*, *33*, 397-411.

Coleman, S., & Robb, A. (2016). Financing high growth women-owned enterprises: Evidence from the United States. In *Women's entrepreneurship in global and local contexts* (pp. 183-202). Edward Elgar Publishing.

Conley, N., & Bilimoria, D. (2021). Barriers and mitigating strategies of entrepreneurial business growth: The role of entrepreneur race and gender. *Entrepreneurship Research Journal*, *12*(3), 391-439.

Cook, L. D. (2020). Policies to broaden participation in the innovation process. *Policy Proposal,* The Hamilton Project, Brookings Institution, Washington, DC.

Cooper, A. C., Folta, T., Gimeno-Gascon, J., & Woo, C. Y. (1992, August). Entrepreneurs' exit decisions: the role of threshold expectations. In *Academy of Management Proceedings* (Vol. 1992, No. 1, pp. 75-79). Briarcliff Manor, NY 10510: Academy of Management.

Crenshaw, K. (2013). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. In *Feminist legal theories* (pp. 23-51). Routledge.

Crenshaw, K. W. (1995). The intersection of race and gender. *Critical race theory: The key writings that formed the movement*, 357-383.

Cross, K. J., & Paretti, M. C. (2020). African American males' experiences on multiracial student teams in engineering. *Journal of Women and Minorities in Science and Engineering*, *26*(4), 381-411.

Cvencek, D., Nasir, N. I. S., O'Connor, K., Wischnia, S., & Meltzoff, A. N. (2015). The development of math–race stereotypes:"They say Chinese people are the best at math". *Journal of Research on Adolescence*, *25*(4), 630-637.

Davey, T., Hannon, P., & Penaluna, A. (2016). Entrepreneurship education and the role of universities in entrepreneurship: Introduction to the special issue. *Industry and higher education*, *30*(3), 171-182.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of business venturing*, *18*(3), 301-331.

Delmar, F., & Davidsson, P. (2000). Where do they come from? Prevalence and characteristics of nascent entrepreneurs. *Entrepreneurship & regional development*, *12*(1), 1-23.

Di Paola, N. (2021). Pathways to academic entrepreneurship: The determinants of female scholars' entrepreneurial intentions. *The Journal of Technology Transfer*, *46*(5), 1417-1441.

Díaz-García, C., González-Moreno, A., & Jose Sáez-Martínez, F. (2013). Gender diversity within R&D teams: Its impact on radicalness of innovation. *Innovation*, *15*(2), 149-160.

Ding, W. W., Murray, F., & Stuart, T. E. (2013). From bench to board: Gender differences in university scientists' participation in corporate scientific advisory boards. *Academy of Management Journal*, *56*(5), 1443-1464.

Dingel, M., & Wei, W. (2014). Influences on peer evaluation in a group project: an exploration of leadership, demographics and course performance. *Assessment & Evaluation in Higher Education*, *39*(6), 729-742.

Duval-Couetil, N., Huang-Saad, A., & Wheadon, M. (2021). Training faculty in entrepreneurship and innovation: An evaluation of the National Science Foundation Innovation-Corps™ program. *Entrepreneurship Education and Pedagogy*, *4*(4), 583-608.

Duval-Couetil, N., Ladisch, M., & Yi, S. (2021). Addressing academic researcher priorities through science and technology entrepreneurship education. *The Journal of Technology Transfer*, *46*(2), 288-318.

Dy, A., & Agwunobi, A. J. (2018). Intersectionality and mixed methods for social context in entrepreneurship. *International journal of entrepreneurial behavior & research*, *25*(8), 1727-1747.

Edelman, L. F., Brush, C. G., Manolova, T. S., & Greene, P. G. (2010). Start-up motivations and growth intentions of minority nascent entrepreneurs. *Journal of Small Business Management*, *48*(2), 174-196.

Eesley, C. (2016). Institutional barriers to growth: Entrepreneurship, human capital and institutional change. *Organization Science*, *27*(5), 1290-1306.

Ellingrud, K., Krishnan, M., & Madgavkar, A. (2016). Miles to go: Stepping up progress toward gender equality. *McKinsey & Company*.

Elliott, J. R., & Smith, R. A. (2004). Race, Gender, and Workplace Power. *American Sociological Review*, 365-386.

Epstein, A., Duval-Couetil, N., & Huang-Saad, A. (2022). Gender differences in academic entrepreneurship: experience, attitudes and outcomes among NSF I-CORPS participants. *International Journal of Gender and Entrepreneurship*, *14*(1), 117-141.

Essers, C., Benschop, Y., & Doorewaard, H. (2010). Female ethnicity: Understanding Muslim immigrant businesswomen in the Netherlands. *Gender, Work & Organization*, *17*(3), 320-339.

Fairlie, R., Robb, A., & Robinson, D. T. (2022). Black and white: Access to capital among minority-owned start-ups. *Management Science*, *68*(4), 2377-2400.

Fairlie, R. W., & Robb, A. M. (2010). *Race and entrepreneurial success: Black-, Asian-, and White-owned businesses in the United States*. MIT Press.

Farhangmehr, M., Gonçalves, P., & Sarmento, M. (2016). Predicting entrepreneurial motivation among university students: The role of entrepreneurship education. *Education+ Training*, *58*(7/8).

Fechner, H., & Shapanka, M. S. (2018). Closing diversity gaps in innovation: Gender, race, and income disparities in patenting and commercialization of inventions. *Technology & Innovation*, *19*(4), 727-734.

Ferguson, S. J. (2022). *The Relationship between Teachers' Cultural Competence and Referrals for Multitiered System of Supports among Racial/Ethnic Minority Students*. Alfred University.

Fleisher, L., & Marquez, A. (2019). A Seat at the Table: Special Considerations for Women and Underrepresented Groups in Academic Entrepreneurship. *Academic Entrepreneurship for Medical and Health Scientists*, *1*(1), 7.

Foschi, M. (2000). Double standards for competence: Theory and research. *Annual review of Sociology*, *26*(1), 21-42.

Fries-Britt, S., & Turner, B. (2002). Uneven stories: Successful Black collegians at a Black and a White campus. *The Review of Higher Education*, *25*(3), 315-330.

Gayles, J. G., & Ampaw, F. (2016). To stay or leave: Factors that impact undergraduate women's persistence in science majors. *NASPA Journal About Women in Higher Education*, *9*(2), 133-151.

Geerts, E., & Van der Tuin, I. (2013, November). From intersectionality to interference: Feminist onto-epistemological reflections on the politics of representation. In *Women's Studies International Forum* (Vol. 41, pp. 171-178). Pergamon.

Bosma, N., Hill, S., Ionescu-Somers, A., Kelly, D., Guerrero, M., & Schott, T. (2021). Global entrepreneurship monitor 2020/2021 global report.

Geschwender, J. A. (1992). Ethgender, women's waged labor, and economic mobility. *Social Problems*, *39*(1), 1-16.

Gewin, V. (2011). Equality: The fight for access. *Nature*, *469*(7329), 255-257.

Giuri, P., Grimaldi, R., Kochenkova, A., Munari, F., & Toschi, L. (2020). The effects of university-level policies on women's participation in academic patenting in Italy. *The Journal of Technology Transfer*, *45*, 122-150.

Gompers, P. A., Mukharlyamov, V., Weisburst, E., & Xuan, Y. (2022). Gender gaps in venture capital performance. *Journal of Financial and Quantitative Analysis*, *57*(2), 485-513.

Gregory, A., & Fergus, E. (2017). Social and Emotional Learning and Equity in School Discipline. *Future of Children*, *27*(1), 117-136.

Gündemir, S., Homan, A. C., De Dreu, C. K., & Van Vugt, M. (2014). Think leader, think white? Capturing and weakening an implicit pro-white leadership bias. *PloS one*, *9*(1), e83915.

Haines, E. L., Deaux, K., & Lofaro, N. (2016). The times they are a-changing… or are they not? A comparison of gender stereotypes, 1983–2014. *Psychology of Women Quarterly*, *40*(3), 353-363.

Hamilton, C. (2020). Increasing Diversity among Women Entrepreneurs in High Growth High Tech Using HBCU Female Academic Entrepreneurs. *Journal: Applied Management Journal*, *21*, 40-81.

Hayter, C. S., Lubynsky, R., & Maroulis, S. (2017). Who is the academic entrepreneur? The role of graduate students in the development of university spinoffs. *The Journal of Technology Transfer*, *42*, 1237-1254.

Hill, C., Corbett, C., & St Rose, A. (2010). *Why so few? Women in science, technology, engineering, and mathematics*. American Association of University Women. Washington, DC.

Hill, K. A., Samuels, E. A., Gross, C. P., Desai, M. M., Zelin, N. S., Latimore, D., ... & Boatright, D. (2020). Assessment of the prevalence of medical student mistreatment by sex, race/ethnicity, and sexual orientation. *JAMA Internal Medicine*, *180*(5), 653-665.

Hochschild, A., & Machung, A. (2012). *The second shift: Working families and the revolution at home*. Penguin.

Högberg, L., Schölin, T., Ram, M., & Jones, T. (2016). Categorising and labelling entrepreneurs: Business support organisations constructing the Other through prefixes of ethnicity and immigrantship. *International Small Business Journal*, *34*(3), 242-260.

Hoogendoorn, S., Oosterbeek, H., & Van Praag, M. (2013). The impact of gender diversity on the performance of business teams: Evidence from a field experiment. *Management science*, *59*(7), 1514-1528.

Huang-Saad, A., Fay, J., & Sheridan, L. (2017). Closing the divide: accelerating technology commercialization by catalyzing the university entrepreneurial ecosystem with I-Corps™. *The Journal of Technology Transfer*, *42*(6), 1466-1486.

Hughes, V. (2010). Women, gender, and Canadian foreign policy, 1909-2009. *British Journal of Canadian Studies*, *23*(2).

Hultin, M. (2003). Some take the glass escalator, some hit the glass ceiling? Career

Hultin, M., & Szulkin, R. (2003). Mechanisms of inequality. Unequal access to organizational power and the gender wage gap. *European Sociological Review*, *19*(2), 143-159.

Hurtado, S., Eagan, K., Pryor, J. H., Whang, H., & Tran, S. (2012). Undergraduate teaching faculty: The 2010–2011 HERI faculty survey. *Higher Education Research Institute: University of California, Los Angeles.*

Jackson, J., Gilbert-Sovern, J., Huang-Saad, A., & Mondisa, J. L. (2022, August). Work in Progress: Examining Diversity, Equity, and Inclusion in Entrepreneurship Programming. In *2022 ASEE Annual Conference & Exposition.*

James, A., Chisnall, R., & Plank, M. J. (2019). Gender and societies: a grassroots approach to women in science. *Royal Society open science*, *6*(9), 190633.

Jayawarna, D., Jones, O., & Macpherson, A. (2014). Entrepreneurial potential: The role of human and cultural capitals. *International Small Business Journal*, *32*(8), 918-943.

Joshi, A., & Knight, A. P. (2015). Who defers to whom and why? Dual pathways linking demographic differences and dyadic deference to team effectiveness. *Academy of Management Journal*, *58*(1), 59-84.

Kacperczyk, A. J. (2012). Opportunity structures in established firms: Entrepreneurship versus intrapreneurship in mutual funds. *Administrative Science Quarterly*, *57*(3), 484-521.

Kacperczyk, Y. P., & Younkin, P. (2019). Detours or dead-ends: The effect of entrepreneurship on the future employment of women. In *Academy of Management Proceedings* (Vol. 1).

Kelly, E. L., Moen, P., Oakes, J. M., Fan, W., Okechukwu, C., Davis, K. D., ... & Casper, L. M. (2014). Changing work and work-family conflict: Evidence from the work, family, and health network. *American sociological review*, *79*(3), 485-516.

Kelly, G. P., & Nihlen, A. S. (2017). Schooling and the reproduction of patriarchy:: unequal workloads, unequal rewards. *Cultural and economic reproduction in education*, 162-180.

Kezar, A. J., & Holcombe, E. M. (2017). Shared leadership in higher education. *Washington, DC: American Council on Education*, 1-36.

Kohl, K., & Prikladnicki, R. (2018, May). Perceptions on diversity in Brazilian agile software development teams: A survey. In *Proceedings of the 1st International Workshop on Gender Equality in Software Engineering* (pp. 37-40).

Kor, Y. Y., & Misangyi, V. F. (2008). Outside directors' industry-specific experience and firms' liability of newness. *Strategic Management Journal*, *29*(12), 1345-1355.

Krueger Jr, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of business venturing*, *15*(5-6), 411-432.

Kumi-Yeboah, A., & Smith, P. (2016). Critical multicultural citizenship education among black immigrant youth: Factors and challenges. *International Journal of Multicultural Education*, *18*(1), 158-182.

Kuschel, K., Ettl, K., Díaz-García, C., & Alsos, G. A. (2020). Stemming the gender gap in STEM entrepreneurship–insights into women's entrepreneurship in science, technology, engineering and mathematics. *International Entrepreneurship and Management Journal*, *16*(1), 1-15.

Kuschel, K., Lepeley, M. T., Espinosa, F., & Gutiérrez, S. (2017). Funding challenges of Latin American women start-up founders in the technology industry. *Cross Cultural & Strategic Management*, *24*(2), 310-331.

Kushnirovich, N., Heilbrunn, S., & Davidovich, L. (2018). Diversity of entrepreneurial perceptions: Immigrants vs. native population. *European Management Review*, *15*(3), 341-355.

Lawton-Smith, H., Etzkowitz, H., Meschitti, V., & Poulovassilis, A. (2017). Female academic entrepreneurship: Reviewing the evidence and identifying the challenges.

Lawton-Smith, H., Etzkowitz, H., Meschitti, V., & Poulovassilis, A. (2017). Female academic entrepreneurship: Reviewing the evidence and identifying the challenges.

Lee, M. J., Collins, J. D., Harwood, S. A., Mendenhall, R., & Huntt, M. B. (2020). "If you aren't White, Asian or Indian, you aren't an engineer": racial microaggressions in STEM education. *International Journal of STEM Education*, *7*, 1-16.

Leicht, K. T. (2008). Broken down by race and gender? Sociological explanations of new sources of earnings inequality. *Annu. Rev. Sociol*, *34*, 237-255.

Lepoutre, J., Van den Berghe, W., Tilleuil, O., & Crijns, H. (2011). 5. A new approach to testing the effects of entrepreneurship education among secondary school pupils. *Entrepreneurship, Growth and Economic Development*, 94.

Liguori, E. W., Bendickson, J. S., & McDowell, W. C. (2018). Revisiting entrepreneurial intentions: a social cognitive career theory approach. *International Entrepreneurship and Management Journal*, *14*, 67-78.

Litzler, E., & Young, J. (2012). Understanding the risk of attrition in undergraduate engineering: Results from the project to assess climate in engineering. *Journal of Engineering Education*, *101*(2), 319-345.

Lowe, R. A., & Gonzalez-Brambila, C. (2007). Faculty entrepreneurs and research productivity. *The Journal of Technology Transfer*, *32*, 173-194.

Ma, Y., & Liu, Y. (2017). Entry and degree attainment in STEM: The intersection of gender and race/ethnicity. *Social Sciences*, *6*(3), 89.

Malone, K. R., & Barabino, G. (2009). Narrations of race in STEM research settings: Identity formation and its discontents. *Science Education*, *93*(3), 485-510.

Marlow, S., & McAdam, M. (2012). Analyzing the influence of gender upon high–technology venturing within the context of business incubation. *Entrepreneurship Theory and Practice*, *36*(4), 655-676.

Marlow, S., & McAdam, M. (2015). Incubation or induction? Gendered identity work in the context of technology business incubation. *Entrepreneurship theory and practice*, *39*(4), 791-816.

Marra, R. M., Rodgers, K. A., Shen, D., & Bogue, B. (2009). Women engineering students and self-efficacy: A multi-year, multi-institution study of women engineering student self-efficacy. *Journal of engineering education*, *98*(1), 27-38.

Marra, R. M., Rodgers, K. A., Shen, D., & Bogue, B. (2012). Leaving engineering: A multi-year single institution study. *Journal of Engineering Education*, *101*(1), 6-27.

Martin, C. L., & Dinella, L. M. (2012). Congruence between gender stereotypes and activity preference in self-identified tomboys and non-tomboys. *Archives of sexual behavior*, *41*, 599-610.

Mau, W. C. J., & Li, J. (2018). Factors influencing STEM career aspirations of underrepresented high school students. *The Career Development Quarterly*, *66*(3), 246-258.

May, V. M. (2015). *Pursuing intersectionality, unsettling dominant imaginaries*. Routledge.

McDonald, M. L., & Westphal, J. D. (2013). Access denied: Low mentoring of women and minority first-time directors and its negative effects on appointments to additional boards. *Academy of Management Journal*, *56*(4), 1169-1198.

McGee, E. (2013). Young, Black, mathematically gifted, and stereotyped. *The High School Journal*, 253-263.

McGee, E. O. (2016). Devalued Black and Latino racial identities: A by-product of STEM college culture?. *American Educational Research Journal*, *53*(6), 1626-1662.

McGee, E. O. (2020). Interrogating structural racism in STEM higher education. *Educational Researcher*, *49*(9), 633-644.

Mickey, E. L., & Smith-Doerr, L. (2022). Gender and innovation through an intersectional lens: Re-imagining academic entrepreneurship in the United States. *Sociology Compass*, *16*(3), e12964.

Milkman, K. L., Akinola, M., & Chugh, D. (2015). What happens before? A field experiment exploring how pay and representation differentially shape bias on the pathway into organizations. *Journal of Applied Psychology*, *100*(6), 1678.

Millán, J. M., Congregado, E., & Román, C. (2014). Entrepreneurship persistence with and without personnel: The role of human capital and previous unemployment. *International Entrepreneurship and Management Journal*, *10*, 187-206.

Milli, J., Gault, B., Williams-Baron, E., Xia, J., & Berlan, M. (2016). The gender patenting gap. *Institute for Women's Policy Research*.

Miranda, F. J., Chamorro-Mera, A., & Rubio, S. (2017). Academic entrepreneurship in Spanish universities: An analysis of the determinants of entrepreneurial intention. *European research on management and business economics*, *23*(2), 113-122.

Mitchell, K., & Pearce, D. K. (2011). Lending technologies, lending specialization, and minority access to small-business loans. *Small Business Economics*, *37*, 277-304.

Morris, L. K., & Daniel, L. G. (2008). Perceptions of a chilly climate: Differences in traditional and non-traditional majors for women. *Research in Higher Education*, *49*, 256-273.

Morris, M. H., Kuratko, D. F., Schindehutte, M., & Spivack, A. J. (2012). Framing the entrepreneurial experience. *Entrepreneurship theory and practice*, *36*(1), 11-40.

Moss-Racusin, C. A., Dovidio, J. F., Brescoll, V. L., Graham, M. J., & Handelsman, J. (2012). Science faculty's subtle gender biases favor male students. *Proceedings of the national academy of sciences*, *109*(41), 16474-16479.

Murnieks, C. Y., Klotz, A. C., & Shepherd, D. A. (2020). Entrepreneurial motivation: A review of the literature and an agenda for future research. *Journal of Organizational Behavior*, *41*(2), 115-143.

National Science Board. (2018). *Science and Engineering Indicators 2018 Digest. NSB-2018-2*. Alexandria: National Science Foundation

National Science Foundation. (2021). *Frequently asked questions (FAQs) for I-Corps[TM] Teams, NSF 18-057*. https://www.nsf.gov/pubs/2018/nsf18057/nsf18057.jsp

Nelson, T. (2020). Strengthening the contribution of scholarship to equity in practice for entrepreneurs and entrepreneurship. *International Journal of Gender and Entrepreneurship*, *12*(1), 103-115.

Neumann, M. D., Lathem, S. A., & Fitzgerald-Riker, M. (2016). Resisting cultural expectations: Women remaining as civil and environment engineering majors. *Journal of Women and Minorities in Science and Engineering*, *22*(2).

Neumeyer, X., & Santos, S. C. (2020). A lot of different flowers make a bouquet: The effect of gender composition on technology-based entrepreneurial student teams. *International Entrepreneurship and Management Journal*, *16*, 93-114.

Neumeyer, X., & Santos, S. C. (2020). The effect of team conflict on teamwork performance: An engineering education perspective. *International journal of engineering education*, *36*(1 B), 502-509.

Newsome, F. A., Gravlee, C. C., & Cardel, M. I. (2021). Systemic and environmental contributors to obesity inequities in marginalized racial and ethnic groups. *Nursing Clinics*, *56*(4), 619-634.

Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., ... & Greenwald, A. G. (2009). National differences in gender–science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences*, *106*(26), 10593-10597.

Nowiński, W., & Haddoud, M. Y. (2019). The role of inspiring role models in enhancing entrepreneurial intention. *Journal of Business Research*, *96*, 183-193.

Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D., & Czeglédi, C. (2019). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, *44*(2), 361-379.

Ogbor, J. O. (2000). Mythicizing and reification in entrepreneurial discourse: Ideology-critique of entrepreneurial studies. *Journal of management studies*, *37*(5), 605-635.

Park, S. H., & Westphal, J. D. (2013). Social discrimination in the corporate elite: How status affects the propensity for minority CEOs to receive blame for low firm performance. *Administrative Science Quarterly*, *58*(4), 542-586.

Parsons, E. C., & Dorsey, D. N. T. (2015). The race problem: Its perpetuation in the next generation of science standards. *The race controversy in American education*, *2*, 215-235.

Perna, L. W., Gasman, M., Gary, S., Lundy-Wagner, V., & Drezner, N. D. (2010). Identifying strategies for increasing degree attainment in STEM: Lessons from minority-serving institutions. *New directions for institutional research*, *2010*(148), 41-51.

Perna, L., Lundy-Wagner, V., Drezner, N. D., Gasman, M., Yoon, S., Bose, E., & Gary, S. (2009). The contribution of HBCUs to the preparation of African American women for STEM careers: A case study. *Research in Higher Education*, *50*, 1-23.

Perry, B. L., Link, T., Boelter, C., & Leukefeld, C. (2012). Blinded to science: Gender differences in the effects of race, ethnicity, and socioeconomic status on academic and science attitudes among sixth graders. *Gender and Education*, *24*(7), 725-743.

Pettersson, K. (2012). Support for women's entrepreneurship: a Nordic spectrum. *International Journal of Gender and Entrepreneurship*, *4*(1), 4-19.

Piperopoulos, P., & Dimov, D. (2015). Burst bubbles or build steam? Entrepreneurship education, entrepreneurial self-efficacy, and entrepreneurial intentions. *Journal of small business management*, *53*(4), 970-985.

Poggesi, S., Mari, M., De Vita, L., & Foss, L. (2020). Women entrepreneurship in STEM fields: literature review and future research avenues. *International Entrepreneurship and Management Journal*, *16*, 17-41.

Portnoi, L. M., & Kwong, T. M. (2019). Employing resistance and resilience in pursuing K-12 schooling and higher education: Lived experiences of successful female first-generation students of color. *Urban Education*, *54*(3), 430-458.

Quadlin, N. (2018). The mark of a woman's record: Gender and academic performance in hiring. *American Sociological Review*, *83*(2), 331-360.

Rakesh, K., Fry, R., & Taylor, P. (2011). Wealth Gaps Rise to Record Highs Between Whites, Blacks, Hispanics, Pew Research Center, July 2011.

Raphael, C. (2022). Digital Skills and Self-employment among Graduates of Technical Higher Education Institutions in Tanzania. *Tanzania Journal of Engineering and Technology*, *41*(1).

Rhoton, L. A. (2011). Distancing as a gendered barrier: Understanding women scientists' gender practices. *Gender & Society*, *25*(6), 696-716.

Robehmed, N. (2013). *What is a startup?* Forbes.

Robinson, W. H., McGee, E. O., Bentley, L. C., Houston, S. L., & Botchway, P. K. (2016). Addressing negative racial and gendered experiences that discourage academic careers in engineering. *Computing in Science & Engineering*, *18*(2), 29-39.

Romero, M., & Valdez, Z. (2016). Introduction to the special issue: Intersectionality and entrepreneurship. *Ethnic and Racial Studies*, *39*(9), 1553-1565.

Rosette, A. S., Leonardelli, G. J., & Phillips, K. W. (2008). The White standard: racial bias in leader categorization. *Journal of applied psychology*, *93*(4), 758.

Rosser, S. V. (2009). The Gender Gap in Patenting: Is Technology Transfer a Feminist Issue?. *NWSA Journal*, *21*(2), 65-84.

Ruiz-Jiménez, J. M., Fuentes-Fuentes, M. D. M., & Ruiz-Arroyo, M. (2016). Knowledge combination capability and innovation: The effects of gender diversity on top management teams in technology-based firms. *Journal of business ethics*, *135*, 503-515.

Sabbaghi, O. (2019). How do entrepreneurship rates vary across different races?. *Journal of Small Business and Enterprise Development*, *26*(3), 325-341.

Sarsons, H., Gërxhani, K., Reuben, E., & Schram, A. (2021). Gender differences in recognition for group work. *Journal of Political Economy*, *129*(1), 101-147.

Sassler, S., Glass, J., Levitte, Y., & Michelmore, K. M. (2017). The missing women in STEM? Assessing gender differentials in the factors associated with transition to first jobs. *Social science research*, *63*, 192-208.

Sassler, S., Michelmore, K., & Smith, K. (2017). A tale of two majors: Explaining the gender gap in STEM employment among computer science and engineering degree holders. *Social Sciences*, *6*(3), 69.

Shane, J., del Puerto, C. L., Strong, K., Mauro, K., & Wiley-Jones, R. (2012). Retaining women students in a construction engineering undergraduate program by balancing integration and identity in student communities. *International Journal of Construction Education and Research*, *8*(3), 171-185.

Shapiro, T., Meschede, T., & Osoro, S. (2013). The Roots of the Widening Racial Wealth Gap: Explaining the Black-White Economic Divide.

Shelton, L. M., & Minniti, M. (2018). Enhancing product market access: Minority entrepreneurship, status leveraging, and preferential procurement programs. *Small Business Economics*, *50*, 481-498.

Sheltzer, J. M., & Smith, J. C. (2014). Elite male faculty in the life sciences employ fewer women. *Proceedings of the National Academy of Sciences*, *111*(28), 10107-10112.

Shneor, R., & Jenssen, J. I. (2014). Gender and entrepreneurial intentions. *Entrepreneurial Women: New Management and Leadership Models, Praeger Publishing, Santa Barbara, CA*, 15-67.

Siegel, D. S., & Wright, M. (2015). Academic entrepreneurship: time for a rethink?. *British journal of management*, *26*(4), 582-595.

Somsuk, N., & Laosirihongthong, T. (2014). A fuzzy AHP to prioritize enabling factors for strategic management of university business incubators: Resource-based view. *Technological forecasting and social change*, *85*, 198-210.

Sørensen, J. B., & Sharkey, A. J. (2014). Entrepreneurship as a mobility process. *American Sociological Review*, *79*(2), 328-349.

Stanley, C. A. (2006). Coloring the academic landscape: Faculty of color breaking the silence in predominantly White colleges and universities. *American educational research journal*, *43*(4), 701-736.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of personality and social psychology*, *69*(5), 797.

Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. In *Advances in experimental social psychology* (Vol. 34, pp. 379-440). Academic Press.

Stroh, L. K., Brett, J. M., & Reilly, A. H. (1992). All the right stuff: A comparison of female and male managers' career progression. *Journal of applied psychology*, *77*(3), 251.

Sugimoto, C. R., Ni, C., West, J. D., & Lariviére, V. (2015). The academic advantage: Gender disparities in patenting. *PloS one*, *10*(5), e0128000.

Tajfel, H., Turner, J. C., Austin, W. G., & Worchel, S. (1979). An integrative theory of intergroup conflict. *Organizational identity: A reader*, *56*(65), 9780203505984-16.

Tausch, N., & Becker, J. C. (2013). Emotional reactions to success and failure of collective action as predictors of future action intentions: A longitudinal investigation in the context of student protests in Germany. *British Journal of Social Psychology*, *52*(3), 525-542.

Tesch, B. J., Wood, H. M., Helwig, A. L., & Nattinger, A. B. (1995). Promotion of women physicians in academic medicine: glass ceiling or sticky floor?. *Jama*, *273*(13), 1022-1025.

Tsui, A. S., & O'reilly III, C. A. (1989). Beyond simple demographic effects: The importance of relational demography in superior-subordinate dyads. *Academy of management journal*, *32*(2), 402-423.

Turner, C. S. (2003). Incorporation and marginalization in the academy: From border toward center for faculty of color?. *Journal of Black studies*, *34*(1), 112-125.

Turner, C. S. V., & González, J. C. (2011). Faculty women of color: The critical nexus of race and gender. *Journal of Diversity in Higher Education*, *4*(4), 199.

Vamvaka, V., Stoforos, C., Palaskas, T., & Botsaris, C. (2020). Attitude toward entrepreneurship, perceived behavioral control, and entrepreneurial intention: dimensionality, structural relationships, and gender differences. *Journal of Innovation and Entrepreneurship*, *9*(1), 1-26.

van Ewijk, A. R., & Belghiti-Mahut, S. (2019). Context, gender and entrepreneurial intentions: How entrepreneurship education changes the equation. *International Journal of Gender and Entrepreneurship*, *11*(1), 75-98.

Van Miegroet, H., Glass, C., Callister, R. R., & Sullivan, K. (2019). Unclogging the pipeline: Advancement to full professor in academic STEM. *Equality, Diversity and Inclusion: An International Journal*, *38*(2), 246-264.

VentureWell. (2019). Impact of NSF's *I-Corps national program on individual participants, data file and codebook: Release 2.1*. VentureWell. https://go.venturewell.org/PublicUseData2

Vinnicombe, S., & Singh, V. (2011). Locks and keys to the boardroom. *Gender in Management: An International Journal*, *26*(3), 200-211.

Vorobeva, E. (2022). Intersectionality and minority entrepreneurship: At the crossroad of vulnerability and power. *Disadvantaged Minorities in Business*, 225-235.

Wajcman, J. (2010). Feminist theories of technology. *Cambridge journal of economics*, *34*(1), 143-152.

Wei, H., Horns, P., Sears, S. F., Huang, K., Smith, C. M., & Wei, T. L. (2022). A systematic meta-review of systematic reviews about interprofessional collaboration: facilitators, barriers, and outcomes. *Journal of Interprofessional Care*, *36*(5), 735-749.

West, C., & Fenstermaker, S. (2002). Accountability in action: the accomplishment of gender, race and class in a meeting of the University of California Board of Regents. *Discourse & Society*, *13*(4), 537-563.

Wheadon, M., & Duval-Couetil, N. (2019). Token entrepreneurs: a review of gender, capital, and context in technology entrepreneurship. *Entrepreneurship & Regional Development*, *31*(3-4), 308-336.

Williams, J. C. (2014). Double jeopardy? An empirical study with implications for the debates over implicit bias and intersectionality. *Harvard Journal of Law & Gender*, *37*, 185.

Willingham, W. W., & Cole, N. S. (2013). *Gender and fair assessment*. Routledge.

Wingfield, A. H., & Taylor, T. (2016). Race, gender, and class in entrepreneurship: intersectional counterframes and black business owners. *Ethnic and Racial Studies*, *39*(9), 1676-1696.

Wladis, C., Conway, K. M., & Hachey, A. C. (2015). The online STEM classroom—Who succeeds? An exploration of the impact of ethnicity, gender, and non-traditional student characteristics in the community college context. *Community College Review*, *43*(2), 142-164.

Wladis, C., Hachey, A. C., & Conway, K. M. (2015). The representation of minority, female, and non-traditional STEM majors in the online environment at community colleges: A nationally representative study. *Community College Review*, *43*(1), 89-114.

Wong, Y. K. (2018). Structural relationships between second-language future self-image and the reading achievement of young Chinese language learners in Hong Kong. *System*, *72*, 201-214.

Wood, J. L., Hilton, A. A., & Nevarez, C. (2015). Faculty of color and White faculty: An analysis of service in colleges of education in the Arizona public university system. *Journal of the Professoriate*, *8*(1), 85-109.

Wright, M., Hmieleski, K. M., Siegel, D. S., & Ensley, M. D. (2007). The role of human capital in technological entrepreneurship. *Entrepreneurship theory and practice*, *31*(6), 791-806.

Yang, T., & Aldrich, H. E. (2014). Who's the boss? Explaining gender inequality in entrepreneurial teams. *American Sociological Review*, *79*(2), 303-327.

Yi, S., & Duval-Couetil, N. (2022). Standards for evaluating impact in entrepreneurship education research: Using a descriptive validity framework to enhance methodological rigor and transparency. *Entrepreneurship Theory and Practice*, *46*(6), 1685-1716.

Young, A. A. (2011). The minds of marginalized black men. In *The Minds of Marginalized Black Men*. Princeton University Press.

Zapata, C. P., Carton, A. M., & Liu, J. T. (2016). When justice promotes injustice: Why minority leaders experience bias when they adhere to interpersonal justice rules. *Academy of Management Journal*, *59*(4), 1150-1173.