

Appendix F: Informed Consent Form

INFORMED CONSENT FORM

Affective Socialization Processes in Mathematics Doctoral Study: Gaining Insight from Successful Students

Dear Participant:

You are invited to participate in a research study. The purpose of this study is to explore mathematics doctoral students' interactions during graduate school and the value that the students place on the interactions in their continued pursuit of and success in doctoral study of mathematics.

INFORMATION:

Your participation in this study includes two interviews with the researcher in person. Each interview will last between 60 and 90 minutes. The interview will be audio-recorded and transcribed for analysis. Once transcribing is completed for the analysis, the audio-recordings will be erased or destroyed.

RISKS:

There are minimal risks involved in participation in this study. The information found in the study will be used as a doctoral dissertation. Furthermore, it may be published in research journals or may be presented at conferences. Any information provided that could reveal your identity, including your name, will remain confidential and anonymous in any published materials.

BENEFITS:

The findings of this study can contribute to the body of knowledge about mathematics doctoral student persistence. Furthermore, this study not only can be conducive in designing and implementing support systems in mathematics doctoral programs, but also can help mathematics doctoral students who may be considering leaving the study of mathematics. However, participant benefits are incidental.

CONFIDENTIALITY:

The information in this study's records will be kept confidential. Data will be stored securely and will be made available only to the persons conducting or directing the study unless you specifically give permission in writing to do otherwise. No references will be made in oral or written reports, which could link your identity to the study.

Participant's Initials: _____

CONTACT:

If you have questions at any time about the study or the procedures, you may contact the researcher, Lauren Wagener, at 53 Joyner Ave. Asheville, NC, 865-974-9323, and wagener@math.utk.edu. If you have any questions about your rights as a participant, contact the Research Compliance Services section of the Office of Research in the University of Tennessee, Knoxville at 865-974-3466.

PARTICIPATION:

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you agree to participate in the interviews described above. However, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT

I have read the above information and agree to participate in this study. I have received a copy of this form.

Participant's name (Print): _____

Participant's signature: _____

Date: _____

Appendix G: Interview Protocol

Interview Protocol

Topic domain: Graduate School Experience

Lead off question: How would you describe your experience in doctoral study of mathematics?

Possible follow-up questions

1. Why did you choose to study math further?
2. Have you ever considered leaving the program? Tell me about it.
3. If you could change something about your program, what would that be?
4. What does it take to do well in your program?
5. Have you ever felt that you didn't fit in during graduate school? Tell me about it.
6. What is some advice that you would give to a new student?
7. Who would you say is a very successful student in your program? Why?
8. What are supports that have been vital to your learning and doing well in the program?
9. What are aspects that have detracted from your learning?

Topic domain: Courses

Lead off question: Tell me about a typical day in graduate school before you finished your preliminary examinations.

Possible follow-up questions

1. What were your courses in graduate school typically like?
2. Tell me about an occasion when you couldn't figure out how to solve a problem.
3. With whom did you interact? Tell me about one such interaction.
4. Describe what goes on in a typical class.
5. What types of interactions did you have with peers in your classes? Tell me about one.
6. Describe an interaction that you had with an instructor of a course.
7. If you could change something about the courses you took, what would that be?
8. What did it take to do well in your courses?

Topic domain: Preliminary and Oral Examinations

Lead off question: Describe the preliminary and oral examination process.

Possible follow-up questions

1. Tell me about how you prepared for a preliminary examination.
2. Describe what it felt like to successfully complete the preliminary and oral examinations.
3. Whom did you interact with in preparation for the preliminary examinations? Tell me about one such interaction.
4. Give me four words to describe the preliminary examinations.
5. Did you pass all of the examinations on the first try? If not, how did it make you feel? Tell me about preparing to take the examination again?
6. Were there any supports that influenced your successful completion of the preliminary and oral examinations? Describe them.

Topic domain: Research

Lead off question: Tell me about the research you are doing (or are interested in doing).

Possible follow-up questions

1. Give me four words to describe mathematical research.
2. Have you had the opportunity to work with professors on their research? Tell me about it.
3. Tell me about how you decided upon an area of mathematics to research?

4. Tell me about the process of deciding on a research topic?
5. Describe an occasion when you reached a “stumbling block” or “get stuck” on your research. What did you do?
6. Tell me about a typical day in graduate school after you finished your preliminary examinations (i.e., once you became a doctoral candidate).
7. Now that you are a doctoral candidate, whom did you interact with? Describe these interactions.
8. What are four differences between the course-taking and the dissertation phases of graduate school.

Topic domain: Peers

Lead off question: Tell me about your peers in the program. What are they like?

Possible follow-up questions

1. Tell me about peers in the department that you feel close to or comfortable with.
2. Do you have friends within the program? Describe them.
3. What is it about these peers that allows you to have good relationships? Why are they good relationship?
4. Describe one recent conversation you had with one of these peers.
5. Give me four words to describe your relationship with these peers.

Topic domain: Mentor

Lead off question: Tell me about a professor in the department that you consider to be a mentor.

Possible follow-up questions

1. Why did you choose this professor to be your mentor?
2. What is it about this professor that allows you to have a good relationship?
3. Why is it a good relationship?
4. Describe one recent conversation you had with that professor.
5. Give me four words to describe your relationship with that professor.

Appendix H: Participant Recruitment Email

Dear _____,

I am emailing to request your participation in my dissertation research study, as it will focus on the experiences of doctoral candidates within the mathematics department.

Mathematics has the highest undergraduate attrition rate among all liberal arts disciplines (and among all disciplines, except for health professions) and the second highest attrition rate of all doctoral programs in the United States (Council of Graduate School, 2008; Lacampagne et al., 2007). This means that as students, who initially express an interest in studying mathematics, progress through undergraduate and graduate mathematics, they become increasingly likely to lose interest and switch to less mathematical fields of study (Herzig, 2004a).

Research has firmly established the impact of graduate students' interactions with faculty and peers on their likelihoods of completing the degree (Ali & Kohun, 2006; Austin, 2002; Bair & Haworth, 2004; Gardner, 2005, 2008a; Golde, 2005; Herzig, 2002, 2004a; Hirschberg & Itkin, 1978; Kluever, 1997; Lovitts & Nelson, 2000; Monsour & Corman, 1991; Smith et al., 2006). In addition, social interaction is a key component of the graduate socialization process, in which graduate students develop the knowledge, skills, and dispositions necessary for successful completion of graduate school and entry into a professional career that requires an advanced level of specialized knowledge and skill (Weidman et al., 2001). So, improving these interactions is one way that programs can increase students' likelihoods of success in graduate programs and in their future careers.

Consequently, the purpose of my dissertation study is to explore mathematics doctoral candidates' interactions with faculty and peers during graduate school and the meaning and value that these students place on the interactions in their continued pursuit of and success in doctoral study of mathematics.

More specifically, through individual interviews with eight to ten mathematics doctoral candidates, I hope to answer the following research questions:

- (1) What interactions do doctoral students in mathematics have with faculty?
- (2) What meaning and value do mathematics doctoral students place on their interactions with faculty?
- (3) What interactions do doctoral students in mathematics have with peers?
- (4) What meaning and value do mathematics doctoral students place on their interactions with peers?

The information in this study's records will be kept confidential, and no references will be made in oral or written reports, which could link the participants or the department to the study.

Upon approval by the IRB, I would like to begin interviewing mathematics doctoral candidates. Please let me know whether you would be willing to be interviewed at a location of your choice

If you have questions at any time about the study or the procedures, you may contact me, at wagener@math.utk.edu, or my advisor, Dr. Colleen Gilrane (865-974-5448 or cgilrane@utk.edu).

Sincerely,

Lauren Wagener
Doctoral Candidate
Mathematics Education

Department of Theory and Practice in Teacher Education
University of Tennessee – Knoxville
wagener@math.utk.edu

Appendix I: Second Participant Recruitment Email

Dear _____,

Is there any way that you would be willing to participate in my study? I really need a few more participants.

The following is a little information about the study:

I am emailing to request your participation in my dissertation research study, as it will focus on the experiences of doctoral candidates within the mathematics department.

Mathematics has the highest undergraduate attrition rate among all liberal arts disciplines (and among all disciplines, except for health professions) and the second highest attrition rate of all doctoral programs in the United States (Council of Graduate School, 2008; Lacampagne et al., 2007). This means that as students, who initially express an interest in studying mathematics, progress through undergraduate and graduate mathematics, they become increasingly likely to lose interest and switch to less mathematical fields of study (Herzig, 2004a).

Research has firmly established the impact of graduate students' interactions with faculty and peers on their likelihoods of completing the degree (Ali & Kohun, 2006; Austin, 2002; Bair & Haworth, 2004; Gardner, 2005, 2008a; Golde, 2005; Herzig, 2002, 2004a; Hirschberg & Itkin, 1978; Kluever, 1997; Lovitts & Nelson, 2000; Monsour & Corman, 1991; Smith et al., 2006). In addition, social interaction is a key component of the graduate socialization process, in which graduate students develop the knowledge, skills, and dispositions necessary for successful completion of graduate school and entry into a professional career that requires an advanced level of specialized knowledge and skill (Weidman et al., 2001). So, improving these interactions is one way that programs can increase students' likelihoods of success in graduate programs and in their future careers.

Consequently, the purpose of my dissertation study is to explore mathematics doctoral candidates' interactions with faculty and peers during graduate school and the meaning and value that these students place on the interactions in their continued pursuit of and success in doctoral study of mathematics.

More specifically, through individual interviews with eight to ten mathematics doctoral candidates, I hope to answer the following research questions:

- (1) What interactions do doctoral students in mathematics have with faculty?
- (2) What meaning and value do mathematics doctoral students place on their interactions with faculty?
- (3) What interactions do doctoral students in mathematics have with peers?
- (4) What meaning and value do mathematics doctoral students place on their interactions with peers?

The information in this study's records will be kept confidential, and no references will be made in oral or written reports, which could link the participants or the department to the study.

Upon approval by the IRB, I would like to begin interviewing mathematics doctoral candidates. Please let me know whether you would be willing to be interviewed at a location of your choice

If you have questions at any time about the study or the procedures, you may contact me, at wagener@math.utk.edu, or my advisor, Dr. Colleen Gilrane (865-974-5448 or cgilrane@utk.edu).

Sincerely,

Lauren Wagener
Doctoral Candidate
Mathematics Education
Department of Theory and Practice in Teacher Education
University of Tennessee – Knoxville
wagener@math.utk.edu

Appendix J: Framework for Typological Analysis

- I. Graduate School
 - a. How You Decided to Pursue Ph.D. in Math
 - b. Coursework
 - i. Studying
 - 1. Office Hours
 - 2. Group Work
 - 3. What Do You Do When You Got Stuck
 - ii. Teaching
 - c. Preliminary Examinations
 - i. Preparation
 - 1. What Do You Do When You Got Stuck
 - ii. Interactions with Peers
 - iii. Interactions with Faculty
 - d. Dissertation
 - i. Choosing an Area of Mathematics
 - ii. Advisor
 - 1. Choosing
 - 2. Interactions
 - iii. Choosing a Research Topic/Problem
 - iv. What's Research Like
 - 1. What Do You Do When You Get Stuck
 - 2. Connection to Prior Learning
 - 3. Undergraduate Research
 - v. Interactions with Peers
 - e. Interactions with Peers (in general)
 - f. Interactions with Faculty (in general)
- II. Affective Socialization
 - a. Conferences
 - b. Collaboration
 - c. Job Search
 - d. Publishing
 - e. Teaching
 - f. Research Workshops
- III. Thinking of Leaving
 - a. Coursework
 - b. Preliminary Examinations
 - c. Dissertation
 - d. Impact of people on decision
 - i. Peers
 - ii. Faculty
 - iii. Advisors
 - iv. Other