WAFFLING & FLAILING:

UNDERGRADUATES IN PURSUIT OF A PH.D.

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INTRODUCTION

While we understand a great deal about the undergraduate admissions process, both how institutions make decisions and how students come to choose which colleges to attend, very little is understood about the doctoral admissions process. In most cases, each academic department makes its own admissions decisions; consequently the process is highly idiosyncratic and decentralized. The processes that departments use for decision making are sometimes further decentralized to individual faculty members. Some departments publicize their criteria freely; others do not. Some offer rich opportunities for prospective students to learn about the department, such as the "recruitment weekends" prevalent in the biological sciences; others assume applicants have already determined whether the institution is a good fit for them. This is in contrast with undergraduate admissions, where decisions are made for the entire campus by a central admissions office.

Equally mysterious is the decision making process that prospective graduate students use. What stages–if there is such a pattern–do prospective doctoral students go through when considering and deciding to attend graduate school? From whom do undergraduates solicit advice? What resources do students use? What factors do students take into account when selecting a program?

This study explores the academic decision-making process of college seniors who anticipate enrolling in a doctoral program within one year of their graduation. The literature suggests that doctoral students, particularly those in the humanities and those who have not had research experiences, have unrealistic expectations about the nature of graduate school (Baird, 1978; Golde, 1998). For example, they often underestimate the amount of studying required, do not anticipate the change from studying facts to learning theory, and do not know how to select an advisor. Many report being surprised by the state of the academic job market; they do not know that jobs are scarce and often preceded by years of postdoctoral training, particularly in the natural sciences. This suggests that many students entering doctoral programs have not been adequately prepared for the experience, and may well have made ill-informed decisions. When doctoral students hold unrealistic expectations about graduate school and possible careers, their chances of success decrease while the chance of their withdrawal from the program increases (Baird, 1978; Golde, 1996; Golde, 1998).

Nonetheless, faculty and administrators assume that incoming students have made rational and well informed decisions. It is assumed that students have a good understanding of what graduate school entails and of the career paths beyond the Ph.D. For example, the key argument that is made against calls to practice "Ph.D. birth control" and reduce the size of graduate programs is that the demand for doctoral education on the part of prospective students continues (Lombardi, 1999). If administrators, faculty, and staff are to influence the educational and career aspirations and the choices of college students, they must understand how these students go about searching for graduate schools and the factors that influence their decisions about what schools to apply to. Exploring how prospective doctoral students make their decisions about graduate school has the potential to contribute to our understanding of factors that influence student success and why students do or do not persist through graduate school.

LITERATURE REVIEW

Three bodies of literature inform this study: research on undergraduate college choice, research on college student development, and research about the graduate school context. Considerable research has been done on "college choice," the decision to attend college, and the process that high school students use to learn about schools and make their decisions. While undergraduate students are likely to be somewhat different in their aspirations, motivation, and independence from high school students, the literature provides a theoretical map from which to begin to explore college seniors' academic decision making. Understanding the ways in which college students differ from high school students—the terrain covered by student development theory—helps us to understand how college choice theories may fall short when applied to pre-doctoral students. Chickering and Reisser (1993) describe seven student development themes, or "vectors," that provide a theoretical context for understanding the developmental stages that college students pass through. This framework informs us about how upper-class undergraduate students might be thinking, feeling, and acting as they make their academic decisions regarding graduate school. Finally, we relied on literature about doctoral education to understand the ways in which doctoral programs and undergraduate programs are qualitatively different.

COLLEGE CHOICE

The literature on college choice draws on two compatible theoretical frames: economic and sociological (Chapman, 1984; Hanson & Litten, 1982; Hossler & Gallagher, 1987; Jackson, 1982). Economic models of decision making—cost-benefit analysis—emphasize the process of collecting and evaluating information and using it as the basis for making a choice of which college to attend. Sociological models—the status attainment literature—emphasize how a student's family and school shape their perceptions of career and college options.

Don Hossler and his colleagues (Hossler & Gallagher, 1987; Hossler, Schmit, & Vesper, 1999) have summarized the extensive literature on college choice, and say that the college choice process takes place in three discrete phases: 1) preference or predisposition; 2) search and exclusion; and 3) evaluation and choice. The predisposition stage is defined not as the *intention* to do something, but rather the *decision* to attend college. By making the decision to pursue further education, students forgo other choices, namely entering the work force. Needless to say, students' background characteristics and their prior educational experiences greatly affect the decision to attend college. The search stage is the period when students seek information about educational opportunities. The search process includes the search for both institutional attributes and for institutions to attend. Furthermore, Hossler and his colleagues assume that the choice list will be tempered by students' current social conditions and influenced in nontrivial ways by the information they gather about various institutions.

During the evaluation and choice stage students continue to narrow their choices based on previously determined criteria. For example, students might select ten schools, apply to only six of those ten, desire to attend only four of those six and consider the other two to be "backups." During the choice stage, students compare the academic and social attributes of each institution to which they have applied and seek the best "value" with the greatest benefits.

At each stage students gather and process information about which colleges to consider and why. The process is iterative in nature: information generated at the end of one stage becomes the starting point for the next stage. College choice theorists also describe how the social context in which

a student is located—parents, peers, teachers—constrain the information they are able to gather and the possible futures they can imagine for themselves.

STUDENT DEVELOPMENT THEORY & ACADEMIC DECISIONS

Although college choice models help to explain the process of college choice for high school students, they may not apply to college students who are making decisions about graduate school because college seniors are, of course, different than high school seniors. During the course of college, students begin to develop in myriad ways, including gaining competence and self-awareness, learning control and flexibility, balancing intimacy with freedom, finding their voice and vocation, refining their beliefs, and making commitments. These developmental themes are presented in Chickering and Reisser's model of student development (1993). The seven themes, called "vectors," are aptly named: developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, developing purpose, and developing integrity. These vectors act as maps to describe the level and direction of student development. Chickering and Reisser (1993) maintain that the development of college students is a process of infinite complexity; students rarely fit into a single pigeonhole or follow oversimplified paths.

Two of Chickering and Reisser's (1993) vectors in particular—moving through autonomy and developing purpose—are especially helpful for examining college seniors' academic decisions. Moving through autonomy means learning to be self-sufficient, learning to take personal responsibility for pursuing one's own goals and aspirations, and learning to care less about other's opinions. Achieving emotional independence is the first step toward autonomy, and it begins with redefining relationships with parents to be adult-to-adult rather than child-to-adult. The support and encouragement of peers and other non-parental figures become increasingly important during the search for autonomy. This means that those adults who are most accessible often have the greatest impact. For college students, and particularly seniors considering graduate school, graduate students and professors may be more important than family members.

Developing purpose requires formulating plans for action and a set of priorities that integrate three major elements: 1) vocational plans and aspirations, 2) personal interests, and 3) interpersonal and family commitments. Developing purpose also "involves increasing intentionality in exercising

personal will on a regular basis. To be intentional is to be skilled in consciously choosing priorities, in aligning action with purpose, in motivating oneself consistently toward goals, and in persevering despite barriers or setbacks" (p. 212). Given their developmental stage, college seniors should exhibit greater intellectual competence, act with greater self-sufficiency and autonomy, take responsibility for pursuing self-chosen goals, be less bound by others' opinions, and have a clearer sense of purpose than high school students. We expect seniors to be able to articulate their career goals and understand how graduate school leads to those outcomes. Furthermore, we expect students to take responsibility and act purposefully to realize those goals.

There are a number of institutional factors that seem to influence college student development: 1) institutional objectives, 2) institutional size, 3) student-faculty relationships, 4) curriculum, 5) teaching, 6) friendships and student communities, and 7) student development programs and services. In examining college seniors' academic choices, we speculate that three might influence academic decision-making the most: curriculum, student-faculty relationships, and friendships and student communities.

The curriculum is a deliberate organization of knowledge areas, and an effort to transmit knowledge to students. It is through their classwork that students find fields about which they become passionate. While it may be obvious, we expect that students will be pursuing doctoral programs in their major fields of study, and that they will be able to talk about the classes and other curricular components that influenced their decision to pursue a Ph.D.

Extensive research on the vector model of student development shows that relationships with faculty members are second only to relationships with peers in encouraging student development. Structural arrangements and the organization of the higher education institution can support or inhibit the form and frequency of interpersonal contacts, but it is interpersonal relationships that ultimately affect each of us. Faculty members not only have an effect on students' competence, but also on their clarification of purpose and aspirations. This seems particularly to be the case for influencing students' decisions to attend graduate school. Pascarella and Terenzini (1991) note that "with few exceptions, the findings indicate significant interactions between student-faculty contact and changes in students' occupational values" (p. 308). This echoes earlier findings by Feldman and Newcomb (1969). The encouragement of faculty members, both in conversation and by way of good

grades, serves to push students towards attending graduate school (Greeley, 1962; Grigg, 1962; Wallace, 1966). Therefore we expect to see faculty play a prominent role in the accounts students give of their graduate school decisions.

Interactions between students can serve to clarify values, purpose, and aspirations. Pascarella and Terenzini (1991) emphasize the importance of "socializing agents," the people with whom students come into contact, in the development of the student. Student culture(s) can also affect the development of identity and purpose by encouraging wide-range exploration or by curtailing it. In addition, a sense of "self" and a sense of purpose is strengthened when students encounter different kinds of people and situations, observe their reactions, try out different roles, and receive feedback from others (Chickering & Reisser, 1993). For college seniors, this may mean interacting with other undergraduates or talking with current graduate students. Another formative experience may be working as a teaching or research assistant. In any case, we presume that such conversations and roles can pave the way for insights about post-graduation career and educational aspirations and goals.

DOCTORAL EDUCATION

There are important ways in which doctoral education differs from undergraduate education systems. First, doctoral education is very decentralized within each university. Most decisions are made at the departmental or program level and relatively little control is exerted from the center. Of particular importance are admissions decisions, which are made by departments and programs, and often by individual faculty members. Second, the form of doctoral education varies enormously by field and university. The shape of a doctoral program—the sequences of requirements, such as courses, dissertation proposals, qualifying exams, and the like—vary enormously by field of study and individual department. For example, in many science departments it is typical for students and advisors to match up during application and admissions. Third, doctoral education is relatively mysterious and little understood, especially when compared with undergraduate education. There is no system of "graduate school counselors," as there are both in high schools and the private sector, who help students understand and navigate the undergraduate admissions process. There are few

guidebooks about graduate school admissions. Relative to the research on undergraduate students and undergraduate education there is also little research on graduate or doctoral education.

To date there has been only one study examining academic decision-making among college seniors who intend to enter graduate school. Ethington and Smart (1986) examined the factors that influence college students' matriculation into graduate school by estimating a causal model that incorporates measures of socio-economic background and undergraduate characteristics and experiences. They found that the primary direct influences on the ultimate decision to enroll in graduate school came from the degree of academic and social integration the students experienced as undergraduates.

While Ethington and Smart's model describes causal linkages, it does not explain the decision-making process that students move through in considering and applying to graduate schools. Since there is no model of the graduate school decision-making process, undergraduate college choice models are helpful in outlining an initial blueprint. By utilizing student development theory (Chickering & Reisser, 1993), we can refine this blueprint to predict not only how college students move through the process, but also what factors influence them at various stages. Knowing such factors can help not only those working directly with college students during the decision-making process, but can also help inform those administrators, faculty, and academic staff involved in recruitment, selection, and retention of graduate students.

HYPOTHESES ABOUT COLLEGE SENIORS

While we were unsure of what we would find, the literature suggested certain themes would be present. We were attentive to these, and deliberately probed for them in the interviews.

- ♦ Upper class undergraduate students will be more likely than high school students to rely on internally formed goals and aspirations to guide their graduate school decisions.
- ♦ We anticipate that students will move through the decision making process in a linear and relatively rational fashion, gather information, evaluate it, and make decisions based on clear self-knowledge (about goals and preferences) and on the available information about graduate school.

- Students will act fairly autonomously and responsibly, seeking out information on their own, rather than waiting for it to be provided.

- Students will rely less on parents and more on peers in their decision making processes.

- Curricular experiences, particular coursework, will influence students to attend graduate school.

- Faculty members and other adults on campus will be important in students' decisions to attend to graduate school, as well as in which school to attend.

- Students' expectations about what graduate school is like, and what realistic career tracks exist may not be accurate.

RESEARCH METHODS

This study is an attempt to uncover the decision-making processes and experiences of college seniors who are considering attending graduate school. In order to best describe students' thoughts, perceptions, experiences, and choices, we used naturalistic inquiry methods. These methods allowed us to provide "thick" descriptions (Stage, 1992) and provide insider perspectives within the context of their natural setting (Whitt, 1991). Over the course of the 1998-99 academic year, we conducted a series of semi-structured interviews with prospective doctoral students about the decision-making process that they employed when considering whether and where to go to graduate school. We relied on open-ended questions and allowed the interviews to take shape as they progressed (Bogdan & Biklen, 1992). Such an approach also allows the researcher to follow leads using probing questions to help participants tell their story in detail (Glesne & Peshkin, 1992).

SAMPLE

We sought to interview college seniors who were planning to enter a doctoral program within one year of graduating. We confined our research to enrolled undergraduates at the University of Wisconsin-Madison because we were on that campus. UW is a large research university, and students can major in a wide variety of liberal arts and science fields. These students were an opportunistic sample. We used many publicity strategies to find these students, including posting to an honors student list-serve, seeking referrals from faculty advisors, and hanging posters around campus.

Despite the size of the campus and the number of students who continue on to graduate school, we found it very hard to identify subjects for the study. We had planned to conduct all of the initial interviews in the early fall, so that we could systematically follow up over the course of the academic year. This proved impossible, because of the difficulty in identifying subjects. We continued to add participants to the study through January 1999. Furthermore, we were hampered by the fluidity of the definition of "junior" and "senior" at UW-Madison. Many students enroll for 5 years, and terms such as "freshman" refer to the number of credits a student has accrued, rather than year in school. Thus some first year students are classified as "juniors" and many "seniors" are still several years from graduation.

We interviewed 11 students planning to graduate at the end of the academic year (for this paper we call them "seniors") and 6 students who planned to enroll for at least one more year ("juniors"). For this paper we rely exclusively on the interviews with the seniors.

Because of the small number of students we ultimately interviewed, we consider this research exploratory and hypothesis generating. We cannot, for example, generalize from our sample to prospective doctoral students at large. Nor can we speak to the ways in which students' backgrounds may effect their doctoral decision-making process.

Table 1 provides information about the 11 seniors we interviewed. They are classified according to their plan for the following year: four entered a Ph.D. program in the Fall of 1999, four entered master's programs, and the remaining three entered the workforce. Nine of the students were traditional-aged undergraduates, one student was a returning adult student, and one student had already completed a bachelor's degree but was fulfilling specific entrance requirements for graduate school. Seven of the students were female and four were male. We designated seven of the students "savvy," and the other four "naïve" based on our assessment of their skill at navigating the graduate school search and selection process. We found this categorization analytically useful, and it is reflected below.

TABLE 1: OVERVIEW OF INTERVIEWED STUDENTS SORTED BY POST-GRADUATION PLAN

Name **	Gender	Savvy/ Naïve*	Undergraduate Major(s) & Research Experience†	Date of first interview	Goal at time of first interview	Date of last contact	Plan at time of last contact
Enrolled in doctoral program							
Chuck	Male	S	Political Science Research	2/99	Ph.D. political science	4/99	Harvard, Political Science Ph.D.
Steve	Male	S	Psychology & Zoology Research	2/99	Ph.D. social psychology	5/99	Ohio State, Social Psychology Ph.D.
Tabitha	Female	S	Zoology Research	12/98	Ph.D. neuroscience	4/99	Duke, Neuroscience Ph.D.
Sharon	Female	S	Geography Research	10/98	Ph.D. geography	4/99	UNC, Geography Ph.D.
Enrolled in master's program							
Amy	Female	N	Music	11/98	Ph.D. ethnomusicology	5/99	NIU, Math master's
Sinan	Male	S	Child and Family Studies Research	2/99	Ph.D. child and family studies	5/99	Arizona State, Human Development master's
Ramona	Female	S	Geology Has BA, taking extra courses	11/98	Ph.D. ecology	6/99	UVA, Ecology master's
Sylvia	Female	N	English & African-American Studies, returning adult student	2/99	Master's with option of Ph.D., in education policy	5/99	Columbia, Educational Policy master's
Working							
Henrik	Male	N	Communication	12/98	Work 1 year, then Ph.D. mass communications	4/99	Work for a while in advertising, then maybe Ph.D. in Comm. Studies
Tina	Female	S	Psychology & Women's Studies Research	11/98	Work 1-2 years, then Ph.D. educ. policy & psychology	4/99	Teach for America, then Ph.D. in School or Clinical Psychology
Elizabeth	Female	N	Linguistics & Psychology	11/98	Work 1-2 years, then Ph.D. cognitive sciences	4/99	Japanese-English Teaching program for 1 year, then possibly Divinity School

* The designations "Savvy" and "Naïve" were based on our assessment of their skill at navigating the search for grad schools.
† Indicates whether student conducted research beyond course work: for pay in a lab or senior thesis.
** All names are pseudonyms.

DATA COLLECTION AND ANALYSIS

Initial interviews took place in Fall 1998/Winter 1999 (see Table 1) and covered a broad range of topics: what students' plans were for graduate school, why they wanted a Ph.D., what schools and programs they were considering, what kinds of information they were seeking, and what resources they used to gather information. In both late January and late March 1999, the students were sent short e-mail questionnaires asking for an update on their plans and current progress toward realizing those plans. Final face to face interviews were conducted in late April or early May 1999, after all of the schools had made acceptance decisions and most students had made their decisions about which school to attend. During the final interview, the seniors were asked about their final decisions, how they were made, who influenced those decisions, and again what resources they used. In those cases where plans were not firm, follow-up emails were sent over the summer. The interviews lasted between thirty and sixty minutes each. All interviews were audio recorded and were transcribed to allow for complete analysis. The interviews were then coded and categorized using the ATLAS/ti software program. Transcripts were analyzed by sorting the data into categories that facilitated comparisons within and between categories (Strauss, 1987).

FINDINGS

Using the techniques of grounded theory, we each read the interview transcripts and email responses several times, looking for patterns and surprises (Glaser & Strauss, 1967). We found rich information that helped answer our research questions, as well as finding additional unanticipated information. We have arrayed these findings in three categories: the findings that pertain to the group as a whole, detailed information about the process students' used in decision making—factors that matter, resources used, and approach taken, and finally their expectations for the future—particularly their lives in graduate school.

1. OVERALL FINDINGS

In this section we discuss three primary findings that pertain to the 11 students as a group. First, we learned something about the steps that students go through as they approach the process of

deciding to attend a doctoral program. Second, we learned that thinking about getting a Ph.D. is by no means a clear plan. Students can and do opt out at any point along the way. Third, it was clear that some students were significantly more savvy about the process than others, and that most of the savvy students were the ones who ended up enrolling in doctoral programs, as shown in Table 1.

Four step process

We would hesitate to posit stages of graduate school choice, as college choice theorists have done, simply because we have so little data. However, there seem be some steps that all the students go through, obvious though they are. First, students decide that graduate school really is a possibility for them, and they begin to investigate this option. Second, they develop a list of possible universities to look at more closely. Third, they make application, and finally, they select a program from among the ones that admitted them. While we were primarily interested in, and asked about, the second through fourth steps, we did learn about the first.

The first step, considering the Ph.D. as a possible future, seems to occur when three things coalesce: understanding what the Ph.D. is (as distinct from other forms of graduate and professional education), realizing that one is "Ph.D. material," and finding a field about which one is passionate. For a few of the students we interviewed this came together as early as high school, while for most it was during the third or even the fourth year of college (at UW-Madison it is very common for undergraduates to enroll for five years.)

Understanding what the Ph.D. is

Four of the students interviewed had known about and considered the possibility of attending graduate school while they were still in high school. Some had very clear ideas about graduate school attendance, and where already thinking about a Ph.D. This goal seemed linked to parental educational attainment. Ramona[1] told us:

> My dad has a Ph.D., and it was always just something I thought I would do, and I have always been into science. So if you're going to go on and do research you usually get your Ph.D.

Others had more vague ideas; for them, graduate school equaled business, law, or medical school. A Ph.D. was not something that crossed their mind, as was the case for Steve:

I guess towards the end of high school, I was thinking "I'll go to college and see what happens"…maybe go to med school…I had a vague awareness that you could get a master's or a Ph.D.

During college the idea of graduate school became more concrete, although the goal of a Ph.D. often did not crystallize until the third or even the fourth year. Tabitha recounted the evolution of her goals:

I kind of always assumed I'd go on after college and up until my sophomore year, I assumed I was going to go on to Med School [but] I decided I didn't like the competition. I didn't like the people who were pre-med in my classes, didn't like the whole thought process. They were not that friendly and I just feel more interested in the hard sciences and started thinking about going into law, working on ethical dilemmas in the sciences. Then I started working in a lab. I thought, "This is where I belong"… This is what I want to do. It felt like home for the first time in my life, like this is where I belong.

Being "grad school material"

Many students told us of some pivotal moments in which they realized that they had the intellectual capacity to pursue the Ph.D. For some this epiphany took place in a class, as Chuck explained:

My second [Statistics] class was in the Poli Sci Department, but it was all grad students except for me…They were fairly impressed that I was in there…I would tell them what I was doing, what I was interested in. They seemed to think that I was a lot more prepared than they ever were for graduate school. So I guess I've done things right, and I've done almost as much as I can to prepare myself and that I'll probably be more prepared than any of my colleagues when I enter a program. That gives me some confidence, that I'm doing the right thing, that this is what I should be doing, and that it's right for me.

For others it was critical that a faculty member encouraged them to consider the Ph.D., as Henrik related:

I also asked [my professors] about my own viability. What were their opinions about me as a student? I got positive feedback from both of them. [They said] I seemed like the type of student who had it in me to go on to grad school and participate in that kind of work, which is a very encouraging thing.

Similarly, Tabitha told us that it was a faculty member who pushed her to apply to top programs, and she is now enrolled at Duke.

I was thinking that I don't have the grades; I have only a 3.4…I was thinking I would not apply to the top tier schools. And he said, "You *can* apply to the top tier schools. Because you have this really great research and you're good." I'm really glad he said that. I think that was the best because otherwise I would have applied only to lower schools and that would have changed the whole graduate school process.

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[1] All names are pseudonyms. Quotes have been edited for grammaticality and readability.

Caring about a field

Third, each of the students we interviewed described the process of getting excited about particular ideas or disciplines. For some this was about a very specific set of problems, which is illustrated by Tina's story:

> I'm in a class about gender/racial stereotypes of children, and my professor has said that in the multicultural education that is available now, there is no research that supports that it actually works, and, in fact, there is a lot of research that says it does not work because of the cognitive limitations that children have. I want to get into that field and do empirical research that will prove that there are certain programs that will help children accept others that are not like them.

For others, like Chuck, the passion came from a set of techniques and a discipline.

> [My] interests within the field of Political Science have kind of tailored my decisions – those being American Government Studies and methodological aspects of research of statistics and survey design. That's spurred my interest, as well as dictated the schools that I've been choosing.

As students took courses either toward their major or in an initial attempt to find a major, several students claimed that it was a particular course that really excited them about a particular field. Tabitha's quest for an intellectual home took her from pre-medical studies to Landscape Architecture to Neuroscience.

> I never thought I'd end up going to grad school at Duke or especially in Neurobiology. I think it was just luck along the way. I had no idea that I'd go into research when I was in high school or when I was freshman or sophomore here. And it seems like life has just kind of kicked me in that direction because last year I decided that I hated science. So, I was going to do Landscape Architecture. I did a day and a half of that and decided that I hated it…absolutely hated it! And then, I quickly got out the timetable, searched through and said okay, what's a 12:05 class that I can go to in science? And it turned out to be Professor H.'s class. And so I went to his class and I fell in love with it.

Courses were not the only places where people's passions caught fire. In fact, most of the savvy students described their undergraduate research experiences at length. It was in the course of this work that the students we interviewed began to understand the process of knowledge creation in the field, and to get excited about the prospect of participating in that in the future. Tabitha continued:

> I got a job in Professor H.'s lab and out of luck started working there and talked to people there and I never thought I'd end up here. It's just amazing and I like it, which is cool, because I never knew what I would be happy in and it just feels right.

It all comes together in the idea of attending graduate school

In every case, these three things came together, and students began to seriously investigate the possibility of getting a Ph.D. Chuck, who is now enrolled in a doctoral program in political science, described his journey:

> Sophomore year I was kind of still toying with the idea of graduate school or law school and at that point I kind of thought I would take the L-SAT and the GRE and go where my best score was. But as I went on through the process and got into more and more high level poli sci classes and got into some research, independently and then cooperatively with a mentor, that kind of solidified grad school as being my primary choice.

> Sharon, who is now at UNC-Chapel Hill studying geography, summarized her process.

> Oh, I knew when I was a Freshman I wanted to be a professor. I just didn't know what area. So, I just decided I took Geography 117 and I really liked Professor H. I went and talked to him and I think he's a great person and he really made me decide I wanted to be a professor even more. And the next course I took was Professor O.'s "Geography of Europe." I loved that course and that was just the clincher that it was going to be geography.

Opting out along the way

While each of these students began to seriously consider getting a Ph.D. (the criterion for participation in the study), it was by no means a firm decision, as the data in Table 1 show. Fewer than half of the students actually enrolled in a Ph.D. program, and that group includes half of the students initially interviewed in February. Moreover, because of the timing of our interviews, we probably have proportionally fewer of the students who changed their mind away from doctoral programs than is present in the population. It was clear in the interviews that many of the students were tremendously undecided, and alternated quite flexibly between various options: working, getting a master's degree, and enrolling in a doctoral program.

Two of our interviewees are notable in this regard. Amy started by applying to Ph.D. programs in ethnomusicology, and rather suddenly changed her mind and applied to master's programs in math. She explained:

> Over spring break I applied to one master's program in mathematics at Northern Illinois University, and have been unofficially told that I am accepted, with full scholarship, and will probably take that road. . . I realized that I missed studying math. I also had many doubts about completing a Ph.D. program in ethnomusicology, which would involve a lot of traveling and an uncertainty in a job at the end of the road.

> Elizabeth is moving further and further from a Ph.D. In her first interview she explained that she planned to take a year off to teach English in Japan. Then she intended to return to the States

and pursue a Ph.D. in educational psychology/policy studies. Over the holidays she re-examined her goals. She is now considering either a degree in library science or a divinity degree. She explained:

> I left town for winter break . . . it was the absence of all the hustle and bustle and work that I'm normally doing in Madison that made me start to think about [graduate school]... Well, I've thought of several possibilities and other things that I'm interested in and/or good at. For example, I've thought of becoming a librarian because part of the research that I'm good at is going to the library and doing literature searches and I was imagining that if I were a librarian somewhere I could help the people that come into the library by helping them find the books that they need and that sort of thing.

> I also thought of becoming a pastor actually. I've been going to a Unitarian Universalist church for about a year, and again, over winter break, I thought about it a lot and I thought how I think this is a really great faith, especially for people who felt that they were in a very restricted faith to begin with and they would rather be in something that is more open and accepting and tolerant. I thought that I would like to be one of the people offering that to the world. So I thought of going to seminary, but I'm very unsure about that as well.

It was this characteristic of rapid decision change that led us to designate this group of students as "waffling." Nevertheless, it was notable that working was usually described as "taking time off," so that continuing schooling was presented to us as the primary goal.

Some are more savvy than others

It was clear that some of the students were considerably more savvy about the process of applying to and selecting a doctoral program than others. These students, which included all of those who actually enrolled in doctoral programs, understood the idiosyncrasies of the process, and shrewdly navigated it. As the descriptions below will illuminate in detail, these savvy students employed a huge variety of resources, asked questions of everyone they could, and worked hard to understand the process. The amount of work that these savvy students did was a stark reminder to us of how opaque the process is to outsiders, and the extent to which it differs from undergraduate admissions—the only frame of reference these students have. These students provided a stark contrast to the students we dubbed "naïve," who seemed to flail about.

Summary of overall findings

Overall, then, we learned that the process of deciding to pursue a Ph.D. involves a great deal of waffling and flailing. Many students bounce between different plans and possibilities, and many struggle to figure out what information would be helpful to them and where to find it. This finding is surprising in light of what student development theory tells us: that college seniors have developed competence, self-sufficiency, and a clear sense of purpose. Furthermore, student development theory

maintains that college seniors should be able to articulate their career goals and describe how graduate school could help them to accomplish such goals. However, few of the students were able to clearly identify vocational goals, nor were they able to say exactly how a graduate program could help them.

In light of this, it is interesting to consider how students even come to consider the Ph.D. an option, and here we learned that it was an internally formed goal, rather than a response to the expectation of others (as attending college is for many high school students.) We expected students' courses to be the catalyst for their decision to attend graduate school, but the effect of courses seemed to be secondary to the importance of research experience. Every savvy student had undertaken such a project.

2. DOCTORAL PROGRAM CHOICE

In this section we talk about the process of doctoral program choice, the main subject of our study. We have broken our findings into three categories: the factors that affect a student's decisions—of which programs to apply to and then which program to attend; the resources they used in making their decisions; and the overall approach that they took to decision making. In our analysis we sometimes distinguish between the three groups of students: the Ph.D.-bound, the master's-bound and the work-bound.

Factors that affect decision

Location

While it might horrify graduate faculty to hear it, the geographic location of the university was an important factor for many of the students we interviewed. Tina declared:

> I would go to NYU just because it's in New York…I don't know why I want to go to New York, but it seems like such the opposite of here. I think the city where the college is will have an influence on whether or not I choose to go there.

The Ph.D.-bound students were less focused on geography than their colleagues were. These students tended to use geographical considerations early on in their decision-making process, often to rule out some schools, but final decisions were driven by other criteria. Steve said:

I started picking [the schools] sort of by location just to start with, and then I started looking at those in more detail and moving on whether I liked them or not.

Program emphases and reputation

The second factor that students cited was the reputation of programs and their emphases. While they may not be very reliable, rankings of graduate programs, such as that in US News and World Report rankings (1999), are used extensively by students. In particular, students access these rankings either by asking faculty for recommendations of programs or by searching the web. Steve clarified the steps he took:

I began looking my Junior year, I just had a little down time with classes, a little extra time so I went first to the web and looked for the listings like US News & World Report, general listings of top schools and Psychology graduate programs. I started from there, looking at the list and considering various factors about what I liked at the certain schools...starting to narrow it down.

Faculty research interests

Once students had selected the top institutions, many of them began to make a more detailed search for faculty members and faculty specializations that particularly suited them. In the initial interview Chuck explained how he focusing his search on those faculty members whose work particularly interested him:

I've got at least three people that I would strongly consider working with. Dr. P, who does a lot of work with social capital. He wrote a piece that deals with social capital and the effects that it can have. That type of behavioral application of political science is what I'm interested in. And then Dr. V., who's a big behaviorist and does research of survey data which I do as well. And Dr. K., who also did his Ph.D. here at Madison and one of his advisors is my mentor right now.

Once students identify faculty with compatible interests, they contact them to see if it is possible to work with them. In the sciences in particular, this is a critical step, because faculty often match with their advisees during the application and admissions process. Ramona gave a detailed account of trying to connect with a faculty member.

In February I emailed a professor at Cornell that I want to work with. She wanted to take me because of my background and what I could offer in her research. She said that she has 4 grad students and a post-doc right now and that they take all of her money. She said if I wanted to wait until next fall she could accept me. Later she wrote to me to say that she had given my application to a colleague of hers with similar interests and that if I came to Cornell she'd be on my committee. I emailed the other person and she emailed back saying she would respond after she had looked over my materials.

Ramona told us that she never heard anything further from the faculty at Cornell. In a later communication, Ramona told us what had happened thereafter:

> I am going to UVA with a TA and RAship. I will be getting about $13,000 for the year. I decided on UVA before hearing from Cornell. I finally decided in the beginning of May and went to visit and find an apartment and meet my advisor (who seems really good). I finally heard from Cornell on June 4th, I didn't get in. I really have decided that UVA was the right place for me. It has the oldest environmental science department (inter-disciplinary hard science), it's 30 years old.

Funding

The fourth important criterion for students was the funding package available. Here the distinctions between the Ph.D.-bound and other students were marked, as one might expect. Students generally knew that most Ph.D. programs offer their students funding, although most knew relatively little at the start of the application process. Elizabeth's comment was typical, "I guess I figured on a sort of abstract level that I would probably be a TA like a lot of graduate students are and make some money that way." Many of the students exhibited only a vague understanding of the complex mix of teaching and research assistantships and fellowships available at the doctoral level.

As students moved along in the application process, they learned more about the funding system. Those students who chose to work or attend a master's program made less of an effort to learn about funding and were much more naïve. Sylvia, who will be attending Columbia for her master's in Education Policy, remarked:

> I don't know how the money piece is going to work for me next year. That's a good question. I haven't really talked to too many people about it. I thought that when I was in NY visiting the school I would go and talk to some financial aid advisor. I don't know how it really works.

However, those who began to be admitted to Ph.D. programs learned what kinds of funding they could expect. Many were advised not to attend programs that did not offer them funding, as Sharon explained:

> My TA said basically that you want to go to a school that is well known, but you also want to go somewhere that will give you some sort of assistantship, whether it's a TA or just a research position.

For some, funding—and the support from an advisor that funding implies—helped drive the decision of where to apply. Sinan related:

> A faculty member [at CSU] shares a similar research interest that I have – Work and Family – and she's starting this project where you can work with different corporations to evaluate work

and family policies and possibly create different policies and try to implement them and see what kind of changes those make. I was really interested in that.

Resources used

Students availed themselves a variety of resources in their search process. Notably, the savvy students (which include all the Ph.D.-bound) used far more resources and used them more intensively than their naïve counterparts. Some of the naïve students explained that they asked very little advice from anyone. Amy said:

> I originally told my parents first that I wanted to Ethnomusicology, and then I just did my own research and contacted professors at the university that I am visiting next weekend. Then I told my ethnomusicology professor that I was planning on this field. A lot of it was on my own. I didn't tell people. All of it was on my own.

Faculty

Not surprisingly, many students used faculty members during their search process. According to the students, the faculty were most often helpful in offering the names of specific institutions to consider, along with faculty members who might share similar research interests with the student. Chuck said one of his faculty members "gave him a pretty big laundry list of schools at first." Steve had a similar experience:

> I used [my advisor] a lot in helping to chose exactly what area I was going into, whether it be Social Psychology or Biological Psychology or Cognitive, because I have a good background in all the areas. I also used him to throw out names of schools I should probably look at.

However, not all advice from the faculty was straightforward. Chuck claimed his advisor was "purposely non-committal, as far as the advice he [gave]...he [didn't] want to lead me one way or another...and even the concept of graduate school, he didn't want to push me towards it." Nor did faculty freely volunteer advice; Chuck sighed and said:

> When I would ask questions and try and get information, he'd be very helpful, but he wouldn't necessarily volunteer that type of stuff. He would wait for me to come to him and ask.

A few students also stated that they received ambiguous advice about where to go for graduate school, and several others—like Henrik—asserted that the advice was generally not very helpful at all.

> I think the advice that I've generally gotten regarding where to go for schools is pretty vague. I haven't gotten a good answer. A common answer is "here, but you can't go here because you did your undergrad here." So that's one thing I'd like a little more clarification on. There may be none.

Despite their willingness to discuss programs and the research interests of faculty at those schools no faculty member openly discussed what graduate school might be like with his or her student.

In a similar vein, faculty members did not openly discuss with students how to apply to graduate school or how graduate schools' admissions decisions were made. Sylvia lamented:

> I still don't have a sense of what makes an application a good application, really. I mean, I didn't get to sit in on the decision-making process and I don't really know how that works...I didn't even realize that the professors themselves may be sitting around looking through the applications...and consequently I didn't really focus my application.

Rather than specific advice, it seems that what students received from faculty were experiences that would help prepare them for graduate school, such as research experience, and confirmation that the students could succeed in graduate school. What a number of students lacked was information about how to search for graduate programs, how to evaluate them, how to apply to them, and what to expect once they entered a graduate program. It may be that faculty are uncomfortable with providing this information because they are so far removed from their own experiences that they can not provide useful information or guidance. Or perhaps advising undergraduates on the search for graduate schools and careers is something they feel underprepared to do, and would rather leave such discussions to the "experts" in a Career Planning Office. Yet, such advising rarely happens in Career Planning Offices.

Graduate Students

Without question graduate students were the most valuable sources of information for prospective students. Most of the students interviewed knew several current graduate students, mostly in their undergraduate departments. Usually, they got to know these students through working together on research projects. Current graduate students gave the seniors guidance about which schools to consider, provided advice about how to conduct the search process, and suggested things to consider when applying for graduate programs. Ramona lauded the graduate students she knew:

> [It was good] having the opportunity to talk to [graduate students] and hear about their experiences, to get their feedback and their input about how to go about the process, schools to consider, faculty members to consider, what sources to look at, and how to do that.

Conversations that began with advice about the search and application process quickly evolved into more in-depth conversations about the actual experiences of the graduate students while in

graduate school. These discussions allowed some seniors to catch a glimpse of what life as a graduate

student might be like. Tabitha said, "They were just the kind of conversations across the lab bench

that would happen while you're doing your work. A lot of it too was just observing how different people

worked." Thus, the seniors who were involved in some form of research with faculty and graduate

students could observe the day-to-day life of these individuals. This helped the seniors form mental

images of whether this was something they could ultimately see themselves doing. Sinan explained:

> You see [the grad students] every day…they're either up or down, they're all over the place. Some days are good and some days are bad, but…they're actually in school…and you look at them, and sometimes you wonder why they do it, and sometimes you're glad and you're happy that you're going to be doing it someday.

> Amy, who decided to postpone graduate school, described an incident involving a graduate

student that helped her make her decision.

> I was sitting in the Spanish Department talking to a graduate student there and a woman I didn't know, who was also a Spanish graduate student, walked in and started announcing to everyone in the room that she is giving up the graduate program. She's just going to leave because she can't handle it because she has to commute to Madison to do it in the first place and she has to take her kids to school in the morning and pick them up, and keep the house clean, and deal with her husband, and all this stuff and that she just can't do it. And I was looking at that and thinking, "Whoa, maybe I don't want to do this either."

> Seniors took the opportunity to ask graduate students many questions. The topics of these

conversations ranged from the climate of specific programs to how graduate life compared to

undergraduate life to the difficulty of coursework and various exams to how graduate school impacts

having a family and raising children. Regardless of the topics discussed, all of the seniors who spoke

to graduate students claimed that they were the most helpful resource, even more so than faculty

members were. Chuck summed up his desire to seek advice from graduate students this way:

> [The graduate students are] experiencing it and from the perspective that I will be experiencing it within a few months… The student perspective is going to be more germane to what you are going to be directly experiencing.

Such observations and conversations allowed the students to juxtapose what they were thinking and

doing with the graduate students' prior experiences and current situation.

> Several students also relied on graduate students for social and emotional support through the

search and application process. For example, Chuck identified the ways that graduate students were

helpful.

They didn't provide me a lot of substantive information on the process or on choosing schools—I've deferred that to my advisors—but more social support…just general goodwill-type of conversations that have helped me out along the way.

Campus visits

Campus visits proved to be very valuable to the Ph.D.-bound students' decisions. Every student in our group made such visits, either at their own expense or at the expense of the host institution. These visits helped students in two ways. First, they were able to see the campus, the labs and departmental space, and try to picture themselves staying there. Tabitha divulged the intuitive nature of her decision making:

Duke is focused on Systems Neurobiology, which I'm really interested in, and when I went there the first night as I was going to bed in my hotel I thought, "I really hope I get in here. I really feel at home here." And that's just after a few hours. And the whole place is much more like a family and I think if I'm going to go through working 60 hours a week and the tough times you have up in grad school, I wanted to do it within a supportive environment where I know people will support me when times get rough. And I knew I wouldn't get that at Columbia as much as I'd get it at Duke. And it just felt I fit in there. And just talking with the different professors, there are lots that are really excited about the things they're doing.

Second, they were able to have conversations with faculty, particularly prospective advisors, and with currently enrolled graduate students. Sinan found the interactions with faculty to be pivotal:

I decided to attend ASU after visiting the campus. The faculty members in the Human Development department were great, the students I met were outgoing and friendly, and of course the weather was fantastic.

Steve, on the other hand, appreciated the opportunity to have detailed discussions with graduate students.

For the actual visit it was a grad student who set me up who took me around to all the people, and I stayed at his place and he was really helpful. I asked him a lot of questions and I also met with grad students and asked them about the professors they were working with. They also me a really good idea of how demanding the coursework was … And what [the faculty] expect out of you in terms of how much they expect you to be doing and what they expect out of you in the courses and how much work courses are. I mean, they gave me a really good picture of what it's like to be a grad student at the schools.

Written resources

All of the seniors interviewed used written resources to aid them in their search process; the most widely used was the World Wide Web. The students used the Web to explore listings of top graduate schools and programs, to explore individual institutions and departments, to examine a program's requirements and curriculum, or to become familiar with faculty member's research interests. For those students anticipating taking a year off from school before continuing on to

graduate school, the Web was the only resource they used. Several students requested catalogues and

departmental literature in addition to exploring web sites. Finally, a few students looked through

college guidebooks such as *Peterson's* to get a "snapshot" of various programs. The guidebooks and

the rankings published by magazines such as *US News & World Report* provided students with a way

to narrow down their schools, especially if they wanted to apply to the top 20-25% of schools.

Family and friends

As we expected, parents and other family members were not important figures in students'

decisions, but we were surprised at how peripheral they were to the students we interviewed. Many of

the parents were left out of the decision making process entirely; the students merely informed them of

decisions as they occurred, as Sinan declared:

> I didn't really consult with my parents that much about it. I just thought it was my own
> decision and…I just said, "this is what I'm doing," and they pretty much supported me. My
> decision didn't really have much to do with them at all.

However, every student claimed that their parents were supportive and encouraging of their

decision to continue their education, as Ramona asserted:

> They just supported me in whatever I decided. I would say "I'm interested in this," and they
> would not really have an opinion about it, didn't try to change my mind in any way.

While parents were ultimately supportive, some were not initially so. Several students

commented that their parents were initially disappointed that they were not pursuing a professional

degree, like medicine or law, although none actually opposed the notion of graduate school. A few

parents were also initially concerned about the financial impact of going on for a Ph.D. and pursuing

an academic job, rather than entering the work force immediately upon graduation with a bachelor's

degree. Tabitha explained that this was a concern of her father's.

> My dad at one point asked me, "So, you're going to go on to more school? When are you going
> to start earning money?" . . . But now he's being more supportive and he's actually proud that
> I'm going on to earn a doctorate.

Approach taken

Three qualities were particularly noteworthy as we considered the decision-making process

that students went through. First was independence, second was the role of intuition, and third was

the importance of persistence. "Entrepreneurial" might be the best description for these students.

These qualities are linked, as students are operating in an environment where pursuit of the Ph.D. is not the normative next step. To take these qualities in order, students had to independently take initiative in seeking out people and information. Steve contrasted thinking about graduate school with the college search process:

> It had to be very much my own initiative…at first it was a little different than I'd been used to because when you are in high school people expect you to go to college: there the guidance counselors and your parents push it…whereas with this, it's something *you* had to do… Maybe some of your professors had mentioned that you could go on to grad school. . . [but] it's actually something you really had to pursue yourself.

The second quality is that of intuitive decision making. While many of the students collected a great deal of information, their ultimate decision was based in large measure on a "feeling" that the particular program was the right match for them. Rather than relying on other people's judgements, these students made their final choices on their own, without much influence from others. Chuck's decision to attend Harvard was based on a "gut reaction":

> I had an opportunity to go to both Michigan and Harvard and I just waited, and I guess I got a better vibe from Harvard.

Third, over and over we heard that students had to be self-starters and persistent in seeking out the advice and information they needed. When we probed, students attributed this to the relatively few roadmaps were available to them, either on the internet, in books, or from a campus office. Tabitha confided her fears:

> I'm scared that I haven't comprehended the whole grad school concept enough, but you just jump in. I don't think you can really know what you're getting into… And I wish that they had better grad school [information]: what is it, how you need to apply, what goes into personal statement kind of thing. I did go to a 'personal statement essay' workshop that was much more focused for going into English or getting into Med School or getting into Law schools, not science at all. She gave one example that was a very poorly written personal statement for science grad schools and how to go about the process. Even if they just had like an outline of what you need to do, maybe in the Zoology office, that would be great. But they just don't.

Summary of doctoral program choice

Most of the students we interviewed appear to go through the search process in a fairly systematic way, although not everyone used the same resources in the same sequence. All of the students said that the Web was a valuable resource, particularly the websites of individual programs. Faculty and graduate students were used by most students as information sources about specific schools, programs, and faculty. In addition, graduate students provided invaluable information about the experience of being in graduate school. However, not all of the students know how to start the

search process, and some students talked to very few faculty and graduate students, apparently because they lacked access to these individuals or felt uncomfortable talking to them about something so personal. Only one student told us that her department had run workshops for students considering attending graduate school. The students we interviewed described the search process as an independent endeavor that they figured out and conducted on their own. These findings largely comport with the expectations we outlined at the start of this paper.

We expected students to make their decisions in a fairly linear and rational manner, and we found this to be true for about half of the people we interviewed. Many of the students seemed to be simultaneously exploring many paths, and bouncing between them as options. It was those students who had a clear vision of graduate school and their lives as Ph.D. students who conducted the most systematic searches for programs to attend.

We expected students to act autonomously, and indeed they did so. This may also be a response to the UW-Madison environment. As a very large, decentralized research university, undergraduates must take a great deal of initiative to create their own opportunities. We wonder whether students at a small selective liberal arts college might undertake this process quite differently.

We expected peers and faculty to play an important role in students' decisions, and parents and family to play a relatively small one. Clearly family were minimally important to these students, although their encouragement was appreciated. Faculty, as expected, were influential. In particular this influence could be felt in seeking students out and providing them with opportunities to conduct research and serve as teaching assistants. Such experiences gave students access to graduate students, gave them a taste of research, and allowed them to interact with faculty in a different way. However faculty were not enormously helpful in navigating the details of the application and program-selection process.

The role of peers was also more complex than we anticipated. Fellow undergraduates were not relevant at all in students' searches and decisions. Most of their direct peers were moving in very different directions. However, graduate students were enormously helpful, and can be considered peers in some sense. In particular, the graduate students that our interviewees met while visiting campuses helped them to see what they could expect. These students were "prospective peers," and

were cited as enormously valuable informants. Indeed, one student developed ongoing email friendships with some students in the program she planned to enter.

3. NEXT STEPS

The final category of findings we have relates to the next steps that students plan to take. We asked students about their career goals, as well as what their expectations of what graduate student life would be like. There were marked differences in the clarity in both these areas between the students in the three groups; the Ph.D.-bound students had the clearest visions of both their post-Ph.D. careers and of graduate school life.

Expectations of Work-bound

Those headed for work see the Ph.D. as a possibility for the future, but one that is receding. They still describe it as an option, but two of the three students we interviewed are less interested in pursuing a Ph.D. as other options begin to look more attractive, exciting and realistic. As they begin to imagine themselves working, they are less prone to imagine themselves as students. Henrik outlined his next steps:

> My plans for next year are to go to New York and try to get a job in advertising or publishing or some such field. … I'm interested in mass communications, so it's kind of a natural thing for me to do to go and study it by getting a job and then I don't know. I'll see what it's like.

Tina explained that one of her motivations was to make an appreciable difference in the world. She felt that doing research was too removed from solving problems.

> I'm less sure about grad school now than I was at the beginning of the year because I started to think about some different things along the way, including the fact that if I went to grad school in the field that I'm in now, which is studying Language & the Brain through the field of Psychology, I would be doing a very primary sort of research that wouldn't be very applicable to people in the world. And that started to bother me and I started to think that maybe I would like to do something for a job that would help people and so I started to think of different alternatives… I think I need to reflect a lot about what I'm good at and what kind of job would give me the most satisfaction.

Furthermore, although we asked these students to describe what it would be like to be a graduate student, they were vague and relatively unable to do so. They simply haven't given the matter much thought. Henrik shared his perceptions:

> From what I can tell it's a fairly intense process, a fairly involving process, a consuming process. It's not as free and open as undergrad. It's not as free and open in some ways; it's a lot more free and open in other ways… It'll be more expensive probably. In terms of the classes,

course work, and types of research I'd be doing, I'm not really sure; a lot of that depends on where and the nature of the curriculum.

Their visions of their future careers are equally unclear. They are taking their lives in small steps, and two of the three seem to realize that they are still seeking a path. Elizabeth sent an email that said:

> I realized the field that I wanted to go to graduate school in is very far removed from any practical applications it might have. Working hard on something all my life, only never to see it applied to anything would be very frustrating. I started to think it might make more sense for me to go into a professional school (e.g. Library Science or the Seminary) than graduate school. When I'm working in my career someday I want to be interacting with other people and the real world, not just the ivory tower.

Initially she described a career predicated on a Ph.D., but was increasingly interested in career paths without a Ph.D. as the year-long interview process unfolded.

Expectations of master's-bound

Although the master's-seeking students are actually heading into graduate school, most are surprisingly unable to describe concretely their future lives, either in graduate school or beyond. Despite this relative lack of clarity, there was still a difference between the savvy and naïve students. The savvy students had some vague notions of how graduate school might be different for them. Ramona explained her thoughts about graduate life in a master's program in ecology:

> It'll be more focused working with specific faculty members and students on certain projects instead of learning a whole bunch of different things that aren't focused. And I'll be applying what I have learned to a research project, instead of just leaning how to do research.

> Sinan described what he anticipates the academic side of graduate school to be like for him:

> It'll be more independent than undergrad. You'll get to make your own schedule. There will also be more faculty-student collaboration and instruction. When you're a grad student, there are smaller classes and you can actually have some dialogue back and forth with your professor.

> In contrast, the naïve students are less well informed about the academic side of graduate

school, and have unrealistic expectations. Sylvia remarked:

> I think life will be the same as it is now [as an undergraduate]. Actually, I think it will be more interesting and it'll be more concentrated in terms of what I want to study. I'll probably do more writing and reading than I do now, and probably only take two classes... It'll be just sort of homeworky, but I don't anticipate much difference.

> While Ramona and Sinan are enrolled in master's programs, they both are seriously

considering pursuing a Ph.D. Both of these students have research experience, and have an idea of

the type of research and career that they would like to be engaged in. Despite this, however, these savvy students are still hesitant about starting the Ph.D., as Sinan summed up:

> Most of the programs I applied to are research based, the number one thing I was looking for, because I feel like I'm a better writer than speaker... But I've been debating whether I want to get my Ph.D...I think getting my master's and then getting a job afterwards would benefit me the most, but this [plan] changes every few months...Maybe I will really like graduate school and stay on for my Ph.D., but I just want to take it one step at a time before committing to a Ph.D.

Amy and Sylvia, our naïve students, are even less clear about their career goals or about what to expect from their programs in terms of actual jobs. Sylvia hoped that graduate school would launch her into a career:

> I hope that I just find something interesting to work on, that I develop a focus that's not so general as what I have now...I hope I come out of grad school having a sense of direction in terms of work. Not that I have to come out of it with a job that I'm going to have for the rest of my life, but so that I can find where my talents will best be applied.

Amy had similarly vague notions about her career expectations and possibilities:

> I just want to do math. I'd rather sit and solve problems than read an article by a musicologist. I just want to get through the program, to get a job, and to be on my own... I know the school places a lot of people. There's a whole list of companies they place people in, but I can't remember them right now.

All of these students had concerns or expectations about other facets of their life as well. Ramona said that she is anxious not so much about going to graduate school, but about just going somewhere new. Sylvia's primary concerns were immediate:

> My biggest anxiety is housing related right now, and maybe money related, since I haven't finalized my financial aid with them and it's so expensive living in New York. I'm not really sure how that's going to work out. But I'm going there regardless.

Expectations of Ph.D.-bound

The Ph.D.-bound students have the clearest vision of their futures. They are able to articulate in some detail what their lives will be like. In particular, they talk about doing research and working in labs or other research settings, although some might find their expectations unrealistic.

> It'll be a lot more focused, is the biggest thing... My day compared to grad students in my lab is constantly changing: going to this class, going to that class, going to study, go to do this. And they're in the lab working the whole time. That's going to be a big adjustment. Hopefully, I'll get more free time, because [now] I never have a moment to relax, and grad students go home at night, and they're done. I know it's 60-80 hours a week, but I think you work more than that as an undergrad. So, it'll be a change in how my day is scheduled.

They talk about their classes; describing how much more focused and harder their classes will be than the classes they have taken. Sharon said:

I know you take a lot less credits, so I know it's going to be a lot harder. And you just put more time on those classes...which I think I'll actually probably like better. Because then you can really focus on [a few] courses versus having, like me, right now, 5 different courses, all different exams and you don't need to focus on them that much.

Intriguingly, they also articulate a set of worries and concerns about the social aspects of graduate school life. They fear being lonely; they are worried about making friends. Steve spoke for the others when he said:

One of my concerns is it might be a bit more lonely, just because a lot of the graduate students I know here don't seem to know a lot of people outside their area. They don't have quite as many social ties and some of them seem very professional, almost working twenty-four seven and very involved in their work

They recognize that peer relationships are important in doctoral education, they have learned this from the graduate students they have talked to, and they are eagerly anticipating belonging to such a group. Steve continued:

I'm also hoping that the community of the grad students in my area and close areas is really friendly and supportive.

The career goal for these students is uniformly a faculty position. Some of them understand that this is a difficult career to realize, others seem entirely unaware of the realities of the academic job market. Sharon shared her thoughts:

Even though I'm in Geography, I might be able to get a job in History or Political Science because those areas include a lot of Geography. A lot of history, sociology, anthropology and environmental topics, like water resources, are mixed into Geography. It's an interdisciplinary thing. So there are probably a lot of places I could go [for a faculty job].

Those who know how difficult the academic career track is are also keeping their minds open to other career options, although their primary focus is a research career. Tabitha explained:

The job market's tight. I actually talked to somebody at Columbia who told me that it's all in 25%. We will accept the top 25% to different schools around the nation. The top 25% of that would get a job as professor around the nation. The top 25% of that will keep their job and do really well at it and get the grants. Let's see you cut that down and I think we're at like 2.5% or something like that, really small. And if I don't get a job there are lecturer positions and those are much easier to get, then there is industry. Another thing would be a non-profit organization.

Summary

Across the three groups it was striking that these students do not frame their reasons for pursuing a Ph.D. in career terms. While some say that an advanced degree will allow them to work in their field of study, access that a bachelor's degree does not provide, most of our interviewees gave touching accounts of their goals for advanced study. The top reasons were a love of learning,

enjoyment of research, the desire to attain expertise, and the status accorded the Ph.D. In his initial interview Henrik called it a "lifestyle of learning." They could articulate a vocational picture for themselves, but were not pursuing the Ph.D. for career outcomes.

Prior research led us to anticipate that students would have somewhat unrealistic expectations of the realities of graduate school life. Baird (1978) found that students dramatically underestimated the amount of work that would be expected of them. The Ph.D.-bound students had some idea of what awaited them, but also admitted holes in their knowledge. The master's-bound students were less clear, and the work-bound had only vague ideas about graduate school.

ANALYSIS AND IMPLICATIONS

As we looked at our findings overall, three points were particularly noteworthy. First, we were struck by the importance—at least to the UW-Madison students in our sample—of undergraduate research experiences and of relationships with graduate students. These two factors, which are clearly connected, were crucial in students' decisions to pursue the Ph.D., in understanding what the pursuit of the Ph.D. meant, and in learning how to navigate the system. Undergraduate research experiences both ignited students' passions for Ph.D.-level research and introduced them to a network of current graduate students in their fields who were valuable resources. Undergraduate research opportunity programs are burgeoning (Reisberg, May 22, 1998) and the recent Boyer Commission Report (1998) touts undergraduate research as a critical experience that should be offered at research universities. Generally, proponents argue that such experiences teach critical thinking and problem solving skills. Our research suggests that it is a critical gateway experience for prospective Ph.D.s. While undergraduates at colleges without graduate programs will not gain the access to the graduate student networks, they are likely to derive benefit from the research experience, and may develop closer relationships with faculty members than the students in our sample did. Further research is needed to understand how student experiences differ at other institutions.

Second, we were impressed by the savvy that some of the students exhibited. These students had developed good strategies for seeking out information, and did so by talking to as many people as possible and developing a network of advisors. This allowed them to get help and collect information at each step of the process. It was very clear that savvy-ness was very closely connected to participating

in research as undergraduates. Both social science and natural science students took advantage of such opportunities and this gave them access to rich networks of advisors. Others, however, were not nearly so well connected nor so entrepreneurial. These students—who we dubbed naïve—were much more likely to flail about and make less well informed decisions.

The stark distinction between savvy and naïve students coupled with the critical role of graduate students and research experiences made us wonder about the implications for diversity of this research. Recruiting and retaining a diverse pool of students, by socio-economic status, race and ethnicity, and the like, is an ongoing challenge for graduate schools. It is striking that recent data suggest that 20% of all doctoral students have at least one parent with a Ph.D. (C. M. Golde, personal communication, October 1999). This suggests a strong influence of cultural capital (McDonough, 1997) and cultural reproduction in the Ph.D. system—those students whose families understand the process of getting a Ph.D. may be better situated to seek out the necessary information and ask the necessary questions. Increasing the diversity of the pipeline into doctoral programs, then, may necessitate interventions at the undergraduate level to help students gain the skills necessary to make application.

These data suggest that there is a pipeline effect. It was starkly evident that those individuals with the most experience in research had the most clearly defined goals, could articulate a vision of themselves in a doctoral research setting, had the most accurate expectations, and were most savvy at navigating the process. Undergraduate research opportunities are a growing emphasis in universities, and we applaud such efforts to connect undergraduates to the exciting enterprise of creating knowledge, rather than just passively consuming it. This can have the effect of exposing students to a world they might never have seen or imagined for themselves. However, this also means that the onus is on students to decide earlier than ever that they are interested in research, and may not help to broaden the pool of possible Ph.D. candidates. Certainly, this system is biased against late bloomers!

The third conclusion that we drew from the study was that students are largely left to their own devices when making decisions regarding graduate school. The naïve students are unaware of how to undertake an informed and thoughtful process of searching, evaluating, and deciding about graduate school. Students do not have an understanding of what resources exist to help during this process, nor do they have understanding of what information they should collect. As a result, their

expectations of what it is like to be a graduate student and of the careers that await them may be uninformed and unrealistic. Even the savvy students, despite actively seeking information and advice, felt that there were things that they did not know. The process demands that students be entrepreneurial and persistent in the face of an opaque system.

We believe that students hoping to pursue doctoral studies need more information at the beginning of and throughout the search process. The responsibility for this should be borne by both the institutions undergraduates attend and the graduate schools they are planning to attend. Professional associations may be able to play a pivotal role in advocating for increased information, and in providing information channels that are tailored to the specialized processes of different disciplines.

If faculty and administrators wish to help students make informed choices, then the search and decision process needs to become much more of an "external" event. Students should not be left to search out sympathetic faculty members or graduate students willing to share their personal experiences. Providing complete information about the search process, the application procedures, and the final decision and evaluation phase can increase the likelihood that students will succeed in graduate school. This success can then be translated into greater persistence rates and possibly lower time-to-degree rates.

Future Research

The students interviewed as part of this study were but a small sample of the college seniors who see graduate school as part of their future. An expanded sample of students will provide greater detail and nuance to our findings. Further research will illuminate the influence of different backgrounds and experiences on how students navigate the process of entering a doctoral program. Only by doing such further inquiry can a thorough academic decision-making model be suggested for college students desiring to go to graduate school. Nonetheless, this study provides a stepping stone for understanding how seniors go about the search and decision process.

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