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Barriers Beyond Equity: An Exploratory Study of Women Graduate Students' Career Pathways in Astronomy

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ABSTRACT

Compared to physics, the field of astronomy has a relatively high representation of women. Most research, however, focuses on physics and ignores astronomy, even though the academic requirements for the two show significant overlap. This project explores the lived experiences of five women in a graduate program of Astronomy at a research-intensive university that had almost double the number of female faculty than the national average. Given that this program is identified as female-friendly by the participants and that all of the participants passed their qualifying exams to move into the PhD program, their stories offer insight into the perseverance of women in the field of academic astronomy. In turn, this may inform physics departments how better to help women to persist in their field. The narratives of these participants, however, show concern about current models of success which continue to adhere to the pipeline model or career trajectory. Instead, these women define success as having work-life balance and long for career pathways which allow them to attain many life goals, not just an academic life goal.

KEYWORDS

Women in science; astronomy; gender in science; career; mentoring

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INTRODUCTION

In recent years, research on women in physics has been concerned with the dearth of women in the field (AIP, 2014; Bug, 2003; Ivie & Tesfaye, 2012; Whitten et al., 2003). Women are currently showing low numbers of representation in the field as measured by undergraduate majors (22%), graduate students (18%), and physics faculty (14%) (AIP, 2014; Mulvey & Nicholson, 2012, 2014), in spite of increased numbers of women studying in the fields of science and engineering (NSF, 2012).

In an effort to understand why the representation of women in physics is so low, it is helpful to look at its sister field, astronomy, which shows a representation of women in undergraduate majors at 37%, graduate students at 40% and faculty at 19%, in spite of the fact that astronomy is frequently housed within physics departments and requires extensive physics knowledge (NSF, 2012). This makes for an interesting comparison. If the fields require such similar knowledge bases and are often housed in the same departments, why are women represented in such greater numbers in astronomy? Or, what is it that draws women to study astronomy at greater rates than they are drawn to pursue physics?

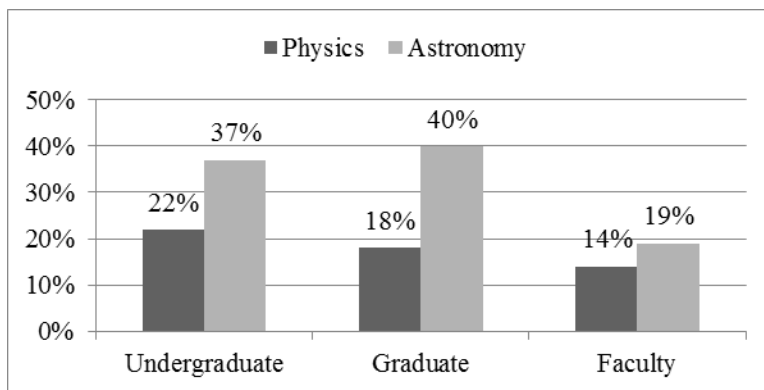


Figure 1. Women's representation in physics and astronomy

Much contemporary research has been devoted to the study of women in physics undergraduate programs (Lorenzo, Crouch, & Mazur, 2006; Ong, 2005; Whitten et al., 2004; Whitten et al., 2003) and graduate programs (Barthelemy, Grunert, & Henderson, 2012; Curtin, Blake, & Cassagnau, 1997; Dabney & Tai, 2013; Hollenshead, Soellner-Younce, & Wenzel, 1994) in an attempt to understand how women persist in the field. Earlier work has primarily focused on the differences between male and female students' successes (Kost, Pollock, & Finkelstein, 2009; Lorenzo et al., 2006; Miyake et al., 2010; Pollock, Finkelstein, & Kost, 2007). Additionally, some of this earlier work on graduate-level women's experiences has become dated (Curtin et al., 1997; Hollenshead et al., 1994). More recent research

has focused upon the experiences of women themselves, versus comparing them to men (Barthelemy et al., 2012; Dabney & Tai, 2013; Danielsson, 2010, 2012; Gonsalves, 2011, 2012; McCormick, Barthelemy, & Henderson, 2014). Since some of the research referenced was conducted outside of the U.S., it would be helpful to have more current information on the experiences of women in graduate programs.

Given the similarities between the fields of astronomy and physics, and given the differences in female representation in the fields, this study aims to explore the experiences of five women in an astronomy graduate program in the U.S. This program was identified by the participants as being female-friendly, boasts a level of female faculty that is almost twice the national average, and is housed within a major national research-intensive university.

BACKGROUND

Research on women in physics has focused on two main areas: women's experiences with mentoring in graduate education and women's career trajectories after obtaining their graduate degrees. This literature review is focused upon the second, looking at the model of the pipeline which has been used to illustrate persistence within and completion of graduate education in physics and other STEM fields (Blickenstaff, 2005).

Pipelines and Pathways: Women in Physics

When taking a closer look at the statistics regarding women faculty, it is found that women are more heavily represented in adjunct positions (21%) and bachelors granting institutions (17%) than in PhD (12%) granting institutions (Figure 2). Women in physics seem to be exiting the research pipeline in favor of part-time and teaching positions, as illustrated by these numbers. This idea of a science pipeline where women "leak-out" has been a persistent model in research focusing on women in science (Alper, 1993; Astin & Astin, 1992; Blickenstaff, 2005; Eccles, 2005; National Academy of Sciences, National Academy of Engineering, & Institute of Medicine, 2011). The idea behind this model is that women leak out at particular career stages, such as from undergraduate to graduate programs and graduate school to faculty positions.

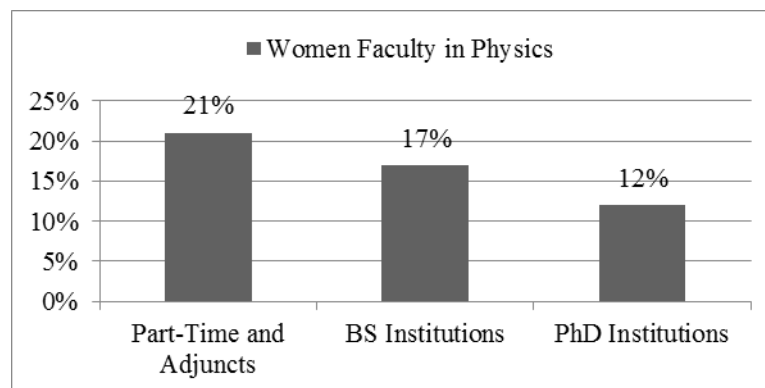


Figure 1 Women's representation in physics positions. Source: (Ivie, White, Garrett & Anderson, 2013)

It has been suggested that this leak may be what causes the shortfall of women at every stage of the pipeline. One significant cause for these leaks at the faculty level has been attributed to the role of having children in a woman's life (Ferriman, Lubinski & Benbow, 2009; Ivie, 2011; Ivie & Tesfaye, 2012; Mason & Ekman, 2007). Such a large life decision has been shown to have significant impacts on women's careers in the sciences.

Xie and Shauman's (2003) book on women in science summarized data from the literature and their own work (Xie & Shauman, 2003). They demonstrated that women in science with children have different career outcomes than those without; women with children at the undergraduate level were less likely to persist into graduate school or to work in science and engineering after graduation, and were more likely to be unemployed and disengaged from graduate education. This same trend was shown for women with master's degrees. This, of course, presents no explanatory model for how children might actually be affecting these women's persistence.

Mason and Ekman (2007) delved into the barriers and challenges of women pursuing both professional careers and bearing children. One of their key conclusions was that attempting to have children while on the tenure track can diminish a woman's available time to conduct research, which could affect her overall chances at securing tenure and having a productive career. Empirical research on women in physics has illuminated this phenomenon further. Ivie and Tesfaye (2012) showed that women in physics with children reported the slowest career progression of any group of persons in the field. Interestingly, the group who reported the fastest career progression were men with children. The authors of this work continued by showing that women also reported having the majority of the responsibility for household work, which may explain why women with children have the slowest reported career trajectories. In addition to being physicists, they have to go home and work a second shift taking care of their families (Hochschild & Machung, 1989). In contrast, men with children may have the additional resource of a spouse who is available to work this second shift so he can continue his academic pursuits.

Furthermore, in a study of the values of men and women in science it was found that as women with children got older they placed a greater value on having flexible schedules and fewer work hours (Ferriman et al., 2009). This was a change not seen in men. If women perceive these familial issues in their graduate careers, it may negatively impact their persistence into research positions. Bug (2003) described the physics researcher as the lone investigator, someone who seeks only to do research and has no other concerns in life. Following from the findings of Ivie and Tesfaye (2012), it may be that men have more of an opportunity to be the lone investigator, because of the added support of their spouses, whereas women may not benefit from this spousal support and may have to choose a childless life in order to become lone investigators (Bug, 2003). This may be a sacrifice many women are not willing to make. Other scholarly works have also pointed to the finding that to be a research-engaged physicist means dedicating one's whole life to that pursuit alone (Hermanowicz, 2009; Traweek, 1988). This realization that

graduate school and the achievement of a tenure track position require a singularly focused life is said to influence graduate students' departures from their programs of study (Golde, 2002).

Women's potential decisions to forego research-intensive careers and place value on other life goals do not necessarily indicate a "leak" from the physics pipeline, however. It may only represent women accommodating their multiple life goals within the context of their science careers. Research has begun to challenge the notion of a leaky pipeline in this way, notably that of Xie and Shauman (2003) and Whitten et al. (2007). Xie and Shuman (2003) showed that at the undergraduate level, women who graduate with science and engineering degrees were actually comprised of more women students who switched into a science or engineering major from another major, rather than those who persisted from the high school level. In other words, women were choosing these programs as students. They were not leaking out, they were opting in.

Whitten et al. (2007) emphasized the importance of conceptualizing women's entrance into physics as occurring through varying pathways. Their work argued that increasing the number of women in undergraduate physics requires building a degree program that allows women to switch from non-science majors, come from non-traditional backgrounds (e.g. those returning to school), or come from other science majors (Whitten et al., 2007). This idea of women coming to physics from many different pathways can easily be retro-fitted to women's choices of careers; they may choose varying career pathways that do not lead into one particular career model (e.g., research).

Although this pathways philosophy has been clearly supported in some areas of the literature, the pipeline model is still a model used by many researchers (Blickenstaff, 2005; Fuhrmann, Halme, O'Sullivan, & Lindstaedt, 2011; Maltese & Tai, 2011; National Academy of Sciences et al., 2011; Rivoli & Ralston, 2009; Subotnik, Tai, Rickoff, & Almarode, 2009). Such recent studies have explored the pipeline in elementary and middle school students (Rivoli & Ralston, 2009), those in special science high schools (Subotnik et al., 2009), minorities in undergraduate education (National Academy of Sciences et al., 2011), and issues of graduate students (Fuhrmann et al., 2011). In the last of these examples, however, the authors called for a re-envisioning of the pipeline as a branching system to accommodate for other careers. As demonstrated, scholars have challenged the efficacy of the pipeline model, but it still pervades research. More research might help to dismantle this notion and support a more comprehensive model to correctly illustrate women's unique career choices.

Summary

Though research exists exploring issues of pipeline leakage for undergraduate physics majors, the same literature base has yet to address graduate physics and the entirety of the field of astronomy. This same literature gap exists for the career goals of women in physics, and astronomy, at the graduate level. To fully understand the barriers women face in physics and astronomy it is important to focus specifically on that discipline.

One way to begin this literature base is to discuss women's lives with women who have navigated the graduate system. An interesting starting point for such research would be the experiences and career goals of women who have thrived in a self-described female-friendly environment. This exploratory study provides this particular environment to uncover the barriers women face beyond equity. This article will do this by exploring graduate women's astronomy career goals and determining if their experiences fit with the pipeline model.

THEORETICAL FRAMEWORK

Feminist Standpoint Theory (FST) was used in this study (Harding, 2001; Hesse-Biber, 2007). FST recognizes that knowledge is situated within particular time periods and places, and upholds the value of listening to the stories of actual persons within these situations. In this case, the situation is a graduate-level astronomy program and the voices are those of the female graduate students. Since females are still minorities within graduate astronomy departments, they will have a different view of the realities of being within the department according to FST. The voices and construction of the findings of this work will come from the women themselves, and the research was coded and validated by a female researcher in tandem with the male researcher who conducted the interviews.

METHODOLOGY

Research Goal

Our goal is to explore the expected career trajectories of five women in a female-friendly graduate astronomy program from their personal perspectives (standpoints). Given that their education is taking place in an environment that is identified as friendly to women, the pipeline model may be a fit for these women. Participants' projected career goals will be explored in order to determine the fit of the pipeline model for these women or to determine that the pathways model speaks better to their lived experiences.

Data Collection and Analysis

The first author conducted on-site face-to-face semi-structured interviews with each of the women identified in this study. General prompts were used in the interviews to guide conversation, such as "Tell me about the pathway that led you to astronomy." Interviews lasted around one hour, were audio recorded for accuracy and were transcribed verbatim, including the natural pauses and language of the participants in order to be true to their voices. Additionally, participants were provided with transcripts as a way to ensure the accuracy of the data. Data analysis began following the first interview. As interviews were transcribed and verified by participants, they were read by the first two authors and compared for themes. Additionally, software was used to assist in data coding. The first two authors met regularly to compare notes and findings from the interview data. After themes were agreed upon, interviews were reread and recoded for themes.

Participants and Recruitment

Participants were recruited from a research-intensive national university that had been identified as having female faculty representation which was almost double the national average. Participants met three criteria for the study: 1) woman gender identification; 2) pursuit of a PhD in astronomy; and 3) passage of qualifying examination or equivalent. In all, five students in the later stages of graduate education participated in interviews. Of these five, four had undergraduate degrees in physics and/or astronomy, and one had an undergraduate degree in another field (see Table 1).

Table 1 Participant Demographics

	Year	Undergraduate Institution	Undergraduate Degree	Race
Annie	6	All Women's College	Astronomy & Physics	White
Cyndi	4	Research-Intensive	Physics & Astrophysics	White
Bishi	4	Research-Intensive	Physics	Indian
Kate	3	Small Liberal Arts	Physics	White
Pat	3	Small Public University	Business*	White

**Went back to school after working in business to take physics classes before applying to graduate programs in astronomy*

RESULTS

The data from the study revealed that the women in this program had very differing ideas of their ideal career trajectories. Many of them identified that their advisors had very particular pathways in mind for them, most of which centered on continuing into academe. For the women themselves, however, their concepts of what success looked like showed greater variation. This serves to illuminate some of the issues with the model of a pipeline in the careers of these women and the better fit of the pathways model proposed by Fuhrmann et al. (2011).

Projected Career Goals

The typical academic trajectory identified by the women in this study includes a series of post-docs, which involve repeated physical moves, followed by attempts to "maybe" obtain tenure-track faculty positions. Some of the women plan to pursue this track, but others have real reservations about the career trajectory that is held out as the standard.

Cyndi is clear about her reservations:

C Yeah, well, so my biggest thing against uh, against kind of the traditional academics, you know academic path is, I don't want to have to do 4 post docs and then, you know get a faculty job and then maybe hopefully get tenure like, I just, I don't, want to have to wait,

until I'm 40 to get job security, you know? I don't, I don't want to have to move every 2 or 3 years, you know? I wanna be able to lay down some roots and, you know, and eventually, like, start a family and stuff and I can't imagine doing that on, on kind of that traditional, like, career path, and, you know, I like teaching, so I feel like I have a viable alternative career path just like waiting for me, so I just, I don't wanna have to waste the time and energy moving around every 2 years and going from post-doc to post-doc to post-doc and hopefully maybe getting a tenure track job. I just don't want to deal with that (chuckle).

Bishi shares similar reservations:

B I mean the protocol now a days is almost like, you have to get a couple of . . . post-doc positions, like, so you get a 1-, -2, to 3-year post-doc and then you go to a second and then maybe even a third. I, I definitely know people in their 3rd post-doc and then maybe you get your faculty position, you know?

Annie, on the other hand, accepts the options presented to her.

A That's the path. You go to grad school, you get post docs, you become faculty, so I didn't even think about like, sort of like, alternative careers for astronomers, which, there aren't many. Um, it's not like a field where you can go into industry pretty easily. Anyways it, it just seemed natural.

Similarly, Kate is following the traditional path. Kate stated:

K I know that like, I'll get my degree, I'm gonna pursue one or two post-doc positions, um, because no matter what I do, I wanna have the science background and have um, I wanna have, you know, the resume to back . . .the credentials. Exactly. So um, following that, if I'm offered some great faculty position, like, we'll see. I'll kind of take it as it goes.

In spite of Annie and Kate expressing that they'll follow the traditional path, both make statements that they're open to other options, and planning to see what's available, or what comes along. For Annie, location matters, as well:

A I think it will be things like, being able to collaborate with interesting people, having access to students who are really invested in my work and at a certain point, I think that it comes in that I don't want to live in the middle of nowhere.

Kate mentions that the discipline is trying to change the stigma about not working in academia, due to the low number of positions available, and mentions that she could see some alternative jobs for herself. "I'm particularly interested in getting

more involved in science policy. Um, I like teaching. I like outreach. I could see myself, um, interacting with the public.” At the same time, however, she states that she can see herself “at a liberal arts school like my undergrad advisor. I can see myself at a top research institution. Um, yeah, I’m kind of open to any possibilities in the future. It depends on what comes along and what’s the most interesting at the time.”.

In addition to awareness of the uncertain nature of pursuing the dominant career trajectory offered in astronomy, Bishi is also cognizant that she is at a point in life when a significant relationship becomes an eventuality, and she recognizes that it is not fair to ask a partner to move as frequently as an academic career trajectory requires:

B You know, I’m going to be 29 when I get out of grad school. I mean, who knows, maybe I’ll be married. Like, I don’t think I could move around a husband 2 to 3 times, you know? . . . I came into grad school thinking totally astro all the way, but I do realize also as you get older your priorities change.

This is particularly salient to Bishi, who has recently become a first-time aunt.

B I think having seen, like, my whole family, all hanging out so much and this new baby—it’s like a very exciting time and I feel like I’m missing out.

For Pat, the tenure track *is* “a little scary”. She describes how she views the life of academics:

P I, for one, like I said, you have to move so much just to be able to get one of those jobs. And then if you do get one, there’s still a ton of work involved. It’s, you know, it’s a little, it’s a little intimidating, I guess. I don’t know, it’s not very conducive to a family life, I feel, sort of as you get older, you realize that a bit more and . . . I don’t think it’s really good for kids moving every two years. And then, just the amount of work required to get tenure. I mean, I see these post-docs, I mean, these young professors, who are in here every night, every weekend. I mean, you know?

Even though these women are committed to their love of astronomy, they are also aware, as Bishi stated above, that their priorities may change and that they may form relationships and build families. And, as Pat stated above, the expected academic trajectory is not very family friendly. All of the women, however, think about what they want to do with their lives and how to balance their career needs with their needs for relationships and family connections.

K Like, do I want to have kids? Do I not want to have kids? I want to experience a lot, I want to travel. Um, at this point in my life, I don’t really see myself settling anytime soon um, but I know that could change really fast. So I don’t look too far ahead on that front.

A Um, I'm not sure if I want to have kids. My current boyfriend doesn't necessarily . . . because I feel that way strongly now, I doubt that in my near future I'll change my mind. Sure, I may change my mind in 5 years but, I'll cross that bridge when I come to it.

Cyndi describes the difficulties she sees of trying to have a family life while pursuing the academic path:

C I mean just from, you know, like grad students and post docs who, who have done that, I mean, it's really really hard, um, and especially if you think, you have to move around constantly, you're not going to ever have like friends or family to, like, be around to help you out . . . most of the post-docs I know come from the claim that there's no child care, there's no affordable childcare, you know, anywhere, so that's a problem. And then, you know, assuming I stay with my, my current partner, like, we're both scientists, so we both have to deal with that, which would make it twice as hard. So I just, I just don't want to deal with it (chuckle). There are other things that are more important to me than my career, so.

Because of the lack of tenure-track faculty positions in astronomy, compared to the number of doctoral students, there are good reasons for these women to consider alternative careers, although, as Kate stated, there is a stigma that comes with leaving academia:

K I went to the meeting (AAS) in January and they had um, a bunch of sessions encouraging like um, other career paths, for astronomers, like they're trying to, uh reverse the stigma that leaving academia is selling out, cause there's like this—you get your PhD, you go into industry. It's seen as selling out in a lot of ways, or you're just not good enough to stick with it, but, um, there's just not enough jobs there, so, they're trying to reverse that stigma and encourage PhDs to pursue other tracks.

These women are considering alternative career pathways in light of the job market and their own personal and professional needs. Bishi's "ideal job" would be to "work on like, some sort of telescope and do that process because I feel like it's a very important, you know very— modeling the way the sky impacts your data, like, that is very a rigorous process, you know . . .?" The problem Bishi faces is that this type of work is not recognized as important in the field, in spite of the value she sees in its pursuit and development. Others are considering their career options, and exploring things they find interesting:

A I definitely, I want to do research and teach. Um, So far I've really liked mentoring students and so I definitely want to be able to have students.

C I like being able to take what I do and what other people do and making it accessible to somebody who doesn't have a science background. And um, and I think you know science education in general, not just astronomy is, all of it is really important and you know teaching critical thinking skills which is

something that, you know we desperately need in this country (chuckle), but I feel like I should teach because I actually enjoy it and I'm good at it, and so I should do it.

When Pat considers what she would like to do, she is obviously experiencing a dilemma due to the mismatch between the preferred career path and her own needs:

P (Exhale) That's a good question. (laughs) I don't know. I, I, I would like stability, you know, at some point. If, (pause) um, yeah, if there is a way to do astronomy and still be able to do that and not have to move every two years, I don't know what that is right now, it doesn't seem like there are many options. It's like you either, you know, do the tenure track route or, yeah, so I'm sort of looking into maybe there is another option, where you could maybe teach or, I don't know. . . . I guess going forward I would like to find a way to be able to be involved in astronomy while, while still making, you know, making a little bit of money and having a little stability so, I guess that's more of a future thing.

Kate shares a vision she has of success in the field, describing one of her mentors:

K She's a woman in physics. She teaches, she is very happy, has a family. I just saw her as the picture of success. Um, and, being at a big research institution now, I found a lot of conflicting views, about like what success is like. Her outcome is often seen like kind of settling for less, because she is not at a big research institution and given big grants, but she's still has a tenure job, is still doing research in her spare time and has like a pretty comfortable life, and I don't understand why that's viewed negatively, because she is in a liberal arts school in some ways. But I think that is the atmosphere being at a big research institution.

These women were largely uninterested in the traditional research faculty career that is held as the standard. Their disinterest in this pathway originated from a perceived lack of jobs and the conflict they saw this lifestyle would have with their desired futures. This perception of few available jobs was well founded. In 2008 there were around 150 PhD graduates in astronomy and only 19.5 new hires to departments of astronomy (AIP, 2014). Mulvey, P., & Nicholson, S. (2014). Astronomy enrollments and degrees. College Park, MD: American Institute of Physics. Whiate, S., Ivie, R., Ephraim A., & Anderson, G. (2010). The Faculty job market in physics & astronomy departments. College Park, MD: American Institute of Physics. These numbers worsen when considering that multiple years worth of PhD graduates may be applying for any one year's faculty hires. The participants' concerns over work-life balance were well warranted, given the literature review previously offered in this article. Women with children on the tenure track lose critical research time and suffer from slower careers than men in physics. Not all of the concerns of these women reflected their desire to have children; many wanted time for other pursuits in life and did not want to spend all their time working on

their careers. To some of these participants, success was more than just having a career in research, it was having a meaningful multilayered life.

DISCUSSION

Pathways Over Pipeline

The career pathways discussed by the participants highlighted the necessity of understanding women's trajectories in science as pathways and not linear pipelines (Blickenstaff, 2005; Whitten et al., 2007). The pipeline metaphor suggests that women enter at age 18 in college and "leak" out as the pipeline flows towards faculty positions. Whitten et. al. (2007) argue that women's educational trajectories into physics need to be seen as branching pathways that have entrance points from many places. Similarly, we project this pathways model onto the career trajectories of women in astronomy. So instead of the "pipeline" ending in a faculty position, each person's educational journey is a pathway ending in a different but equal career. The women in this study demonstrate this model with the varying interests they show in terms of careers. These interests were often driven by factors outside the walls of the academy and their control. Many women were choosing careers to accommodate their personal lives and potential desires to have children.

Although the pipeline imagery is used to describe the career trajectory of students in physics, and in this case, astronomy, this is not a useful description for most of the women in this study. A couple of the women do seem to be headed in the direction of the pipeline; however, what we see for all these women is that they are all trying to find a way to make their career pathways work with the lives they want to lead. Success is defined beyond career for them, in that success includes family and life outside of academia. In some cases, success also means doing things that do not fall in the traditional line of what academic careers are supposed to be or what are held up as model careers.

Some of the women are clear that what they need in life is not compatible with some of those ideals, and they want their needs met, while being able to remain connected to a field they love. This leads them to attempt - creatively to come up with ways in which they can meet all of these needs; this career trajectory lends itself to the pathway metaphor proposed by Whitten and colleagues (2007). Since the pipeline is seen as too limiting or too uncertain for such a substantial life investment, these women are attempting to create career pathways for themselves which allow them to meet multiple needs in their lives, and which give them a greater sense of balance.

Figure 3 shows our model for possible pathways into various careers. The model is designed as a roundabout with many exits, each of equal merit or importance. At the center of the roundabout are some competing interests and values of women who are looking to create careers in astronomy. Women in astronomy enter the roundabout and move around the center considering issues of family, work-life balance and more before deciding on the career pathway that is right for them.



Figure 3 Career Pathways for the Participants in This Study

New and equal career pathways need to be developed and acknowledged, or the academic pipeline model must be revisited. Speculating on how the pipeline model and current academic structure could be rebuilt to accommodate women's varying desired lives is beyond the scope of the paper. We can only suggest that their career trajectories can be conceptualized as varying pathways that lead to many careers outside of research-intensive universities. If we do, however, want to increase the number of women in physics and/or astronomy pursuing research-intensive tenure track positions, we as a community may want to address women's concerns with the field through policy and university-wide approaches which recognize that women's chosen pathways vary from the model which is consistently presented as the preferred career path.

CONCLUSION

Even in this near ideal environment, the women were hesitant about continuing in their fields to become research professors. This tendency is shown across physics and astronomy, where women have lower representations at the more research-intensive institutions. Some of these women's aversion came from their valid concerns about work-life balance. These women did not perceive research careers as compatible with other life goals. The only one of the five firmly interested in a research career was Annie, who was not interested in having children and had a spouse willing to relocate for her career advancement. Her decision not to have children may have led her to believe she could succeed in academia.

These women showed that even in a female-friendly environment, they still faced unique issues. Women saw their careers being limited by their desire for more in life than just work. They did not want to take up the mantle of their advisors for fear of missing out on other things they wanted to experience in their lives, and their view of the realities of making the choice to follow the pipeline into academe seemed to require multiple, significant commitments that may or may not lead to the stated goal of becoming part of the academy. They showed that in astronomy women face hurdles that do not emerge from purposeful discrimination. They arise from an institutional structure designed around the lives of men who have spousal support at home and who choose to take on the mantle of working every night and every weekend, as Pat saw. These women were facing barriers beyond equity, and they were clearly stating that they wanted more from life than a career in academe could offer.

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