I am writing to apply for the Waller Summer Fellowship. This application is organized by how I meet the major criteria necessary to qualify for these awards.

A major criterion for the Waller Summer Fellowship includes making excellent progress toward professional goals. Since I began my graduate training (September, 2007), I have successfully earned my MA degree (2009), passed both of the required written examinations for my PhD (2010, 2011), am in the process of scheduling my preliminary oral defense (2011), and have overall maintained a cumulative GPA of 3.9 At the end of this semester (2nd year PhD program), I will have completed all of my course requirements. I have earned no incompletes. I have met program milestones early (e.g., passed Critical review examination in my first semester of the PhD program). I have gained a variety of research and teaching experiences, including following through with each of my degree requirements (thesis, critical exam, special project) by submitting manuscripts to the top journals in our field (including the Journal of Marriage and Family, the Journal of Family Theory & Review, and the Journal of Family Psychology). I have had the opportunity to guest lecture for several classes, and give presentations at the National Council of Family Relations, Theory Construction and Research Methods Workshop, as well as at our own Family Social Science Colloquium (see abbreviated vita for details).

These experiences have added to the progress of achieving my overall career goals. I aim to work towards a tenure track position by balancing both my desire to engage in research, and my desire to share my knowledge with students through teaching and advising. While this application is for funding surrounding my research interests, I am also very passionate about teaching. I have taken GRAD 8101: Teaching in Higher Education which has allowed me to determine my own teaching philosophy, learn about several active learning strategies, and developed a course in which I have an approved application to teach this coming summer (2011) (FSoS 4150: Sibling to Sibling Interactions). Being able to talk with students about research in a way that they can both understand and be academically pushed is really exciting to me, and I am thrilled to teach on a topic that I actively research this coming summer. My career goals also include remaining active in the community through volunteer work. Right now I am a volunteer with the Medical Reserve Corp and have been deployed to administer psychological first aide after extreme devastation cause by flooding (see abbreviated vita for more). Altogether, I believe I have demonstrated that I have a strong desire to continue to balance research, teaching, and community work, thereby making excellent progress toward my professional goals.

A second major criterion for the Waller Summer Fellowship includes an aggressive and realistic research plan. I am proposing three goals to accomplish to this summer. First, (a) complete my NIH formatted dissertation proposal, and schedule my proposal meeting. Second, (b) contribute to and revise two collaborative papers (outlined below). Three, I expect to (c) complete manuscript revisions for two of the three manuscripts that I have recently submitted for publication. The goals and timelines for these tasks are broken down below. Altogether, I expect the first goal (dissertation proposal completion) will take up the majority of my time and energy this summer. Still, I expect to have time and complete the additional 2nd and 3rd goals based on the work I have already began concerning all three goals.

**GOAL 1: Dissertation Proposal Completion**

To begin, I have identified my research questions. Building on my program of research (thesis, critical exam, special project), my overall goals are to further our understanding of what contributes to sibling similarity and difference in adolescent substance use, by partialing out and explaining sources of both shared family and nonshared environmental effects.

**Background and Significance.** Adolescent siblings are often similar in their substance use (McGue, Sharma & Benson, 1996; Rende et al., 2005; Rowe & Gulley, 1992). Understanding why siblings are similar or different in their substance use is important because it can give us some insight on the etiology substance use, as well as how to potentially reduce substance use amongst adolescents. The behavioral genetics methodology is particularly useful to incorporate in understanding sibling similarity because it partials out sibling similarity due to shared genetic versus shared family and nonshared environmental effects.
Variables that explain a significant proportion of estimates for the shared family environment are important for two reasons. First, shared environmental affects often correspond to family effects. Specifically, they contribute to sibling similarity due to a common rearing environment. Though shared environment estimates are smaller in size compared to estimates of additive genetics, they do have moderate to strong effects, particularly in adolescence (e.g., Hopfer, Crowley & Kewitt, 2003; McGue, Elkins & Iacono, 2000; McGue et al., 1996). For example, McGue et al. (2000) found shared environmental effects explained 40-60% of the variance in adolescent substance use. Second, while we cannot change genetic predispositions or other fixed predictors to reduce the likelihood of substance use, it is especially useful to understand what exactly contributes to estimates of the shared environment in order to understand and potentially manipulate aspects of the family environment to reduce adolescent substance use.

Sibling effects have been shown to be stronger than those of parents in explaining shared environmental variance in adolescent substance use (Fagan & Najman, 2005; McGue & Iacono, 2009) and various other adjustment outcomes (Bussell, Neiderhiser, Pike, Plomin, Simmons, Howe, Hetherington, Carroll & Reiss, 1999; Feinberg, Neiderhiser & Hetherington, 2001; Pike et al., 1996). That is, while genetic variance explains most of the relationship between parent and child similarity in outcomes, shared environmental variance explains most of the relationship for sibling similarity in various outcomes in adolescence (Neiderhiser et al., 2007). This points to the importance of understanding and assessing the sources of sibling environmental influences in particular to further our understanding on the shared environmental contributions to adolescent substance use.

There is some evidence that siblings are more similar in their substance use if their relationship is warm and close (Rende et al., 2005; Rowe & Gulley, 1992), potentially because they share the same friends (Samek & Rueter, 2011). Moreover, sibling closeness has been found to moderate the association between additive genetic and shared environmental effects on sibling tobacco use, such that shared environmental effects were stronger when siblings were close, and genetic effects strong when siblings were less close (Slomkowski et al. 2005). This suggests that warm and close sibling relationships may contribute to shared environmental effects. Additional sources of the shared and nonshared environment that could help explain sibling similarity and difference in substance use may include other characteristics of sibling and parent-child relationship quality (communication and conflict patterns), as well as the discordant experience of major life events (e.g., being bullied), which have also found to associate with adolescent substance use patterns (Wills, Vaccaro & McNamara, 1992, Windle, 1992), and general adolescent adjustment outcomes (Steinberg, 2001).

Specific aims. First, I aim to determine the best measurement strategy for analyzing patterns of sibling substance use (using latent class analysis). Second, I aim to predict patterns of sibling substance use based on previous research (by predicting patterns based on gender, age, genetic similarity), as well as extending it (by predicting patterns based on sibling and parent relationship quality – self-reported and observed – and by predicting patterns based on self reports of major negative life events). Finally, I aim to determine if characteristics of sibling and parent relationship quality explain a significant proportion of the environment (using cholesky decomposition).

Expected outcomes. Based on this research, I expect to distinguish which characteristics of sibling and parent relationship quality explain a significant proportion of shared environmental estimates. That is, I expect to clarify what specific components of the family environment contribute to adolescent substance use that are not confounded by genetic effects (which, historically, family science has largely ignored). Specifically, I expect the association between relationship quality and adolescent substance use will be explained primarily by the shared environment, more so for siblings than parent-child relationships. Second, I am to determine which characteristics of relationship quality (e.g., sibling and parent communication and conflict patterns, observed versus self-report differences, siblings having the same friends, experience of negative life events such as being bullied, losing a friend, or being held back in school) contribute to the environment. These determinations can help to define which characteristics of family relationship quality might be more effective to hone in on during adolescent substance use therapy. Therefore, the importance of the proposed research to the family field is that it will lead to better understanding of family contributions to adolescent substance use, which should help to inform therapy and treatment interventions for adolescents that need help with substance use. Of course this advancement will come after necessary replication and intervention research.

Feasibility of research proposal. By the end of Spring semester, 2011, I will have completed a rough draft of my
dissertation proposal that is in the traditional format (intro, methods) as part of the requirement for a course that I am currently enrolled in (FSoS 8047: Integrative). I will have a good foundation to build my NIH formatted dissertation proposal because of the work I will have completed throughout Spring semester. Yet, I will still have plenty of work to do regarding the Research Strategy component of the NIH formatted proposal. Therefore I am proposing the following timeline to complete my project goals. Throughout this timeline, I will be regularly and meeting with my advisor (weekly basis), to seek advice and feedback on my research progress.

- **Mid-June:** I aim to complete the first draft of the Background and Significance, and begin the Specific Aims sections of my NIH formatted dissertation proposal.
- **End of June:** I aim to have completed my Specific Aims section, and to have calculated descriptive statistics and correlations and begin my Preliminary Analyses section of my dissertation proposal.
- **Mid-July:** I aim to have completed my Preliminary Analyses section and begin the Research Strategy component of my dissertation proposal. I will have outlined the research design, expected outcomes, potential problems, and alternative strategies for each of the three aims.
- **End of July:** I aim to complete the justification and feasibility sections for each of the three aims and finish the Research Strategy component of my NIH formatted proposal.
- **August:** At the beginning of August, I will send my proposal to my advisor to review. By the end of August, I aim to have completed my dissertation proposal and to have scheduled my proposal meeting with my committee.

**GOAL 2: Collaborative Papers**

My second goal is to work on two collaborative papers. The first paper (with me as the first author, and Student A, Dr. X as 2nd and 3rd authors, respectively) describes a basic introduction to the key methods, assumptions, and findings of behavioral genetics research for family scientists and other family professionals. This paper is based on the knowledge I have gained from my supporting program in behavioral genetics, and desire to share that knowledge with family professionals. The paper is also based on a formal presentation given to the FSoS Colloquium this Spring (see abbreviated vita for details).

**Feasibility of research proposal.** We have done considerable work in thinking and discussing our paper topic, and have a working rough draft of the paper in place. Still, there are considerable changes to make to this paper it based on new ideas that we incorporated into our presentation. I expect the paper will be able to be turned around quickly and be submitted by the end of August by sticking to the following timeline:

- **June:** I will work on incorporating the new ideas into our working paper throughout June.
- **July:** I will spend the first two weeks of July editing and polishing the paper.
- **Mid-July:** I will have completed the rough draft of the paper (with updated changes based on the presentation) and will send it to the 2nd and 3rd authors for their review and suggestions.
- **Mid-August:** The 2nd and 3rd authors will provide their feedback and suggestions.
- **End of August:** I will incorporate feedback and suggestion and submit the manuscript for publication to the *Journal of Family Relations*

The second paper I was be a third author with Dr. X and Student Y, in which we will describe changes in parent-child and sibling relationship quality over time. I will be assisting in the creation of the data set, and providing general comments and suggestions on the sibling literature specifically. This paper has a more fluid timeline, in which the 1st and 2nd authors aim to submit a proposal for the paper and receive feedback on the proposal from the principal investigators by the end of summer.

**GOAL 3: Expected Manuscript Revisions**

Finally, I expect that I will be given revise-and-resubmit guidelines for two papers that I have recently submitted right around the start of the Summer term (based on an estimated 3 month turn around by the editor and reviewers). Although it is impossible to know the extent of the revisions, I expect that I will be able to turn the revisions around by the end of August (see abbreviated vita for details).

In closing, I want to express my gratitude to the committee for reviewing my application. I believe I am a strong candidate for this award due to the excellent progress I am making toward my professional goals, and the aggressive and realistic research plan that I have for this summer. Thank you for this opportunity.