UNIVERSITY OF CALIFORNIA, SAN DIEGO

The Ventured Student: Impacts of University Startup Culture

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in

Sociology

by

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2018

The Dissertation of Daniel Brent Davis is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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Chair

University of California, San Diego

2018

DEDICATION

To Rachel and Madison:

For making life, and all of its striving, a ball.

EPIGRAPH

The impulse to acquisition, pursuit of gain…of the greatest possible amount of money, has in itself nothing to do with capitalism. This impulse exists and has existed among waiters, physicians, coachmen, artists, prostitutes, dishonest officials, soldiers, nobles, crusaders, gamblers...

~ Max Weber

We're gambling on our vision, and we would rather do that than make "me too" products. Let some other companies do that. For us, it's always the next dream.

~Steve Jobs

The dream of entrepreneurism, it's a hope of a better life. Like Zuckerberg or Jobs. And if I fail, I'm that much closer to success… It feels so much more meaningful than the 9 to 5.

~College Junior in University Startup Program

Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun. I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning.

~Clifford Geertz

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ABSTRACT OF THE DISSERTATION

The Ventured Student: Impacts of University Startup Culture

by

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Undergraduate entrepreneurial training in colleges and universities is rapidly expanding. The creation of university-sponsored venture incubators—programs providing workspace, resources, and advice to nascent startups—is another expanding campus phenomenon. I conducted observations for two years within the San Diego regional startup ecosystem anchored by two universities and their incubators. Additionally, across California, I conducted web analysis of university incubators, correspondence with incubator staff,

interviews with 56 student participants, and followed the LinkedIn profiles of 301 student participants post-graduation. My findings come in three articles. In article one, I show that campus incubators have remarkable similarity in the services they offer, however universities differ greatly in the model of their startup ecosystems. Centralized models are dominated by business students, decentralized models are dominated by STEM students. STEM students are less likely to persist with their startups after graduation, but are also less likely to need supplemental work to make ends meet. In article two, I analyze student interviews and show why some of these gaps exist. Students come to college with little startup know-how, but find themselves drawn into campus entrepreneurial programming via events and peer influence. They report significant sacrifices in time and resources, and typically avoid other internships. Post-graduation, STEM majors at more research-oriented universities often find that their experience supplements their resumes nicely, making them more appealing to employers. On the flip side, others find that their non-STEM majors, from broader access colleges, and their typically less sophisticated products, fail to give them resume-boosting capital. Nevertheless, these student's new entrepreneurial identities make it hard to let go of their startup dreams, and often persist in languishing projects. In article three, I take a more theoretical turn, exploring the foundations of emerging entrepreneurial identity. The language that new entrepreneurs use to talk about their entrepreneurial identity maps on to three traditions of sociological literature about identity formation—identity is simultaneously individually internalized, contextually performed, and collectively mobilized. I show how using a more integrative approach helps make sense of a range of complex identity experiences.

INTRODUCTION

Entrepreneurism has come to campus. No longer is startup culture limited to a few high-profile innovative research universities, like Stanford or MIT, nor is it contained to specific corners of the university, like the faculty in departments of computer science or mechanical engineering. Startup culture has become mainstream in the American university. So much so, that as I show in the articles contained in this dissertation, the influence of startup culture is even spreading to non-research universities as well as spreading broadly throughout the undergraduate curriculum and college experience. This is a phenomenon ripe for sociological analysis, not only for entrepreneurism's relevancy du jour as a favored buzz word of the time, but because, as Durkheim argued many years ago, how we train our youth is both an intellectual and moral education (1925/2011) that shapes the construction of society across generations. Colleges are embracing entrepreneurism and, in many ways, changing its meanings in alignment with Silicon Valley style tech culture. As it becomes institutionalized in university structures, it is sure to have long-lasting effects on society as a whole.

In this introduction, I seek to do a few things. First, I briefly sketch some of the literature showing how this new phenomenon, university-sponsored entrepreneurism, emerged out of the broader social and economic trends of the United States over the past several decades. For as much as universities seek to influence broader culture, campuses are also the reactive products of it (Stevens and Gebre-Medhin 2016). Then, I give a rationale for my choice of incubators and accelerators as the organizational site of my study, and undergraduates as the demographic of interest. Next, I define and describe exactly what incubators and accelerators are and do. Last, I offer abstracts that outline each of the three

articles that comprise the primary chapters of this dissertation, each of which is written as stand-alone pieces, intended for separate peer-reviewed publication.

I have written the first article with a meso-level unit of analysis, looking at campus structures, while the second two articles have a more micro-level unit of analysis, looking at individuals. The first two articles are more inductive and driven by the phenomenon they are examining, though theoretical questions are asked and answered in them. The third is more theoretical, though with empirical observations to build a case for my proposal. The first article is written more for organizational and entrepreneurial scholars, the second two articles are written more for sociologists of higher education and identity, respectively. Side by side, they may seem somewhat different, but I will offer some concluding remarks in a brief conclusion to braid the cord as best I can; because I do believe these three articles together offer a perspective that can not only help us better understand some broader sociological questions, but also make some smarter policy and programmatic changes to improve the future career outcomes for our entrepreneurial undergraduates.

Where the Enthusiasm for Campus Entrepreneurism Came From

I point first to what has widely, though vaguely, become known as the 'new economy.' The new economy, borne out of the transition from a manufacturing-based to a financial and service-based economy (Appelbaum and Batt 2014; Tomaskovic-Devey and Lin 2011), and described as the "creative nexus between culture, business and technology" (Fisher and Downey 2006:26), has resulted in profound modifications across U.S. structures of employment. Just after the dot-com crash in the 1990s, Benner (2002) looked at employment in Silicon Valley and linked its tenuousness to a mix of variables including unpredictable

fluctuations in market demands, rapid technology change, intense global competition, shorter product life cycles, and faster skill obsolescence. The new economy is described as an era of turbulent unpredictability (Smith 2010). Among the many changes confronting the U.S. economy, a chief one is the need for a more flexible workforce able to buffer companies from turbulent markets (Jung 2015). Amman and colleagues (2007) noticed that at first these changes were presented to workers as exciting moves toward greater flexibility, often in flatter organizations promising more creative ownership. But over time the situation has revealed itself not as the giving of greater agency and empowerment to the worker, but more akin to becoming "sharecroppers who bear the burden of risks in exchange for the opportunity to work" (Amman, Carpenter, and Neff 2007:3).

Hollister's (2011) review of the literature on employment stability in the U.S. concludes that declines in job stability have consistently taken place, especially for male private-sector workers, with somewhat more complex changes for female and public-sector workers. While work has decidedly grown more precarious, new possibilities for work lives have emerged as well, new kinds of jobs, new work arrangements, and new work-facilitating technologies. This new work environment has been described as more "liquid" and individualizing (Bauman 2001). Kalleberg (2011) documents how this results in growing polarization between good and bad jobs, those with high pay and security and the many more that have neither. Giddens has coined a phrase for this more turbulent and polarized system, the *high opportunity, high risk society* (Giddens 2014).

The new economy has also been cited for bringing greater corruption and inequality to the workplace. Tillman and Indergaard (2005) argue that work is now done in environments of scandal more often than before. This results largely from the proliferation of tradable

products disconnected from the creation of physical goods; for example, the various species of financial vehicles traded on Wall Street. Tillman and Indergaard (2005) also say it stems from reliance on semi-closed social networks with their own informal norms that diverge from societal norms; for example, the 'masters of the universe' sub-culture of elite bankers. Public misinformation and regulatory loopholes allow economic deviance to become normalized. In terms of inequality, McCall (2001) showed that high-technology regions have more pronounced gender and racial inequality; and that gender-based equal opportunity policies have only helped a small percentage of women at the top of the wage scale, while greater work insecurity has harmed many women toward the bottom, resulting in wage gaps among women greater than many of the wage gaps between the genders. Kim and Sakamoto (2008) found related complexities, showing that intra-occupational wage gaps have grown more pronounced than between-occupational wage gaps, arguing that occupation may be becoming less important in the new economy than a blend of individual characteristics and workplace organizational features. In other words, the kind of lawyer or doctor you are, and where, has greater wage impacts than whether you choose to be either a lawyer or doctor.

Greater flexibility and risk taking is required of workers to survive in the new economy. This is parallel with the rise in predominance of contingent and precarious labor, often branded as freelancing or independent contracting. Typically, these arrangements have had few benefits like insurance or retirement. Employees expect less loyalty from their employer, and offer little back; rather, employees remain prepared to exploit market opportunities and to remake themselves as necessary (Neff 2012). It is survival of the most agile. These skills and value sets serve some very well, less so for others. One term in

particular has been extended to describe what it means to possess the agility to adapt to the chaos of the tumultuous liquid new economy: *entrepreneurship*.

Reconstruction of many economic relationships are visible across multiple fronts: between consumers and products, as seen in the rise of the sharing economy; between consumers and physical space, as seen in the rise of enormous online retail environments; between workers and investors, as seen in the rise of crowd funding; between workers and employers, as seen in the rise of the gig economy; and so on. Silicon Valley culture emphasizes a particular social actor as the individual most able to adeptly navigate these newly reconfigured environments, the entrepreneur. This frame, the entrepreneur as the idealized worker of the new economy, has grown so prominent that variants of it have begun to multiply. A couple scholarly examples include work on "intrapreneurs," those with entrepreneurial mindsets but within a traditional company (Tietz 2014), to "ecopreneurs," those pursuing ventures that are greener and more sustainable than status quo capitalist-organized businesses (Schor and Thompson 2014). More popular-level online "-preneur" glossaries help define dozens more variations, including: antipreneurs, appreneurs, passivepreneurs, socialpreneurs, solopreneurs, etc[1]. Labor scholars show how a national discourse has arisen that "invites actors to embrace a seemingly rebellious posture toward bureaucratic employment, construed as anathema to personal fulfillment and creativity" (Vallas and Prener 2012:347). This new conception of the entrepreneur—the cleverly opportunistic and voluntarily flexible worker of the new economy—is quite different than the

[1] A couple examples: https://en.wiktionary.org/wiki/Category:English_words_suffixed_with_-preneur and https://startupbros.com/entrepreneur-glossary/

small business entrepreneurs of earlier eras, whom C. Wright Mills defined as workers whose incomes were rooted in property ownership and long-term labor commitments to extract revenues from shop or land (Mills 1953)—such as the carpenter, farmer, or store owner. Now we have the freelance coder, appreneur, and the venture capitalist, whose work is not only much less tangible, but draw from far more liquid conceptions of property ownership and labor commitment. Whereas the artisan apprentice of old developed their skills under more senior craftspeople, the parallel aspiring worker of today may be building their digital portfolio from autonomous gig work, acquired from sites like fiverr.com or upwork.com, paying what regularly amounts to less than minimum wage and with no benefits.

All of this is to reiterate that as work arrangements have evolved, and in many ways become more tenuous, entrepreneurism culture has arisen in parallel. At the higher end of opportunity, entrepreneurism has become popular because of the astounding innovations and financial fortunes that advancing technologies have facilitated. At the lower end of opportunity, entrepreneurism has become popular as a term valorizing the new service work; used both by platform capitalists—like those behind Airbnb, TaskRabbit, or Uber—seeking to attract workers, and by workers themselves, as a way to rationalize their sacrifices in search of meaningful work (Kenney and Zysman 2016; Friedman 2014).

Higher Education in the New Economy

Institutions of higher education in the U.S. have a long history of active participation (Slaughter and Rhoads 2004) and co-evolution (Stevens and Gebre-Medhin 2016) with the economic, social, and political changes in the broader culture. As would be expected, the new economy has its manifestations inside of colleges and universities, from an increased reliance

on financialized sources of income (Eaton et al. 2016), to the growing commercialization of academic science (Berman 2012), to the adjunctification of tenure track employment (Kezar 2012). Just as a range of activity in the broader economy has taken on the language and label of entrepreneurship, each of previous three examples has as well, respectively: entrepreneurial universities come up with innovative new revenue streams, entrepreneurial faculty make startups out of their research, and entrepreneurial instructors are gig workers with the flexibility to moonlight or do other projects.

Students also feel the effects of this more precarious new economy. Students express increased expectations for colleges to help them obtain jobs—almost 9 out of 10 now say that "to be able to get a better job" is a "very important" reason for going to college (Eagan et al. 2016), a roughly 20 percent increase from the 1970s. Structured recruiting on elite campuses mixed with student anxieties lead to career funneling into a small band of industries understood by students as more stable shelters from the tumultuous new economy, sectors like finance, management consulting, and marquee technology companies (Binder, Davis, and Bloom 2016; Rivera 2015). But even these industries have begun showing the increasingly precarious and liquid character pervasive in the new economy (Lyons 2016; Benner 2015; Frier and Satariano 2015; Roose 2014; Ho 2009). Campus administrators have embraced several strategies to help students, from the development of a slew of new vocational majors (Brint 2002) to the launch of new corporate partnership programs in career centers (Davis and Binder 2016). Internships became mainstream, typically without compensation, even while the educational and professional value of most are highly suspect (Perlin 2011).

In addition to these, promoting student entrepreneurism has become a major focus of strategic development for campus administrators (Torrance 2013). A study by the Kauffman

Foundation reports that entrepreneurship is one of the fastest growing subjects in undergraduate curricula with the number of entrepreneurial courses offered in U.S. four-year campuses growing from 250 in 1985 to more than 5,000 by 2008 (Torrance 2013). Beyond curricular promotion of entrepreneurism, a whole new university sector encouraging student startups has emerged over the past decade. This is chiefly done through the creation of campus new-venture incubators and accelerators. The policy changes of the Bayh-Dole Act in 1980 paved the way for campus entrepreneurism, as federally funded research could now be commercialized with ownership remaining with the founders and university rather than the federal government. University technology transfer offices spread rapidly and their staff sought to license faculty science and technologies out to firms. But rather than waiting for companies to come to them, faculty researchers discovered that creating startups around new technologies was often more lucrative and expedient than solely relying on technology transfer offices to commercialize their work (Slaughter and Rhoades 2004). Incubators and accelerators slowly began emerging to help faculty create startups around their products. As I will show in the first article however, it was not until the Great Recession and soaring unemployment rates for recent college graduates, that university leaders embraced a logic promoting entrepreneurism for students. Incubator creation surged rapidly at this point, and almost all incubators, while still catering to faculty, also opened to student participants—with some even specifically targeting undergraduates.

Rationale for the Focus on Undergraduate Incubators and Accelerators

Incubators and accelerators are both environments that nurture nascent startups by delivering technological assistance, expert mentoring, co-working space, and in many

instances various forms of material resource investment. They are also epicenters of entrepreneurial culture on campus; promoting regular events, from high-profile speakers to high-drama hackathons and business plan competitions—usually with many thousands of dollars of prize money at stake. Ethnographic research at these hackathons show they are high emotion events for students and reshape unpaid and precarious work in student perspective as an extraordinary opportunity of self-investment (Zukin and Papadantonakis 2017). Even so, while these events are only a day or two long, the incubators create similar environments that last several months. It is because incubators are such central features to the university entrepreneurial ecosystem that they are a rich location for study. More than in formal coursework, technology transfer offices, and other startup-promoting events, incubators and accelerators are where individuals are attempting to create real startups on a day-to-day basis. It is where much of "the stuff" of entrepreneurial behavior and identity formation happens, and begs to be investigated. Many studies have been done on entrepreneurial education, but the relative newness of incubator popularity on campuses has left this organizational phenomenon with only a very small body of literature to explain their culture, effects, and effectiveness. In addition, the increasing trend of allowing, and sometimes directly targeting, undergraduates as participants is also an area in need of research. Ever since the Bayh-Dole Act, in 1980, allowed faculty and universities to monetize and gain from research discoveries that were created with federal funding, faculty entrepreneurism has predictably increased. But the growing push among university administrators to get undergraduates to participate at higher rates is a more curious move. Not only do undergraduates rarely make large monetary gains from their startups, but campuses generally do not attempt to claim rights to the intellectual property of undergraduates. The logic is typically that undergraduates own their

intellectual property made on campus because they pay to attend the university and use its resources, as opposed to faculty and graduate students who are employees of the university (Duval-Couetil et al. 2014). Without a clear financial incentive, the spreading emphasis on undergraduate startups has more of a cultural impetus, which I explore.

In addition, there are three other reasons I focus on undergraduates. First, they represent a more impressionable and often more vulnerable population than most other stakeholders of the university, and one where faculty and university leaders have a responsibility to do well by. Therefore, situations where university leaders are encouraging undergraduates into high-risk situations is worth examining. Second, undergraduates are a useful demographic for studying the organizational effectiveness of incubators. This is because undergraduates are all relatively unaware of the specifics of startups when they arrive on campus. They are at more equal starting points across campuses than graduate students or faculty entrepreneurs may be. They all also only spend a relatively similar and short amount of time in campus incubators, typically a year or two. This roughly more equal starting point and time duration means that where patterned differences in outcomes do arise, they are more likely due to organizational variables than individual characteristics. Lastly, there is currently momentum in the sociology of higher education for examinations of the organizational impacts of universities on undergraduates across a host of domains; this project is in good company among the work in that movement.

Incubators and Accelerators, Distinctions and Definitions

Incubators and accelerators on university campuses are where most of my observations were done and where I identified my interviewees, therefore some detailed

descriptions about what they are and what they do is in order. While my observations of incubators and accelerators on campus led me to the conclusion that these two organizational forms are often blurred in on-campus settings, in their original non-campus environments there is a distinction between them.

Accelerators can generally be distinguished from incubators based on their basic business model: accelerators have a portfolio of companies they invest in, and from which they seek to draw equity, while incubators have companies in residence that they support and from which they seek to draw monthly occupancy rent. While incubators appeared in the 1980s (Mian 1996), the first accelerator was Y Combinator, founded in 2005 (Cohen and Hochberg 2014). Y Combinator has remained the industry leader, having "accelerated"—or helped scale more quickly via mentoring, networking, and capital investment—successful startups like Airbnb and Dropbox, and boasts an acceptance rate of less than three percent of applicants.

While some have understood the term accelerator as simply a replacement term for incubator after the dot-com crash left the term incubator carrying negative connotations, Cohen and Hochberg (2014) spell out accelerators distinguishing features: shorter timeframes, more formalized educational programming, and culmination in a demo day. They argue that accelerators actually have more in common with angel investing than they do with incubators. Incubators, on the other hand, can be more likened to co-working spaces or research parks as an organizational practice (Chan and Lau 2005; Phan, Siegel, and Wright 2005; Löfsten and Lindelöf 2002). Nevertheless, there are many programmatic similarities between accelerators and incubators, with both actively engaging in mentorship and offering support services with their affiliated startup teams. See Figure 1 for the most basic distinctions among these types.

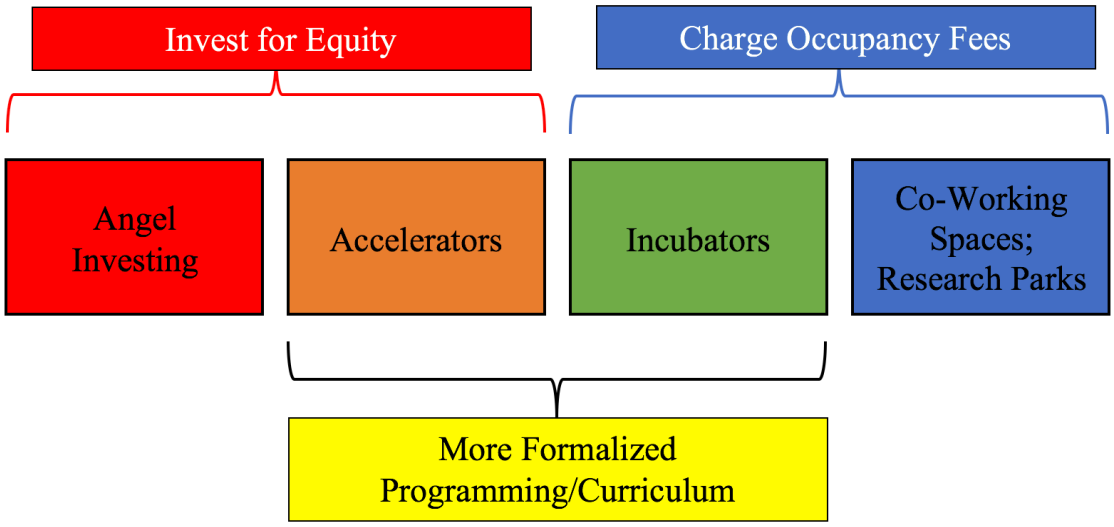
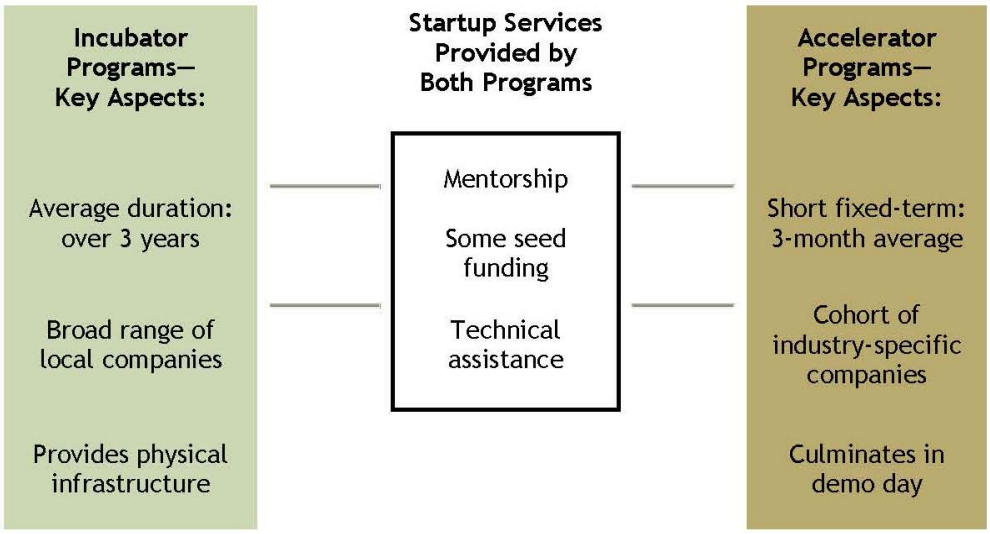


Figure 1. Basic Distinctions Between Common Types of Startup Support Programs

In most cases, accelerators and incubators both provide a range of targeted services such as formal networking opportunities, workshops, expert advice (e.g. accounting, legal, HR), office support, and more. The U.S. Small Business Administration offers the following illustration (see Figure 2) to distinguish them (Dempwolf, Auer, and D'Ippolito 2014).



Source: U.S. Small Business Administration (Dempwolf, Auer, D'Ippolito 2014)

Figure 2. Primary Distinctions Between Incubators and Accelerators in Non-University Settings

In this dissertation, campus based incubators and accelerators are treated more synonymously than they are outside of universities. This is because timing for both tend to run on academic terms, and campuses do not tend to charge much by way of either rent or equity stakes. They nearly all offer similar services such as mentoring, workshops, workspace, pitch competitions, etc. While the differences between incubators and accelerators are minimized on campuses, there is still great difference between the types of incubator and accelerator programs that exist, in terms of what they emphasize and how selective they are.

For example, attempts at typologizing incubators abound and serve to highlight incubator heterogeneity. To date, all the typologies either ignore university-sponsored incubators, or treat them as a single type, a practice that appears less viable in the future as campus-based incubators and accelerators are growing into the dominant market share of such programs nationwide. Nevertheless, the following non-exhaustive chronological sample

illustrates the types of typologies that exist. Allen and McCluskey (1990) use institutional categories as the key variable to divide for-profit, non-profit, academic, and other types of incubators. Aernoudt (2004) divides incubators up using incubator philosophy, goals, and industry sectors as the key distinguishing variables. Clarysse and colleagues (2005) use the degree of sophistication of incubator activity and the varieties of resources they offer to categorize them. Von Zedtwidtz and Grimaldi (2006) categorize using target foci in even greater depth, adding to industries variables like geographical regions and market segments. Bergek and Norrman (2008) use incubator's selection process, the varied programming and support services they offer, and how well the incubator helps client firms find beneficial social networks. Barbero and colleagues (2012) divide basic-research incubators from university incubators and also distinguish incubators focused on promoting regional economic development from private profit-seeking incubators. Bakkali, Messeghem, and Sammut (2014) even attempt to create an incubator typology based on differences in human resources policies.

While there is considerable diversity in approaches to categorizing incubators, consensus exists around why the task of categorization is so difficult: divergent sets of objectives and heterogeneous institutional features. The incubator literature also points to a need for separate evaluation of university-sponsored programs. For example, Chan and Lau (2005) studied incubators found in research parks and noted that those that also have a university affiliation have significantly different opportunities. Similarly, Ensley and Hmielseski (2005) and Peters, Rice, and Sundararajan (2004) reveal differential outcomes from university-sponsored incubators compared to non-university sponsored types.

Educational institutions do not simply produce the workers demanded by the economy as a Marxian, direct correspondence theory might predict (i.e. Bowles and Gintis 1976). If the economy needs more entrepreneurs, universities do not directly serve them up. Nevertheless, the new economy does have an influence on evolving campuses norms, practices, and values. Students pick up these norms, practices, and values during their time in college—what sociology of educationists call the "hidden curriculum" (Hamilton and Powell 2011). Student identities are developed while on campus, from the personal (Armstrong and Hamilton 2013), to the political (Binder and Wood 2013), to the professional (Rivera 2015). Certainly, the hidden curriculum at individual campuses will have variants mediated by localized organizational differences (Hallett 2010), but collectively, colleges and universities play a primary role in legitimizing the core value sets and socially agreed upon bodies of knowledge shared across American culture (Baker 2014; Frank and Meyer 2007). Thus, as the new economy influences campus hidden and explicit curriculums to promote entrepreneurial practice and value sets, the larger outcome is not simply more entrepreneurs, but a legitimization of entrepreneurship culture.

To use Stevens' and colleagues (2008) set of metaphors—as a *hub* deeply embedded in American social institutions, universities have mobilized a whole new apparatus for interfacing with this demand for entrepreneurialized persons. As a *temple*, they have legitimized entrepreneurial knowledge and activity. As a *sieve,* they have sorted entrepreneurial training into a range of higher and lower-quality programs able to interface with the hierarchical range of market demands, sorting graduates among them. As *incubators,* they are nurturing cohorts of college students trained to value, if not entirely possess, an entrepreneurial identity. To this last point, the new organizational units most often tasked with

incubating this entrepreneurial identity—and the major location of observations and interviews in this study—are coincidentally called "incubators." Colleges and universities across the country are launching these programs at a rapid pace. Previously they were mostly the domain of engineering and computer science faculty, but the latest generation of incubators includes participation from students from across university departments. The articles in this dissertation examine this spreading phenomenon and its implications for how colleges and universities are preparing students for work in the new economy.

What norms, values, and practices are universities fostering by institutionalizing entrepreneurism on campus? The following articles examine this question in varying ways. Article one looks at campus organizational arrangements and the different kinds of entrepreneurial foci and outcomes emerge from centralized versus decentralized models: centralized models appear to emphasize business and marketing processes for startups, while decentralized models appear to emphasize science and technology processes. Article two examines undergraduate incubator participant's preparation for the precarious new economy: STEM majors are regularly able to use their startup experiences as resume boosts for more stable employment, non-STEM majors tend to languish in startups with little market traction while becoming contingent workers on the side. Lastly, article three examines the formation of new entrepreneurial identities and shows how heterogeneous sources of identity formation illuminate a helpful new heuristic for thinking of identity formation processes more generally.

The Chapters

Below are the abstracts associated with each chapter. I break them into distinct parts clarifying the research question, methodology, and brief findings.

1. Rainforests on Campus: Comparing Centralized Versus Decentralized University Entrepreneurial Ecosystems

Research Question:

This paper contributes to the missing literature on how the organizational design of university entrepreneurial ecosystems impacts entrepreneurial outcomes. Entrepreneurial aficionados, Victor Hwang and Greg Horowitt[2], in their book *The Rainforest: The Secret to Building the Next Silicon Valley* (2012), suggest that regional startup ecosystems that are decentralized—which they liken to rainforests—have distinct advantages over master-planned, top-down, and centralized ecosystems; which they liken to farms. This is because, as the metaphor goes, the increased species diversification creates more frequent, and serendipitous cross-pollination, or innovation, than typically happens in farms. Though widely received positively among the entrepreneurial community, little scholarly evidence exists to support their hypothesis. I am attempting to provide such, but also, I am specifically looking at university-based entrepreneurial ecosystems rather than regional ecosystems. Do universities

[2] **Victor Hwang** was a corporate and tech attorney, turned entrepreneur, who then led several startup support programs, and is most currently serving as the Vice President of Entrepreneurship for the Kauffman Foundation. **Greg Horowitt**, a serial entrepreneur, consultant, and venture capitalist, carries, among multiple concurrent roles, the title, Director of Innovation Design for UC San Diego's new Office of Innovation and Commercialization.

with decentralized entrepreneurial ecosystems have significantly better outcomes than those with more centralized entrepreneurial ecosystems?

Methodology:

I take a mixed-methods approach to compare centralized and decentralized models of campus entrepreneurial programming. I made field observations at two public university case campuses, one with a centralized startup ecosystem (at San Diego State University) and one with a decentralized startup ecosystem (at the University of California San Diego). I also reviewed programs across California to determine their size and model, then I followed over 300 undergraduate participants on LinkedIn for 18 months to determine if the campus model they were in led to noticeable differences in startup sustainability or hiring outcomes post-graduation. I use Chi Square tests to look for statistical significance.

Findings:

Qualitative observations at San Diego State and UC San Diego reveal that there are inverted strengths and weaknesses to the centralized versus decentralized model. Centralized models have more visibility, efficiency, and administrator participation. Decentralized models have more expert mentoring, technological focus, and faculty participation. Undergraduate outcomes diverged significantly across the two models. Centralized models appear most commonly at mid-tier state universities and smaller liberal arts universities, where the majority of student entrepreneurs are in non-STEM majors, most typically a business program of some kind. Decentralized models are most common at flagship public universities and elite private universities, and the student participants are predominately in STEM majors.

Quantitative observations show that the non-STEM students at less selective institutions have higher rates of persistence in their startups after graduation but a higher rate

of needing supplemental work to make ends meet. Conversely, STEM students, and especially at higher-tier research universities, show greater rates of non-persistence with their startups after graduation, where graduates typically accept full-time employment at traditional companies; they also show much lower rates of needing supplemental work to make ends meet. This leads me to the perspective, that many of the non-STEM majors at lower-ranked schools are being career side-tracked by remaining in startups with little market traction.

2. Failing Forward? The Risks and Rewards of Undergraduate Entrepreneurism

Research Question:

This article goes into more qualitative depth than the last one, and with a greater focus on student experiences and outcomes, rather than on the organization of entrepreneurism programs. It fleshes out more of the 'why' behind the gaps seen in student entrepreneurism between higher and lower ranked universities, as well as between STEM and non-STEM based projects and student majors. What impacts does participation in a university-sponsored startup incubator have on students' college experience and career plans, particularly across institutional types and majors; and why?

Methodology:

I examine the undergraduate startup cultures at two public university campuses in Southern California at two slightly different locations in the post-secondary rankings hierarchy, one a little higher, the University of California San Diego, and one a little lower, San Diego State University, while also interviewing entrepreneurial undergraduates from across California to add field-level context. Interviews were conducted with 56 undergraduate entrepreneurs, roughly half in STEM majors and half not.

Findings:

Nearly all students first came to seriously consider entrepreneurism from campus programs after, not before, enrolling in college. Non-STEM majors reported more negative academic influences, such as lower GPAs and less time for assignments, studying, and class attendance. Non-STEM majors were also more likely to create lifestyle and consumer products with more tenuous market opportunities. Nearly all incubator participants I interviewed reported an increased risk tolerance and the willingness to sacrifice for their startups, most readily in the form of time and money. Most interviewees came to see risk-taking as a character virtue and they also reported increased preferences for flexible future employment arrangements. Nevertheless, STEM majors, especially at higher ranked research universities, are more likely to quit their startup when better job offers come along—their startup experience having served as a resume boost. Non-STEM majors, especially from lower-ranked colleges, are more likely to keep persisting in startups, whether sustainable or not, often accepting precarious labor roles to support their startup ambitions. Ultimately, undergraduate startup programming, particularly for non-STEM majors at lower ranked universities, risks directing these students into precarious work.

3. That's How I Knew I Was an Entrepreneur: An Integrated Model of Identity Formation

Research Question:

The entrepreneurship literature shows a fair amount of concern for how entrepreneurial identities are formed, yet they borrow mostly from psychological and management literature on the topic, while a trove of sociological writing on identity formation is overlooked. The sociological literature has several families of identity theory that can be broadly organized into three traditions based on their unit of analysis and mechanisms they tend to focus on when analyzing identity formation. One tradition, rooted in social psychology and interactionist sociology, underscores how individuals internalize identities as self-structures that become relatively stable across settings. This tradition tends to take a micro approach. The second tradition, rooted in dramaturgy and cultural sociology, emphasizes how individuals contextually perform their identities through various scripts, tools, and capitals that can be accessed relative to the situation. This tradition typically looks at macro cultural forces. The third tradition, rooted in literature on social movements and the sociology of the local, stresses how collective identity becomes nurtured and mobilized at the group level. This tradition is oriented toward meso-level approaches. I also found that the three traditions are also separated from each other by a main tension or pole: identity formed more from individual or collective experiences; identity refined more from between group boundaries (us-versus-them) or within group boundaries (status heirarchies); and identity as more durable or dynamic across settings and situations. As I argue in this article, the three traditions of sociological identity theory are not contradictory, but rather, can be integrated to more productively make sense of complex domains of identity formation.

Methodology:

I conducted 56 in-depth interviews with student entrepreneurs about their experiences becoming an entrepreneur. The poles that I mentioned above were useful to identify which tradition my interviewees experiences most reflect. Once they were each categorized into the tradition their experiences most closely reflected, I then carefully looked for the unique ways the student from each tradition articulated their entrepreneurial identities. Clear patterns existed.

Findings:

Entrepreneurial identity can indeed be: individually internalized, contextually performed, and/or collectively mobilized—each with differing opportunities and challenges. Students in the individually internalized category were much more likely to speak of their entrepreneurial identity as something in their personalities or unique traits. They understood it as a kind of mindset that can be deployed in several types of contexts. The students in the contextually performed category of entrepreneurial identity formation understood their entrepreneurial identity as something that was earned through specific actions and achievements. To the students in this category, claiming that oneself is an entrepreneur without sufficient evidence is shameful. They often compared themselves to others to determine who were "real" entrepreneurs and who were simply want-to-be entrepreneurs. The students in the collectively mobilized category viewed their entrepreneurial identities as emerging out of shared team experiences, and especially out of overcoming the difficult challenges they were confronted with by a capricious and unmerciful market. I also discuss potential implications and future directions for research based on the integrated model of identity that I used.

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Article 1. Rainforests on Campus: Comparing Centralized Versus Decentralized University Entrepreneurial Ecosystems

Rainforests on Campus:

Comparing Centralized Versus Decentralized University Entrepreneurial Ecosystems

ABSTRACT:

This paper contributes to the missing literature around how the organizational design of university entrepreneurial ecosystems impacts entrepreneurial outcomes. I apply a mixed-methods approach to comparing centralized and decentralized models of campus entrepreneurial programming. I made observations at two public university case campuses, one with a centralized startup ecosystem (San Diego State University) and one with a decentralized startup ecosystem (the University of California San Diego). I also reviewed programs across California to determine their size and offerings, comparing centralized versus decentralized models. Then I followed 301 undergraduate incubator participants on LinkedIn for 18 months to determine whether their campus model, and their major, led to noticeable differences in startup sustainability or hiring outcomes post-graduation. Observations reveal that there are opposing strengths and weaknesses to the centralized versus decentralized models. Centralized models have more visibility, efficiency, and administrator participation. Decentralized models have more expert mentoring, technological focus, and faculty participation. Undergraduate outcomes diverged significantly across the two models. Centralized models appear most commonly at mid-tier state universities and smaller liberal arts universities, where student entrepreneurism is usually practiced among non-STEM majors, typically in a business program of some kind. These students show higher rates of persistence in their startups after graduation as well as a higher rate of needing supplemental work to make ends meet. Decentralized models are most common at higher ranked public research

universities and elite private universities, where student entrepreneurism most commonly flourishes among STEM majors. These students show higher rates of non-persistence after graduation, with most accepting full-time employment at traditional companies; they show much lower rates of needing supplemental work to make ends meet.

KEYWORDS: Entrepreneurial Ecosystems, University Entrepreneurism, Organizational Impacts

Entrepreneurism is both an individual and organizational process, though most scholars of entrepreneurism have tended to study the individual characteristics of successful or unsuccessful startups and entrepreneurs. More recently, several calls have been made for a shift in focus from the traditional approach to a greater emphasis on the role that regional ecosystems assume in stimulating entrepreneurial activity (Spigel 2017; Kwon, Heflin, and Ruef 2013; Hwang and Horowitt 2012; Parker 2008; Saxenian 2007). Other scholars have noted that universities play an essential part in these ecosystems by creating relevant networks, technologies, and new startups themselves (Kenney and Mowery 2014; Walshok and Shapiro 2014; Easley and Miller 2012). Further, new calls have been made in the sociology of higher education to pay greater attention to postsecondary ecologies (Kirst and Stevens 2015) and fields (Scott 2015)—in other words, to analyze higher education institutions as ecosystems unto and among themselves. Thus, significant literatures exist that 1) highlight the importance of regional ecosystems to entrepreneurial outcomes, 2) demonstrate how universities contribute to these regional ecosystems, and 3) show why universities should be treated as their own ecosystems. But still largely absent from this literature is work connecting point three back to point one: An examination of how the type of entrepreneurial ecosystem found

within the university itself contributes to entrepreneurial outcomes. This study is a contribution to that missing link.

Fetters, Greene, Rice and Butler's (2010) edited volume, *The Development of University-Based Entrepreneurship Ecosystems*, offers six case studies[3] of very different campuses that all grew robust entrepreneurship organizations and cultures, while tracing the historical steps of each campus's progress. Reflecting on the lessons of their six cases, they offer several recommendations to others trying to build campus startup ecosystems. Most of their recommendations are pretty straight forward: include senior administrators and faculty leadership in the effort, commit substantial time and resources to the endeavor, and develop high-quality curriculum and university-industry networks. But one of their findings is less obvious: that the distributed organizational structure of universities into silos makes entrepreneurial program development more challenging. As the authors explain it, "The structural organization of the university into profit centers . . . makes the cross-disciplinary collaboration needed for an effective ecosystem difficult at best. Concerns about sharing tuition revenues, faculty salaries and general expenses often create barriers that are difficult to overcome" (Fetters et al. 2010:193). Fetters and colleagues' concern rests with the observation that the emerging economic and organizational decentralization growing on campuses creates additional barriers for the formation of entrepreneurial ecosystems. Since the time of their writing, universities have only grown more market oriented (Eaton et al. 2016), further divided into semi-autonomous economic units (Berman 2015), and simultaneously have climates more encouraging of entrepreneurial activity among their

[3] The six case campuses are Babson College, EM Lyon Business School, University of Southern California, The University of Texas at Austin, Tecnológico de Monterrey, and National University of Singapore.

several groups of constituents (Nabi et al. 2017); which leads one to believe that the challenges Fetters and colleagues (2010) outline should be even more acute now than at the time of their writing.

However, at least scholars of business and entrepreneurial ecosystem growth argue that decentralized and distributed organizational arrangements can carry distinct benefits over centrally planned and administrated environments. The most prominent theory of the benefits of decentralization in entrepreneurial ecosystems comes from Hwang and Horowitt (2012), who use the metaphors of a rainforest compared to a farm. The rainforest is unwieldy, chaotic, and sprawling—yet they can be dynamic breeding grounds for rich species diversity in flora and fauna. On the other hand, the farm is ordered, planned, and limits redundancies; but it only produces pre-ordained crops, and stifles serendipitous cross-pollination, their metaphor for innovation. While Hwang and Horowitt have extensive industry experience, and their theory has been positively received with robust book sales, it has not been held up to empirical verification.

In this project, I attempt to adjudicate between these potentially opposing positions: Do university entrepreneurial ecosystems benefit more from centrally organized models with enough administrator, faculty, and resource support to bridge silos and break down departmental barriers? Or do university entrepreneurial ecosystems work better when they are not centrally managed, but rather distributed among various more focused units or departments, despite redundancies and duplications of effort? I will use a mixed-methods approach for answering this, but first I outline a few key arguments about centralized versus decentralized organizations and their applicability to institutions of higher education.

LITERATURE

Centralized Versus Decentralized Organizations

Hwang and Horowitt's (2012) metaphor of the rainforest as opposed to the farm is not the only metaphor in this realm of inquiry. Brafman and Beckstrom's (2006), *The Starfish and the Spider*, argues for the benefits of decentralized approaches to organizational leadership. As they describe, if you cut a spider in two, it is severely diminished if not destroyed; but if you cut a starfish in two, it is likely to grow into two separate starfish. For an example, they look to the United States military, which, despite its superior technology and resources, struggles against decentralized terrorist cells. When the armed forces eliminate one cell, others simply fill the void—becoming the proverbial starfish. In the realm of software engineering, Raymond (1999) promoted a veritable digital revolution when advocating for a decentralized or bottom-up approach to software creation using Linux, open-source code, and crowd-sourced strategies against the centralized or top-down approach used in major software companies like Microsoft. His chosen metaphor, and book title, was *The Cathedral and the Bazaar*. The bazaar is unruly and unmanageable compared to the stained glass–adorned cathedral, but shut down a shop and it is readily replaced by another vendor; shatter a window or remove some stonework in the cathedral and you have vandalized it, and perhaps compromised its integrity entirely.

Beyond metaphors, organizational scholars have repeatedly pointed toward innovation as more of a socially embedded process *between* organizations than something contained within a central organization's R&D department. Von Hippel (1988) asserted that innovation can emerge from several sources in an interactive process between suppliers, firms, and users. Powell and colleagues (Powell, Kput, and Smith-Doerr 1996; Powell and Grodal 2005)

maintain that in complex industries with dispersed expertise, the locus of innovation resides in the networks of learning, not in individual firms. Chesbrough (2003) coined the term "open innovation" to describe a "distributed innovation process that involves purposively managed knowledge flows across the organizational boundary" (Chesbrough 2014:4). In other words, these scholars all argue that intentionally decentralized networks provide the best avenues for innovation in environments with diverse and distributed expertise. Thousands of other articles and books have cited and continued to build on these ideas, whose authors also argue for the benefits of innovation in decentralized networks. Nevertheless, universities continuously struggle with tensions between centralization and decentralization.

Application to Institutions of Higher Education

In *Fixing the Fragmented University*, Burke (2006) edits together several accounts of decentralization gone awry, which he says can lead to a lack of accountability as well as units working at cross-purposes. Or as Clark Kerr describes the "multiversity" with its several competing factions and visions, "The university is so many things to so many different people that it must, of necessity, be partially at war with itself" (Kerr 1963:7). More recently this complexity has been called "institutional pluralism" (Kraatz and Block 2008) and described as an environment that "possesses multiple, institutionally-derived identities which are conferred upon it by different segments of its pluralistic environment" (p. 243). Decentralization, according to the argument, can lead to more than just silos, even resulting in divergent tribes with missions at odds with one another. In university environments, this can generate the "organized anarchies" described by Cohen, March, and Olsen (1972), with subsequent sub-optimal "garbage-can" models of decision-making, where the solutions and

answers of each tribe seek problems and questions to match, rather than the other way around. Or as Strauss and Curry (2002) write about in their book *Responsibility Center Management: Lessons from 25 Years of Decentralized Management*, the naturally decentralized nature of academic departments has historically caused budgetary problems without some mechanisms of centralized finance management also instituted throughout. They give some historic examples:

> Starting with Harvard's *Each Tub on its Own Bottom* and moving forward in time to the University of Pennsylvania's *Responsibility Center Management*, the University of Southern California's *Revenue Center Management*, and Indiana University's *Responsibility Center Budgeting*, a rich history of the design and use of formal decentralized management systems in higher education is evolving" (Strauss and Curry 2002:vi)

But Kraatz and Block (2008), acknowledging the challenges of decentralization, also offer optimistic possibilities, suggesting that it can also lead to a "coalition of identities" that work together to, at the very least, reach a reluctant acceptance of each other for mutual benefit. In sum, while plenty of literature on organizations and innovation advocates the benefits of decentralized environments, other literature, specifically looking at the context of universities, gives reason for caution—or at least warns against uncritical acceptance of decentralization as helpful in all situations.

One case of this tension can be seen in industry-affiliate programs (IAPs), which began emerging in various STEM departments around the country, seeking fees in exchange for access to research and talent (Berman 2012). Many campuses have several different industry-affiliate programs in a highly decentralized federation of programs. One of the more developed examples is at Stanford, which currently lists 55 different IAPs[4]. The money these

[4] A list can be found at: https://corporate.stanford.edu/affiliate_programs.html

companies give to their designated academic department partners returns to them a host of perks: first dibs on faculty research with potential for industry application, networking and cross-training opportunities between industry and university scientists and technologists, preferential access to talent in the form of recruiting student interns and graduate employees, and more. By contrast, centralized university career centers more recently began trying to offer similar services by representing the whole university rather than separate academic units; working in parallel to the IAPs found distributed among various academic departments (Davis and Binder 2016). The staff deploying this centralized strategy experienced much greater difficulty navigating the cross-campus politics—as well as politics in their own offices—and had much more limited success than the decentralized industry-affiliate programs. Even if the centralized programs were not competing against decentralized departmental IAPs, it is difficult to imagine that a centralized model on a campus without distributed IAPs would do much better. This is because so much of the value perceived by the company affiliates in IAPs is the specialized skill they can access from the academic department, not just general association with a specific university for marketing or status purposes, which are secondary benefits. Yet, centralized programs tend to be full of generalists instead of specialists, limiting the value they can offer.

This same tension exists at universities around entrepreneurism. For example, in a case study written about how the entrepreneurial ecosystem originated at the University of Southern California, the historians account how decentralized processes dominated, "The real work of creating the entrepreneurship ecosystem at USC has occurred within departments and laboratories and among the student organizations" (Allen and Lieberman 2010:93). They also say, "attempts to own innovation or entrepreneurship in specific [centralized] institutes or

centers have largely failed because innovation and entrepreneurship are activities that do not respond well to formal processes but rather bubble up in many diverse ways" (Allen and Lieberman 2010:92). Nevertheless, despite describing a very decentralized process, the authors lament a lack of centralized planning that they think would help:

> Champions have emerged in rather opportunistic and altruistic ways despite a lack of incentives or rewards. . . . A key individual most often takes responsibility for each major node of the ecosystem, but even after years of evolution, there is no formal structure for bringing together all the nodes of the ecosystem to coordinate efforts. As a result there is still some overlap in activities and the current ecosystem is probably not operating as efficiently as it could be. (P. 94)

The entrepreneurial ecosystem at USC is highly decentralized and one of the most developed in the country. But as the as the case writers wonder, is this success due in large part because of its decentralized processes, or despite them?

METHODOLOGY

All of the data that I collected comes from campuses in California. I chose to study California because it has the most extensive system of universities with nine public undergraduate-serving University of California campuses and 23 California State Universities, along with several dozen private universities. California also has a long-established history of entrepreneurial activity and culture, emanating largely from Silicon Valley, which has become as synonymous with entrepreneurism as Hollywood is to film or Wall Street to finance.

Website Observations: I began by making website observations of every university-sponsored incubator and accelerator across the state of California to catalogue their features, services, goals, and start dates. Whenever this information was unavailable from the website, I used phone and/or email to contact staff and try to fill in missing data. Incubators and accelerators are arguably the most prominent organizational features of campus

entrepreneurial ecosystems that nurture new startups, thus the organizational focus of this study. While a few incubators exist at community colleges, I limited my analysis to regionally accredited four-year universities. I also excluded campuses with graduate-only offerings as my focus in this study is on undergraduates. At each university website, I searched for four keywords: "entrepreneur," "incubator," "accelerator," and "innovation." Table 1 is a breakdown of the number of incubators and entrepreneurship centers across institution type.

Table 1. University Sponsored Venture Incubators in California, 2015

Institution Type	Proportion of Campuses with Incubators	Total Number of Incubators	Entrepreneur Center/ Competition*
University of California	9/9 (100%)	32	9
California State University	8/23 (35%)	9	9
Private Campuses	11/41 (27%)	16	9
Small Private Campuses**	4/34 (12%)	4	0
For-Profit	0/12 (0%)	0	0
TOTALS	32/119 (27%)	61	27

**Entrepreneurial programming that is not yet developed enough to count as an incubator*
***Defined as fewer than 1,000 Undergraduate FTEs*

From this list of campuses with incubators, I selected eight campuses with highly developed but centralized models of entrepreneurial activity and eight with highly developed but decentralized models of entrepreneurial activity. Centralized campuses have one main entrepreneurship center and incubator servicing all constituent groups across the university. Decentralized campuses have several entrepreneurial institutes, programs, or incubators distributed across several academic departments and divisions. In determining centralized from decentralized campus programs, I did not include technology transfer offices, student-led entrepreneurial clubs, or formal course and degree offerings—not because these are not

important parts of entrepreneurial ecosystems, but simply because of their general ubiquity. I did count centers for entrepreneurism, incubators and accelerators, or other large-scale entrepreneurial programming or events, such as the presence of an NSF Innovation Corps (I-Corps) training program, specific centralized administrative offices to coordinate and promote campus entrepreneurship, large entrepreneurship conferences with at least several hundred in attendance, or a chapter of Sigma Eta Pi (a co-ed entrepreneurship fraternity/sorority). The centralized campuses I chose included three liberal arts universities: Cal Lutheran University, Chapman University, and the joint Claremont Colleges; as well as five California State Universities (CSU): California Polytechnic University San Luis Obispo, CSU Chico, CSU Fresno, CSU Northridge, and SDSU. The decentralized campuses included two elite private research universities: Stanford and the University of Southern California; and six University of California campuses: UC Berkeley, UC Davis, UC Irvine, UC Los Angeles, UC San Diego, and UC Santa Barbara. Obviously, the decentralized model is not unassociated with size, resources, and research proclivity. Nevertheless, as campuses pursue entrepreneurial programs at all tiers of the post-secondary system, greater knowledge of the impact of organizational models is necessary, as there is no reason why campuses like San Diego State University or the Claremont Colleges could not have taken on a more decentralized model, or that UCSD or the University of Southern California could have taken on a more centralized model.

LinkedIn Observations: From these 16 campuses, I used their website listings of student participants to identify 301 undergraduate participants, 228 men and 73 women, who had LinkedIn accounts and who also accepted my invitation to connect on LinkedIn. I observed their accounts for 18 months until nearly all had graduated (or dropped out as in the

case of a couple), to see what differences in post-graduation entrepreneurism and/or employment existed among them. All of the students maintained their LinkedIn profiles during that time. While it is possible that only choosing students with a LinkedIn account could introduce a slight bias, as perhaps students with LinkedIn profiles are more career minded than other students; however, the bias will be minimal because LinkedIn accounts are highly mainstream and promoted by virtually all university career centers. In addition, because all groups in my comparison have accounts, that variable is held constant among them. I chose undergraduates because of their relatively uniform lack of startup experience across campuses, as well as their relatively short time in startup programs, typically one to two years, before graduating and moving on. This tells me more about the influence of campus arrangements on them during their time involved than I might get from faculty or graduate students, who stay longer and are more likely to be affected by the differences in campus resources available to campus scientists. Because much, but not all, entrepreneurial activity is rooted in science-based products and techniques and advances in new technologies, I also categorized the students into two additional groups: STEM majors and non-STEM majors. This left me with a 2x2 typology, Centralized and Decentralized campus with STEM and non-STEM majors; and students fell into one of the four quadrants. I looked at both whether they persisted in their startup or not and whether they needed supplemental employment to make ends meet. I used Chi Square tests to compare these outcomes, startup persistence and need for supplemental work post-graduation.

Case Observations: From the list of campuses with incubators, I also chose two case campuses for more in-depth observations and interviews. I selected them based on both access and that they are highly developed examples of the centralized and decentralized models. My

two case campuses, San Diego State University (SDSU) and the University of California San Diego (UCSD), are both large, public research universities in the same major metropolitan region of California. I am using their actual names so that future researchers can make contextual distinctions between my case campuses and their own in trying to apply the findings of this study. SDSU is part of the 23-campus California State University system, and UCSD is part of the more selective 10-campus University of California system. They both have similar sized undergraduate populations just under 30,000. Both campuses have acceptance rates hovering around 35%; though incoming high school GPAs for SDSU are typically in the 3.8 range while students entering UCSD average 4.0 or higher and also have slightly higher SAT scores. According to Carnegie classifications SDSU is a "Doctoral University with Higher Research Activity" while UCSD is classified as a "Doctoral University with Highest Research Activity." Both have recently had several millions of dollars invested, from both campus and private sources, to enhance their entrepreneurial capacities and startup-related physical facilities. Both have high levels of support for entrepreneurial activities from their presidents, and both have entrepreneurial courses in their formal curricula. According to LinkedIn Alumni data, looking only at post-recession graduates from 2010–2017, both have approximately 70,000 alumni with LinkedIn profiles. Of which, both have just over 2,000 (or 3%) indicating that they are, or have been, entrepreneurs; and entrepreneurism is ranked the 15th most common industry for alumni employment at SDSU and the 13th most common industry at UCSD.

I carried out field observations at each campus for two years between Fall 2015 and Summer 2017. This included 10 interviews with entrepreneurial faculty and entrepreneurship program staff on each campus, interviews with 16 student entrepreneurship program

participants at SDSU and 18 at UCSD, attendance at over a dozen startup-related meetings and events at each, tours of the startup-related facilities, observation of all entrepreneurism-related online webpages and videos produced by each campus, and an audit of an online entrepreneurism course at UCSD in design thinking for new products. I used Dedoose qualitative analysis software to track themes in my field notes and interview transcripts. The codes I used covered a range of topics from student experiences, to the types of programming utilized by participants, to organizational items.

This mixed-methods approach allows for a statewide field-level view of university incubators and their influence on student participants' post-graduate jobs, as well as a more up-close organization-level analysis of my case campuses' programmatic arrangements and activities. This is consistent with Hallet and Ventresca's (2006) call to bring people back into organizational analysis (i.e., inhabited institutionalism), which uses the macro theory of new institutionalism but weds micro-level interviewing and observation. The state-wide program inventory and tracking of student occupational outcomes increase the generalizability of the case findings beyond just the findings of my two case campuses. Kirst and Stevens' (2015) also call on future research that pays attention to overlapping contexts; which I do in this study, blending overlapping units of analysis at both the field and organization level.

RESULTS

The three sources of data give overlapping perspectives on how the organizational design of a campus entrepreneurial ecosystem influences startup outcomes. First, using my website observations and correspondence with incubator staff, I show the programmatic similarities and differences in incubators coming from centralized versus decentralized

campus startup ecosystems across the state. Second, using my two case campus observations, I point out differences between centralized and decentralized systems. These findings show more in-depth program differences than the statewide inventory could show. Lastly, using my LinkedIn observations with 301 student participants, I compare and contrast occupational outcomes for undergraduates who participated in incubators at campuses with centralized and decentralized programs. This gives greater generalizability to my findings than observations at two case campuses alone could give.

Statewide Programmatic Similarities and Differences in Incubators by Ecosystem Model

Statewide, there were at least 61 university-sponsored incubators on 32 different four-year campuses (See Table 1). An additional 27 entrepreneurial programs or competitions existed that may evolve into or sponsor an incubator in years to come. Two or three campus incubators began emerging annually across California through the 2000s and then took off rapidly after 2010. In fact, 42 of the 61 programs I found were less than five years old.

Programmatic Similarities Between Both Models: After separating incubators into those found at campuses with centralized and decentralized models, several basic features were highly similar in both models. The average number of venture teams housed was similar, around 12, with a range between 4 and 39. Table 2 shows the rate of adoption of other common services: mentoring, technical assistance, networking, workspace, demo days, pitch competitions, etc.

Table 2. Common Features in University-Sponsored Incubators by Centralization Model

Program Element:	*Rate of Adoption (percent):*	
	Centralized	*Decentralized*
Mentoring, Expert Advice, Technical Assistance:	100	100
Workshops, Speakers, Seminars:	95	92
Formal Networking Events*:	84	97
Workspace**:	80	100
Demo Days / Pitch Competitions:	91	83
Prototyping & Maker Spaces:	61	70
• Specialized Wet/Dry/Tech Labs:	22	39
Seed Funding / Capital Investment by University***:	25	31

* Includes peer and alumni networking events, and opportunities to meet venture capitalists.
** Includes shared open-space and dedicated team space, but not just meetings rooms.
*** Not counting prize winnings or financial aid awards, which nearly every pitch competition includes. The average amount of seed money was around $8,500 for both models.

The average duration of a participating venture is around one academic year, with time limits ranging from one academic term (more of a traditional "accelerator" format) to those with no formal time limit. The vast majority of the incubators in this study were open to a range of campus participants—students, staff, faculty, and some even include alumni and community members who license campus technologies. Only a few incubators are exclusively reserved for students or faculty only.

All of the incubators reported having some form of mentoring and expert or technical advice. All but a couple had educational events like workshops or seminars. Equally common were networking events with either venture capitalists and/or potential investors from the alumni or business community. Workspace was available at almost every program. Demo days and pitch competitions were very popular, though slightly more common in incubators at centralized programs; a finding that made sense after observing the increased marketing expectations put on my case campus with a centralized startup ecosystem, SDSU. Competitions are central tools for both recruitment of future participants, and displaying its

accomplishments to other campus constituencies from administration to donors. Competitions also provided the primary method through which most programs delivered small amounts of seed money to winning contestants. Unlike seed investments outside of universities that are tied to expectations of equity, prize winnings from campus competitions are typically free of equity expectations and unrestricted in how it can be spent. The amount of winnings advertised is usually a split of cash services, typically from sponsoring companies like accounting or legal firms. When asked if they offered seed money, only 26 percent said they did separately from competitions. Prototyping labs and industry-specialized lab space were available in 61 percent of cases. These labs generally took the form of small maker spaces with 3-D printers and a few other tools, but in a few instances, highly specialized labs based on industry-specific incubators (i.e., wet labs and biotech gear) were available. Despite providing all of these resources, few programs charged significant fees or equity stakes for participation. More than half were free. A few industry-specific and sciences-based programs asked for equity around two or three percent. Others did charge fees or facilities rent, which ranged from $25 a month to several hundred, but most offered sliding scales based on the startup's ability to pay. Overall, despite the market-orientation of programs like incubators, campuses extract relatively little from the ventures they support; this finding is consistent with Mars and colleagues (2008).

In sum, university-sponsored incubators at campuses with both centralized and decentralized entrepreneurial ecosystems have very similar types of programming. Where they diverge has more to do with industry focus, admissions rates, and definitions of success. My case observations will also show that while there may be similarities in the types of programming advertised, the quality of that programming can vary dramatically.

Programmatic Differences Between Models: The first notable point of departure between incubators at campuses with a centralized versus decentralized entrepreneurial ecosystem is their orientation toward specific industries compared to industry agnosticism or openness, with 95 percent of incubators at centralized campuses open to startups of all types, compared to only 41 percent at decentralized campuses. The greater industry specificity in incubators in a decentralized model is a function of the emphasis or the host unit of each incubator. On campuses with centralized models, independent centers for entrepreneurism, the business school, or a centralized administrative unit (e.g., a research foundation) tends to host incubators. At campuses with decentralized ecosystem models by contrast, incubators come from the aforementioned units as well as a host of additional academic departments, including: computer science, engineering, medical and pharmacology, public policy and law, and inter-campus consortiums. These academic departments tend to restrict their programs to either students from their unit(s) or startups serving target populations relevant to their area of academic expertise. This narrows the types of applicants who can get in, but also develops niche strengths in their area of focus.

Another point of divergence rests with admission rates into the incubators. Only 14 percent of incubators at campuses with centralized models identified themselves as having highly competitive or selective admissions for founders or startups, compared to more than half at campuses with decentralized models. At both types of campuses, being selective was most commonly defined as admitting 25% or fewer applicants. However, a few programs had even more stringent rates, such as the 10 percent admission rate boasted by the University of California's inter-campus CITRIS Foundry and the five percent admission rate to the Qualitative Biosciences (QB3) institute shared by UC Berkeley, UC Santa Cruz, and UC San

Francisco. These programs had much higher standards for the development of the product before entering.

Lastly, definitions of success differed between incubators at campuses with centralized and decentralized models. When talking to incubator staff about their lists of potentially successful outcomes, it was clear that success was regularly broken into three categories: success for the startup, success for the participants, and success for the incubator or campus. Success for the startup, at campuses from both models, typically centered around raising money, with a future vision of sustainability and job creation. However, few programs had clear records of how many companies had successfully launched, largely because most programs were only a few years old and still lacked established track records. Success for the next two categories—the participant and the program—diverged by campus centralization model. Program leaders at campuses with centralized models typically articulated success as a blend of honing business skills and creating alternative career paths; while at campuses with decentralized models, it was articulated as creating cutting-edge leaders and innovators of the future. Program leader's definitions of success for the incubators themselves also differed slightly by ecosystem model. At campuses with centralized models program leaders more often mentioned investing in student long-term success, which may one day become generatively and philanthropically returned to the campus or incubator. At campuses with decentralized models, program leaders more commonly mentioned disseminating and commercializing research technologies more broadly and quickly than relying only on traditional campus tech transfer offices alone. My conclusion is that centralized models foster more student-centered programming, while decentralized models foster more product centered-programming. This became even clearer in my case observations.

Case Campus Differences: Opposite Strengths and Weaknesses in the Two Models

San Diego State University (SDSU) contains one central entrepreneurial institute broken into two halves: the Lavin Entrepreneurship Center in the business school, which promotes an entrepreneurial curriculum and internship program, and the Zahn Innovation Platform Launchpad (Zahn Center), which is a relatively large incubator—listing 50 startups in residence at the time of writing—with a range of services and events. SDSU was named the National Model Undergraduate Entrepreneurship Program for 2017 by the United States Association for Small Business and Entrepreneurship (USASBE). During my observations, the Zahn Center had also received several million dollars of philanthropic support, was in the process of moving into an expansive new state-of-the-art facility, and had landed Cathy Pucher (who was the previous director of the region's leading technology accelerator EvoNexus) as its executive director.

The University of California San Diego (UCSD) on the other hand has a decentralized web of entrepreneurial programming, ranging in quality from woefully underdeveloped to stunningly successful. For example, on one occasion I attended an incubator-sponsored elevator pitch competition that started 45 minutes late, most of the judges failed to show up, and there were more contestants than audience members. Yet, UCSD is ranked first in the UC system for rates of technology transfer, and it is ranked second, behind UC Berkeley, for the number of startups created and patents filed (Freeman 2016). During the time of my research, there were more than 10 incubator/accelerator programs, with new ones launching and others in the works. One of these was exclusively for undergraduates, but the rest allowed undergraduate participation on teams, even if the incubator more generally served graduate

students or faculty. The oldest incubator appeared to be in the Von Liebig center in the Jacobs Engineering School, founded in 2001; the business school had launched a couple of accelerators in 2011 and 2013. Other incubators across campus units also exist, including one that engaged visual artists; the alumni department hosted the incubator exclusively for undergraduates, launched in 2015. The company Qualcomm sponsored a new campus incubator; there was another incubator for social ventures; another for biomedical startups; a new globally focused incubator was just getting off the ground in an inter-department joint effort; as was one for personalized therapeutic medicines; and the institute of oceanography was making plans for a "blue tech" (i.e., water related) incubator. A new campus-wide conference had just been launched. More than one business pitch competition existed, with one offering over $200,000 in prizes and services to winners. A chapter of National Science Foundation's (NSF) Innovation Corps (I-Corps) was active on campus. A new Office of Innovation and Commercialization (OIC) had been founded with the intention to coordinate efforts among the several disparate startup-related units. In 2014 an $8 million Triton Technology Fund launched to create seed investments in campus startups. In addition to all of these entrepreneurial offerings, UCSD also participated in multiple UC system efforts to promote entrepreneurism and provided dozens of other smaller startup-supporting programs within disciplinary and research units. Again, while this most of these programs were not focused directly at undergraduates, undergraduates were present on teams across the range of programs. According to the OIC, over 760 UCSD-related startups had launched, resulting in approximately 37,000 jobs created and an annual economic impact of $3.7 billion.

Visibility: From my observations while on campus and my interactions with students, the average visitor, or even student, would not necessarily realize that the UCSD

entrepreneurial ecosystem eclipses the SDSU ecosystem several times over in scale. A walk across SDSU's campus would most likely present an observer with multiple advertisements, from ads on rotating digital screens to sandwich board signage, promoting Zahn Center events. A walk across UCSD's labyrinthine campus offers no parallel. SDSU's homepage prominently features its entrepreneurial culture along with leadership and athletics, while UCSD's homepage promotes research and academics. Student startup products were given prominent floor space for sale at the SDSU bookstore, but not so at UCSD. At SDSU, discussions with students in the social sciences and humanities—those *least likely* to participate in startup programming—revealed that they were generally aware of what the Zahn Center was, although they lacked detailed information about its offerings. At UCSD, social sciences and humanities students knew that startup-related programs existed somewhere on campus, but they were hard-pressed to name one of the several options.

Administrator and Faculty Participation: Within the incubators, SDSU's most prominent Zahn Center events typically involved participation by top administrators as well as community and business leaders. At UCSD, competition existed for such representation, as Chancellor Khosla could not attend events for each program, nor did such events tend to be as large or promoted with as much organized fanfare. Faculty involvement, however, took an opposite tack. SDSU struggled to get faculty involved and had just launched a "faculty ambassador" program, giving one faculty member a single course release to advocate to the faculty about participating in the Zahn Center. Faculty at SDSU did not appear to have much incentive to add entrepreneurial practice to their list of activities, as they were focused primarily on teaching, service, and research. Thus, the Zahn Center was primarily driven by administration, staff, and students. At UCSD, where the incubators and startup programs were

embedded within disciplinary and research units, such participation dovetailed more closely with faculty research agendas and teaching mission; involvement in entrepreneurial activity was regarded as supplemental to those efforts in several departments.

Student Mentorship: In this same vein, each campus handled student mentorship very differently, with SDSU arranging for students to meet with local business leaders to acquire general tips on managing a startup, while UCSD focused its student mentorship on faculty-disciplinary or industry-expert advice on technical or scientific aspects of the students' products. Several SDSU students said their mentorship experience was meaningful, but not necessarily helpful—that they enjoyed it, but it did not significantly enhance their business. Conversely, more UCSD students described the mentorship as challenging but indispensable. One notable exception was feedback from undergraduates involved with The Basement, which was undergoing key leadership transitions almost immediately after opening and lacked organization.

Decentralized campus environments, I came to realize, have unevenly distributed pockets of quality, compared to the more uniform standards of centralized programs. Interviews with students about incubator services showed that UCSD students reported less overall satisfaction with the services they received than did their SDSU counterparts. Surprised by this at first because of what I viewed as more extensive opportunities, I later came to realize that it was largely because UCSD participants often knew, from interactions with peers in different departments, what the other programs offered in comparison to their own. Whereas, SDSU students, having no other points of on-campus comparison, had few complaints, even in instances when they felt they had gained little—their experience was still seen as a positive learning or networking opportunity. Students at SDSU generally viewed

participation with the Zahn Center as synonymous with the choice about whether or not to attempt entrepreneurism, creating a halo effect on the program. Like when John, at SDSU, said, "The incubator has been extremely helpful. Not only have they provided a ton of guidance and mentorship and connections to people that have helped us even further, but we got a few thousand dollars' worth of funding from them that's really helped us get started. So, we owe the incubator a lot." At UCSD students had to make the choice about whether or not to pursue entrepreneurism separately from their choice about which incubator or startup-related program(s) to participate in, sometimes shopping among them for the best services or fit. David, a bioengineering major at UCSD, who had participated in three programs (the undergraduate incubator, an engineering department incubator, and the iCorps program) said, "We have a chance to interact with other teams and the one thing I notice is that every project is very different and has different needs. So, like at the Basement they are like, what do you need? And we wanted to talk to venture capitalists. They brought them, but when we met them, they were like, we don't fund medical devices, so that wasn't going to be useful for us. So, each program can offer things that are more or less helpful to different groups and different projects." The students at UCSD were more aware of program limitations, as they compared programs, and had more neutral views of what each program could offer them compared to the more glowing accounts of the Zahn Center common among SDSU interviewees.

Focus and Goals: Another point of contrast I observed between SDSU and UCSD incubators stemmed from what appeared to be divergent foci and goals. At UCSD, where there was little administrator and outside awareness of the often-opaque inner workings of the various campus incubators and programs, energy was mostly spent on efforts related to

research and development, applications of technologies for industry affiliates, and securing intellectual property—particularly for programs embedded in STEM-related departments. In addition, more than one team I had interviewed in one program, I later discovered had moved on to join a different program. For example, one team, working on engine parts for rockets, had started in the Basement but later joined the Qualcomm incubator. Their team would not have immediately qualified for the Qualcomm program, but after developing their product and nascent company in the Basement for a year, they had nearly exhausted the resources they could gain from the Basement and had moved themselves into a position where the more sophisticated incubators would be interested in their products and ideas. Where the programmatic services in the first one ended, new resources in others were available. It was common to find teams, if not concurrently participating in multiple programs, then using them like a fish ladder as they developed their startups.

At SDSU, the Zahn Center served as a central facet of the overall campus brand-image, a brand-image that included entrepreneurism. This added higher visibility to the Zahn Center, as well as what I perceived as higher expectations from the administration for its performance. The Zahn Center drew media and philanthropic attention, and potentially even future enrollments. At the same time, the Center's emphasis on undergraduate-led startups (at least in practice, if not intentional philosophy) did not lead to a substantial track record of sustainable startup launches, jobs created, or regional economic impact. The Zahn Center's website[5] advertised that 22 of 150 teams had "launched," over 400 students had been "helped," and over $8.1 million had been "raised." But no descriptions existed of what counted as

[5] http://ziplaunchpad.sdsu.edu/

launched, helped, and raised. In an interview, the Zahn Center director shared with me that these terms were interpreted very broadly. Significant energy at SDSU was devoted to: recruiting teams to apply to the incubator, recruiting students to join other startups as interns, regular meetings with incubating teams, attendance at events and workshops, and placement of student products for purchase by the campus community.

In short, at SDSU, more energy was spent tracking *inputs* (e.g., participants, attendees, investment, awareness) than *outputs* (e.g., job creation, sustainable businesses, new technologies, regional economic impact). While UCSD incubators were not necessarily focused on job creation or regional economic impact, they spent less energy and time on recruitment and promotion. Instead, more time was spent on the science and technology behind their products and techniques. This typically meant a greater likelihood of marketplace rewards than less sophisticated products in the lifestyle, consumer services, or web industries more typical in the Zahn Center.

Program Staff Perspectives: Lastly, program director perspectives on their own roles varied widely between campuses. Cathy Pucher at the Zahn Center understood her role as helping move startups to the next level, however broadly defined. It might mean incorporation, graduation to another off-campus incubator, or a successful Kickstarter campaign. Her task was difficult, a blend of executive director and mentor, and required significant range. On any given day, she may have been interfacing with an undergraduate student brainstorming startup ideas and then later meeting with top administration to coordinate a philanthropic connection. She had a handful of interns and part-time support staff. Despite the challenges, in my interactions with and observations of her, she consistently displayed a mostly positive attitude

about her role; perhaps her personality, but also likely a function of the visibility of her position.

At UCSD, program staff were more likely to complain about the overall state of affairs. For example, one staff member working part-time in the undergraduate Basement incubator told me how leadership changes had left the program a bit unorganized. The CEO of the Entrepreneurship Challenge pitch competition was planning on trying to incorporate the program outside of UCSD's formal structures, because of what he perceived as limitations in their support. Others talked about how hard it was to even have a clear picture of what all was going on around campus in terms of entrepreneurism; the weekly listserv of startup related events was typically double-digits long. Most events and workshops were very small, but more was happening across the several startup-promoting units than anyone could hope to be fully involved in. An administrative assistant from the alumni office, supporting the Basement, said, "There is definitely duplication of effort. I mean, an example, does every program need their own workshop series?" One student participant in two programs said that the staff from each had very little communication with each other, which made it tricky when a milestone deadline at one was conflicting with a requirement at the other. Sam, an engineering major at UCSD said, "I'm supposed to focus more on market validation in one, before building a business plan. In the other, you need a more developed business plan before you are supposed to go looking for sales. I understand the logic of both, but I end up having to try to do them at the same time to appease both hurdles." One faculty member shared with me, during a mingling session of a demo day that he wondered if there were some students learning to become "professional pitch competitors," who were floating from program to program and becoming "overfunded" through campus resources at the expense of other worthy startups.

The new Office of Innovation and Commercialization (OIC) was little understood by most other units on campus; and its physical location was removed into an administrative office building across the street from a far corner of the main campus, ambiguous if it was even considered on-campus or not. The launch of the OIC came with new staff positions, including vague, though attractive sounding, titles like Associate Vice Chancellor for Innovation and Commercialization, a Director of Innovation Design, six Senior Managers of Innovation and Commercialization, two Alliance Officers, and a Startup Advocate. In total, this single office listed 34 employees[6]. I interviewed the Startup Advocate[7] at the beginning of my observations, shortly after her job was first created, and then again two years later. Her language had noticeably changed, from using terms like "direct," "administrate," and "create," she was later talking about "coordination," "facilitation," and "communication." Whereas she first explained her role as helping to create an "umbrella over" the startup ecosystem, later her metaphors indicated more of a role creating "connective tissue between" the various entities. She instituted monthly meetings where startup-related program leaders could give each other updates, although representative attendance from various campus units was spotty. She created a website that listed the myriad campus resources entrepreneurs may be interested in and was working on a unified startup calendar of events to help prevent programs from hosting competing entrepreneurial events on the same days—which happened with surprising regularity. Two years into her role she said she was still occasionally discovering startup-related programming that nobody had told her about and was regularly annoyed at how little collaboration the various programs shared with each other. She worried about the UCSD

[6] http://innovation.ucsd.edu/directory/
[7] I chose not to name her in this paper because unlike the director at SDSU, this interviewee's more mid-level title in a larger bureaucratic hierarchy warrants greater confidentiality.

community getting "event fatigue" if the programs could not get better at partnering up to make fewer, but bigger and better events.

Student participants at UCSD, however, while they did sometimes complain about specific elements of the programs they participated in, showed a surprising knowledge of several resources available to them. All but two of my UCSD student interviewees had participated in more than one campus-related startup program, and some in several. Thus, while several program staff viewed the system as highly unmanageable, students did not appear to find it unnavigable. In sum, the very strengths of the entrepreneurial ecosystem at SDSU were weaknesses at UCSD, and vice versa. See Table 3 for a summary of these items discussed above.

Table 3. Inverted Strengths and Weaknesses of Centralized Versus Decentralized Models

	Centralized	*Decentralized*
Strengths/ Opportun-ities	1. Visibility & promotional advantages 2. Streamlining & efficiency of effort 3. Top administrator involvement	A. Specialized mentorship B. Focus on tech & securing intellectual property C. Home-unit faculty involvement
Weaknesses/ Threats	A. Generic mentorship B. Focus on inputs over outputs C. Struggle to enlist faculty involvement	1. Obscurity & lack of visibility 2. Silos & duplication of effort 3. Competition for top administrator involvement

While these observed differences help explain why there might be divergent outcomes between student startups in the two models, it does not fully give a picture of what those

divergent outcomes are. This is where following student participants over time, across several campuses, is helpful, to see what happened in the first months and years after graduation.

Divergent Outcomes for Student Post-Graduation First-Jobs

After identifying eight campuses with highly developed centralized startup ecosystems and eight campuses with highly developed decentralized startup ecosystems, I connected on LinkedIn with as many undergraduate participants of campus incubators as I could find, 301 in total. I captured images of their LinkedIn profiles at the time of connection and then again after 18 months. Several patterns emerged.

First, it became clear that at the eight campuses with decentralized models, which are also all research universities, participation is by and large mostly from students in STEM majors. At the eight campuses with centralized startup ecosystems, which are all middle-tier public campuses or smaller liberal arts colleges, participation mainly comes from non-STEM students. I was able to find and follow 84 student participants from the eight campuses with centralized models and 217 from the eight campuses with decentralized models. Of the students from campuses with centralized models, 82 percent were non-STEM majors, while an exact inverse of 82 percent of students from campuses with decentralized models were STEM majors.

After 18 months, it became clear that STEM majors were much less likely to persist with their startups than non-STEM majors (See Table 4), and even more so at campuses with decentralized models. Comparing the two extremes, 61% of non-STEM majors at campuses with centralized ecosystems persisted, while only 37% of STEM majors at campuses with decentralized models did. A chi-square test of independence showed that major and campus

model make a statistically significant impact on student startup persistence [χ^2 (3, n=278) = 15.268, p<.01] [8]. For the students who did persist, the top five industries at campuses with centralized models were: retail, software, higher education, marketing and advertising, and consumer goods and services. At campuses with decentralized models, the top five industries were: software, internet, healthcare, health and wellness, and financial services.

Table 4. Undergraduate Startup Persistence by Campus Model and Major

	Centralized Model	*Decentralized Model*
STEM Major	6/14 (43%)	59/161 (37%)
Non-STEM Major	42/69 (61%)	21/34 (62%)

Among the students who did not persist with their startup (or a subsequent startup), but accepted traditional employment, again there were industry differences. Students from campuses with centralized models were most likely to go into marketing and advertising or financial services (e.g., insurance, local bank branches, real estate), whereas students from campuses with decentralized models were more likely pursuing graduate school and/or at tech companies or working on medical devices.

In addition, for each of the 301 students, I examined whether or not they had to take on supplemental employment to make ends meet. LinkedIn profiles do not show whether work is full- or part-time, but they do give date ranges, titles, company names, and job

[8] This table excludes participants from Stanford's StartX because of its unusually high persistence rate at 68% in my sample, compared to a 41% average persistence rate at all other campus incubators on campuses with decentralized models (including all majors). But even when including StartX, the chi square is still statistically significant: χ^2 (3, n=301) = 10.891, p<.05.

descriptions. If a student only listed their startup or other employment as their sole role, I counted that as full-time employment, not requiring additional employment to make ends meet. However, if over the past 18 months they had overlapping job roles I examined those further. In instances where the overlap was with volunteer work (e.g., tutoring refugee students, advisory board of another startup), I did not count it as supplemental work. Similarly, I did not count elite research opportunities (e.g., fellow in a university lab) or subsequent startup co-founding as supplemental work. However, if the description was service work (e.g., barista, cashier) or was a contingent role (e.g., freelancer, independent contractor), I did code it as supplemental work. Using this indicator, an even more dramatic divergence became clear (see Table 5). Less than two percent of students in STEM majors at campuses with a decentralized model required supplemental work to make ends meet, whereas a full two-thirds of students from centralized models in non-STEM majors did need supplemental employment to get by. A chi-square test of independence showed that major and campus model impact the likelihood of needing supplemental work to make ends meet with highest statistical significance [χ^2 (3, n=301) = 140.579, p<.001].

Table 5. Need Supplemental Work to Make Ends Meet, by Campus Model and Major

	Centralized Model	*Decentralized Model*
STEM Major	1/15 (7%)	3/178 (2%)
Non-STEM Major	46/69 (67%)	6/39 (15%)

In fact, pursuing entrepreneurism appears to have positive influences on career formation if a student is a STEM major, despite the campus model. However, if the student is not a STEM major, the decentralized campus model (and perhaps higher prestige and

resources of research universities) appears to cushion the negative effects of needing supplemental work. The worst situation an entrepreneurial student can be in appears to be as a non-STEM major at a centralized campus model (i.e., mid-tier state universities and smaller private colleges). That group of students is by and far the most likely to persist with startups and to need supplemental work to make ends meet.

DISCUSSION

Fetters and colleagues (2010) see the transformation of universities into independent cost centers and organizational units (a.k.a., their decentralization) as a great hurdle for the development of university ecosystems. Conversely, Hwang and Horowitt (2012) propose that entrepreneurial ecosystems that are more like rainforests (i.e., decentralized) will outperform ecosystems that are more like farms (i.e., centralized). So, is there a greater advantage to universities with centralized or decentralized entrepreneurial ecosystems?

First, I found that programmatically, many of the entrepreneurial centers and incubators at both centralized and decentralized campuses look surprisingly the same. There is clearly isomorphic pressure for smaller and middle-tier campuses to imitate elements of the programming found at research universities. While Berkeley and Stanford were launching programs in the 1990's, few other campuses did until the 2000's. In the UC system, 11 of the incubators I found had been launched prior to 2010, but only four from the CSU system, and none from the smaller private universities. So, while research universities set the defaults in the programmatic offerings of campus incubators, they did so with those incubators rooted in academic departments; but as mid-tier campuses and smaller colleges began their incubators,

they kept the same list of program offerings, but moved the emphasis away from scientific departments and into industry-agnostic business schools or centralized institutes.

Second, in my case comparisons, I did find some advantages to a centralized model, namely in terms of visibility, streamlining of effort, and administrator participation. However, there are great losses in the quality of expert mentoring, greater difficulty getting faculty involved, and what I observed as a maladapted focus on input measures over output measures. When a single entrepreneurial center is put in the spotlight, there is a naturally greater pressure to look active and at capacity. Mentors also tend to be drawn from the ranks of local business leaders, which, while useful in many ways, rarely have the specialized expertise that more sophisticated science-based products can benefit from. This is where the greater faculty involvement in incubator programs rooted in academic departments gives a significant advantage.

Lastly, and relatedly, I found that at universities with a decentralized entrepreneurial ecosystem, entrepreneurism is largely a science-and-technology-based enterprise, which makes it fundamentally different than the more business-and-marketing-oriented endeavor taking place at campuses with centralized models. This difference reveals itself especially clearly in the need for student entrepreneurs to pursue supplementary or contingent employment to help make ends meet. STEM majors tend to leave their startups for stable jobs after graduation (60%); but whatever their choice, only 4 out of 193 (2%) STEM majors in my sample needed supplemental or contingent work. Contrastingly, non-STEM majors—and especially from campuses with a centralized model—tend to struggle among odd jobs (67%) to make ends meet while they strive to get their startups to work (61%) or to reorient to other career opportunities they had not prepared for (39%). Undergraduate entrepreneurism appears

most helpful to undergraduates, in terms of their first careers after graduation, when it is rooted in academic departments and scientific products. Certainly, part of student-career outcomes will be related to the amount of resources connected to a campus' scientific footprint. For example, SDSU won over $130 million in research grants in the 2015-2016 school year[9], while UCSD won over $1 billion[10]. But nevertheless, schools with centralized startup ecosystems, like SDSU would still likely see better student entrepreneur career outcomes if they made steps to move their entrepreneurial culture away from a business-school dominated culture, toward a startup culture more connected to STEM disciplines. For example, students could be more encouraged to join a faculty led startup team, and less encouraged from recruiting each other for lifestyle product startups.

Fetters and colleagues' (2010) concerns about the challenges posed by a decentralized university entrepreneurial ecosystem are accurate only from the perspective of a campus leader trying to build a top-down, umbrella-type centralized entrepreneurial program within an otherwise decentralized ecosystem. This would be very difficult to do, as was discovered by the staff member I interviewed at UCSD's new Office of Innovation and Commercialization who realized the decentralized nature of the campus needed coordination support rather than top-down administration. Thus, in my estimation, Hwang and Horowitt's (2012) arguments about entrepreneurial ecosystems appear applicable within university environments. Rainforests on campus may indeed be difficult to manage, but as observed, for inhabitants they are not impossible to navigate, and cross-pollination occurs quite regularly. In less metaphorical terms, this is because when university entrepreneurism is rooted within

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[9] http://newscenter.sdsu.edu/sdsu_newscenter/news_story.aspx?sid=76250
[10] http://ucsdnews.ucsd.edu/pressrelease/uc_san_diegos_1.16b_in_research_funding_sets_new_record

academic departments and research organizations, instead of in centralized administrative units, it becomes an inherently science and technology–driven process that is more aligned with traditional university priorities and cost structures. The silos Fetters and colleagues (2010) lament actually become helpful organizational infrastructure for promoting campus entrepreneurism in decentralized environments that are experiencing institutional pluralism (Kraatz and Block 2008). For example, likeminded faculty in one department could agree to begin including entrepreneurial activity in rank and tenure decisions with little pushback from outside their unit. The same task would certainly become a hotly contested political battle if similar implementation were attempted in a top-down capacity across the university as a whole.

Implications

Nevertheless, I do agree with Fetters and colleagues' recommendation to campuses trying to build up an emergent entrepreneurial ecosystem:

> Start with a small number of initiatives that are aligned with the rest of the organization and that clearly advance institutional priorities. . . . Focus on doing something well in order to create a foundation for success and growth. . . . Over time design, develop and implement organizational entities that can effectively focus resources on achieving key performance outcomes related to research, teaching and programs that support applied learning, network building, new venture creation, technology transfer and so forth. (Fetters et al. 2010:193)

This is especially relevant to campuses more like the California State University system and smaller liberal arts colleges in my study. Instead of launching full-service entrepreneurism institutes and incubators that look on paper and websites like parallel entities to those existing at larger research universities, start with a few initiatives emerging out of disciplinary academic units. This may take the form of expert mentoring, internships in faculty applied

research, creation of a campus venture fund, etc. Build these focused, rather than full-service, entrepreneurial programs into strong competencies. Later, supplement them with supporting programs that bring coordination and communication to the disparate resources. In short, I recommend pursuing a decentralized model from the start, even among smaller campuses.

Entrepreneurs on campus appear quite adept at finding the resources available to them across university units. Similar to research on other industry clusters, organizations working in the same industry (in this case, creating entrepreneurs) and in the same geographic area (in this case, the same university) experience "information spillover" or knowledge sharing that tends to filter throughout the cluster, leading to greater efficacy than would be the case without the cluster (Engelberg, Ozoguz, and Wang 2013). Decentralized models of university entrepreneurial ecosystems are like mini-industry clusters that allow for different specializations and information sharing, whereas centralized models are like a single firm, with the same limitations. After all, as shown by the student career outcomes on LinkedIn, there are career boosts to entrepreneurial participation on campuses with decentralized entrepreneurial ecosystems and with a STEM focus; but on campuses with centralized models and with programs focused mostly on non-STEM faculty and students, the outcomes are dubious at best, and quite possibly more harmful to student first-careers than helpful.

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Article 2. Failing Forward?: The Risks and Rewards of Undergraduate Entrepreneurism

Failing Forward?

The Risks and Rewards of Undergraduate Entrepreneurism

ABSTRACT: University-sponsored incubators designed to support student startups are spreading rapidly, but what impacts do they have on students' college experience and career plans? I examine the undergraduate startup cultures at two public university campuses in Southern California, while also interviewing entrepreneurial undergraduates across California to add field-level context. Interviews were conducted with 56 undergraduate entrepreneurs, roughly half in STEM majors and half not. Nearly all students first came to seriously consider entrepreneurism from campus programs after, not before, enrolling in college. Non-STEM majors reported more negative impacts on their academics. Non-STEM majors were also more likely to create lifestyle and consumer products with more tenuous market opportunities. Nearly all incubator participants interviewed reported an increased risk tolerance and the willingness to sacrifice for their startups, most readily in the form of time and money. Most interviewees came to see risk-taking as a character virtue and also reported increased preferences for flexible future employment arrangements. Nevertheless, STEM majors, especially at more selective universities, are more likely to quit their startup when better job offers come along—their startup experience having served as a resume boost. Non-STEM majors, especially from broader-access colleges, are more likely to keep persisting in startups, whether sustainable or not, often accepting precarious labor roles to support their startup ambitions. Without regulation, university entrepreneurism programs risks funneling undergraduates with non-STEM majors toward contingent work arrangements.

Keywords: Precarious Work, Entrepreneurship Education, Risk Taking, Student Career Formation, Startup Incubators, STEM and Non-STEM Students, Venture Labor

Stratification scholars of higher education have traditionally tended toward large quantitative studies, focusing mainly on admissions and college completion rates. But a growing group of scholars are studying the experiential core of college life, metaphorically coined an "incubator" by Stevens and colleagues (2008) because of how colleges shape students' thoughts and actions. This identity-forging process emerges on campuses from a complex interaction of class, culture, and organizational structure (Stuber 2011), and several sociologists of higher education have begun pursuing this vein of inquiry with topics ranging widely, from how campuses influence students' political selves (Reyes 2015; Binder and Wood 2013) to their sexual selves (Armstrong, England, and Fogarty 2012). A central societal concern rests with how colleges shape students' professional selves.

In this paper, I focus on student career formation in one of the fastest growing areas of campus life: the recent and robust push toward undergraduate entrepreneurism, described in a *New York Times* article as an "innovation arms race" among universities attempting to nurture the startup founders of the future (Singer 2015). At first, undergraduate entrepreneurism was primarily a curricular movement. For example, a Kauffman Foundation study (Torrance 2013) identified entrepreneurism as being one of the fastest growing areas of undergraduate education. But soon entrepreneurism was not only taught as a subject matter; universities began actively promoting it as a high-intensity extracurricular activity (Mars, Slaughter, and Rhoades 2008). Among the many forms of promotion, from Shark Tank–style business plan pitch competitions to pizza and energy drink–fueled overnight hackathons, the most intensive form of promoting entrepreneurism is the startup incubator. Designed to nurture startup

companies to market with a blend of co-working space, technical mentorship, resource support, and more, incubators have become social and cultural hubs for the student entrepreneurs in residence—for many participants, their home away from home. For these reasons, the incubator is an ideal location to study the organizational-cultural influences of campuses on undergraduates' budding professional identities.

Despite the surge of growth in this sector, little work has been done to examine how these incubator experiences shape students. Incubator marketing suggests that not only is participation a resume boost, it also empowers students to follow their dreams. But there are critics, aware of the high risks and costs of entrepreneurship, asking if students may be getting in over their heads (Rao 2015). Ultimately, in this paper, I answer the questions: How do undergraduates first learn about, and then become interested in, startups? How does participation in university-sponsored incubators impact students' academic performance, career preparation, and first-job choices post-graduation? Do outcomes differ for students at more or less selective colleges, and from different majors (i.e., STEM and non-STEM)?

LITERATURE

The New Economy on Campus: Commercialization and Entrepreneurism

Institutions of higher education in the U.S. have a long history of active participation (Slaughter and Rhoads 2004) and co-evolution (Stevens and Gebre-Medhin 2016) with the economic, social, and political changes in the broader culture. As would be expected, features of the new economy can be seen inside colleges and universities, from an increased reliance on financialized sources of income (Eaton et al. 2016), to the growing commercialization of academic science (Berman 2012), to the adjunctification of tenure-track employment (Kezar

2012). In a similar vein, undergraduates, who face a more complicated path to career entry into an economy that changes rapidly and provides less job security overall than decades past, express increased expectations that colleges will help them obtain jobs—almost nine out of ten now say that "to be able to get a better job" is a "very important" reason for going to college (Eagan et al. 2016)—up from less than 7 in 10 five decades ago.

Relatedly, local business and political leaders increasingly call upon universities to spur regional economic growth—not just indirectly, through training workers or doing basic science, as in the past—but now directly, in the sense of venture, job, and product creation (Fu and Hsia 2014; Kenney and Mowery 2014). Colyvas and Powell (2007) show how in the life sciences, faculty entrepreneurism, once a taboo form of moonlighting, has become an admired practice. Stuart and Ding (2006) similarly explain how life-science faculty gravitate toward entrepreneurship when they are in close proximity to high-status colleagues who lead startups—indeed, in some departments, startup activity is assumed, like teaching and research, as part of becoming a successful professor.

Beyond faculty, by the early 2000s, campuses expanded the promotion of entrepreneurship from an almost exclusive focus on professors and their associated postdocs and advanced graduate students, to an increasing promotion of entrepreneurism among undergraduate students as well (Mars, Slaughter, Rhoades 2008). First, this was achieved through the rapid expansion of entrepreneurial coursework, with the number of entrepreneurial courses offered in U.S. four-year campuses proliferating from 250 in 1985 to more than 5,000 by 2008 (Torrance 2013). The incubators that had been almost exclusively the realm of faculty began opening to students, with many new programs targeting undergraduate students directly (U.S. Department of Commerce 2013). In addition, promotion

of undergraduate entrepreneurism as a cultural-organizational practice has spread from its origins in research universities to smaller teaching-oriented colleges and even community colleges (Mars and Ginter 2012).

As the push for entrepreneurism training has become widespread across colleges and universities, research about it has proliferated as well, including several pieces attempting to summarize the sprawling literature. Nabi and colleagues (2017), looking at 159 articles, summarize findings on the pedagogical practices found in entrepreneurship education on campuses. Honig and Martin (2014) compare the content covered in the leading entrepreneurship textbooks in use. Bae and colleagues (2014), looking at 73 articles, find that entrepreneurial education does indeed boost entrepreneurial intentions among students, although it has a less clear impact on students actually creating startups. Martin and colleagues (2013), looking at 42 studies, find that entrepreneurial education on campuses has a positive, albeit modest and inconstant, impact on startup performance. Rothaermel and colleagues (2007), looking at 173 articles, find the literature tends to be broken into four broad areas: entrepreneurial research universities, productivity of technology transfer offices, new firm creation, and environmental contexts. The spreading emphasis on entrepreneurism, is not only in faculty research and in student curriculum, but also in high-intensity extracurricular activities—such as incubators—and modeled by high-status faculty leading their own startups. How does all of this new emphasis on entrepreneurism impact undergraduate students' college experience and the formation of their career plans?

Universities Shape Student Career Plans and Identities

Students are influenced by campus structures and cultures. The often-unspoken sets of norms

and values communicated to undergraduates while on campus by leaders, peers, and organizational arrangements—the "hidden curriculum" (Hamilton and Powell 2011)—influences students' sense of identity and action in several domains. For example, milestone studies have explored how educational institutions shape ethnic and racial identities (Tyson 2013; Carter 2006), class identity (Khan 2012; Willis 1977), gender identity (Pascoe 2011; Thorne 1993), etc. More specific to this study is how campuses shape undergraduates' nascent professional identities and resulting career paths.

Armstrong and Hamilton (2013) observed that within the same university, the influence of organizational cultures differentially shaped romantic and academic identities for students from different class backgrounds, with eventual impact on their career pathways. Arum and Roksa (2011; 2014) found that the oft-meager academic selves formed by students at many campuses—in large part because of organizational factors (e.g., grade inflation, easy majors, too intensive of extracurriculars)—leads to more difficult transitions into career and adulthood. At elite universities, Binder and colleagues (2016) found that student status anxieties and structured corporate recruiting practices funneled students into a narrow band of career options, often despite their own ambivalence toward those industries. At community colleges, Nielsen (2015) noticed that among working-class women, ambition to complete their degree represented not only a rational decision for the hope of future gain, but also a deeply moral component of their sense of self; in other words, they viewed college persistence as a point of moral "virtue" (Pg. 8). Each of these studies points to the power of campus organizational and cultural environments to have a significant influence on students' sense of self, including moral and character components, with documented outcomes on job and career pathways. Employers also look for the cultural capital students have gained during their time

in college.

Rivera (2012) found that elite employers looked for the cultural capital students gained in college, oftentimes favoring more expensive extracurricular activities (e.g., lacrosse, crew, prestigious traveling orchestras, international volunteerism) over less expensive extracurricular activities (e.g., football, baseball, campus clubs, local volunteerism) and even over traditional measures of student accomplishment, like grades and test scores. Similarly, students' goal-oriented social capital, or the people with whom students talk to about their career goals, have a direct impact on the transition from college to work, and many of these connections are developed while in college (Jokisaari and Nurmi 2005). Gerber and Cheung (2008) review the literature on how different characteristics of universities, like college quality and type, gender and racial composition, and majors and fields of specialization on campus, contribute to stratified labor market outcomes for students. Put simply, not all colleges are equal in how they set students up for transitioning to the world of work, nor are all organizational pathways in the same university equal. Ultimately, colleges and universities become metaphorical "incubators" (Stevens, Armstrong, Arum 2008) and "funnels" (Binder et al. 2016) for the development of many types of student career plans and professional identities. Therefore, as campus leaders at a rapidly expanding number of universities continue to embrace a heightened emphasis on entrepreneurism and new venture creation, attention must be paid to what impact, intentional or inadvertent, direct or indirect, this exposure has on students' career formation. There is a rising concern that the culture of university entrepreneurism leads students to shift their perspectives on unpaid and precarious work, learning to view it as extraordinary opportunity and as an investment in themselves—an investment with uncertain pay off (Zukin and Papadantonakis 2017).

METHODOLOGY: TWO CASE CAMPUSES IN STATEWIDE CONTEXT

My study began in 2015 with a review of websites of 119[11] regionally accredited four-year universities in California to see how many extracurricular startup programs existed for undergraduates. I chose California because of its highly developed entrepreneurial culture and its large set of colleges and universities. I searched each campus website using the terms "incubator," "accelerator," "entrepreneur," and "innovation" to look for campus startup programming. Then I looked through the first five pages of search results and wherever I could find a startup incubator or related program, I tracked what services and resources were offered to undergraduates. If I could not find that information on the program website then I would contact their staff to collect it.

Statewide Overview: There were far more entrepreneurial extracurricular programs than there were universities, as many campuses were home to several programs. Dozens of centers for entrepreneurism exist across the state as well as over 100 entrepreneurial clubs and pitch-fest type events, not to mention technology-transfer offices and industry-affiliate programs that host an array of startup-promoting features. However, I was particularly interested in incubator and accelerator programs because they typically include a centralized place to gather and work, as well as significant time durations—creating a more culture rich environments for examination. Across the state, I identified 61 incubators and accelerators (from this point forward simply referred to as incubators[12]) offering access to

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[11] Excluding graduate-only campuses as well as special-focus campuses like divinity schools, law schools, or medical schools—even if they had small undergraduate programs.

[12] While there are some distinctions between these two formations outside of universities, inside campus environments the differences are blurred. For example, campuses rarely take equity from students (more common in accelerators) or charge them occupancy fees (more common in incubators),

undergraduates[13] (see Table 1).

The nine University of California (UC) campuses that enroll undergraduates had 32 startup incubators between them. The California State University (CSU) system had nine startup incubators among their 23 campuses. Of private campuses with more than 1,000 full-time students, 16 of 41 had incubators. Stanford had several programs that encouraged startups that I did not include in this count because of ambiguous language about their actual entrepreneurial resources. For example, I did not categorize the "d.school" for design thinking as an incubator because it is more of a general innovation training space than specifically dealing with entrepreneurs. Small private campuses, those with 1,000 or fewer undergraduate students, were the least likely to have incubators, with only four among the 34 campuses housing one. Lastly, the 12 for-profit campuses that I examined had no incubators. This indicates that the likelihood of a campus promoting undergraduate entrepreneurism via an incubator is associated with the university's size, resources, and, to some degree, research footprint. Furthermore, 42 of the 61 programs had been started within the previous five years, indicative of the recent growth in these types of programs. In later field observations of the startup ecosystem at the University of California San Diego I found additional incubators that had escaped my web screening of campuses, so I consider these counts in Table 1 conservative at best.

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and campus timelines are typically based on cohorts following academic years for both types (outside universities, incubators are usually longer in duration, due to the rent-based business model).

[13] This includes graduate program incubators allowing undergraduate team-members to participate.

Table 1. University-Sponsored Startup Incubators in California, 2015

Institution Type	Proportion with Incubators	Total No. of Incubators
University of California*	9/9 (100%)	32
California State University	8/23 (35%)	9
Larger Private Campuses**	11/41 (27%)	16
Smaller Private Campuses**	4/34 (12%)	4
For-Profit Campuses	0/12 (0%)	0
TOTALS	32/119 (27%)	61

**Not including UC San Francisco because it is a graduate-only university in the medical fields.*
***Larger defined as more than 1,000 Undergraduate FTEs, Smaller as 1,000 or less.*

I chose to focus on two case campuses in the same metropolitan area for deeper field ovservations, the University of California San Diego (UCSD) and San Diego State University (SDSU). They occupy different tiers of the post-secondary hierarchy; UCSD is part of the higher-tier 10-campus University of California (UC) system and SDSU is part of the middle-tier 23-campus California State University (CSU) system. In addition to interviews and field observations at my two case campuses, I also drew interviews and website observations from incubator programs at 10 other campuses (both public and private) across California. I wanted to compare incubator outcomes at campuses from a range of rankings levels.

The more selective campuses in this study are those that the US News and World Report's (USNWR) 2016 College Rankings listed as part of the top 50 national universities, and include: Stanford, University of Southern California, UC Berkeley, UC Los Angeles, UC San Diego, UC Irvine, and UC Santa Barbara. Broader-access campuses in this study are defined as the campuses categorizes as regional universities (instead of national universities), except SDSU, which is listed 140th among national universities. The list of broader-access campuses in this study include: SDSU, Cal Poly San Luis Obispo, Cal State Fresno, Chapman University, and California Lutheran University.

I use inhabited institutionalism, a theory and method that wed neo-institutional theory

with symbolic interactionism (Hallett and Ventresca 2006). As a result I am keeping an eye on broader cross-organizational and institutional trends in campus incubators, as well as the idiosyncrasies displayed by inhabitants of my two case campuses. Including interviews from other campuses also helps me determine which influences on students are unique to my cases and which are more common across university incubator programs, increasing the generalizability of my findings. Finally, my emphasis on campuses from a broad range of rankings helps contribute to the "missing middle" (Gumport 2008:354) in the sociology of higher education, as a disproportionate number of studies have tended to focus on either the most elite or the least-resourced campuses in the postsecondary field.

Student Interviews: Just over half of the undergraduate incubator programs that I inventoried had pages on their websites listing the startup companies they were housing. I used these lists to compile contact information for over 300 undergraduate participants of campus incubators from across the state. I emailed students to request interviews, many had graduated and no longer used their campus emails, so I used LinkedIn to reach out to them. Respondents came from 12 campuses.

I conducted 56 undergraduate incubator-participant interviews, with nearly two thirds coming from my two primary case campuses (18 from UCSD, 17 from SDSU, and 21 from the remaining 10 campuses). All of the interviews were approximately 45 minutes in length and covered several topics related to when and how students joined the programs, questions about their experiences with their startup and with the campus-sponsored incubator, and questions about their future career plans. All interviews were voluntary and done under the understanding of confidentiality—thus I use pseudonyms for any quotes I share from my undergraduate participants. (See Table 2 for student interviewee demographics by gender,

race, major, and campus selectivity.) It turned out that 38 of the students listed on campus incubator websites had already graduated a year or two earlier, and the mean age of the respondents at the time of the interview was 24.3 years. I continued to follow student interviewees via LinkedIn for 18 months after the initial interview, particularly watching for job changes and startup survival. In particular, I wanted to see if there were differences in career outcomes based on the ranking of the campus they attended and the major they had. As mentioned previously, my campuses were divided into higher-ranked national universities and lower-ranked national or regional universities. I further divided students based on their majors into one of two categories, STEM or non-STEM majors. All interviews were transcribed and then coded for themes and patterns in Dedoose qualitative research software. Several codes were used based on their experiences in the incubator and with their startup, their career plans, and their academic performance.

Table 2. Interviewee Demographics

Undergraduate Incubator Participants	n=56
Gender	39 Male, 17 Female
Race	26 Asian, 24 White, 3 Hispanic, 3 Black
Major	29 STEM, 27 non-STEM (20 Business, 7 Other)
Campus Ranking	34 Higher Ranked, 22 Lower Ranked

Field Observations at UCSD and SDSU: When I first began collecting data at UCSD, I knew of four incubator programs. Two years later, one had closed, six more opened, and plans for additional ones were in the idea stages. Several startup pitch competitions, speaker

series, and entrepreneurship-related courses existed. A newly launched Office of Innovation and Commercialization (OIC) was tasked with coordinating the sprawling startup initiatives and kicking off a new campus-wide startup conference. In contrast, most of the entrepreneurial programs at SDSU were merged into a single program, an incubator and entrepreneurship institute called the Zahn Innovation Platform Launchpad. One other long-running startup program still existed in the business school and also offered formal curricula in entrepreneurism. At both campuses, I attended over 20 events, workshops, and meetings. In addition, I read the published print materials and watched the video materials issued by the incubator programs. This paper relies more heavily on student interviews than on field observations.

FINDINGS

Students Learn to Seriously Desire Entrepreneurism After *Enrolling in College*

From interviews and correspondence with incubator staff, I was under the impression that the spread of incubators was in response to an increasing student demand for entrepreneurial training. However, I was surprised to find from my student interviews that very few students reported having strong desires for entrepreneurism before coming to campus, nor much previous knowledge about entrepreneurism or their campus' startup-related programs. A full 45 of the 56 student interviewees said they had no idea the incubator they participated in even existed when they first arrived on campus. Ten said they had some ideas of their campus's entrepreneurial reputation, and only one claimed strong advance knowledge of the campus's startup resources—mainly because he had already started his company before enrolling. Certainly, students have basic ideas about entrepreneurship in general, and some

interviewees had parents who owned small businesses, but few knew any specifics about creating startups and much less about the incubators and programming available at their chosen campuses. Ethan's[14] experience at UCSD, for example, was very similar to what most students shared:

> Nobody ever really talked about entrepreneurism when I was in high school; no one ever really thought about that. But once I got to college, everyone seemed to have a much better knowledge of it all, and I met people who've done startups and there's these events. And you kind of find out about it that way; you find out about it later on.

A combination of startup events and peer word-of-mouth were the most commonly cited ways of learning about entrepreneurism on campus. Per interviews and field observations, startup events typically consisted of pitch competitions evaluated by judges or audiences, team hackathons, product demo days, and other events that provided a similar combination of competition and camaraderie. At SDSU product demos were practically unavoidable on certain days, with student-entrepreneur booths lining the main campus mall—evoking a startup-themed farmers market or career fair. For business majors, another common way of learning about campus incubators came from announcements made in class, especially for those who took entrepreneurship courses. No students from other majors said they learned about incubators from in-class announcements. Thus, despite administrator claims that the expansion of entrepreneurial offerings is in response to growing student demand, campus startup programming is creating much of its own demand—with students catching the desire from campus programming.

[14] All student names are pseudonyms to protect their confidentiality.

Campus Entrepreneurial Culture: The Valorization of Risk-Taking as Character Virtue

Contemporary entrepreneurial culture has certain distinguishable features; for example, it tends to be male-dominated and tech-oriented (Mundy 2017). It also contains certain value sets shared by most of its constituents, such as promoting long hours, eschewing traditional "nine-to-five" employment culture, celebrating failure, and venerating risk-taking (e.g., Lyons 2017, Stewart 2015). While these features emanate from Silicon Valley as the cultural Mecca of the startup ethos, they also find their way into a diaspora of settings which champion entrepreneurism.

Field observations at the two case campuses, UCSD and SDSU, revealed that these values—and especially risk-taking and the celebration of failure—were prominently promoted by both students and staff in incubators. At UCSD, during a pitch competition in an undergraduate incubator called The Basement, Stacey, a staff member from the advancement department (the unit overseeing The Basement) told the gathered audience that "we celebrate failure." The venture capitalist speaker she introduced added, "We have nothing to learn from success; failure is the only teacher." This emphasis on accepting failure goes hand-in-glove with the message to take big risks. For example, a promotional trailer for UCSD's student E-Challenge business plan pitch competition features Chancellor Pradeep Khosla[15] saying, "The risk is not about the money that you may have or may not have. The risk is about your aspiration. So, you want to evaluate the risk not in terms of the stability of your situation, but more in terms of your aspirations. What is the risk of not achieving your aspirations?"[16]

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[15] Names of public figures are not pseudonyms
[16] https://www.youtube.com/watch?v=yPbFNx57Evw (Start at 0:55)

The video played to a several-hundred-strong audience at a kickoff event at the beginning of the 2016–2017 academic year in hopes of drawing more participants into that year's competition. The keynote speaker, Mark Bowles, a serial entrepreneur and venture capitalist, shared his story about a string of failures before finally hitting it big and selling his company for millions of dollars; it was a narrative arc frequently recounted by guest speakers at both campuses. His advice to students was to keep failing until they grew a thicker skin to it, because one never knew when success may be just beyond the next failure.

A guest speaker at an SDSU event gave advice that I subsequently heard repeated by several student interviewees: "Fail fast, fail forward." The catchphrase appears to have several potential sources of origination. When asked what it means, one engineering student said it has to do with iterating prototypes of minimum viable products, citing Eric Ries' popular book *The Lean Startup* (2011), in which sense it could almost be understood as a tool for risk mitigation—testing low-cost versions of products to find market fit before allocating more resources to develop them. But this was not how most of the other student interviewees understood it. Most commonly, I was told that to "fail forward" meant that one had learned from the mistakes of previous failed startup attempts, helping assure that the next startup attempt would be more successful. With failure downplayed, and in some instances even celebrated, risk-taking becomes destigmatized. Ryan Berman, a San Diego startup founder, marketer, and regular speaker shared with students that, "Risk mitigation is courage mitigation," and challenged them to be "courageous." Examples like these illustrate how risk-taking has transformed from a rational calculation (e.g., "How much is sensible to invest?") into a *virtue* (e.g., "Be courageous.") in mainstream startup culture.

Student comments across all campuses reveal that this message does not go unheard. When asked if they have become more risk tolerant as a result of their time in the campus incubator, 53 of 56 said yes. One said no because he claimed he was already a big risk-taker to begin with, one said she was more "risk aware," and the third said he was better at calculating risk.

An increased risk tolerance was self-reported by student participants from both higher and lower-ranked campuses, with remarkably similar sentiments. For example, Melissa, who was a Science, Technology, and Society major at Stanford said, "I have definitely become more risk tolerant, and I think I have become more failure tolerant from being in the incubator. I think it helps you realize that every time you fail, and maybe this is super cliché and cheesy, but every time that you fail it brings you a step closer to success." Similarly, Tom, an Economics and Psychology double major at California Lutheran University said, "They say 9 out of 10 startups fail, you know, so I am not gonna be upset you know, and go cry if this startup fails, because then it is on to the next one."

Students also picked up a notion from their time in the incubator that they can risk much more now precisely *because* they are college students. Lakshay, at SDSU, put it well, "I tell other college students to take big risks now because in 10 to 15 years they can't take these risks anymore because they're going to have a family or children and a lot more responsibilities." Eliza, at UCSD, echoed that idea: "I feel while in college, there's really no risk involved, just because if you fail, either you waste a semester or you kind of put internships on the back burner. But the worst-case scenario is that you move on to the next project." The idea that college is a risk-free time of life makes it easy for students like Eliza to ignore the potential opportunity costs of putting internships on the back burner.

Jared, also at UCSD, likewise valorized this seize-the-day mentality and noted that it came from years of exposure to entrepreneurial campus culture. In a sense, then, incubators can directly or indirectly indoctrinate undergraduate participants into a Silicon Valley–esque ethos that celebrates failing one's way forward. Jared shared takeaways from his UCSD entrepreneurial experiences regarding risk:

> One important thing would be really just don't be scared, really put yourself out there, be brave. . . . Maybe I'm speaking like this because I've read books like Elon Musk's and heard other students talk this way. But I think that at the very beginning of the startup you have to take all the risk that you have. At least that's the kind of mentorship I got, and that's what I learned. I've definitely learned how to take risk and become very risk tolerant over the years for sure.

When I asked if he was ever cautioned by program staff about taking too big of risks, he replied, "No, not really. That more came through just, uh, the school of hard knocks I guess." In the interview, Jared shared that he had three failed ventures thus far. Likewise, when I asked Melissa from Stanford if she was taught anything about taking precautions, she replied, "I don't think anything super explicit like teaching you how to calculate risk." She continued, "Just kind of a lot of motivational talks from different entrepreneurs in the Valley who talked about the times that they've failed and the times they succeeded and the risks that they took." But as shared by my interviewees sacrifices and costs were more common than successes and rewards.

Sacrificing for the Startup

Almost every student interviewee described sacrificing in some way for his or her startup, with a wide range of investment types, including: working for cheap or free, turning down other job opportunities, spending savings, putting business expenses on credit cards, and borrowing from family and friends. While none of the students had taken out small-

business bank loans or gone into extreme company-related debt, for many of these young people, what they had chosen to sacrifice still represented the largest financial decision(s) of their lives.

Many of those who had joined another undergraduate student's startup talked about their main sacrifice coming in the form of working below market value or, more often, working for free with the hope of some eventual equity stake in the company, *if* it became sustainable. At SDSU, James, who was chief marketing officer for an app startup, recounted a story about how the 21-year-old undergraduate CEO of the company felt that it was time for the rest of the team to shift to full-time commitment, just as they were all nearing graduation. James, working in sales for the startup, was otherwise unemployed at the time, but a few of his computer-science teammates working in the app development side had received strong post-graduation job offers elsewhere—and had a hard decision to make. James recounts how he helped them commit to the startup:

> It seemed like everybody was waiting for one guy to say they'd do it. I didn't have anything else at the time, so to me it was like, I don't necessarily see a better alternative, so I just jumped. I was the first guy to say I'd go all in, you know. I pretended that I had something to quit. I said, "I'll quit everything I'm doing, and I'll do this!" and these guys were like "Then I'll quit too!" Oh my god (chuckles), they had a lot more to leave than what I was doing. Two had like $70,000 job offers; it was easier for me just because I was at the lowest point anyways.

His actions inspired the other students to turn down their more substantive job offers and join full-time. Nearly a year later at the time of the interview, all of them were still working there as independent contractors (IRS form 1099), receiving relatively meager pay, and worried that the next few paychecks may not be steady if they could not get another round of venture capital investment soon—as their first set of investments, over $100,000, was rapidly running out.

Student sacrifices were not only material, but also emotional. Jada, a Business major at SDSU, shared how she felt as if her entire identity was shattered when the startup she had joined failed. Jada had worked in a startup led by another undergraduate between 20 to 30 hours a week, for free, for two years. She reflected on the failure: "For at least two weeks I was just numb. I had ate, drank, slept, and breathed the startup. I was entrepreneur girl. Who was I now that I had told everyone I was an entrepreneur, but I didn't have a startup?" After what she assumed would be her full-time job upon graduation evaporated, she took part-time secretarial work as a stopgap to cover her overhead until she could figure out her next career move. Months later she joined the startup James, mentioned previously, was participating in.

Undergraduates directly or indirectly involved in this study proved incredibly willing to work without pay. Every single startup team represented by my interviewees had recruited, at some point along the way, other undergraduate "interns" to work without compensation, and two of the startups had each recruited dozens of unpaid interns over a two-year period. The incubator-sponsored campus events helped facilitate this process. They hosted career-fair-style recruitment events and lent an aura of legitimacy over their startups in residence, prompting many students to see them as great internship opportunities, although in most cases the all-undergraduate-led startups were far from stable, and many were very early stage.

As for spending and borrowing, several students had tapped into personal savings to get their startups going. John, an engineering student at SDSU involved in a startup that creates kegged coffee products, said, "I've spent my summers working, and I put every dollar I made into the startup, and then both my business partner and I have had to borrow money from family that we are currently paying back monthly." The vast majority of students interviewed, if they had not done it themselves, at least knew someone who had borrowed

from their parents. Jared, at UCSD, told us about one member on their team who did it for the rest of them: "One of our cofounders comes from a better-off background, and so he actually took out a personal loan from his father. . . . I believe it's about ten grand; it's a pretty hefty amount." No clear equity advantages to this team member had been discussed. Others did not want their parents to know about their investments. Lauren, at UC Berkeley, shared that one of her cohort-mates in the incubator "sank three or four grand into a food truck startup while he was still a student. I remember for him that was kind of a huge risk. He didn't tell his parents about it—it was all his life savings—just kind of hoping that this food truck would succeed. . . . It has been very stressful for him."

Rather than discouraging students from borrowing from their families and friends, several interviewees said the incubator staff treated borrowing as an expected first source of funding—unless they were winning competitions or successfully crowdsourcing (e.g., Kickstarter, GoFundMe), and typically well before approaching angel investors or venture capitalists. Navya, a Retail Design major at Stanford, shared that she and her team members planned to ask their parents as their first step: "We just heard a lot about friends and family fundraising. I think that was a big one they were talking about as an easy way to start, along with Kickstarter." However, borrowing was not easy for all. One group of interviewees at UCSD, for example, had actually dissolved their startup, as well as their friendships, because not all of the members were willing or able to ask for equal amounts from their parents.

Jared, an Environmental Engineering major at UCSD, went as far as to say that if you had not sacrificed by putting your own money, or the money of your family, into the startup, then why should any other investor trust you or invest in you when you have "no skin in the game?" Marcus at Chapman echoed this sentiment: "A lot of people get capital from their

family, credit cards, I have a line of credit. It's one of those things where you cross from *want*-repreneur to entrepreneur, when you're willing to take in debt, because it shows that you're committed and dedicated." In other words, for Marcus, those unwilling to go into debt for their startup are just "wannabe" entrepreneurs, not willing to risk enough to be taken seriously.

After hearing several of these stories, I began asking if the incubator staff were doing anything to help mitigate risks that might be unwise for some students to take. A few students did see the degree of undergraduate risk-taking as problematic. Dustin, an English major at UC Irvine, shared his surprise that nobody told him how he should allocate his resources and time:

> They didn't really help out with that. It was more of like if we had already decided on pursuing something they could help with that. It would have been useful if they had been a little more articulate about what they thought were good investments of time and money. Especially because I went into college kind of like a loose cannon.

Derrick, a Business major at SDSU, saw other undergraduates making mistakes all around him. He explained, "Some are too willing to throw, excuse my language, but throw shit at the wall and see what sticks, you know? Like they're just too trigger happy, and sometimes you need to be a little more conservative about your decision-making and especially with capital. Like if you're spending money on it, you should make sure it's the right decision." Lastly, Rohan, a Mechanical Engineering major at the University of Southern California, whose bike-sharing app eventually failed, lamented:

> I don't think we were ever evaluating our personal risk when we were in the incubator, just things like when it came to strategy, or how to test and grow the business, those were the conversations we had. But, god, the risk conversation that I wish we would have had was, "How long can I do this and at what point do we pull the plug?" And this wasn't addressed, everybody was like, "Just do it!" I feel that student entrepreneurship is not properly handled yet. Some of the things that clouded our judgment was this constant positivity around us. It made us think we had more momentum than we did, and it kept us going.

The encouragement and enthusiasm kept them going longer, which cost them more, than Rohan wished they had sacrificed.

Negative Academic Impacts, But Less So for STEM Majors

I also asked several questions about the effect incubator participation had on student's academic dedication and performance. Over two-thirds (42 of 56) of respondents said they had less time for assignments and studying because of their startup and incubator participation, and just over half (31 of 56) said that their GPA was lower as a result. Two students, both engineering majors, said their GPAs might be higher as a result.

Notably, STEM majors were more likely to say their entrepreneurial participation had little or no negative impact on their GPA, while non-STEM majors were more likely to say it had at least a somewhat negative impact. This was because for STEM majors, their products were often direct extensions of technologies they were learning in classes or working on with faculty members. Non-STEM majors were considerably more likely to be building web apps, consumer, or lifestyle products and considerably more likely to be part of all-undergraduate teams. As for persistence to graduation, the vast majority of students did not say that they had or were seriously considering dropping out of college because of their startup. Three interviews, however, had already dropped out—one of whom did so as a requirement of his Thiel Fellowship (grants given to young entrepreneurs from PayPal founder Peter Thiel, who garnered media attention for taking a negative stance toward higher education). All three expressed intentions of going back to earn their bachelor's degree.

Startup Participation on Resume Development, Internships, and Desires for Future Work

The students in this study unanimously felt that their experience with their startup and time in the campus incubator had strengthened their resumes. However, only 27% (15 of 56) of my interviewees had managed to do an internship or other employment as an undergraduate apart from their entrepreneurial activities, a considerably lower number than the two-thirds completed by college students nationwide (NACE 2016). Most interviewees considered their startup an equivalent experience to a traditional internship that made it unnecessary to do both.

Students' confidence about the perceived valued of their startup experience to potential employers ranged. On one extreme of optimism, Seth, a Business major working on a rock-climbing-themed website at California Polytechnic University, San Luis Obispo, said, "Say everything fails, you know, like that's not even that big a fear because it's like, with how much we've learned from this we could go get any job we want after this." A few STEM majors had very specific examples of techniques or software that their startup projects concretely demonstrated. Several more students, especially the Business majors, emphasized the soft skills associated with entrepreneurism that they believed employers wanted, including: people and leadership skills, a preference toward action and innovation, and ambition or drive. When asked why they believed these skills were in demand by employers, several mentioned that they had been told this by incubator staff, mentors, or speakers. Nevertheless, at least one student's experience after graduation provides reason for pause. Mark, a Political Science major at SDSU building a web-based business, decided to apply for jobs when his company hit a rough spot and he needed money. In a job interview, the hiring manager balked at the CEO title on Mark's resume and wondered out loud if he would be able

to follow instruction in a traditional company not dominated by peer culture. Ultimately, Mark did not get offered the job.

I asked each interviewee what his or her views were toward potentially working for a non-startup company in a more traditional full-time employee role. No student said he/she preferred traditional employment, 12 said they could be happy either way but slightly preferred startups, 26 said they strongly preferred to work in startups given a choice, and 18 said they would exclusively work in startups no matter the circumstance and/or planned to be serial entrepreneurs for the duration of their careers. A few of the engineers said traditional employment was fine with them because they were engineers before they were entrepreneurs, and as long as they were able to innovate products, the job would be relatively the same—still entrepreneurial, even if not in a startup. But outside of that group, most identified as entrepreneurs first, which in their minds had become synonymous with alternative employment situations.

Brandon, at SDSU, a Mechanical Engineering major working on brewing tools for the craft-brewing industry, said gleefully, "I'm ruined for normal employment (laughs). I probably wouldn't be a very good employee. I would ask too many questions and want to try too many of my own things." Donald, an Electrical Engineering major at UCSD, offered:

> I actually joke about it with a friend all the time. We tease each other, "You want to work that nine-to-five life?" (contorts face and uses sardonic tone). It's kind of boring. I definitely seek excitement in things that are less predictable. Making decisions with 60% of the knowledge and making the most out of that. Most people wouldn't take risk as much as entrepreneurs do. Take ideas to reality: that's where it's at.

Others simply liked the flexibility that they believed entrepreneurism would bring, such as Andrew, a Computer Science major at UCLA, who explained, "I like working for myself and, you know, having my own schedule. And being an entrepreneur really fits that,

like, life that I want." The students began to display attitudes that align with what Vallas and Prener (2012) show is an emerging national discourse that encourages workers "to embrace a seemingly rebellious posture toward bureaucratic employment, construed as anathema to personal fulfillment and creativity" (P. 347). For example, Kiaan, a Business major at UCSD, told me "I don't want to work for anybody, because I don't like listening to anybody."

Nor were my interviewees' outlooks on future employment typical of their non-entrepreneurial peers, at least in their estimation. Ana, a Computer Engineering major at SDSU, spoke of the difference between her entrepreneurial mindset and what she called a "job mindset," saying that most of her peers have a job mindset that they picked up from their parents, a sense of a structured path: "You go to school and you get a job, you do this and you get a job. . . . If you're in the job mindset, it's really hard to stray off of that path and go and do your own [company]." Vivaan, an Engineering major at UCSD, who had graduated a few months before the interview, shared the surprise his parents and his friends expressed at his choice to pursue his company instead of looking for a full-time engineering job:

> They think I'm crazy. They're like, "Why don't you go get experience first, and save up some money?' But I want my own time and my own thing. If I have to [get a job], then I have to. But I would want to do something else. I already know what my next company idea will be.

While many, if not most, college students might say that they would like flexible work arrangements, there is a perceptible difference between the full-time positions most college graduates apply for and the active choices made by several of my recently graduated interviewees. However, in the 18-month follow-up, despite articulations across categories of student desires for alternate work arrangements, clear distinctions began to emerge around who did or did not pursue startups.

Significant Gap in Employment Outcomes Based on Type of School and Major

Just as university campuses are highly stratified (e.g., Davis and Zarifa 2012; Gerber and Cheung 2008), so are the resource capacities and quality of the campus incubators among them. Within-university stratification can exist between the several incubator programs at some large research universities, but even more pronounced is the between-university stratification linked to the resource contexts of the parent institution. At one end of the extreme, for example, is StartX, an accelerator at Stanford University that launched the Stanford-StartX fund in 2013. The Stanford-StartX fund has already distributed over $119 million to over 230 StartX companies[17], and is known for its deeply embedded relational network ties to Silicon Valley (Fu and Hsia 2014). At the other extreme are any of the several entrepreneurship spaces, typically at small colleges, which offer drop-in work desks and free internet, host an occasional speaker series, introduce students to local businesspeople as mentors, and host business pitch competitions—the smallest I saw across the California campuses offered its winner a $100 Amazon gift card, a far cry from the tens of thousands of dollars awarded to winners at other campuses. But as revealed in the 18-month follow-up, entwined with this university resource stratification appears to be the bigger role that STEM-based startups play, and especially at more selective research universities.

All 56 of my interviewees had LinkedIn profiles that I tracked. At 18 months after the point of their first interview, I took an inventory of which students were still persisting with their startups (whether full-time, part-time, or as a side activity) and which students had solely taken employment elsewhere (see Table 3). Several interviewees had started graduate

[17] From StartX website: http://startx.com/faqs#question-6b (as per Sept. 8, 2017)

programs, but all 56 had a current employment situation listed—either their startup or a new startup, or some other employment or full-time internship opportunity at larger companies.

Table 3: Persisting in Startups Versus Acceptance of Full-Time Employment Opportunity

	Non-STEM Major	STEM Major	Totals
More Selective Campus	5 of 9 Persisted (56%)	8 of 25 Persisted (32%)	13 of 34 Persisted (38%)
Broader-Access Campus	14 of 18 Persisted (78%)	2 of 4 Persisted (50%)	16 of 22 Persisted (73%)
Totals	19 of 27 Persisted (70%)	10 of 29 Persisted (34%)	

Entrepreneurial students at selective campuses were far more likely to have been STEM majors (74%), while entrepreneurial students at broader-access campuses were far more likely to have been non-STEM majors (64%), most typically business majors. STEM majors who graduated from selective research universities had largely left their startups for employment at more established firms, with only 32% still pursuing their startup. Conversely, 78% of non-STEM majors at broader-access universities had chosen to remain working on their startups instead of acquiring other forms of employment. On one hand, the high entrepreneurial persistence rates among non-STEM majors at broader-access campuses could be viewed as a positive. The campus resources being spent to promote entrepreneurism are clearly having an effect on students' career directions. But on the other hand, the interviewees' narratives around the types of products made and quantities of sales achieved clearly favored the work of STEM majors from more selective campuses. For STEM majors, especially at selective universities, incubator participation appears to function more as a resume booster leading to traditional employment, at least within the first couple years after graduation, than it does as a launch pad into post-graduation entrepreneurism. For the non-STEM majors, especially at

broader-access colleges, incubator participation appears to create more lasting entrepreneurial efforts—even though none of my interviewees' startups from this category had become economically sustainable yet and several had taken on part-time side jobs to support their continued efforts.

Even in the first round of interviews, multiple students who had already graduated had noted that their plateaued startups were beginning to turn into "side hustles." For example, Natalie, an Art major at Cal State Fresno, decided to prioritize her part-time job over her photography business because the former paid more of her bills. This type of scenario was less common at the most selective research universities. For instance, Lauren, a Business major from UC Berkeley, said that despite assembling a strong team, winning a competition with tens of thousands of dollars in prize money, and finding a large company willing to try their startup's software at a price tag of several thousands of dollars, it was not enough when graduation approached. Lauren explained, "Even though we liked the idea of having our own company, the five of us were not, I think, inherently passionate enough about the particular product. All of us had other standing job offers that we would have had to decline as well." Lauren's startup was objectively more successful than many of the languishing startups I saw hosted by less-resourced campuses, yet the team members shut it down to take better job offers. But despite this "failure," it is hard to say that this was an unsuccessful outcome for Lauren and her classmates, compared to those startups still in existence but withering, like Natalie's photography business. However, it was only after the follow-up that I was able to see that the choice of major had at least as much to do with these outcomes as the selectivity of the university itself. Undergraduates who participate in technology and science-based

entrepreneurism show stronger employment outcomes than those who pursue less sophisticated marketing-driven entrepreneurism.

The Tale of Three Skateboarding Startups

As an illustrative case of the impact of major (STEM versus non-STEM) and campus type (selective versus broad-access) on post-graduation employment choices, I share here the stories of three white male student interviewees from three different campuses who were all pursuing startups related to the skateboarding industry. All three expressed high-risk attitudes, had novel ideas, and were passionate hard workers.

Derrick, a Business major at SDSU, had a 2.8 GPA at graduation, and while his company, which made 3-D printed LED headlights for skateboards, had been highlighted in recruitment and promo videos for the campus incubator as an example of a successful student startup, in reality sales were limping along. The company still existed at the time of the interview, but Derrick was forced to temporarily work another job he loathed at a marketing agency to support himself while he was searching for ideas for a second startup. In my follow-up 18 months later, he had left his skateboard company to be run by friends still in college, and had already left a second startup selling pet hairbrushes. His ultimate career goal was to be a serial entrepreneur, and Derrick expressed his belief that starting enough startups—and "failing forward"—would eventually lead to success:

> I would say that one out of ten companies succeed, so in my mind now I know that I have to start at least ten companies so that I know for sure that I'll be successful at one of them. . . . The grind of the nine-to-five is much harder if the dream isn't there for like a bigger picture, you know? And that's what startups do: allow you to know, or not know, but to *hope* that there's something bigger coming.

Rather than seek traditional career pathways, startups give Derrick a sense of meaning and "hope" that makes repeated entrepreneurial attempts, and likely subsequent failures, worth the risk in his estimation.

Ethan, a Structural Engineering major from UCSD, had a 3.4 GPA at graduation and was part of a startup making a modular device that could transform any regular skateboard into an electrically powered one for cheaper than the retail price of an electric skateboard. This company had functioning prototypes and a website at the time of the interview. In the follow-up 18 months later, Ethan had, similarly to Derrick, decided to leave the company to his friends, but instead of trying a different startup, Ethan accepted a full-time paid internship at Elon Musk's SpaceX, in the launch engineering department. He was able to gain this internship because his working electronic skateboard prototypes demonstrated a functional knowledge of engineering skills that were in demand by his new employer.

Brian, a Rocket Science major at the University of Southern California, had a 3.5 GPA at graduation. While working at a jet propulsion lab as a research assistant, he was tasked with trying out new ways to optimize carbon fiber. Brian realized how much of the material was discarded after jet and spacecraft parts were made. He founded a company making skateboards from this scrap carbon fiber. Not only does each skateboard save the discarded carbon fiber from going to a landfill, but the boards are literally made of spacecraft material and can be thrown off of tall buildings or run over by cars without breaking—as promotional videos on their website demonstrate. A faculty member with extensive company management experience joined as a co-founder, and the NASA astronaut with the longest recorded spacewalk serves as an industry advisor and de facto mascot. At the 18-month follow-up,

Brian was still developing the business, one of the top two or three most sustainable companies in my entire 56-student sample.

All three of these young men discovered their campus incubator and learned the nuts and bolts of entrepreneurism after arriving on campus. All three said they had grown more risk tolerant and more willing to take chances. All three wanted alternative employment to the nine-to-five grind. But not all three were on the same career pathways. Derrick, representing the non-STEM majors from broader access campuses, was one of the 14 out of 18 (78%) of my interviewees who chose to pursue startups over traditional career pathways. Nevertheless, he was working a side job, while making additional attempts at a new venture. Ethan, by contrast, is in the opposite quadrant from Derrick, a STEM major from a higher ranked university who was one of the 17 out of 25 (68%) STEM majors interviewed who had left their startups. Derrick, like many of those in the same quadrant, left their startups not necessarily because they were failing, but because the students could not turn down the stronger job opportunities that their startup experience helped them secure. In contrast to both Derrick and Ethan, Brian is in a category still distinct from theirs. While still too early to be sure, his is one of only two or three of my 56 interviewees whose companies appear poised to grow into sustainable and profitable businesses.

Nevertheless, Derrick was recognized at his SDSU incubator as a shining example of why other students should also participate. Many do, and like him, many non-STEM majors at broader-access campuses become more focused on starting a company and becoming entrepreneurs than on crafting products that display in-demand hirable skills to potential employers. Derrick's peers were creating companies, like he did, with products and services that also face long odds—companies selling, for example, organic sunscreen, adventure-sport-

themed t-shirts, homeless-student artwork, handmade bracelets, chewy toothbrushes for infants, brain-teaser workbooks, kegged coffee, catering services, and more. These types of goods are vastly different than some of the STEM-based products in my sample, such as a virtual-reality headset and wands for mapping DNA and other bio-informatic models, the printing of new types of metals that can more efficiently cool jet engines in extreme conditions, new blood tests that can search for several diseases from a single vial of blood instead of multiple vials, or even Brian's novel application of spacecraft-grade carbon fiber to other consumer products.

DISCUSSION

Almost all of these students arrive on campus unaware of the specifics of entrepreneurism, but gain a desire for it from campus programming and peer-influence. Again, virtually all come to see risk-taking as an important personal character trait. Most will sacrifice time and money on their startups and in most cases, particularly outside the STEM majors, their GPAs will slip because they have less time for schoolwork. Very few will have time to take on additional internships, and most will come to prefer alternative work arrangements more than they had before. But when graduation comes, only a fraction will have a sustainable venture to graduate into. This is where the divergence takes place. Some will leave their startups for traditional employment or graduate programs; these are mostly STEM majors, and especially those from higher-ranked research universities. Others will remain in unsustainable startups and pursue side-jobs to help make ends meet; these are mostly non-STEM majors (most typically business majors in all-undergraduate-led startups in the lifestyle, apps, and consumer products industries).

Because so few undergraduates have sustainable startups at graduation, campus leaders and entrepreneurship program staff should recognize that the career formation taking place in incubators is more likely to influence students' post-graduate *employment* than their post-graduate *entrepreneurism*—at least in the initial years after college completion. For those whose startup participation, like Ethan's electric skateboards, showcases functional skills that are attractive to employers, incubator participation does appear to act as a rough equivalent to a high-quality internship. Rivera (2011) has also documented the value of certain types of extracurricular activities for helping elite students gain employment in top-flight firms.

On the other hand, for those whose startup participation has mainly given them greater entrepreneurial vision, identity, and desire—but without clear resume-boosting skills—their incubator participation has largely primed them to join the alternative labor economy and/or to be unhappy with traditional "9-to-5" employment. Their greater risk tolerance, preference for flexible work arrangements, and belief in the virtues of failing forward make them ideal matches to what Neff (2012) calls "venture labor." Venture laborers are workers who bet their own labor on high-risk employment, sacrificing higher rates of pay and job stability in hopes of greater future rewards. The problem is that unlike venture-capital decisions, when wealthy individuals use rational calculations of their risk capacity to determine their risk tolerance before making an investment, the students in this study instead internalized risk-taking as a character virtue rather than as a careful assessment process. This mindset leads to instances where the students' faulty perception of their own risk tolerance largely exceeds their actual risk capacity—inducing bad betting on their own labor.

Arum and Roksa (2011) warn of the impact that high-intensity extracurricular involvement can have on undergraduate learning and the potential career detriments this can

present a few years later as students try to transition from college into careers (2014). Similarly, Armstrong and Hamilton (2013) highlight the role that "business-lite" (Pp. 70-71) majors play in helping students avoid more rigorous educational and career preparatory experiences, which are particularly damaging for students from lower-class backgrounds. Some business entrepreneurship programs on campuses function in a parallel way when the incubator teaches more about the entrepreneurial mindset and strategies for stalking venture capital than about the specialized work of sophisticated product or technology creation, supplemented by expertise from academic departments. One early winner of UCSD's Entrepreneurial Challenge competition went on to create a biotech company that decades later has an estimated value of a half-billion dollars. But just as with student athletes and actors turned stars, meteoric success stories are exceedingly rare—however, these entrepreneurial stars are brought back to campus as speakers and role models to encourage students to develop similar ambitions. This reinforces the meta-analytic findings of the impacts of entrepreneurial education in higher-education settings conducted by Nabi and colleagues (2017). They found stronger links to subjective outcomes (e.g., intention to start up, inspiration, knowledge about startups) than objective outcomes (e.g., actually starting up, long-term venture survival, financial outcomes). In both their and my study, far more students end up excited about entrepreneurism and entrepreneurial culture than the number who actually found sustainable businesses.

More research is needed about the longer-term outcomes of undergraduate startup participation. After five or 10 years, how does undergraduate participation in university-promoted incubators/accelerators impact students' career trajectories? Do the students who are still holding on to their languishing startups today continue to do so several years later?

Do they end up in similar employment situations as their non-entrepreneurial peers, or have they been permanently slowed down in their career pathways? Thought should be given to different ways incubator staff might regulate undergraduate startups, perhaps around the kinds of teams that can form. For example, is it ethical to allow more privileged students to recruit less privileged students without established protocols for how much time the joining team members can spend in a week, minimum pay levels, or how potential equity splits would be calculated (tasks typically left up to the undergraduate founders to determine)? Should there be regulations on how much startup debt (if any) undergraduate participants of incubators can take on, especially when some of the money may be in the form of student loans—which are inexpungible via bankruptcy? Should incubators bar participation if GPAs fall below a certain level, similar to the policies adopted by many sports programs?

Campus startup culture is strong, growing, and alluring to many students; and it can be highly empowering to students. I observed this firsthand more than once, such as when students landed venture capital investments or made significant sales of their products. But when performed in a way where Silicon Valley's "fail forward" values of heightened risk tolerance and celebration of failure are imported without sufficient attention paid to individual student contexts, it can result in funneling students (especially non-STEM majors and those at lower-ranked universities) toward employment opportunities that are much less stable than they might have otherwise pursued.

This is reminiscent of the "science as alchemy" critique made by Skrentny and Novick (2016), who show that the U.S. government has policies that assume that more scientists equate to more innovation and economic growth, but without a clear picture of how or why this might work; similarly, many universities are making an "entrepreneurism as alchemy"

mistake by over-assuming the link between increased student entrepreneurial involvement and increased innovation and economic growth, but also without a clear picture of how or why this works. Worse, for the many students unable to rebound from financial failure as quickly as their more resourced counterparts, they need to work to recover the money they have lost; and many reach for stop-gap jobs rather than positions intended to serve as the early rungs of an intentional career ladder. Increased risk tolerance benefits those with higher risk capacity, either because of their own capitals or those supplied by their postsecondary institutions and families. Not every student will be equally able to "fail forward," as the opportunity to fail one's way to success is often underwritten by significant privilege and/or achieved by those with inordinately honed abilities. Those who develop an elevated risk tolerance out of sync with their risk capacities or abilities are chief candidates to make bad bets on their own labor, and ultimately become the venture labor (Neff 2012) that is in ever increasing demand in the new economy. This is the potential risk of a one-size-fits-all undergraduate startup culture.

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Article 3. That's How I Knew I Was an Entrepreneur:

An Integrated Model of Identity Formation

That's How I Knew I Was an Entrepreneur:

An Integrated Model of Identity Formation

ABSTRACT: I conducted 56 in-depth interviews with undergraduate student entrepreneurs across 12 universities in California to understand how their entrepreneurial identities developed. The range of responses was both unexpected and difficult to explain with existing entrepreneurial identity literature. The sociological literature on identity is much broader, but primarily falls into three traditions of theory on how identities are constructed. One tradition, rooted in social psychology and interactionist sociology, underscores how individuals internalize identities as self-structures that become relatively stable across settings. The second tradition, rooted in dramaturgy and cultural sociology, emphasizes how individuals contextually perform their identities through various scripts and tools that can be accessed relative to the situation. The third tradition, rooted in literature on social movements and the sociology of the local, stresses how collective identity becomes nurtured and mobilized at the group level. All three bodies of literature highlight different levels of analysis and core processes behind identity construction which, as I argue in this article, are not contradictory, but rather, can be integrated to more productively make sense of complex domains of identity formation—as with the student entrepreneurs here. Some felt their entrepreneurial identity was rooted in long-held personality traits, others felt it was achieved through specific types of action, and still others felt that the experience of struggling together was sufficient to make them entrepreneurs. I offer an integrated model of the sprawling sociological literature on identity, as well as the main poles differentiating them.

Keywords: Identity Formation, Identity Theory, Entrepreneurial Identity, Undergraduate Entrepreneurs

Entrepreneurial identity formation is a relatively new concern in entrepreneurship literature. In fact, Murnieks and Mosakowski (2007) claim to be the first to apply identity theory to the realm of entrepreneurship. When Ireland and Webb (2007) conducted an extensive literature review on entrepreneurial research for the Journal of Management, they designated entrepreneurial identity as one of the top-three research areas poised to profit from future work across disciplines—sociology included, as will be done in this chapter. There are several reasons identity is an area of great import for scholars of entrepreneurship: Greater desire for an entrepreneurial identity is linked to greater startup behaviors (Farmer, Yao, and Kung-Mcintyre 2011), the more central the identity the more likely entrepreneurs will persist (Hoang and Gimeno 2010), and venture capitalists are more likely to invest in entrepreneurs who can articulate a compelling narrative about the legitimacy of their own entrepreneurial identity—not just the viability of their company (Navis and Glynn 2011). Sociologists of identity can also profit from the analysis of entrepreneurial identity because the integrated model I used offers a novel way of understanding the relationship between the sprawling sociological literature on identity.

The entrepreneurism literature on identity itself is still quite anemic. But as the number of studies in this area have begun to grow, new insights into the role and function of entrepreneurial identity have emerged. Shepherd and Haynie (2009) look at how entrepreneurs balance identities of being "different" with needs for belonging. Fauchart and Gruber (2011) develop a typology of three types of entrepreneurial identities, the self-interested "Darwinians," the socially oriented "Communitarians," and the benevolently

minded "Missionaries." Murnieks, Mosakowski, and Cardon (2014) find that "passion" rises and falls in connection with entrepreneurial identity centrality. Powell and Baker (2014) find that differences in how entrepreneurs understand their identity will shape their responses to adversity. Donnellon, Ollila, and Middleton (2014) come to the conclusion that entrepreneurial training programs in colleges do not do enough to develop entrepreneurial identity. Dominant throughout these studies are insights from social identity theory (drawn from psychological social psychology; i.e., Tajfel and Turner 2004) and identity theory (drawn from sociological social psychology; i.e. Stryker and Burke 2000)[18].

As fascinating as these studies are, most of them examine the results of identity rather than the origins of it. In addition, as I asked my interviewees how their entrepreneurial identities developed, I received an unexpectedly broad range of replies that were difficult to make sense of within the still budding entrepreneurial identity literature. For example, despite similar levels of startup achievement, some students said they had been entrepreneurs since childhood, while others said that they were still aspiring to the title. Some talked about entrepreneurship as an inherently team-oriented process and others made it out to be a lonely journey. To some it was a mindset that one could take anywhere, even into traditional employment, while others saw it as a skillset honed though specific types of action. Of course, while identity theory is new in the study of entrepreneurism, it has an incredibly long tradition in sociology, which is where I turned to next.

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[18] Social Identity Theory, promoted more by psychologists is not to be with confused with Identity Theory, promoted more by sociologists. Among sociologists there is a general understanding that human behavior emerges out of social interaction; therefore, they would be less likely to label a theory as "social" lest it sound superfluous.

IDENTITY FORMATION IN SOCIOLOGICAL PERSPECTIVE

From classical origins in Marx's class consciousness; to Durkheim's collective conscience; to Weber's account of how class, status, and political party influence group identities—rich accounts exist of how people come to define themselves and locate their place in the social world. Interest in understanding how identities develop has only grown since, not only because identity is central to helping humans answer fundamental questions about themselves (Who are we? What should we do? What is worthwhile?), but also because of the unique socio-economic conditions of late modernity—urbanization, secularization, pluralism, and globalization to name a few—which create a host of new challenges for identity formation (e.g., see Bauman and Raud 2015). Most of the identity work in the sociological literature centers on specific identity domains, such as how people develop identities around their gender (Pascoe 2012), sexuality (Ghaziani 2017), race (Collins 2008), class (Bottero 2004), or religion (Peek 2005). Other identity research centers on the cultural resources people use to construct identity, such as narrative and storytelling (Ezzy 2008; Polletta 2006), symbols and language (Sandstrom et al. 2014; Riley 2007), and roles and role models (Blair-Loy 2003; Merton 1957). Some of the work even extends to the importance of specific elements of identity expression, from hip-hop (Clay 2003) to clothing (Crane 2000) to football (Guilianotti, Bonney, and Hepworth 1994).

But beyond these highly specific identity domains, identity resources, and elements of identity expression—there are also several general theories about how identities develop. Owens, Robinson, and Smith-Lovin (2010), in their Annual

Review of Sociology article, "Three Faces of Identity" offer a tri-part division of the literature. First, they list theories emphasizing internalized social positions and their meanings as part of self-structure. Second, they name theories that emphasize culture and situational context. Third, they discuss literature that emphasizes collective identity. In the sections that follow, I build on this division, identifying touchstone literature, as well as some additional works that fit in each tradition, as well as tensions that separates each tradition.

Tradition One: Identity as Individually Internalized

The emphasis on identity as something to be internalized through some process of socialization is common across works in micro-sociology, social psychology, and symbolic interactionism. In this conception, once identity has been successfully socialized and internalized it becomes a set of relatively stable self-structures, self-concepts, and cognitive-schemas (Howard 2000). The source of this stability is varied somewhat between studies; for example, it may be due to ongoing social feedback loops, or to the role of language, or other cognitive structures. Further, while these internal structures are perceived as stable, they are not rigid. In the micro-sociology tradition, identity is understood as at least somewhat dynamic, though largely crystalized during primary socialization, or childhood. This means that identities more or less have sticking power across settings, but under the right conditions and/or with significant effort, identities can be deconstructed and gradually continue to evolve. It is this sticking power that facilitates a sense of the unique self, consistent over time and milieu. Perhaps the

most important hallmark writings in this tradition come from Mead, with his concepts of the "I" and the "Me" (1934). Though the Me is reflexive and at times aspirational, once the I has been constituted it imposes limits on the range of social action available to an individual. Another milestone piece is Cooley's (1902) work on the looking-glass self and generalized other. Both of these works offer explanations of how our deeply personal and internalized identities emerge from the interactions between individuals and society.

Other theories have expanded on the ideas of Mead and Cooley. Identity Accumulation Theory (Thoits 1983) underscores the value to personal well-being that comes from carrying multiple identities simultaneously over time. Identity Control Theory (Burke and Stets 2009) highlights the processes under which otherwise stable identity feedback loops can be challenged and stressed. The more social psychological side of this tradition commonly pulls from work by Erickson (1966) and Marcia (1966) that emphasize stages of individual identity formation that people pass through, particularly as adolescents mature into adults. Works in this tradition include all of those that focus on identity as a micro process and feature identity as internalized by an individual and then carried across social situations with relative stability.

Tradition Two: Identity as Contextually Performed

Other bodies of sociological identity literature focus less on internalized structures that are stable across settings, and instead concentrate on the influences of external social structures and situations that alter day-to-day enactments of self.

The most eminent example is Goffman's *The Presentation of Self in Everyday Life* (1959), which brings us a dramaturgical account of life as theatrical performance, complete with rotating sets, masks, scripts, and front versus back-stage environments. Though emerging from interactionist roots, Goffman shifts the locus of social activity under analysis from internalization to performance, or from the internal to the external. With this shift, because performances can change widely across sets, settings, times and places, there is a natural tendency to emphasize what parts of the self are adaptive rather than what parts are enduring.

Cultural sociology is also a largely actor-oriented and performative sub-field of sociology, especially when compared to the emphasis on internalization and socialization in the previous tradition. It is not surprising then, that cultural theories sometimes draw on dramaturgical language even if not explicitly dramaturgical, like "acting white" (Ogbu 2004) or "gender performativity" (Butler 1990); and often carry *action* titles: "Creating a Class" (Stevens 2009), "Engineering Culture" (Kunda 2006), "Manufacturing Consent" (Burawoy 1982), or "Learning to Labour" (Willis 1981). Cultural sociologists emphasize interpreting the meanings produced among specific groups of people in specific places and times. This orientation towards context leads to a natural emphasis on temporariness because contexts evolve and so do the people with them. Identity is performed, acted, and crafted. Another milestone piece in the cultural tradition is Swidler's (1986) article describing "tool kits" of habits and skills at the center of our "strategies of action" relative to living in "settled versus unsettled times." Like Goffman, the emphasis is on performance (i.e., action with our tool kits)

based on contextual settings (i.e. settled versus unsettled times); over how the tool kit was first individually constituted. To use Bourdieuian theory as a metaphor for comparison, the emphasis of the first tradition on internalization and identity durability can be likened to the habitus and shapes the probabilities that a person will come to possess certain capitals; whereas the emphasis of the second tradition on a performative and dynamic identity can be likened to how people deploy those capitals across various fields of action (Bourdieu 1977).

Boundary work (e.g., Lamont and Molnar 2002) is also central to this tradition of performative identity-making in cultural sociology. The boundaries, or markers of differentiation studied in cultural sociology, are regularly enacted within groups of relatively similar persons creating status hierarchies, rather than creating lines in the sand between opponents or enemies. Some of these boundary lines can be very subtle, nevertheless they can have consequential outcomes for individual life courses. Rivera (2015; 2012) found that boundaries as simple as preferring classier extracurricular activities in college (e.g., lacrosse instead of football) led elite service firms to judge some job applicants as a better "culture fit" than others. Students at Harvard feel they must demonstrate their identities as "elite" by entering only a narrow band of professions deemed "prestigious" enough for their standing, creating pecking orders of preference among highly similar firms (Binder, Davis, and Bloom 2016). Faculty judge the merit of each other's work using similar status hierarchy creating boundaries (2009). Lest the examples seem all about elites, examples exist in many arenas. MacLeod (2009) showed how the rifts between two groups of young men in the same

impoverished housing projects, the "Hallway Hangars" and "The Brothers," constructed their identities in relation to each other based on such boundary making processes. Similarly, Pascoe (2012) showed how identity cliques developed at "River High School" based on how boundary work was enacted around masculinity.

Tradition Three: Identity as Collectively Mobilized

The largest vein of sociological work on identities that are collectively mobilized comes from studies of social movements. Representative works include McGarry and Jasper's *The Identity Dilemma: Social Movements and Collective Identity* (2015) or Melluci's *The Process of Collective Identity* (1995). The emphasis in this tradition is on how identities emerge at the group level, instead of the emphasis on individual experiences in the internalization-focused tradition one. Polletta and Jasper (2001), distinguishing collective identity from the individualized emphasis in tradition one, argue that collective identities are not just aggregates of individual identities; collective identities make people occupying a certain category similar while individual identities make people unique.

Boundary work also plays an important role in identity refinement in this tradition, but not in the same way that it does in the cultural tradition two. Instead of boundaries within groups creating status hierarchies, here the boundaries are dividing lines between opponents—reinforcing identity in an us-versus-them fashion. Social movements scholar, Alberto Melluci writes, "During

a conflict, the internal solidarity of the group reinforces identity and guarantees it" (1995:48). This difference is illustrated well by a social movements scholar with rich cultural training, Ghaziani (2008) writes about lesbian and gay activist marches, but rather than emphasize the opponent as would be typical of a social movements scholar, his cultural analysis leads to an emphasis on the identity benefits gained from group in-fighting.

In addition to the collective movements literature, a smaller body of work on the sociology of the local, such as Gary Alan Fine's *idocultures* (1979). Belonging to a group "provokes a communal identity, and often those identities powerfully shape a sense of self" (Fine 2012:20). Examples of identity-shaping groups range widely, from a group of "corner boys" in an urban slum (Whyte 1943) to a group of Chicago sociologists in an academic department (Abbott 1999). Fine's work has also contributed to a renewed interest in group-level analysis in organizational sociology (Hallett and Ventresca 2006), as the employees of a given shop or location may develop group identities that differ from those of similar employees at a different shop or location. Eliasoph and Lichterman (2003) offer working definitions for analyzing group-based identity construction, which they call "group styles." Their three-pronged methodology instructs researchers to pay attention to group boundaries, group bonds, and speech norms (P. 784-787). Their argument is that even amid broader macro-cultural contexts, individual groups create their own meso-level interpretations and group cultures through group interaction, distinct from macro culture.

These three traditions share many overlapping sociological ideas—for

example, all of them recognize that identity is socially constructed, arising out of the interactions between individuals and their social environments. Nevertheless, because they accentuate different aspects of identity, each tradition can be thought of as comprising a unique ideal type offering multiple perspectives on how identity is formed (see Table 1 for an outline of these ideal types).

Table 1. The Three Sociological Traditions of Identity Theory

Emphasis	Core Process	Most Typical Level of Analysis	Originating Literatures	Thumbnail Description
Individual	Internali-zation	Micro	Social Psychology, Micro-Sociology, Interactionist Sociology	Internally organized self-concepts; once established, tend to be largely stable across situations
Contextual	Performance	Macro	Dramaturgy, Cultural Sociology, Boundary Work	Externally organized social settings and situations; people choose among tools, scripts, roles to enact
Collective	Mobilization	Meso	Social Movements, Sociology of the Local, Sociology of Groups	Locally organized shared meanings; dependent on group relationships and us-versus-them tensions

The three traditions are not mutually exclusive, they simply differ in what they emphasize. The first tradition focuses on identity stability across settings, while the second tradition emphasizes identity dynamism across settings. The second tradition emphasizes the role of boundaries *within* groups to reinforce identities amidst status hierarchies, while the third tradition emphasizes the role of boundaries *between* groups to reinforce identities in an us-versus-them fashion. Lastly, the third tradition emphasizes the role of shared experiences in identity formation, while the first tradition emphasizes the role of individual experiences

in identity formation. See Figure 1 for an illustration of these three poles of accentuation between the traditions.

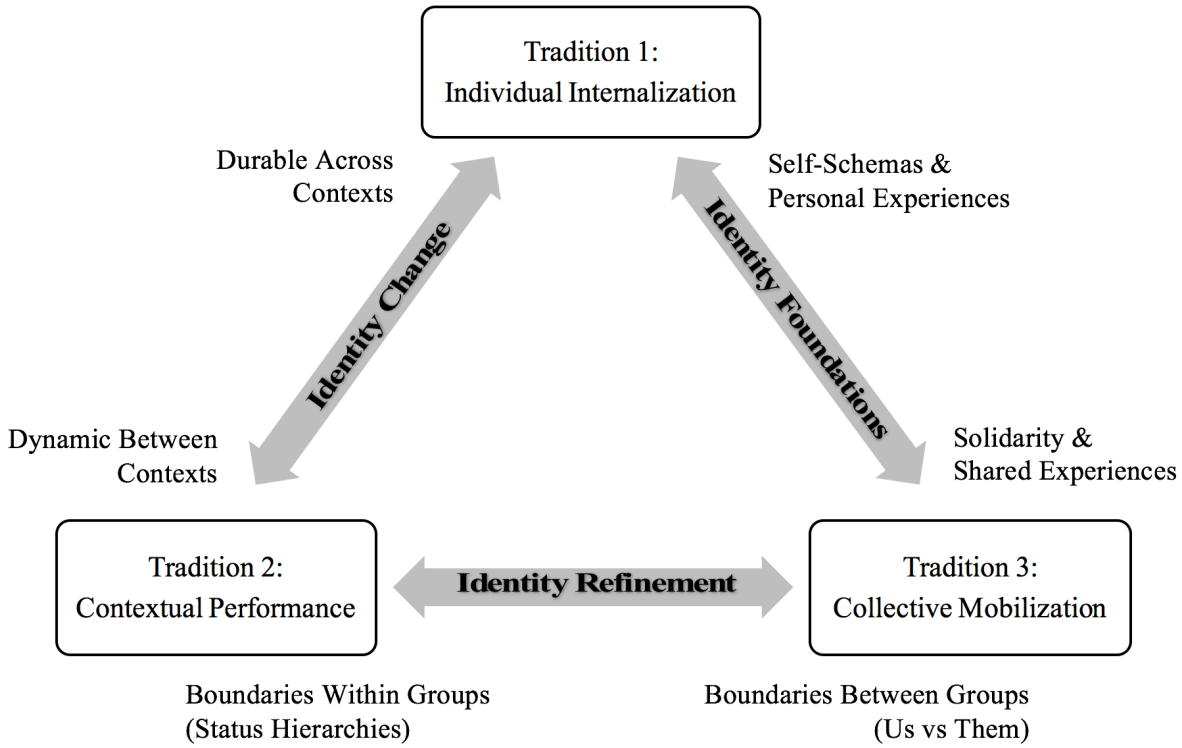

Figure 1. The Three Identity Traditions and the Poles Separating Them

While this basic tri-partitioning of the sociological identity literature is not new (Owens et al 2010), I do expand the corpus of work included in each tradition. Namely, I add the role of boundary work in tradition two, and I add work on the sociology of the local and the sociology of groups to tradition three (see Table 1) because they handle identity in very similar ways as the social movements literature with a meso-level focus. In addition, I add what I have identified as the primary tension between each tradition (see Figure 1). I first approached this literature for empirical reasons, I was in search of insights to make sense of the

complex explanations that came from my student entrepreneurs. While reading different pieces I could see the parallels between the literature and my interviewees, but because many of my student entrepreneurs also said things that matched more than one of these categories I needed a clearer way of separating the three traditions. It was not enough to know that the traditions differ, I needed to operationalize the central reasons why. Differences in the level of analysis (macro, meso, micro) made sense of why many of the scholars arrived at the differing perspectives they did. However, it was the poles I outline separating the traditions (see Figure 1) that offered the most useful analytic tool for distinguishing between my interviewees. For example, a student might use collective language "we" and in the next sentence also talk about formative individual experiences. In these cases I pressed further to see which was more central to their identity. Because there is an inherent tension in each pole, it is unlikely that an individual will equally match both extremes on any one. So in the example above, the student was either drawn more to entrepreneurism because of team experiences or more because of individual experiences, and this is reflected in their articulation of those experiences. As I approached my interviews with this set of ideal types and with the main pole of difference between each of them, I was able to choose one tradition out of the three for each student that best matched their language as they articulated the experiences they had around their budding entrepreneurial identities.

METHODOLOGY

Sample

I interviewed 56 entrepreneurs who were undergraduate participants of university-sponsored startup programs. I did not choose interviewees who were simply in entrepreneurial coursework, clubs, or other events that may not actually require a student to be actively involved in a startup. All of my interviewees were actively or very recently part of new ventures. To recruit interviewees, I reviewed the websites of all undergraduate-serving campus startup incubators[19] in four-year campuses across California—finding 61 programs. Where the websites included lists of student companies clearly indicating undergraduate participation, with contact information, I sent email requests for an interview. The initial contact list I compiled had over 300 undergraduates. However, I learned that many of the students had recently graduated, and I could not reach many of them by their campus emails. I then searched for the students on LinkedIn and eventually conducted 56 interviews before saturation in responses was achieved (Glaser and Strauss 1967). Interviewees came from private and public universities. The private campuses were: Stanford, the University of Southern California, Chapman University, and California Lutheran University. The public campuses were: U.C. Berkeley, U.C. Los Angeles, U.C. San Diego, U.C. Irvine, U.C. Santa Barbara, San Diego State University, California Polytechnic University- San Luis Obispo, and California State University,

[19] Incubators are organizational units that provide workspace for entrepreneurs, as well as mentoring, technical advice, business pitch competitions, networking events, and more.

Fresno. Each student interview lasted approximately 45 minutes and was conducted under an agreement of voluntary participation and confidentiality. The interviews were audio recorded and later transcribed. See Table 2 for a list of interviewee demographics.

Table 2. Student Interviewee Demographics

Undergraduate Incubator Participants	n=56
Gender	39 Male, 17 Female
Race	26 Asian, 24 White, 3 Hispanic, 3 Black
Major	29 STEM, 27 non-STEM (20 Business, 7 Other)
Founder Status	30 Lead Founder, 9 Co-Founders, 17 Early Team Members

Coding

The interviews were semi-structured, meaning all students were asked the same basic set of questions, but follow-up questions were asked often whenever unique narratives were shared. The questions I asked included whether or not they identify as an entrepreneur and why, and what the term entrepreneur means to them. I asked about the origins of their startups and how they first got the idea of becoming an entrepreneur. I also asked questions about when, in their opinion, a person can actually lay claim to the title of entrepreneur. Several other questions were also asked including several about their experience with their startup and with campus startup programming. All of the interviews were coded

in Dedoose qualitative analysis software.

After conducting the interviews and seeing divergent patterns in my interviewees language around their entrepreneurial identities, I wanted to make sense of these patterns and turned to the identity literature. The entrepreneurial identity literature is not yet developed enough to offer explanations for the range of responses I received, while the sociological literature has the opposite problem, it is too sprawling to easily make sense of. This is where the tri-part system was useful, but especially so when I could identify the chief point of difference between each of these three traditions—the poles in Figure 1. Therefore, if a student's transcript emphasized personal experiences forming an identity that was durable across settings, I placed them into tradition one. To illustrate, this might be something like "I sold lemonade as a kid and the entrepreneur bug has stuck ever since." If student language emphasized an identity that is dynamic between contexts and reinforced by differences between members of their own group I placed them in tradition two. By way of illustration, this might have sounded like, "I won the pitch competition, and the entrepreneurs I beat had really good product ideas, so I knew if I was better than them, I must be an entrepreneur." If a student's transcript emphasized an identity that is anchored in shared experiences with a group and reinforced by differences between their group and an opposing group, I placed them in tradition three. An illustration for this might be, "We had built product X from scratch together, only for company Y to announce they were launching something really similar—so we knew that we had to work together or our company would not survive."

Obviously, the students were not 100 percent matches for a single tradition, and there is some margin for interpreter subjectivity. For example, students might talk about the importance of being creative and having an innovative mindset (which are internalized abilities), but also talk about how execution of ideas is just as important (which are performative actions). In such cases I would press students to tell me which, in their opinion, is more important to being an entrepreneur. In each instance, one of the three would appear more dominant and ultimately, I was able to confidently place each student into a tradition that best matched how they articulated their experiences.

Of my 56 interviewees, 16 were placed in tradition one (internalized), 27 in tradition two (performative), and 13 in tradition three (collective). After the students were placed in the three broad traditions I began inductively coding them for the more fine-grained ways they articulated the development of their entrepreneurial identities.

FINDINGS

Tradition One: Entrepreneurial Identity as Individually Internalized

The theories in this tradition emphasize identity that is rooted in cognitive structures, an identity that is highly internalized, and an identity that is carried across contexts and settings. Several of the interviewees in this category explained that the source of their entrepreneurial identities came from having "entrepreneurial mindsets," or other semi-permanent personality traits. They regularly appealed to the long-standing nature of their entrepreneurial traits as

evidence that they must be entrepreneurs. They easily spoke of this identity as carried between ventures—even if the initial venture(s) failed and in a couple cases when they left startup work entirely. I unpack each in turn.

Internalized Entrepreneurial Mindsets: Donald[20], an engineering student at U.C. San Diego, said, "The word entrepreneur itself, it's more of a personality, a lifestyle instead of a profession because . . . it's just a way of approaching problems and seeing a lot of things." Jason, also from U.C. San Diego and whose company had failed, said, "Even though you might not be part of a company right now of your own, you always have that entrepreneurship mind where you're trying to always create something. Trying to create change for someone . . . it's definitely more of a mindset." Tony, a U.C. Los Angeles student working on a finance app, commented that just thinking about business ideas does not make one an entrepreneur; rather, one must be "entrepreneurial in *nature* (emphasis his), like you know, you have that innovative mindset." When I asked if he thought this mindset could be taught, he said "maybe, but probably more likely, they have it or they don't." This language of personality, mindset, lifestyle, and even nature emphasizes how these students see their entrepreneurial identity as deeply internalized within their essential self-concept and cognitive processes.

Entrepreneurial Identity Rooted in the Past: Several of these students spoke to the historical duration of their entrepreneurial identity. Jada, a recently graduated business major at San Diego State University, said, "I think it's part of

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[20] All student names are pseudonyms to protect confidentiality.

me. I think it has always been part of me." She expressed this despite the fact that she had previously revealed that she did not think entrepreneurship was for her, but then took a class in it and the instructor changed her mind. I brought this up, but she did not see it as a contradiction, rather that the instructor had helped her come to realize that she had always been entrepreneurial. Several students appealed to what they saw as long histories of their entrepreneurial identity, often rooted in childhood money-making endeavors such as mowing lawns, giving swimming or violin lessons, selling snacks at school, and even household chores for allowance money. Undoubtedly, many youths engage in similar types of nascent economic activities who do not come to view themselves as entrepreneurs; nevertheless, these students were framing relatively common childhood experiences as evidence of the unique entrepreneurial character traits that they had long carried—even before they knew to recognize them as signs of their entrepreneurial traits. Their self-narratives connected the dots in ways that made their current startup activities seem almost pre-destined, by their estimation. Anna, a computer science major at San Diego State University, explained how her entrepreneurial identity was already showing itself in childhood by telling me the story of how her father offered to pay her a nickel for every snail she could pick up from their backyard. However, Anna also went around the neighborhood asking neighbors if she could collect their snails and returned with several bags of snails. Her dad complimented her economic ambition and paid her for all of them. She went on to explain how her father used to say, "If you do what everybody else does you will end up like everyone else."

From this she emphasized, "So, it's really that mindset… [Entrepreneurism] is more of a way of thinking than actually having a specific project lined up." This idea that one's entrepreneurial identity does not require specific entrepreneurial activity was common among the students with a more internalized entrepreneurial identity, but was highly counter to the way students in the performative category saw things.

Persistence of Entrepreneurial Identity Across Settings: As most of the interviewees in this category understood entrepreneurial identity as a long-term mindset and set of ingrained traits, they also consistently said it did not even require startup activity to make it salient. Four different students in this category volunteered the term *intrapraneur,* a term used in entrepreneurship circles to describe people with entrepreneurial mindsets who have taken traditional employment in a non-startup company. All of the interviewees in this category said that an entrepreneur is still an entrepreneur between ventures, or if their startup fails, or if they had joined a startup as a team-member rather than as the founder. As Bethany, a business major at U.C. Irvine, said, "It's less about having a startup right now, and more about the kind of person you are. Are you an entrepreneur in here and here? (points to her head then heart)"

To sum up, for the student entrepreneurs whose articulation of their entrepreneurial identity most fit the first tradition, they tend to believe that they became entrepreneurs because of something that emerged out of the core of who they are. They tend to see it as something that exists in their personalities, unique mindsets, or even their natures. Despite none of the students having known much

about the specifics of entrepreneurism until after entering college, they nevertheless thought these core traits had begun much earlier, often in childhood. As a result, they believed that their entrepreneurial mindset or personality was a part of them, even between ventures or outside of startups all together. While they certainly understood that startups required dedicated action, to them, an entrepreneurial identity was something other than the actual activities required to launch a new business or organization. This view is particularly responsible for the durability of the entrepreneurial identity across settings. But this was not how all students saw entrepreneurism. Others eschewed the idea of claiming the title of entrepreneur apart from performing observable actions.

Tradition Two: Entrepreneurial Identity as Contextually Performed

The theories in this tradition emphasize identity that is rooted in performance for various audiences, regulating status boundaries within groups, and choosing among tools or scripts to enact. For the entrepreneurs in this sample, they often described feeling a need to prove their entrepreneurial identity with successes and by achieving milestones, by being more than just wanna-be-entrepreneurs (defined in various ways), and by needing to seize windows of opportunity—even in the face of fear.

The Importance of Achieving Milestones. Several students understood the title of entrepreneur as something to actively aspire for, rather than as a mindset. John, from San Diego State, said, "I'm an entrepreneur in training, because right now I'm really just, I'm learning to be an entrepreneur. The business is relatively

new and so it hasn't been that successful yet, so I wouldn't call myself an entrepreneur yet, but I'd like to be one day. So, that's the goal." Mark, a political science major at San Diego State University, said, "I'll only call myself a true entrepreneur once I've done it and I've been successful." This language of success as the marker of "true" entrepreneurism was repeated by several interviewees in this category. I began asking what their definitions of success were, that once attained, would allow them to comfortably apply the title of entrepreneur to themselves. Or likewise, what did others who claimed to be entrepreneurs need to have done for them to take that person seriously? Here answers diverged widely, but were all linked to specific actions or milestones: creating a working prototype, becoming full-time in the startup, raising money, creating jobs, selling the company, etc. Rohan, a student at the University of Southern California who was working on a bike-sharing app, answered my question with, "The most important side of being an entrepreneur is being able to scale something, and that's not something that I've done yet." This was the only category with several students, like Rohan, who did not yet claim the title of entrepreneur; an obvious break from category one, where most students pointed to their distant pasts as the time when their entrepreneurial identities were forming. Of the students who did identify as entrepreneurs, they similarly pointed to milestones that gave evidence supporting their legitimate achievement of that title. For other students, the markers ranged from very early actions to more advanced stages. For example, Natalie who had launched a photography business at California State University, Fresno, said she was an entrepreneur "when I

started a Facebook page and got a website and logo with my name on it," while Kiaan, a U.C. San Diego student working on a virtual reality–based medical device, said that the line in the sand for him was finally getting paid: "Writing my first check to myself was a really big moment."

Boundary Work by Avoiding Being a "Wantrepreneur." For these students, self-comparisons with peers was a regular theme. To them, the only thing worse than feeling like they had not yet earned the title of entrepreneur, would be to claim it too soon in the eyes of others. As Derrick, a business major at San Diego State University, said about those who claim the title without having performed enough action:

> The truth is there are a lot of *wantrepreneurs* out there. I hate saying that because it's just kind of disrespectful, but there's a lot of people who think that they want to do entrepreneurship . . . but there's a contrast between people who are doing school projects and people who are doing like funded launched products you know, like headed towards revenue with paid employees and everything.

To claim the title without performing appropriate action left one a "wantrepreneur"—which he defined as a wannabe entrepreneur, rather than the real thing. This boundary work was expressed well by Bradley, at San Diego State, when a peer overstepped it. He was at a networking event and a new member from the incubator was introducing himself to a group. As Bradley tells it, "He had just started, like barely even written a business plan; and I was like 'introduce yourself' and he said, 'I build companies.' (laughs hard) And we were dying, and I just remember thinking, 'Oh my god, I love this guy!' I mean, he's full of shit, (still laughing) but I love his audacity." Marcus, from Chapman University, said that if a person has not put personal capital or gone into some

kind of debt for their startup then they are a "wantrepreneur…because they have no real skin in the game." Similarly, others said that those who simply have ideas with no execution are not real entrepreneurs. Aaron, an architecture major at the University of Southern California, remarked, "Ideas are cheap. People overestimate how valuable their 'great' ideas are. But if you can't pull it together, it's worth about as much as the napkin it's written on."

Enacting Confidence Step-by-Step to Seize Opportunity. The students who perceived an entrepreneurial identity as arising from performative action were much more likely to say that they had never imagined they would eventually become entrepreneurs compared to the individually internalized group discussed previously. Two students working on different student-engagement apps expressed this clearly. Vivaan at U.C. San Diego said his Indian immigrant background meant he was destined to be an engineer and only gradually as his product developed did he think it could become a full-time job—something he still has a hard time explaining to his parents, "It took more than one conversation, and some of them made me sweat. But I just kept making progress [on the product] one day at a time, and now they're pushing me [about getting an engineering job] less." James at San Diego State University had just beaten a fight with cancer and was living on a minimal disability check when the opportunity to co-found the startup presented itself. His story of taking on an entrepreneurial identity evolved out of performative activities in present-tense blocks of time:

> When I got sick, everything I had worked for was gone. And so, my mindset had been you know, 'I'm already used to living uncomfortably.'

> That's why most people don't want to do entrepreneurship, because they don't want to live on that type of an income. And so, I was like well what's an extra six months? So, I did it for six months and then it was like, well this is kind of promising, what's an extra six months? And we just kept doing it for six months. At some point, I got a pay check and I was just like, 'I can keep doing this.'

Later when he was presenting at an event hosted by the campus incubator the director introduced him as an entrepreneur to the audience. James said it was at that moment, when he realized he did not feel a need to correct her, that he from then on identified with the title entrepreneur because he had, "earned it by then" from his sacrifices and activities along the way. James said the process was intimidating, and that he could not think too far ahead for fear of losing his nerve.

In multiple cases, students even spoke of needing to 'fake it till you make it.' This is opposite to the previous view of entrepreneurism as a set of internal traits—that are part of who you are. Jarred, a materials science student at U.C. San Diego, even corrected my use of the term 'traits' by saying: "*Skills*. Just generally having all the skills to launch and run a company." While skills may also be internal, they are learned and highly dynamic, not rooted in the more longitudinally static concepts of traits or personality. This view of skills over traits and action over personality is particularly responsible for the dynamism of the entrepreneurial identity across settings.

Still other students claimed they were entrepreneurs, not because of something inside of them, nor something they had achieved, but simply because they were part of a startup team.

Tradition Three: Entrepreneurial Identity as Collectively Mobilized

The theories in this tradition emphasize identity that is rooted in group-level processes. This includes how individuals were recruited or how the group was formed, any us-versus-them distinctions, and experiences of solidarity in the face of struggle. For the entrepreneurs in this sample, the unique manifestations of what these theories predict emerged as: recruitment by roommates or romantic partners (the latter for female respondents only), a belief in 'who' over 'what' as most important element of entrepreneurial success, a fight against "the market" primarily and secondarily against specific competitors for survival, and becoming galvanized by facing challenge together.

On Team and Recruitment, Who then What. Those interviewees who most prominently displayed a collectively mobilized entrepreneurial identity had tendencies to speak of how their relationships with others in the group helped them discover their entrepreneurial selves. Dustin, an English major at U.C. Irvine working on an app-based recycling service, similarly shared joining purely because of the team, all of whom had been his roommates. Dustin said, "You know, trust, loyalty, reliability—those are the core values to being on a team. . . . I joined because I wasn't working at the time and they are good friends and I was like I've got a useful brain I could probably help out. I mean, they're my really good friends. They got my back and I've got their back." Several students mentioned joining their teams because of the people, independent of the product. Brandon, a mechanical engineering major at San Diego State University, mentioned joining a startup that makes parts used by the craft brewing industry because his best friends asked him to: "I would definitely have been less inclined

(to join) if I didn't already know all three of them." Two students in this category quoted a metaphor by Jim Collins, in his business book, *Good to Great* (2001), telling me that it is more important to first pick the right people and get them on the right seats in the bus, and only then to determine where the destination of the bus is—they called this 'first who, then what.' This thinking was illustrated well by Kyle, a computer science major at U.C. Irvine, who said he imagines his team will start more than one company, selling them, and then starting new ones. He added, "It's like being in a band. There will be different albums or tours over the years, and that's fine. But if you lose the core people, you've broken up the band." While Kyle did say he identifies as an entrepreneur, he went on to tell me that if "the band" did break up, he was not sure if he would try to do another startup or pursue traditional employment. His experience of being an entrepreneur is very much bound up with being part of the team.

Identity Boosts from Fighting "the Market." There was regular talk about competitor companies, and at least one slide in every team's pitch deck identified key competitors and compared the differences between them and their own startup[21]. Nevertheless, most of the us-versus-them language was not centered on specific competitor companies and was generally leveled against a more ambiguous enemy—the market. Ryan, working on a physical therapy device startup at California Lutheran University, said:

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[21] Participation in pitch competitions is nearly universal in university incubators, and in virtually every case that I saw, and an industry standard "pitch deck" (set of slides) always included a slide about competitors and threats.

> The market has no mercy, either people want your product or not. And it doesn't care about if you're good people or deserving or whatever. So, not to be too dramatic, but we're in this fight to the death with it... It's less about, 'What is company X or Y doing?' Which does matter, but we could make adjustments. More important is if people will actually buy (our product) in the first place.

The market becomes a personified force representing the team's struggle for startup viability. Perhaps this emphasis on fighting a generalized market instead of specific competitors is indicative of the early stage of most of these startups. But it does show that the 'us-versus-them' boundary work used to boost group-level identity can be both specific groups (e.g., Uber) and/or somewhat indefinite personifications of a more ambiguous enemy (e.g., customer demand). Lauren, at UC-Berkeley, talked about this when telling me how her team had to learn to interact with potential customers with confidence. They would make up exercises to help them get over their fears of interacting with people (who to them represent the market, or customer demand), including a team game where they ran around campus filming themselves asking strangers for favors, such as piggy back rides. She explained, "The more outlandish thing you can ask for, the less scared you get of rejection. The market might reject you, but you have to put stuff out there to see or you'll never know. One time I got a homeless guy to teach me guitar. We will only make it by getting out there in the real world and interacting with people, because we can't know what the market wants by sitting in a desk." These team experiences were not only bonding moments, but for the interviewees in this category, they represented very tangible experiences of being entrepreneurial. This is very different from the need for milestone achievements

common of the interviewees in category two. For the students from category three, instead of an outcomes-orientation they displayed more of a group-journey-orientation; in other words, the experience of team participatory activity in a quest to beat 'the market' was substance enough for them to claim the title entrepreneur.

Identity Boosts from the Solidarity in Collective Struggle. To this group, even the fear of failure had a collective tone to it. They were less afraid of losing the company or economic rewards compared to the greater fear of letting their team down. Nicoletta, working on an education app startup at San Diego State University, had joined the team a year before to help her fiancé who was a co-founder and the chief marketing officer, while they were engaged:

> Before I was just kinda helping my husband. It was something I was just doing for him. But I'm full time now and there's only three of us (in sales) and I am responsible for a certain amount of revenue . . . and we have big bold goals. We are pretty much trying to 10x our revenue. And when I don't get my numbers, I not only hurt myself, but also everyone else. But seriously, my personal anxiety is being able to not disappoint the team.

She went on to describe how their cash runway was almost depleted, and she feared they would not be able to pay the team if she did not win enough sales. She felt deep personal responsibility for the team's well-being, which is what motivated her most. Roman, working on a web-startup at the University of Southern California, said "At first I was scared of failing because of what it would cost me. But now that some of my closest friends are putting their necks out for what started as my dream, I am a lot more motivated to make sure we don't fail for them. We're in it together." The company was two years old, and had six members. I asked if he considered the newer team members entrepreneurs

as well, he replied again, "We're in it together." In short, the right to lay claim to the title entrepreneur came from participation in the group struggle. See Table 3 for an outline of how entrepreneurial identity appears to map onto the three identity theory traditions in sociology.

Table 3. Entrepreneurial Identity Among the Sociological Identity Traditions

Source:	Tends to Emphasize:	Entrepreneurial Identity is:	Typifying Quotes
Individual Internalization	Personality Traits innovation over convention, passionate visionary, intangible qualities	Enduring across settings	"I have the entrepreneurial mindset Wherever I go, I see things differently." "I'd say I'm a serial entrepreneur. It's in my blood at this point."
Contextual Performance	Executed Skills action over ideas, seizing opportunity, achieving milestones	Proven by successes	"You're not an entrepreneur until you've done it. Execution is king." "I had to try it. When would another chance like this happen?"
Collective Mobilization	Key Relationships who over what, loyal solidarity, group struggle	Shared with team	"We knew we were going to start it together before we knew what 'it' was." "We're family. It's not just business."

DISCUSSION

Potential Utility of an Integrated Model on Other Types of Identity Formation

The basic partitioning of the sociological identity literature into three traditions has been previously proposed (Owens, Robinson, and Smith-Lovin 2010), and in both that work and an earlier piece by Cerullo (1997) the authors lament the lack of

interaction between the identity literatures, namely between the social psychology and social movements sub-fields. I would add that what I called tradition two, the performative and culture sub-fields, while rarely using the term identity, nevertheless do a lot of identity work—and also need more interaction with the other two identity literature traditions.

Sheldon Stryker's writings are an example of perhaps the most integrative work existing between the three traditions; on one hand, as a structuralist emphasizing broader social contexts and meanings of situations and focusing on role choice (1968) in identity formation, his work seems like a fit for the performative and context sensitive tradition two. Yet at other times he draws deeply from the internalization oriented first tradition, stressing identity at the cognitive level and places identity consistency as a key feature: "As cognitive schema, [identities] are not situation specific and can be carried by persons into the many situations they experience, affecting conduct in those situations" (Stryker2008:20). In fact, in co-authored works in a single year, Stryker explicitly draws links to both the interactionist camp in tradition one (Stryker and Burke 2000) and the social movements camp in tradition three (Stryker, Owens, and White 2000). Unfortunately, this type of integrating is rare in the sociological identity literature.

Further, situating the three traditions of sociological identity theory not as conflicting schemes, but as ideal types accentuating different elements of a mutually constitutive model was very helpful in explaining the otherwise vexing range of responses in my sample of student entrepreneurs.

The basic poles differentiating the traditions (see Figure 1) served as a useful heuristic, and I suspect would be useful for scholars analyzing other forms of identity as well. I'll point out a few examples of this with literature around racial identity. The pole between traditions

one and two illustrates that identity can be both durable across settings and dynamically performed differently between contexts. Hughes and colleagues (2015) highlight the benefits of a stable and internalized racial identity that is consistent across settings, while Prudence Carter's cultural piece (2006) shows how racial groups have heterogeneous experiences and often practice "code switching" as a useful tool to perform race differently across settings. The pole between traditions two and three illustrates how identity is refined with boundary work both within and between groups. An example of this is Reyes (2015) article showing how different types of Latino-activist-identities developed on the same campus based on which of the Latino campus clubs the students chose to attend, as they compared themselves to their counterparts in the alternate clubs, while Biggs (2006) shows that student activist participants of 1960's sit-ins had stronger collective identities when they had heightened racial grievances—a more typical us-versus-them orientation. Lastly, the pole between traditions three and one illustrates how identity emerges from both personal and shared experiences. Altschul and colleages (2008) show how racial-ethnic self-schemas contribute to academic achievement, while Hollinger (2006) proposes that solidarity is the central component of identity and says that knowing "who we are" is more important than knowing "who I am." Again, using the three traditions and the poles of distinction between them (see Figure 1) has potential for use in more identity domains than just entrepreneurism.

Strength from Blended Sources of Identity?

I categorized each student into one category based on whichever tradition the preponderance of their language leaned toward. However, each student had at least some quotes that fit the other categories. For example, Seth, a business

major with a rock climbing–themed web business at Cal Poly San Luis Obispo, displayed a blended internalized and performative entrepreneurial identity when he said:

> I consider myself an entrepreneur; all throughout college I had the traits of an entrepreneur. But more so in the last year because we're not just a project, now it's like 'hey it's actually a functioning business,' it's actually growing you know, and we're in a good position, so I would say it wasn't until I felt like we really had something legitimate that I actually really considered myself more of an entrepreneur than just having entrepreneurial traits.

We can see that Seth has internalized the sense of possessing the traits of an entrepreneur, which he believes he has carried for some time—even when he is only working on "projects" rather than having a stable startup. But with the accomplishment of certain activities, such as the building of what he described as a "legitimate" business, a performative source of entrepreneurial identity is now buttressing the already modestly held internalized identity. Seth also spoke in the plural, often slipping into "we" rather than "I" talk, suggesting that a collectively mobilized element of his entrepreneurial identity may be forming as well. It is easy to conceive that if all three of these continue, the likelihood that Seth will remain in entrepreneurship is high. Future research is needed to determine if individuals who present more blended types, like Seth, who is presumably drawing identity from multiple sources, might have more robust identities as a result.

Limitations and Future Research

Perhaps not surprisingly, language matching a collectively mobilized entrepreneurial identity was more common among those who identified themselves as team members rather than as lead-founders or co-founders. Though

outside the scope of this paper, there also appears to be a gendered component to this, as male interviewees were more likely to identify themselves as the lead-founder than as a team member. Relatedly, three female interviewees mentioned joining because their male significant other had asked them to, a reason not given by any of the male interviewees. The sample size in this study makes it difficult to draw definitive conclusions about the role of gender, race, campus type, major, or founder versus joiner status on the likelihood of an entrepreneur mapping onto one of these three identity traditions over another. More than one engineering major said they held their identity as an engineer ahead of their identity as an entrepreneur, if this phenomenon is widespread, it is worth future investigation for what it might mean for startups led by engineers. Future research with a larger sample size, but using this integrated model of sociological identity theory, could fruitfully uncover any relationships between characteristics like major, gender, and institutional affiliation on the type of entrepreneurial identity they develop.

Conclusion

Students from multiple campuses reflected on their developing entrepreneurial identities and gave a wide range of, sometimes contradictory sounding, responses. While identity is still a developing area of inquiry in the entrepreneurship literature it has a rich history in sociology. The three broad traditions of sociological identity literature presented here—internalized, performed, and collective—offer differing perspectives on how identities develop. Yet, while they differ, in an integrated model they made sense of the

range of responses in my sample. While the theory traditions offer general predictions of the types of experiences that help form identity, each unique identity domain—the type of identity being studied (e.g., race, gender, profession)—will flesh the category out differently. For example, tradition three predicts us-versus-them experiences, and for the entrepreneurs in my sample the us-versus-them opponent was often a depersonalized sense of 'the market.' I propose that scholars of entrepreneurial identity, and of other identity domains, use a similar integrated model.

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DISSERTATION CONCLUSION

A revived focus on entrepreneurism is overdue in mainstream sociology. It was a recurrent topic of focus in the founding era of the discipline. Sociology was born out of the great social changes and upheavals that followed the widespread growth of capitalism and its associated features of industrialization and urbanization. Central to the growth of capitalism were entrepreneurial actors, undertaking significant financial endeavors that heretofore would have only been feasible by royalty, aristocracy, church, or state. While contemporary sociologists have regularly maintained a critical eye towards the outcomes of capitalism and corporations, and to some extent entrepreneurism as well, the founding thinkers of sociology were often enthusiastic toward entrepreneurism.

Karl Marx held the ability to control one's own mode of production in high regard. While he was very critical of the large owners of capitalist industries that exploited workers, his utopian communist vision included individuals free to pursue their own means-producing activities on their own terms. We might say that he was less critical of capitalism in all of its manifestations, as he was of large corporations controlling the work lives of the many; he was a proponent of smaller scale independent economic activity—what many might call entrepreneurism. Emile Durkheim, while never directly using the term entrepreneurism in his writings, talked considerably about how the ever-increasing division of labor, driven by economic and career innovations, including entrepreneurism, led to greater organic social cohesion. Max Weber describes the entrepreneur as an innovator with elements of the charismatic personage he had outlined in his writings on legitimate authority. Weber writes about entrepreneurs several times in *Economy and Society* (1922/1978), saying that modern

business bureaucracies have three main types of actors: bureaucrats, workers, and entrepreneurs. Unlike the worker, the entrepreneur can challenge the bureaucrat and act as a counterbalance to an ever more rationalizing society that risks grinding the economy to a slow halt, while building the 'iron cage' that Weber warned about. Further, to Weber it was the religio-entrepreneurial impulse of Calvinism that brought capitalism into existence in the first place, challenging existing political, religious, and economic orders (Weber 1905/2002). But unlike his contemporary and colleague, Joseph Schumpeter, most known for his theories of entrepreneurism and creative destruction (1942/2008), rather than focusing on the traits of the entrepreneurial individual, Weber focused on the cultural organization of a society to bring about entrepreneurial activity.

Most importantly, entrepreneurs were of interest because the economy was in a time of major flux with the rise of capitalism—and entrepreneurs, as economic and cultural innovators, played a major part in the changes. We are again in such a major shift of the economic and cultural fabric in our society. As I outlined in the literature in the introduction to this dissertation, our transition to the 'new economy' brings a host of social and economic changes; and once again we need to pay attention to the actors most responsible for innovating and adapting to these changes—the entrepreneurs. But, like Weber, we should not look so much to individual traits that make a 'heroic' entrepreneur, but rather to the way economic and business structures are organized that make innovation and entrepreneurism more or less possible for ordinary people. It is no coincidence that in recent years, students of elite universities have traded their desire to be lawyers for hopes of working at the newest high-tech firms (Binder et al 2016). At the same time, all manner of undesirable, or at least unstable, employment has been white-washed with labels of entrepreneurism—from multi-

level marketing to driving Uber. For entrepreneurism, it is both the best of times and worst of times.

Only two pieces exist so far, giving an overlay of the state of sociological knowledge of entrepreneurism: Patricia Thornton's (1999) Annual Review of Sociology article titled, *The Sociology of Entrepreneurship*, and Lounsbury and Ruef's (2007) edited volume with the same title in the Research in the Sociology of Organizations series—much more work is needed in this area of sociological inquiry. It is both timely and important.

POLICY AND PROGRAM RECOMMENDATIONS

The overall findings between the three articles in this dissertation point to the powerful role that entrepreneurial identity has to shape career plans. For STEM students, their identity as scientists or engineers often takes precedence over their identity as entrepreneurs, making them more susceptible to hiring by traditional employers. For business and non-STEM students, their identity as an entrepreneur comes to be held more closely than their identities with their other majors or as business people more generally. Strong entrepreneurial identity is helpful in entrepreneurial persistence, the challenges I found, are that some entrepreneurs and projects should not be persisted in as long.

Silicon Valley culture has proven seductive and alluring, and when carried into university contexts with high drama events and exciting peer culture, many students find it difficult to resist. While this may not entirely be a bad thing—it is hard to argue against the continual need for more innovators, new technologies, and solutions to social needs—it certainly is a double-edged sword; especially for undergraduates with little knowledge of their career options or clarity of their own career desires. My recommendations are two-fold, first a

recommendation for supporting students, and second, for building better campus entrepreneurial ecosystems.

Campus startup programming should not enthusiastically support or promote all-undergraduate-student led projects that lack faculty supervision and are centered on lifestyle products, consumer products, or generally unsophisticated apps or websites. Undergraduates are much better served if their first entrepreneurial training takes the form of a placement onto an existing startup that is either led by a faculty member or advanced graduate student or post-doc; or they can be placed into more developed startups outside the campus that are already stable and funded. These internship style opportunities will prove much more fruitful for most students that attempting it themselves. Further, students should not be allowed to participate in campus incubators if their GPAs drop below a certain level. Students should also be discouraged from borrowing money, going into debt, or using student loans to fund their first startups. Very few undergraduates will receive a return on their sacrifices of time and money that will be anywhere near worth the cost. Lastly, career fair days where undergraduates recruit other, typically slightly younger, undergraduates as unpaid interns should be exercised with extreme caution—the benefits of these "internships" to students are highly suspect.

For campus ecosystems, despite isomorphic pressures to have programming similar to other campuses, program leaders will do well to avoid launching full-service incubators or centers of entrepreneurism. Instead, look for pockets of strong expertise across the university. Maybe a startup mentoring program in a single high-potential discipline, limited to a few individuals per year. Or a pitch competition, unconnected to requisite incubator residency, that brings with it significant funding awards, rather than acting primarily as a promotional event for an under-resourced campus incubator. Entrepreneurial coursework is better when

focused on specific skill sets, like financial management, product testing, or marketing, instead of focused on entrepreneurial mindsets and traits—again, prioritizing marketable skills over the formation of entrepreneurial identity that may outpace entrepreneurial abilities. Or, instead of building an incubator on campus and then struggling to recruit students to fill it, a program leader could lease a block of desk space at the nearest co-working space in the broader community. This will keep campus program directors from over-zealously recruiting undergraduates into entrepreneurism that may not be ready or equipped for it. It will also give the students in those environments richer professional network exposure than they would have received at a mostly peer-undergraduate campus incubator. In summary, look for decentralized and focused opportunities to build strengths. Repeat this process until several creative and successful pieces exist, then begin building structures to communicate the resources available to those interested. The already decentralized structure of most campuses with individual academic departments and units is very difficult to work against. In addition, startups rooted in more sophisticated sciences and technologies have two advantages over the less sophisticated products created by many non-STEM undergraduates. First, more sophisticated products are taken more seriously by investors and other key collaborators; and they tend to have greater competitive advantage in the marketplace (e.g., a t-shirt company faces stiffer competition than a new way to detect skin cancer). Two, in the event of non-persistence with the startup, which is likely, the experience is taken more seriously on resumes by future potential employers when it displays in-demand tangible skill sets.

My hope with this dissertation, including its critiques of campus entrepreneurism, is not that entrepreneurism is diminished at universities or becomes seen as frivolous or unrelated to a university's mission; but that it can be improved to become more socially

generative for both students and other constituencies. Entrepreneurism has the potential to be a great contributing force and socially extractive. For every new product that has improved our lives, there are several that suffer from oversimplified tech solutionism or financialized unicorn buy-out seeking behavior. These can harm customers, workers, and the economy; my hope is that we keep it from harming students.

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APPENDICES

Appendix A: Student Interview Protocol

Ask for permission to record. Let them know that anything used in a research paper will have a pseudonym and that their identities will be kept entirely confidential.

Info About their Venture

1. What was/is the company and incubator name? What kind of startup is/was it?

2. How did you first get involved in that project? Where did the idea for that startup come from?

3. Do you have a team for your project? How big, and how did you choose them or how did they choose/find you?

4. Are team members compensated for their work? If so, how? (equity or pay? from what?)

5. How do/will you define a successful outcome for your venture? (NO NEED TO ASK IF IT ALREADY STOPPED/FAILED)

6. What is your biggest fear or anxiety regarding your venture?

Incubator Promotion and Joining the Incubator

7. Did you come to the campus because it has an incubator or did you learn about it later? How did you first decide to join the incubator?

8. How does word about the incubator spread for most students? How does the incubator mainly promote itself to students?

9. How much do most undergraduates/your peers already know about incubators from the media or internet BEFORE coming to college?

Incubator Training & Programmatic Elements

10. What was the most important takeaway or learning from participating in the incubator?

11. What programmatic feature of the incubator was the most helpful to you?

12. Is there a favorite book that you would say made a big impact on your development and/or success as an entrepreneur?

13. What part of the program seemed the least helpful? Or say a new incubator starting up was wanting advice on what not to do, based on your experiences, what might you tell them?

Student Entrepreneurial Identity

14. Would you describe yourself as an entrepreneur (to yourself and/or to others)? Do you use that label?

15. When did you first start to identify with the term entrepreneur? Was there (or will there be) a moment or milestone when you first said to yourself, "I'm an entrepreneur now"? What is that marker?

16. Do you feel like working at a traditional company as an employee is something you are less interested in now that you have done startup work? Do you see yourself mainly doing startup work or working for yourself in the future over more traditional employment?

Impact on Academic Life

17. Do you feel like you give less effort to your academic studies than you otherwise would because you are participating in this program? For example, do you find it difficult to find time to study or do class assignments because of how demanding your entrepreneurial activities are?

18. Did the campus incubator make you more or less likely to stay in or drop out of school?

19. If you had not participated in the startup do you think you would have done an internship or other career prep opportunity? Tell me about that.

Impact on Wellbeing

20. Do you think because you are participating in this program that you are happier and/or more confident than you otherwise would have been, or perhaps more stressed and anxious? Both?

Diversity/Inclusion

21. In your experience with the incubator, do you feel like women or minority groups are treated differently in the incubator, or face any additional challenges? What about students from working class backgrounds or non-STEM majors, like majors in the arts or humanities? (If they fall in one of these categories, probe a bit more)

Post-Incubator Goals (only ask items they have not already talked about)

22. What are your plans immediately after graduation? Did this change because of your experiences in the incubator?

23. What are your career goals 10 years after graduation? Did this change because of your experiences in the incubator?

24. What do you plan to do if this particular venture doesn't work out for whatever reason? (DON'T ASK IF COMPANY ALREADY FAILED/STOPPED)

Risk

26. Startups are risky projects. Are there any lessons you learned about risk while being in the incubator? Would you say you have become more risk tolerant?

27. Did the incubator teach any specific lessons on risk tolerance or handling risk? Do any students you know with poorer backgrounds, or less safety nets, approach entrepreneurism differently?

28. Did you or any students that you know take out loans, borrow money from family or friends, or go into any kind of debt to pursue their startup? In general does that seem to have paid off?

Demographics (tell them they can say pass on any item they are uncomfortable sharing)

29. Ethnicity, Age, Marital status, Year in school/year graduated, Household income before college, Student debt, Major, Overall GPA, Major GPA, Number of undergrad participants in incubator.

Conclusion

30. Is there anything else that came to your mind through this interview that you would like to share about either your experiences with the incubator or entrepreneurism in general?

Thank you for your participation!

Appendix B: Faculty/Staff Interview Protocol

- Obtain Permission to record
- Ask their:
    - Gender
    - Ethnicity
    - Relevant educational and professional background

How did you get into this position/field?

What are one or two key principles or ideas you hope students take away from their time in the incubator?

What is the most important resource for a program like yours to offer to student entrepreneurs?

If you were to recommend a books that is at the top of the essential reading list for student entrepreneurs?

Have you faced any resistance to the work of this program from any individuals or groups on campus? Which groups on campus seem the most supportive? The least supportive?

What are the biggest challenges to overcome for anyone hoping to create a similar program on their campus? What advice might you give a faculty member trying to start something like this?

What are you looking for in students?

What is the core definition of success here?

What are some of the best student outcomes you have seen so far?

How many student teams successfully launch businesses? Ratio to those who do not?

Do you know after 5 years or so, how many of the businesses are still going?

What additional program elements would you most like to add to this lab?

Could you see a program like this at every college?

What challenges do you think small colleges, lower tier state schools, or even community colleges would have in implementing this?

What programs at other campuses inspire you or give you ideas about ways to run this program?

What do you think the key differences are between your program and ones at a public/private school?

What do you see for this program in 10 years?

What do you see for programs like this across the country in 10 years?

What are the advantages/disadvantages of a centralized university-wide incubator for all majors like this one, as opposed to unit specific programs, say housed in the engineering, business, or medical school?

Do you think female or minority students face unique challenges while participating in the incubator? How so?

Do you think students coming from a working class background face unique challenges while participating in the incubator? How so?

Do you think their time in the incubator detracts from or competes with their academic achievement, or compliments it in some way? How?

Do you think time in the incubator changes students' long-term career trajectories? How so?

Some say startups are too time consuming and risky for undergraduates, what would you say to that?

Is risk tolerance something that some students just have an innate capacity for, or does it need taught through your program?