

Working Outside Universities

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INTRODUCTION

An academic position has traditionally been held up to graduate students as the top-tier job for which they are being trained: 'If you fail to get an academic job, you can get a job in industry or with a non-profit'. I have long wondered about the origins of this somewhat biased perspective passed on – sometimes explicitly but always implicitly – by a professors' guild to generation after generation of graduate students.

The truth of the matter is that, while there are similarities and differences in the challenges facing research leaders who work inside versus outside universities, a thriving research career is possible in both environments. My husband, Stuart, and I have spent the last several decades, actually all of our post-PhD lives, working as researchers outside a university setting. We have been blessed with multidimensional rewards. Working outside universities has not stopped us from publishing, winning academic recognition and awards, making more money than we would

have in the ivory tower, and having an impact on our fields and on society. Our jobs have been in the 'business world' of for-profit companies, Stuart in a large Fortune 500 company and myself in a small company I founded 30 years ago. But others have chosen similar paths to ours with similar blessings: academic entrepreneurs who design, secure funding for, and manage large scale research projects from within universities; researchers who perform excellent applied work within private foundations, research institutes, think tanks.

A complex set of multidimensional determinants, components, constraints and success drivers propel the research process forward. Among these are research time allocation, research personnel, funding resources, professional achievement criteria, advancement opportunities, internal research support, and external research support. These components play out differently inside versus outside academia. But the variance remains large if one restricts the assessment to university environments alone, or to for-profit corporate settings alone or to non-profit jobs alone. For example,

doing research in a small college in a rural area is likely a very different experience, with different success drivers, from doing research in a major university in an urban area. Similarly, working as a researcher in a large corporation such as IBM or Microsoft is vastly different from doing research in the small company I run (Sociometrics Corporation) with two dozen social and behavioural scientists.

Thus, while we open this chapter with a focus on similarities and differences in the challenges faced by researchers inside versus outside universities, we should not ignore the fact that universities and non-university research settings are not monolithic environments. Moreover, even within a particular organization, there are a variety of research careers and niches available. We discuss these opportunities in the second half of this chapter.

THE RESEARCH PROCESS INSIDE AND OUTSIDE UNIVERSITIES

Choosing a college to attend as an undergraduate is a process that to some extent foreshadows choosing an environment in which to carry out one's research much later in life. In both situations the choice is often constrained by the pool of destinations that want us (either by offering us a spot in the freshman class or by offering us a job). In both situations there is not necessarily an *a priori* better or best choice. Rather, the 'match' with one's abilities, interests, and personal situation will likely be the principal determinant of eventual personal satisfaction with the decision. Hopefully, this chapter will paint a realistic picture of what to expect in university and non-university research environments, so that one can navigate the challenges with confidence and success.

Many of the differences between university and non-university research settings are structural in nature. Some differences favour university settings, others favour non-university settings. Some of the challenges have to be accepted as 'coming with

the territory'. All we can do is learn to live with them. Many others can be overcome. I describe both sets of challenges here.

Research time allocation

Most university professors have teaching obligations in addition to their research obligations. Researchers working outside universities have more hours to devote to research projects, assuming they are successful in getting funding for such projects.

The word 'professor' means scholarly teacher. By definition, therefore, professors have significant teaching responsibilities during the academic year (and in some cases over the summer as well). Teaching the next generation is how professors typically earn their salaries. Researchers working outside universities do not have teaching responsibilities and thus have more time for research. However, such freedom and flexibility come at a price: research leaders working outside universities usually have to secure funding to cover not only their own salaries, but also the salaries of those researchers working under their supervision.

Research personnel

Competent, well-trained colleagues, consultants, and project staff are required to carry out research efforts. Different pools of workers are readily available to assist research leaders working inside versus outside universities.

University professors doing research have ready access to a current pool of graduate students to help carry out such research. This is a source of free, or at the very least low-cost, labour for such projects. Balanced against this cost advantage is the fact that graduate students sometimes have no or little experience in the research the professor is conducting and other times have but a semester-long attention span before they move on to the next topic they want to explore. In contrast, researchers

outside universities often have a standing group of highly competent Bachelors, Masters and PhD-level workers who are experienced in working together on project teams.

When multidisciplinary expertise is needed, one can often find such expertise amongst colleagues within one's own university. Research leaders working outside universities, especially in small organizations, have to hire outside consultants to provide them with the multidisciplinary expertise required by different projects. One way we address this challenge at Sociometrics is to have our projects be guided from get-go to wrap-up by Expert Panels. Sociometrics' mission is to translate what the social and behavioural sciences know about promoting health and preventing disease into commercial products and services of use to teachers, clinicians, staff members of community-based organizations, and lay citizens themselves. The company has several product lines, the most popular of which are our topically-focused collections of the best data in a dozen health fields, our collections of replication kits for effective behavioural interventions (EBIs), and our collections of training materials in effective program development and evaluation. Our Scientist Expert Panel members are typically university professors who select and review the resources we package and disseminate to ensure that they meet the highest scientific standards. Some members of the Scientist Expert Panel for Sociometrics' National Institutes of Health-sponsored Data Archive on Adolescent Pregnancy and Pregnancy Prevention are in their third decade of service to this project! We also hire Practitioner Advisory Panels to guide us. Practitioner Advisory Panel members are typically middle and high school teachers, clinicians, and staff members of community-based organizations who represent the target market for our products. They help design how our products will be packaged, review product prototypes, and approve final commercial versions of products before they go to market, ensuring the relevance and interest of these products to their peers.

University and non-university researchers also often differ in the depth versus breadth

of their experience and expertise. Typically, university professors have more depth but less breadth of expertise than their colleagues working outside universities. Professors tend to be specialists in their topical niche. In contrast, researchers working outside universities have more breadth than depth because funding realities reward flexibility in chasing funders' priorities, making it difficult for these researchers to sustain a long-term programme of research on a single topic of choice. For both groups, hiring other project staff and outside consultants to supply what is missing in their own capabilities is the answer to this challenge. What is important is that the project personnel *team* has the capabilities needed to carry a project to success. No one requires that a research leader be a know-it-all or a jack-of-all-trades.

Funding

Research requires resources. To ensure that a project is not left bereft of resources midstream, it is common practice to secure research funding up front and to bring the work to a preset 'research success point', after which additional funding can be secured if warranted. University professors may have more personal financial stability than their colleagues working outside academia because their academic year salaries are paid for by their university employer. In addition, some universities subsidize pilot studies, exploratory research, or smaller research projects conducted by their professors.

Most scientists, whether working inside or outside universities, now have to find funding to carry out their research. This requirement poses a larger challenge for scientists working outside universities for a couple of reasons. First, scientists working outside universities generally have to fund all (or almost all) of their annual compensation out of 'soft money' (grants or contracts). In contrast, university professors, as a general rule, are on 'hard money' (guaranteed salaries) during the academic year: this gives them greater financial stability. In addition, universities sometimes subsidize the cost of their scientists' smaller research projects such

as pilot studies, exploratory research projects, or secondary data analysis.

On the other hand, university scientists may have more difficulty accessing the ‘overhead’ or ‘indirect cost’ portion of the grant and contract monies that they bring into their organization. These dollars are frequently managed by university administrators for university-wide research infrastructure assets (such as erecting new buildings or maintaining old ones) that are remote from the individual scientist. In contrast, scientists working outside universities, especially those working in smaller organizations, may have more ready access to the indirect cost portions of awards. Often such indirect costs can pay for at least some of the time they spend writing proposals; for on-demand status reports on their project budgets and expenditures; for morale boosters such as long-service awards and celebrations, and the like; or for profit-sharing bonuses or bonuses for exceptional performance.

In the United States most funding mechanisms are open to all researchers, whether university-based, for-profit-based, or not-for-profit-based. But there are some restricted funding mechanisms such as the US Small Business Innovation Research competition (SBIR), open only to small, for-profit organizations, or private foundation grants, which give preference to not-for-profit grant recipients. In perusing Research Solicitations for fit with one’s research group, it is important that the Solicitation be read closely before investing time in proposal writing, to make sure that one’s organization meets all eligibility requirements.

Professional achievement criteria

Human beings are motivated by the sense that they are accomplishing something, making a contribution that is acknowledged as such by the field, their colleagues, and their employers. Universities and research organizations have different reward structures and allocate differential priority to key research by-products, such as publications.

There are both external and internal reward structures for scientists. Being a professor in a well-respected university is a highly prestigious professional achievement accorded high status by both society-at-large and by one’s peers. Having an analogous job outside academia may not be accorded quite the same level of prestige by the external environment. As far as internal rewards are concerned, being a ‘rainmaker’ – a supplier of large grant and contract monies to one’s organization – is a professional achievement that is generally rewarded by esteem and advancement both in and outside university environments.

However, significant differences across the two settings are found in other elements of the reward structure. Most notably, the Holy Grail for academic achievement and advancement is the research publication. Promotion, salary, tenure and other awards inside university settings are based largely on the number and nature of scientific publications produced by an individual researcher. This potentially constrains the type of funding that a university researcher is incentivized to pursue. Research projects that may have no or little potential to result in academic publications – for example because of small sample sizes, proprietary requirements imposed by the funder, the inability to carry out true randomized control experiments because of real-world constraints, or high risk accompanying an ‘idea outside the box’ – may be avoided by university researchers, regardless of their level of interest in the topic of the research or the potential applied (social) impact of the research. For this reason it is more typical for university professors, at least in the USA, to be focused on ‘basic research’ that pushes an academic field forward via scientific publications and for researchers working outside universities to be focused on ‘applied research’ that is aimed at having ‘impact on the real world’ even if it does not result in new knowledge or a research publication.

The relative importance of applied societal impact in outside-the-university settings makes scalability, dissemination, and commercialization of research by-products

more important in these settings than inside academia. A recent trend, however, shows universities making an effort to incentivize their professors to commercialize their work. Many universities now offer their professors joint venture opportunities, seed money, shared profits on patents, or assistance with setting up a new company to commercialize research-based products that are considered market-worthy.

The already stated need to raise funds to cover all of one's own salary, not to mention the salary of one's colleagues if a research director, causes non-university organizations to sometimes disproportionately incentivize and reward funding prowess in making advancement decisions. Staff publication records may not be scrutinized as closely as they would inside a university. This results in a Catch-22 for many non-university researchers because some of the key funders for behavioural and social research – e.g., the US National Institutes of Health and National Science Foundation – give a lot of weight to publication record in making funding decisions. Thus, paying undue attention to securing grants and contracts (as incentivized and rewarded by one's employer), at the expense of publishing results from these grants and contracts, may actually make it harder to get the very grant and contract funding one is pursuing.

Security

Another significant difference between university and non-university settings is that, in the former, there are two extreme outcome possibilities that could occur about seven years post receipt of one's doctorate. One could either be offered a tenured position (a guaranteed-for-life job), or one could be asked to leave the university altogether. Tenure is not available outside universities. Indeed many non-university employers find it hard to believe that there still exist employers willing to guarantee a job for life. Time will tell whether this time-honoured tradition unique to academia will survive the next

decade or two, or whether academia will revert to the more 'for as long as it's good' relationship with its professors just like non-academic organizations.

Advancement opportunities

There are more restrictions to advancement in universities than outside universities even if, as previously described, universities have positions that are 'tenured' and that ensure a job for life.

Many universities restrict the research project leadership position (called Principal Investigator, or PI, in the United States) to tenure track faculty members. Other members of the university community are barred from applying to be PIs, even if they may have PhDs. There is no such restriction for scientists working outside universities. Indeed outside universities – perhaps because of the already stated need to raise funds annually to cover staff salaries – grants and contracts are welcomed as good for everyone ... the more the merrier! Within universities there is also frequently a zero-sum game quality to advancement, such as: only one of three current assistant professors will get tenure. Clearly this can be the source of significant stress for the individual scientists involved.

Internal research infrastructure

Beyond the money required to carry out a particular research project, other environmental assets – such as office or laboratory space, furniture, equipment, software, library access, online journal subscriptions – are needed to bring research to one or more success points. Research environments differ in the research infrastructure assets they provide to members of their organization.

Universities typically come with a deep internal infrastructure to facilitate research.

They have their own libraries; they subscribe to hundreds of online journals; they have computer labs and office space. Small companies may not have such a highly developed, existing research infrastructure. However, it is not too difficult to build the infrastructure slowly by including specialized needs in a research proposal, or by leasing use from a nearby university. For example, Sociometrics has a small on-site library covering journals in our major topical areas of operation and expertise. For other journals and books we rely on nearby Stanford University using a \$500/year corporate library card. Or we swallow the cost of downloading a few key journal articles not available in our own library for \$20–\$30 each.

While universities have deeper research infrastructures than non-university research organizations, they also have more entrenched bureaucratic procedures. Businesses have more nimble procedures for hiring consultants, buying equipment and supplies needed by their projects, turning budgets around, etc. At Sociometrics we pay consultants and reimburse employees for expenses within a few days of receiving an invoice. We use a corporate credit card to buy equipment and supplies so we can turn those requests around in a few days as well. Project budget expenditures and balance remaining statements are provided monthly to Principal Investigators and Project Directors. If a special need (such as project closeout) requires more frequent turnaround, we do so within a couple of days at the request of the PI.

External research infrastructure

Human subjects are needed for most behavioural and social research. Universities have an advantage in often being able to supply needed research subjects (students, patients) from within the institution. But the challenge to get 'buy-in' to data collection of high quality, especially when research demands 'real-world' subjects, is universal.

Different types of research projects require different types of human subjects. Environments differ in the number and types of human subjects they can supply from within the organization. The management of human subjects obtained from outside the organization requires collaboration with institutions that may not understand or prioritize requirements for rigorous, valid research.

Much social and behavioural research conducted in university settings uses members of the university community (undergraduates, hospital or clinic patients) as human subjects from which research data are collected and analysed. Industry and non-profit corporate settings are not as ready a supplier of human subjects. Moreover, certain types of research – whether managed from within or outside a university – require human subjects drawn from 'real world' pools of human subjects such as: 7th grade female students, high school students from a rural area, patients with a particular disease, incarcerated females, gay and bisexual teens, teen moms, men over age 75, etc. These research subjects are recruited from outside the organization performing the research project, typically with the help of, and in collaboration with external 'real world' partners such as schools, clinics, and community-based organizations.

External partners can pose challenges to research leaders if they are not schooled in research methods or if their priorities are different (for example, assuming 'service provision' is more important than 'research rigour'). One or more of several approaches can be taken to mitigate this challenge. The first is to select partners who are receptive to research, even if they have not been engaged in the research enterprise. A second approach is to educate partner organizations' gatekeepers up front, ideally before applying for funding but at the very least before starting data collection. A third is to have a contact point person within the partner organization who will be trained to avoid pitfalls and to shepherd the research through what can be complex requirements of

Institutional Review Boards, health departments, or hospital boards.

WHICH SETTING WILL WORK BEST FOR ME?

While there are the generally structural differences in research environments (described above) between universities and non-universities, the two environments have started growing more alike in recent years. Many universities now have independent multidisciplinary Research Centres that are organized and managed like their non-university counterparts. A growing number of universities are requiring even their tenure-track professors to raise at least part of their academic year salaries. Industry and non-profit environments are encouraging their staff members to publish more, incentivizing these research by-products with mini-cash awards and including publications as explicit criteria for promotion and advancement within the organization. So if one can both (1) publish and (2) write proposals that get funded, one has the essential building-block requirements for a successful research career in both academic and non-academic environments. This will facilitate movement to and from both settings, opening up a wider set of career opportunities in the future.

For those who wish to stay within the environment of choice, there are a variety of roles available.

In universities

The Master Teacher

In many of the smaller colleges and universities, teaching prowess is at least as important, if not more important, than research success. In all institutions of higher learning, large or small, end-of-year student evaluations of professors' teaching are common and are given careful consideration in advancement decisions. Given that professors' academic

year salaries are paid for by their employers, the expectation is that they will teach and do this with excellence.

The Professor Researcher

In larger universities there is the additional expectation that professors will excel not only as teachers and student mentors, but also as researchers. Student evaluations of teaching excellence are used in conjunction with indicators of research success (e.g., publications, conference presentations, invited addresses) and contributions to the department and the university (e.g., serving as faculty research adviser to students, serving on university committees, serving as department chair) to guide professors' annual performance reviews. Positive student evaluations of teaching abilities, publications in good journals with a high impact scores, high standing in the field as gauged by peers, and outside awards are indicators of success as professor researcher.

The Centre Researcher

A growing number of independent research centres are sprouting up in universities. These centres tend to be multidisciplinary. Centre staff leaders consist of professors from several departments, as well as PhD-level researchers who are employed by the Centre but who are not tenured or tenure-track faculty members. These Centre-based researchers do not teach, but rather engage in full-time research funded by 'soft money' grants and contracts, just like researchers working outside universities.

Outside universities

The Researcher

Masters and PhD-level staff can have thriving careers as researchers working in industry (small and large businesses) or non-profit research organizations. These staff members help write proposals and staff them if funded. Their daily work runs the gamut of research activities such as interface with clients and partners, human subject recruitment, data

collection and analysis, writing up of results for reports and publication, and attendance at professional conferences.

The Research Manager

As with any other career, with seniority often comes promotion to managerial roles, including project-focused leadership roles such as PD (Project Director in charge of day-to-day operations involving staff and outside partners) or PI (Principal Investigator in charge of ensuring, first, that grant or contract funds are spent for the legitimate purposes for which the grant or contract was awarded; and second, that high quality work is produced on time and within budget). With these project responsibilities comes the power to approve the actual expenditure of grant or contract funds in the form of project staff salaries, human subject payments, office supplies, hardware and software purchases, required travel, etc.

Research managers of grants have more flexibility than research managers of contracts. Research grants fund the Specific Aims described in the funded proposal. Discretion is given to the PI as to how to achieve these Aims. The grant funding mechanism allows PIs to deviate slightly from the specific procedures and deliverables specified in the funded grant application, if new needs and data warrant such changes. In contrast, contracts come with a very clearly defined scope of work and list of 'deliverables' to be submitted to the funding agency at pre-specified dates. Research managers of contracts typically need written approval of the funding agency's project officer before deviations to the scope of work or to work product delivery dates can be made. Because of the relative lack of flexibility on contracts, this funding mechanism typically comes with a 'fee' (also called 'profit' or 'retained earnings' paid by the funding agency for conducting the work). In contrast, research grants will generally cover the cost of doing the research, but will not pay the organization a fee for doing the work. Two exceptions are the Small Business Innovation Research (SBIR) and

Small Business Technology Transfer (STTR) grants, aimed at commercializing research by-products. SBIR and STTR grants pay a fee of up to 7% to the institution(s) doing the work.

The Employee on a Corporate Mission

In many for-profit organizations, research leaders are hired or assigned to work on a problem or challenge of high priority to the employer. These corporate assignments can range from doing market research or usability testing for a new product to creating and implementing a strategic plan for growing a new area of research for the company. The corporate assignment can be short-term or long-term. One advantage of being an employee on a corporate mission is that the corporation will often shoulder at least a part of one's salary, minimizing or negating altogether the need to write research grant proposals to cover one's salary.

The Entrepreneur

The birth of the above described SBIR and STTR programs in the 1980s has helped develop a new breed of researchers who translate the latest social and behavioural science research findings into commercial products and services. Many of the scientists at Sociometrics fall into this category. Over the last 28 years, with funding from the US National Institutes of Health, Centers for Disease Control and Prevention, Office of Population Affairs, Office of Adolescent Health, National Center for Health Statistics, National Science Foundation, various State and local governments, and various private foundations, Sociometrics' scientists have developed several hundred health and education research-based products for academic and non-academic audiences alike. Most of these products can be obtained online on www.socio.com. The products include: (1) nine topically focused health data archives comprising over 500 primary research datasets known as the Social Science Electronic Data Library (SSEDL); (2) replication kits for approximately 90 effective behavioural intervention

programs in the teen pregnancy/STI/HIV/substance abuse prevention and early childhood education fields; (3) evaluation research and evaluation-related technical assistance tools; (4) training-related products and services; and (5) digital health promotion tools. While the target markets for these science-based products are largely schools, clinics, and community-based organizations with extremely limited budgets, Sociometrics has managed to disseminate its products at a profit. The company is an early example of the new and growing field now known as social entrepreneurship.

RECOMMENDATIONS AND TIPS

In short, there exist a wide variety of jobs both inside and outside universities that await behavioural and social science research leaders. This chapter has described both work environments and the career paths they offer. I close with some tips on successfully manoeuvring a milieu to achieve a successful research career suited to one's abilities and interests.

Know what you are good at and what kind of work makes you happy

Be mindful as you go through high school, college, graduate school, and your first couple of jobs of what you are good at and what you enjoy doing (these are usually correlated). Then find an environment, and projects within that environment, that nurture and reward these assets. As the late Steve Jobs said, it is important to love hard, not just in your personal life but also in your work life. If you love what you do for a living, you will be one of life's fortunate individuals.

Make your career purposive

Set yourself some career-related long-term goals and short-term objectives and reflect

every now and again about the extent to which the work environment in which you find yourself furthers these goals and objectives. Make sure you share your goals and objectives with your supervisor so that she/he can think of you as projects arise that can further them. As you advance in your own career, you can more directly seize control of your destiny by applying for research funds (as Principal Investigator or Project Director) to implement projects that meet and foster achievement of your long-term goals and short-term objectives.

Make publications an integral part of your research career

Because publications are essential to academic success inside universities and help research careers outside universities as well (in helping you get credibility for getting your research proposals funded), make sure you set aside time for publications from very early in your career. This will likely mean 'donating' a little time at evenings or weekends to the effort. The investment will pay off in terms of more rapid career advancement.

Learn how to write winning grant proposals early in your career

From early on in your research career, work hard not only to develop your publication record but also to hone your proposal writing skills. As we saw earlier in this paper, rainmakers (successful grant and contract writers) are welcome everywhere (both inside and outside universities). They control their careers by writing proposals in areas of interest to them. They help cover their colleagues' salaries. In short, they write their own tickets to career success.

Learn how to work as part of a team

Another important determinant of career success is your ability to work as part of a

project team. Whether you are a research leader, staff member, intern, or student, it is good to be sought out by your colleagues to work on their (or your) projects. This will happen if you make sure to do a few simple things. First, pull your own weight as a contributing member of every research team you participate in. Second, be respectful of all team members, and show appreciation for their individual contributions. Third, if you are the research team leader, work hard to bring out the best work of each team member. Assign each team member the work she/he does best. Give prompt and honest feedback on performance. Cultivate a mentoring relationship with each team member.

Focus on the positive

We have all heard it said that life is too short to sweat the small things. All jobs have things

we enjoy doing and things we do not enjoy doing as much. All jobs come with colleagues we adore and colleagues we can probably do without. It takes a village to get the job done. Learn not to sweat the small aspects of your job that you might not enjoy doing so much. Focus on, and be grateful for, those aspects you do enjoy.

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