Precluded Interests[1]
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In the undergraduate major in philosophy, women persistently make up a third or fewer of all philosophy majors in the United States. There is increasing interest in explaining and addressing this fact, and current there are a variety of hypotheses for why female undergraduates do not elect the major in philosophy at anywhere near the rate of male undergraduates. The following essay is intended to contribute to the explanatory hypotheses and menu of suggestions for what philosophy departments might do to make the philosophy major more attractive to women students.

Let me begin with a bit of the good news, before turning to the bad news. Unlike in mathematics, women aren't under-prepared in philosophy in relation to male students for the philosophy major. Students in general have little exposure to philosophy prior to college. And unlike in computer science and other science disciplines, female undergrads are not dropping the philosophy major once they elect it at rates significantly different from those of male undergrads. It is also good news that women are sufficiently interested in philosophy to want to take an introductory philosophy course; and in intro level courses the gender balance is roughly equal. So there's not a problem getting female students in the philosophy door. While there has been some speculation that students regard philosophy as an impractical major—which might explain why there aren't large numbers of philosophy majors--the recent AAUW report *Graduating to a Pay Gap* indicates that women are less concerned than men with

selecting majors that might lead to well-paying jobs. With the exception of the 18% of female students who choose business, female undergraduates tend to choose majors that lead to lower paid salaries than the majors male students choose. The AAUW attributes women's lower income one year out of college in part to gender differences in choice of major.[2] Finally, and most importantly, we know *where* the primary problem is, namely, between female student's choice to take an intro philosophy course and their election of the major in philosophy.

The central question to which we need an answer is: *What is precluding women's interest in **majoring** in philosophy?* How should we interpret the drop in the percentage of undergraduate women in philosophy from between the introductory course and the philosophy major?

   a) We might think that something unfortunate is happening in the course that turns off those women who would otherwise have considered majoring in philosophy. *They lose interest.*

   b) We might think that something is <u>not</u> happening in the course. Here we might think that women come into the course—just as do most men in intro courses--thinking they just want to take <u>a</u> philosophy class. *Their reasons for not considering it as a major are not overcome.*

The first hypothesis invites us to look particularly at factors that women didn't expect to find and are displeased to find in their philosophy courses—for example, the argumentative style, expressions of implicit bias against women, a virtually all male reading list, and the like. The second hypothesis invites us to look at factors that women

expect to find—or at least aren't surprised to find in their philosophy course--that confirms their existing disinterest in majoring as well as at factors that are absent but that would be relevant to encouraging women to reconsider the option of majoring in philosophy.

I'm inclined toward (b). The Office of Institutional Research at Colby College keeps longitudinal data on what incoming students state they expect to major in and on what they actually major in, which I had access to while I was at Colby. Between 1971 and 2002, 29% of over 11,000 student respondents (52.1% of whom were women) expected to major in philosophy. Between 1999 and 2003, 28.6% of the philosophy majors were women.[3] That data strongly suggested that women's interest in majoring in philosophy, and their ultimate choice to major, was being shaped by factors that antedate their taking their first philosophy course. Recently Tom Dougherty and his colleagues conducted a study at University of Sydney confirming what they call the "pre-university influences hypothesis"—the hypothesis that women's interest in philosophy as a major is precluded by something that occurs before they ever get to college.[4] They administered a questionnaire on the very first and last day of a large (609) philosophy intro class, and again on the last day. What they discovered was a significant difference in male versus female students' interest in majoring philosophy--a difference that did not change over the course of the semester. Dougherty did not find any evidence to support what they call the "classroom influences" hypothesis. In particular, there was no evidence that gender is connected to students' perception that philosophy is unsuited to their learning styles, that they were treated unfairly, that the classroom
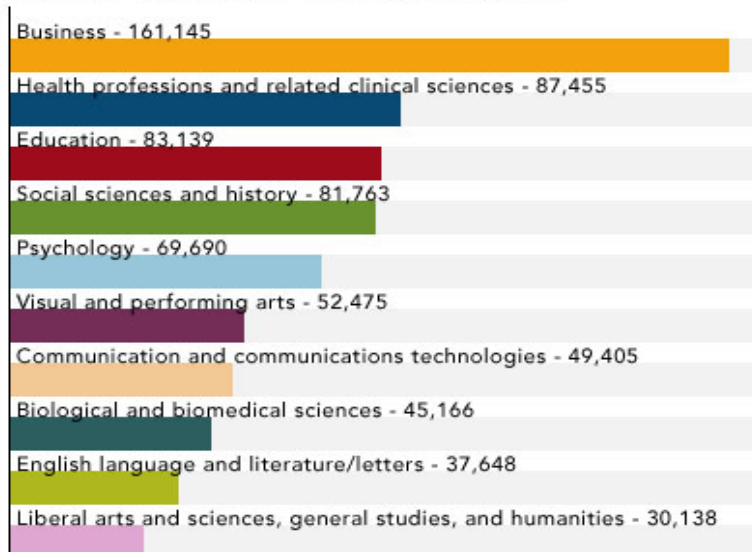
method is adversarial, or that the class was uncomfortable. Toni Adelberg and colleagues' study of 700 intro philosophy students at George State also failed to confirm the classroom influences hypothesis.[5] Despite a gender difference in students' interest in taking more philosophy classes, students did not report unfair treatment, generally agreed that students were treated with equal respect, and generally disagreed that the classroom was combative.

So what factors, external to their philosophy classes, might be influencing female students' perception of the philosophy major? Why do fewer women students than men students come to their first philosophy class with an interest in, or openness to, *majoring* in philosophy even though they have roughly equal interest in including a philosophy *class* in their college or university studies? Given that students who do not major in philosophy major in something *else,* Tom Dougherty, Samuel Baron, and Kristie Baron suggest that it would be useful to reframe the central question. Rather than focusing on why women do not choose philosophy, we might look at what women undergraduates do major in and ask "Why do women prefer studying these subjects to philosophy?"[6] Taking up this reframed question, we might proceed by looking at (1) the factors that are most important in students' choice of major generally, and (2) what subject areas female undergraduates tend to choose, and what subject areas have the highest concentration of female students. We would then be in a better position to frame some explanatory hypotheses about what it is about the subject areas that female undergraduates major in that they find more attractive than what they expect a philosophy major to be able to deliver.
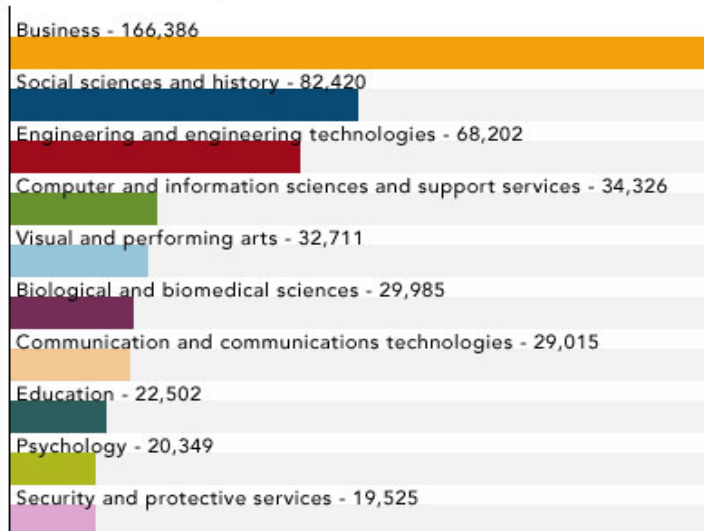
Female Undergraduates' Major Choices

How do students choose majors? Richard N. Pitt and Steven A. Tepper's survey of 1760 undergraduate students at nine schools revealed that the majority of both single and double majors cite *both* job prospects and expressing one's identity as primary reasons for choosing a major. These results likely come as no surprise. Many students are explicitly concerned about what jobs will be open to them once they have a degree in hand. Even if they don't expect their major to be directly connected with a job, they may nevertheless have a sense for the general range of jobs that they are most likely to end up in and be sensitive to the fit between their major and that range of jobs. The idea that students should choose a major that fits their personality and whose subject matter they're passionate about is fairly standard advice to students trying to select a major. Women's interest in majoring in philosophy, then, might be precluded by factors connected to future job prospects or fit with who they are, or both. To get a sense of what those factors might be, let's look at what women major in.

Top 10 Women's College Majors

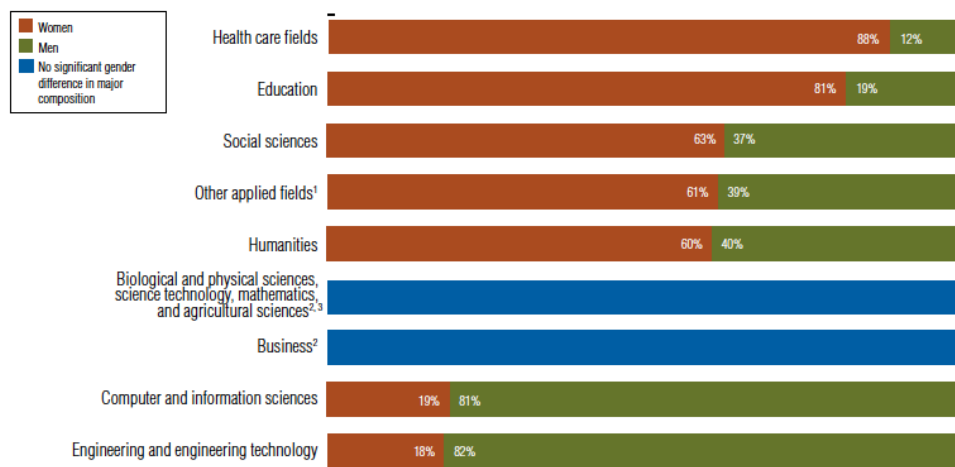| Major	Count
Business	161,145
Health professions and related clinical sciences	87,455
Education	83,139
Social sciences and history	81,763
Psychology	69,690
Visual and performing arts	52,475
Communication and communications technologies	49,405
Biological and biomedical sciences	45,166
English language and literature/letters	37,648
Liberal arts and sciences, general studies, and humanities	30,138

Setting aside business, which is the number one choice for both male and female undergraduates, the top majors for women are in health professions, education, social science, and psychology.[7] For men, the picture is different:

Top 10 Men's College Majors

Business - 166,386

Social sciences and history - 82,420

Engineering and engineering technologies - 68,202

Computer and information sciences and support services - 34,326

Visual and performing arts - 32,711

Biological and biomedical sciences - 29,985

Communication and communications technologies - 29,015

Education - 22,502

Psychology - 20,349

Security and protective services - 19,525

The gender ratio of women's top 3 choices after business, looks like this[8]:

FIGURE 3. Gender Composition of College Majors

Legend:
- Women
- Men
- No significant gender difference in major composition

Major	Women	Men
Health care fields	88%	12%
Education	81%	19%
Social sciences	63%	37%
Other applied fields[1]	61%	39%
Humanities	60%	40%
Biological and physical sciences, science technology, mathematics, and agricultural sciences[2,3]	No significant gender difference	
Business[2]	No significant gender difference	
Computer and information sciences	19%	81%
Engineering and engineering technology	18%	82%

Note: This chart shows undergraduate majors among 2007–08 bachelor's degree recipients and excludes graduates older than age 35 at bachelor's degree completion.
Source: Authors' analysis of U.S. Department of Education, National Center for Education Statistics, 2008–09 Baccalaureate and Beyond Longitudinal Study data.
[1] Includes architecture, communications, public administration and human services, design and applied arts, law and legal studies, library sciences, and theology and religious vocations.
[2] Women and men each make up about half of graduates who majored in these fields. Percentages are not significantly different for men and women ($p < 0.05$, two-tailed t-test).
[3] Although these majors are gender balanced as a group, the representation of women varies substantially among the majors included in this category. Women are more likely than men to major in the biological sciences, and men are more likely to major in the physical sciences, agricultural sciences, and mathematics (National Science Foundation, 2011, table 5-1).

In terms of the majors with the highest concentration of women, Early Childhood Education is the major with the highest proportion of women (97%). It is followed by Medical Assisting Services (96%), Communication Disorders Sciences and Services (94%), and School Student Counseling (94%).[9]

Female Undergraduates and Job Prospects

Why would majors in the health care fields, education, sociology and psychology be attractive to women? Let's start with women's job prospects. We continue to have a gender-segregated workforce. The different gender choices of majors lead to differently gendered job occupations. According to an AAUW, the difference in major partially explains the gap in men's versus women's earnings one year out from college.[10] Men are, for example, more likely to go into business management, while women are more likely to go into social services, health care, and PK-12 education.[11] Women are also more likely to work in the non-profit sector; 19% of women vs. only 7% of men do so.[12] Even when they have the same major, men and women are not going into exactly the same types of jobs.

The connection between major choice and the gender structure of the workforce is worth paying attention to. We often try to sell the philosophy major by arguing that it provides universally applicable skills in the job market. But we might ask whether the skills as they are typically described in informational webpages for philosophy majors are in fact more relevant to the kinds of jobs men go into than those that women go into. In particular, are we focusing on skills that suit students for managerial,

administrative, and policy-making jobs, jobs that men are more likely to go into, rather than skills that suit students for communicating with, understanding others' perspectives, and helping people, which would be more relevant to the kinds of jobs women are more likely to go into? In short, it may make a difference *how* we try to persuade students that philosophy enhances one's job prospects. Rather that exclusively stressing "critical thinking skills" and "problem solving skills," it may be useful to also stress that philosophy develops students' "skills at reasoning with other people," "clearly communicating," and "appreciating others' perspectives." In trying to figure out how the skills learned in philosophy might fit with women's job prospects in a gender-segregated workforce, it would be useful to know what gender differences there are in the skills that male versus female students put on their resumes. In a 2005 study of senior sociology majors, the American Sociological Association discovered that female sociology majors were less like than their male counterparts to list on their resumes: interpreting data results, developing evidence-based arguments, evaluating different research methods, and discussing percentages and significance tests.[13]

In addition to thinking about how we sell the value of philosophical skills to students, we might also ask whether the jobs that are typically mentioned in "What can you do with a philosophy degree?" statements are relatively male-dominated jobs. The first eight of nineteen jobs mentioned in the APA's guidebook, "A Nonacademic Career?" are:

1. Business: advertising executive; assistant manager of a hotel; assistant to the president of a national firm; brewer; development manager; manager of a winery; manpower services coordinator.

2. Computers and Technology: computer systems analyst; consultant; owner of a computer firm; programmer; technical writer.
3. Consulting: in business, education, and publishing.
4. Education (non-teaching fields): admissions officer; alumni relations officer; archivist; college president; dean; educational testing administrator; humanities bibliographer; librarian; residence hall director; provost; vice-chancellor for academic affairs.
5. Engineering.
6. Finance: bank officer (various departments); commodities broker; financial advisor; investment broker; tax accountant.
7. Government (federal): armed forces officer; CIA staff member; congressional staff member; diplomat; immigration service staff member; intelligence officer; intern in the Department of Defense; policy analyst; policy and planning consultant; United Nations official; U.S. Postal Service staff member.
8. Government (state and local): director, human services agency; county commissioner; county supervisor."

The heavy emphasis on administrative and managerial jobs, the inclusion of very heavily male dominated jobs in computers, technology, and engineering, and (remarkably!) the exclusion of actual teaching from the sample of education jobs make for a distinctively gender-biased job list. I suspect that part of the problem here is that we all know that most philosophy majors are male and so it's natural to focus on jobs that would be attractive to men. Part of the problem is also that we want to convince majors that they can earn a good living, so it's also natural to focus on higher paying jobs, which also tend to be male-dominated professions.

Hofstra University's webpage, "What You Can Do With a Philosophy Degree," provides an example of a refreshingly different, and much more gender-balanced way of presenting the range of jobs open to philosophy majors.[14] In addition to Law, Medicine, Business, and Ministry, Hofstra lists these careers:

> **Parenting**. We don't usually think of parenting as a career. But perhaps we should. And as Sarah Ruddick points out in her book, Maternal Thinking, parenting well requires a lot of thought! Philosophy teaches us to think clearly

about what matters most and to communicate passionately but respectfully. Surely these are skills parents need more than anyone else!

Teaching. Teachers must begin by showing kids that the world is something to marvel at! It is a miraculous, wondrous, fabulously interesting place, well worth learning to know. Philosophy, perhaps more than any other discipline, teaches us to wonder and marvel, to be surprised and excited, to be curious. Teachers who learn this can infect their students with a love of learning.

Journalism/Writing. An open democratic society depends on its journalists to `tell it like it is,' ask tough questions, point out hypocrisy, dig up buried truths, rattle our consciences, wake us up, inform us. Philosophy trains students to write clearly and carefully about matters of the utmost importance to human lives.

Psychotherapy. While studying psychology is indispensable to anyone wanting to be a psychotherapist, philosophy can be a great help too. Philosophy helps us to understand how the mind works, how people think, the common mistakes we make, moral issues, religious concerns, all of which figure prominently in therapy.

Activism. Surely the world is in some serious need of fixing. Activists dedicate their lives to pushing the world to change for the better. Many philosophers end up being activists because their studies show them where the problems are and that we're all collectively responsible for the conditions under which we live.

Given that women are more likely than men to adjust their labor force participation to accommodate childrearing, that women are more likely than men to work in non-profits, and that PK-12 education is heavily female-dominated, the inclusion of parenting, activism, and teaching kids addresses female students' job futures. In addition, women are more likely to choose careers where they can make a difference to other's lives, and all of the job descriptions here address that interest.[15]

In short, while both male and female students are likely to have difficulty envisioning how a philosophy major will lead into a job, one hypothesis worth exploring is whether women's interest in majoring in philosophy is, at least in part, precluded by their *greater* difficulty imagining how philosophy fits with the kinds of jobs they are most likely to occupy in a gender structured workforce. We need to ask ourselves

whether what we say about philosophy and the job market adequately addresses female students' concerns about finding a job.

Female Undergraduates, Self-Expression, and Disciplinary Stereotypes

Now let's turn to the factors that may preclude women's interest in the philosophy major that are connected with feeling that the major is self-expressive or connected to one's identity. Toni Adelberg, Morgan Thompson, and Eddy Nahmias, discovered in their survey of introductory philosophy students that "female and black students seemed to feel out of place in the philosophy classroom" and are less likely to agree that they have a lot in common with philosophy majors and philosophy instructors.[16] Sally Haslanger has argued that there is a schema class between 'philosopher' and 'woman';[17] and on the basis of this and anecdotal evidence, I speculated that female students find it more difficult to imagine themselves as philosophy majors.[18] Tom Dougherty and his colleagues found confirmation of this later hypothesis in their recent study, which, among other things, asked students whether they agreed or disagreed with "I can imagine becoming a philosopher." Male students were significantly more able to imagine themselves as philosophers.[19]

But why exactly do female undergraduates find it difficult to identify with philosophy majors and philosophy professors? The most helpful work that I have found on this topic is a set of studies by a sociologist Sapna Cheryan and her colleagues on the connection between women's disinterest in majoring in computer science and their feelings of dissimilarity to the stereotype of the computer science major.[20] Reporting on

a variety of studies aimed at getting a fix on college age and gradeschool students'

stereotype of the computer scientist, Cheryan and colleagues observe that computer

scientists are imagined to be

- technology oriented, interested in programming and tinkering with electronics
- having little interest in people
- singularly focused on computers and programming to the exclusion of other interests (they "dream in code")
- loners who lack interpersonal skills
- exceptionally (and nerdily) smart
- unattractive: pale, thin, glasses-wearing
- male
- fond of science fiction and video games

"Taken together, the image of a computer scientist that emerges in the U.S. is one of a

genius male computer hacker who spends a great deal of time alone on the computer,

has an inadequate social life, and enjoys hobbies involving science fiction."[21] She and

her colleagues were able to confirm that college students who had not taken a

computer science course shared most of this stereotypical image of computer science

students, an image that is routinely reinforced in the media. As Fisher and Margolis

observe, of the stereotype of computer scientists as "narrowly focused, intense

hackers": "For students for whom this is not an appealing work style, and whose career

aspirations extend beyond narrowly technical work, this image can be repellent or

discouraging."[22]

     The stereotype of the computer scientist doesn't seem to me too far off of the

stereotype of the philosopher if, plausibly, one imagines the stereotype to be of

someone who is singularly focused on philosophy, interested in argument for its own

sake, exceptionally smart, male, and not especially socially skilled or fashionable.

However, since popular culture does not tend to depict philosophers at all, it would be interesting to know exactly what students imagine philosophers and philosophy majors to be like. I attempted to do some very unscientific web surfing on this topic, and didn't come up with much although this description struck me fairly apt:

> My image of a philosophy major has less to do with physical appearance and more with attitude. I see them as having vast knowledge of the subject, able to quote and argue at will, but having very little common sense or real purpose. In short, they live in some sort of metaphysical plane and not the real world. After they graduate they will get a job at Office Depot and argue about the nature of the soul with the customers, using nothing but the most prominent of philosophers to support their claims.[23]

If stereotype impedes female students' ability to see themselves as like other philosophy majors and thus as belonging in philosophy, and if that in turn precludes female undergrads' interest in the philosophy major, then we have reason to worry about the content and durability of that stereotype. The Adelberg study of introductory philosophy students revealed that women students are less likely to 1) enjoy and be interested in philosophy, 2) feel confident in their philosophical abilities and good at philosophy, and 3) feel that they had a lot in common with the typical major and with their instructors. Cheryan, in her work on computer science students, aimed to get a fix on the relationship between these three factors--interest, confidence, and perceived similarity. What she discovered was that perceived similarity to the typical computer science major affects both confidence and interest. And *it is perceived similarity in particular that predicts interest in the major***,** not perceived sexism, stereotype threat, belief that their gender will not be valued, or estimation of the proportion of men versus women in the discipline.[24]

In a series of studies, Cheryan and her colleagues investigated the way that exposing women students to people or props that embody the stereotype of the computer scientist reduced women's interest in computer science by comparison to women students who confronted neutral or stereotype challenging people or props. In one of her studies,

> undergraduate women who had a brief two-minute interaction with a male or female computer science major who embodied current computer science stereotypes (e.g., a t-shirt stating **"I code therefore I am"**) were less interested in pursuing computer science and anticipated being less successful in the field than women who encountered a male or female computer science major who did not embody computer science stereotypes.[25]

And
> Similarly, women who were exposed to an introductory computer science classroom containing objects stereotypically associated with computer scientists (e.g., Star Trek posters, videogames) expressed less interest in majoring in computer science, felt less belonging in computer science, and believed they would be less successful in computer science compared to women who were exposed to the same classroom containing non-stereotypical objects (e.g., art posters, water bottles)."[26]

In another study, female students were given a "news" article that either confirmed the image of computer science majors as geeks or reported that this stereotype no longer fit. Women's interest in the major increased after reading the 2nd article.

One implication of Cheryan's work for philosophy is that it isn't sufficient just to just increase the representations of women in philosophy, either through incorporating more images of women or through having more women philosophers on the syllabus or through having more female bodies around (either students or faculty). If what female students are responding to are quite specific personal attributes—dress, (un)sociability, hobbies, (lack of) breadth of interest, (exclusively) valuing discipline specific activities

for their own sake--just changing the sex associated with philosophy won't make philosophy significantly more attractive to women students even if maleness is *one* part of the philosopher stereotype.

To illustrate the problem of just focusing on exposing students to more "femaleness" in their philosophy classes, philosophy club, syllabi, faculty selections, consider this poster that I designed *before* I began thinking about what women find attractive in the majors they tend to choose and their lack of identification with the philosophy major stereotype.

My aim in creating this poster was to disrupt the association of philosophy major with 'male.' But notice how the poster plays into other stereotypical traits—loner, concerned with ideas in their own heads, using arguments against other people, similar to science majors.

Now here's an example of a student's recommendation of philosophy that I think does a better job at disrupting the stereotype:

> Perhaps quite uninterestingly, I think the world, human relationships, actions, and social structures are much more confusing and complicated than we generally realize. It's quite fascinating to try to understand and make sense of the world in which we live, the political structures we live within, and the social relationships we develop. I really like puzzles, thinking, and reading—I initially became a philosophy major because I enjoyed being challenged. I've stayed in philosophy because it rarely assumes that anything is obvious, and puts nearly everything up for debate. This provides a lot of scholastic latitude but combines it with rigorous thought, argumentation, and writing.[27]

Notice in particular the way this student begins by speaking of human relationships and social structures and recall our earlier charts of both the majors that women students are most likely to choose and of the majors that are most heavily dominated by women. They are largely people-oriented fields where students are likely to learn how to make others' lives go better, and once they graduate, will be able to make a difference to other person's lives.

Conclusion

During the rise of women's studies in the 1970s and 1980s, there was an explosion of intra-disciplinary critiques of the androcentric bias in the methods, paradigms, theories,

and canons within academic disciplines. There was also an extraordinarily rich attempt

to rethink what academic disciplines that genuinely included women would look like.

What became popularly known as the "add women and stir" method of including

women in academia—leaving all of the existing disciplinary assumptions in place but

applying them now to women and not just men—was resoundingly rejected as an

inappropriate and ineffective way to go about producing a more inclusive disciplinary

scholarship. In thinking today about how to go about rectifying the disproportionately

low numbers of women in the undergraduate major, it's important to keep in mind that

you can't just *add* women undergraduates and stir them into existing conceptions of

what philosophy majors do (or should) value in philosophy and existing conceptions of

natural career trajectories for philosophy majors. Men and women fit into a gender-

structured workforce in different ways, are socialized into and routinely confront

different gendered expectations about what they will do and who they will be, and find

themselves fitting or not fitting a different range of disciplinary stereotypes.

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[1] The title of this essay derives from Sapna Cheryan and Victoria C. Plaut's "Explaining Underrepresentation: A Theory of Precluded Interest" *Sex Roles* 63 (2010): 475-488.

[2] Christianne Corbet and Catherine Hill, *Graduating to a Pay Gap: The Earnings of Women and Men One Year After College* (Washington DC: AAUW, 2012).

[3] Cheshire Calhoun, "The Undergraduate Pipeline Problem," *Hypatia* 24(2009): 216-223.

[4] Tom Dougherty, Samuel Baron, and Kristie Miller, "Female Underrepresentation Among Philosophy Majors: A Map of the Hypotheses and a Survey of the Evidence" (unpublished); Samuel Baron, Tom Dougherty, and Kristie Miller, "Why is There Female Under-representation Among Philosophy Majors? Evidence of Pre-University Influences" (unpublished). Many thanks to Tom Dougherty for sharing these essays with me.

[5] Toni Adelberg, Morgan Thompson, and Eddy Nahmias, "Women and Philosophy: Why is it 'Goodbye' at 'Hello'?"

[6] Dougherty et al, "Female Under-representation Among Philosophy Majors," p. 12.

[7] http://www.forbes.com/2010/03/02/top-10-college-majors-women-forbes-woman-leadership-education.html

[8] Corbett and Hill, "Graduating to a Pay Gap."

[9] Anthony P. Carnevale, Jeff Strohl, and Michelle Melton, "What's it Worth: The Economic Value of College Majors," Georgetown University Center on Education and the Workforce, 2011. Available here: http://cew.georgetown.edu/whatsitworth.

[10] Corbett and Hill, "Graduating to a Pay Gap," p. 13.

[11] Ibid., p. 16.

[12] Ibid., p. 19.

[13] "What Can I do with a Bachelor's Degree in Sociology? A National Survey of Seniors Majoring in Sociology. First Glances: What Do They Know and Where are They Going?" American Sociological Association, Research and Development Department, January 2006, p. 19. Available here: http://www.asanet.org/employment/factsoncareers.cfm.

[14] https://www.hofstra.edu/Academics/Colleges/hclas/PHI/phi_phidegree.html

[15] For example, lmost half of graduating female sociology majors, compared to one-third of male sociology majors, regarded changing society as an important reason for choose a sociology major ("What Can I Do with a Bachelor's Degree in Sociology?" p. 13).

[16] Adelberg et al., "Women and Philosophy," p. 6.

[17] Sally Haslanger, "Changing the Ideology and Culture of Philosophy: Not by Reason (Alone", *Hypatia* 23(2008): 210–223.

[18] Calhoun, "The Undergraduate Pipeline Problem."

[19] Dougherty et al, "Why is There Female Under-Representation."

[20] Sapna Cheryan and Victoria C. Plaut, "Explaining Underrepresentation: A Theory of Precluded Interest" *Sex Roles* 63 (2010): 475-488; Sapna Cheryan, Victoria C. Plaut, Caitlin Handron, and Lauren Hudson, **"**The Stereotypical Computer Scientist: Gendered Media Representations as a Barrier to Inclusion for Women" *Sex Roles* 69(2013) 58-71; Sapna Cheryan, "Understanding the Paradox in Math-Related Fields: Why Do Some Gender Gaps Remain While Others Do Not?" *Sex Roles* 66(2012):184**–**190.

[21] Cheryan et al, "The Stereotpyical Computer Scientist," p. 60.

[22] Allan Fisher and Jane Margolis, "Unlocking the Clubhouse: The Carnegie Mellon Experience" *SIGCSE Bulletin* 34, no. 2 (June 2002): 79-83, p. 80. This is a report of a study at Carnegie Mellon that involved student interviews and on the basis of which they were able to increase the percent of women in computer science form 7% to 42% in five years.

[23] http://answers.yahoo.com/question/index?qid=20080916150224AALDfIo

[24] Cheryan, "Explaining Underrepresentation," p. 483.

[25] Cheryan, , "Understanding the Paradox in Math-Related Fields," p. 185

[26] Ibid.

[27] http://www.3ammagazine.com/3am/62984/