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Mentoring Undergraduate Research

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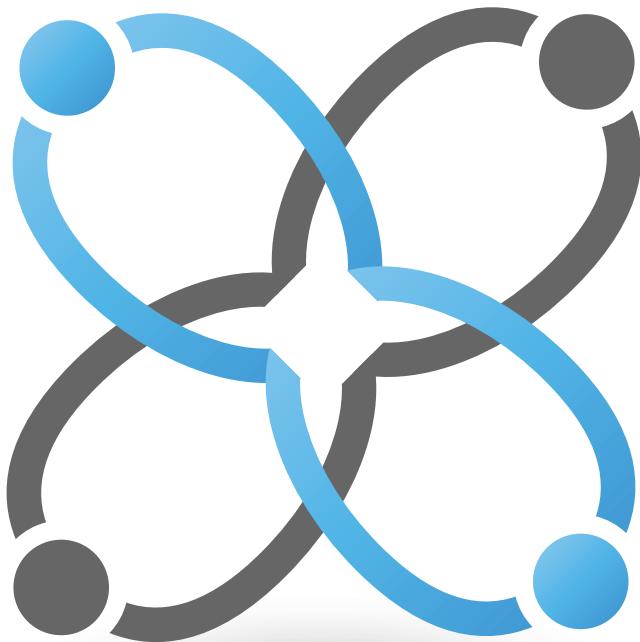
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MENTORING UNDERGRADUATE RESEARCH

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Why this Handbook?

"How mentoring is defined determines the extent of mentoring found"
(Merriam, 1983)

There is often a chasm between what is taught in the classroom and what students need to be successful. Mentorship provides a vehicle for provoking greater expectations by students. Mentorship provides also excellent ways to gauge whether or not a student is prepared to be successful in post-baccalaureate endeavors or in the world of work. Unfortunately, mentorship remains a hidden pedagogy in undergraduate education. Institutions that place high value on mentoring build a vital bridge between the traditional classroom and the preparation experience that graduate schools, corporations, businesses, and industry demand.

This handbook contributes to the foundational knowledge on mentoring undergraduates in research. It is intended for faculty, staff, administrators, research assistants, post-doctoral fellows, academic advisors, residential advisors and anyone engaged in mentoring undergraduates. It is not intended to be a comprehensive handbook, but offers the research base and tips to individuals beginning or engaged in mentoring undergraduates.

This handbook is a work in progress. It provides an overview of the benefits of research mentoring, mentoring theories, a discussion of barriers to mentoring and potential strategies to overcome obstacles. Georgia College, the state's public liberal arts university, serves as an institutional case study by showcasing strategies and resources to barriers in mentoring undergraduates.

References

- Merriam, S. (1983). "Mentors and protégés," *Adult Education Quarterly*, 33(3), 161-174



*Benefits of Undergraduate
Research Mentoring*

Why mentor?

Historically, mentors have been viewed as coaches and advisors. In the apprenticeship model, the mentor's responsibility is to increase the expertise and experience of the novice. When students are effectively mentored in undergraduate research and creative activity, they report ownership of the work, a deep sense of satisfaction, and high levels of self-efficacy.

The landmark Boyer Commission report called for a "reinvented undergraduate education" that would equip and prepare U.S. students to matriculate through robust post-baccalaureate degree programs and succeed in a complex, competitive workforce (Boyer Commission, 1998). In response, undergraduate research has been put forth as a high impact practice essential to developing graduates with

requisite skills to confront 21st century challenges.

In an ideal situation, undergraduate research occurs when a student works closely with faculty members or other another member of the disciplinary community on a high-quality, original research project or creative endeavor. However, resource limitations interrupt this ideal experience for many. Therefore, it is crucial that institutions of higher education harvest the essence and principles of meaningful research experiences (Council of Undergraduate Research, 2012) in order for more students to benefit. Whether students are mentored in a one-on-one approach or in a group environment, undergraduate research mentoring can offer significant benefits.

How have you benefitted from being a mentor?

Mentoring makes my job in the classroom easier.

Many students do not fully realize their strengths and weaknesses. Oftentimes students become more self-actualized outside of the classroom because they are in much smaller numbers. Once students have the knowledge and realize what their strengths and weaknesses are, it becomes much easier to guide them in a classroom setting.

As an undergraduate cohort mentor I have taken on the responsibility in helping to assure that children whom I no longer directly teach continue to be provided an environment where they are able to be successful, safe, and confident. Hopefully, cohorts that I mentor will be willing to try new ideas, as well as, implement evidence-based practices to maximize each student's potential.

Mentoring makes my job worthwhile.

People in higher education sometimes look at the cup as half-full. We spend long-hours teaching huge classes while doing tons of research, writing and reading-for very little pay; however, we ultimately do not recognize our impact. Sometimes I will get a call or a text at 6 a.m. with exciting news that my (former) student landed a great internship or job and I realize I am the first one they told and I am blown away by how lucky I am!

Mentoring allows me to see things from a student perspective.

Sometimes university employees can forget what it is like from the student perspective. Mentoring is a great way to get to know students outside of your traditional faculty/staff role. Once you become a mentor, students are more likely to give you true insight into their experience and show you their perspective on issues in the university setting.

Mentoring allows me to do well because my students do well.

"I got into medical school today!" These six words truly underscore the reason that I continue to mentor students. Swap "medical school" for any graduate program, post-baccalaureate program, internship opportunity, or job position that my students achieve and I re-understand my role as their mentor – to help them launch so that they can experience greater expectations.

Mentoring keeps me fresh and anchored.

Mentoring has kept me from sitting on the sidelines and stagnated in what is constant and comfortable; this can be cancerous to scholarly growth as well as to the growth of my students. Mentoring students reminds me not to "check out" when things are difficult to find but to "lean in" in the midst of administrative and departmental challenges.



Quotes selected from interviews of Georgia College Faculty

How have you benefitted from being mentored?

Mentoring helps me make informed career choices.

I definitely think [my mentor] gave me a lot of great advice on how to better myself as a researcher and she helped me decide what I want to do in the future. I definitely think the one-on-one interaction was helpful. She gave me a lot of good advice and helped me understand the literature a little bit more.

I definitely feel like the relationship added to my future career because I feel like I have a lifelong advisor even after I go off to law school.

Mentoring increases my confidence and agency.

Well little freshman me, I was completely petrified of my professors, and now I can definitely tell that I am her senior Research Scholar. I can go into her office and talk about my life, talk about more than just research, definitely. She's been a point of contact for other things, too, which is really important. It's nice to have someone local who you can relate to a little better.

Mentoring provides me with support.

I think it's having that one point of contact, like someone you know you can go to. It's just really nice to have that point of contact whose well connected throughout the campus community.

Mentoring created trust.

I would consider [my mentor] almost a friend (in addition to a teacher student relationship) and I know she is someone I can count on even after I graduate and even when I am in law school. So I would say that increased greatly.

Mentoring challenges me.

[I came] into every single project with a challenge that was more than the last and having that expectation that this is going to a bigger and better stage, this could be put on bigger and wider people, just knowing that you're never going to digress in what you're doing... was really great.

Quotes selected from interviews with Georgia College students and alumni (Sams et al, 2014.)

Benefits to the Mentor

Mentoring is a mutually beneficial relationship. Mentors benefit by receiving the personal satisfaction of seeing students develop as competent colleagues. Mentor-mentee interactions increase the mentor's own knowledge, and in institutions that value these relationships, the mentor's standing within the organization improves. In some cases, mentoring and research productivity are closely associated but may differ from traditional faculty scholarship. Mentorship benefits mentors because it:

- broadens interpersonal skills
- demands meaningful mentor-mentee interaction
- develops and retains future talent
- expands skills and knowledge
- facilitates productive interactions with diverse students
- generates meaningful scholarship
- improves and enriches the instructional process
- transfers "academic DNA"

Benefits to the Student

The mentoring relationship adds to the student's development within the discipline in ways that classroom instruction alone cannot foster. The student experiences deeper learning through practical application. Close association with a mentor improves professional disposition. Undergraduate research adds value to the student's career trajectory by increasing student's credentials for competitive job opportunities and admission to graduate programs (Lopatto, 2010). Other research (Elrod, Husic & Kinzie, 2010; Crowe & Brakke, 2008; Kuh, 2008; Sams, Richards, Lewis, McMullen, Hammack, Bacnik & Powell, 2014) suggests that mentorship benefits students by:

- promoting transfer of knowledge
- providing frequent feedback
- requiring responses to novel situations
- requiring time on task
- testing hypotheses and strategies
- challenging thinking in new ways
- connecting learning to real-world settings
- creating coherent context for challenging curricula
- increasing self-efficacy and self-confidence
- facilitating working with diverse people
- broadening interpersonal skills
- developing innate potential
- developing leadership skills
- improving skills and dispositions
- increasing career awareness
- increasing learning gains

Benefits to Higher Education

Research contributions achieved through rich faculty-student collaborations reflect positively on the reputation of higher education as a whole. Pedagogies of guided inquiry, investigation and creative discovery improve the quality of undergraduate education by offering relevant experiences to students. Academic institutions offering real-world, contextual research experiences ensure long-term connections with the future professional. Through undergraduate research, academia can:

- create intellectual communities
- enhance and build external partnerships
- develop and enhance internal collaborations
- enhance institutional reputation
- increase intellectual capacity and influence
- strengthen recruitment and retention of students, faculty and staff
- strengthen the quality of undergraduate education

Benefits to a Liberal Arts Institution

Many question the value of the liberal arts education in the wake of rising educational costs. Yet, over 80% of Americans embrace the liberal education ideal; they believe that the role of colleges and universities is to prepare individuals to meet the expectations of the professional world, develop responsible citizens, and prepare future leaders of society (Peter D. Hart Research Associates, 2004). Mentoring at liberal arts institutions reinforces the focus on the student as a whole in order to:

- confront complex, capacious problems and offer viable solutions
- emphasize inquiry and discovery
- encourage inclusive collaboration
- encourage social learning and responsibility
- offer opportunities to challenge existing paradigms

Benefits to Graduate Programs

New graduates require hundreds of hours to acclimate to graduate programs. Post-baccalaureate programs that accept and matriculate mentored students are more likely to experience:

- reduced student induction time
- higher student adaptability quotients
- lower resource burden for professional development
- higher first year retention rates
- higher progression to graduation
- increased student productivity

Benefits to Employers

Similar to graduate programs, mentored undergraduates entering the workforce save employers significant resources for training and professional development. Students who have been mentored are found to be more productive, experience higher job satisfaction, increased professionalism and career commitment (Bland, Taylor, Shollen, Weber-Main, & Mulcahy 2009; Fisher, 2013; Peter D. Hart Research Associates, 2007 & 2013). Organizations that hire effectively mentored graduates are more likely to experience:

- reduced induction time
- higher adaptability quotients
- lower resource burden for basic professional development
- higher retention rates
- increased productivity
- higher ethical response
- increased creative/innovative outputs

References

- Bland, C. J., Taylor, A. L., Shollen, S. L., Weber-Main, A. M., & Mulcahy, P. A. (2009) *Faculty success through mentoring*. Rowman & Littlefield Education, Lanham, MD.
- Boyer Commission on Educating Undergraduates in the Research University (1998). *Reinventing undergraduate education: A blueprint for American Universities*. Menlo Park, CA: Carnegie Foundation for the Advancement of Teaching. Available online at - http://www.niu.edu/engagedlearning/research/pdfs/Boyer_Report.pdf
- Crowe, M., & Brakke, D. (2008). Assessing the impact of undergraduate research experiences on students: An overview of current literature. *Council of Undergraduate Research Quarterly*, 4, 43-50.
- Council on Undergraduate Research (2012). *Characteristics of Excellence in Undergraduate Research*. N. Hensel, Ed. Available online at - http://www.cur.org/assets/1/23/COEUR_final.pdf
- Elrod, S.; Husic, D.; Kinzie, J. (2010). Research and discovery across the curriculum. *Peer Review*, 12(2).
- Fisher, K. (2013). Marketplace: A college degree sorts job applicants, but employers wish it meant more. *The Chronicle of Higher Education*. Available online at - <http://chronicle.com/article/The-Employment-Mismatch/137625/#id=overview>.
- Kuh, G. D. (2008). High-impact practices: What they are, who has access to them, and why they matter. Association of American Colleges and Universities, Washington DC, Available online at - http://www.aacu.org/downloads/aacu_high_im-pact_2008_final.pdf.
- Lopatto, D. (2010). Undergraduate Research as a high-impact student experience. *Peer Review*, 12(2), 27-30.
- Peter D. Hart Research Associates (2004). Summary of existing research on attitudes toward liberal education outcomes for the Association of American Colleges and Universities. Available online at <https://www.aacu.org/leap/pdfs/HartExistingResearchReport.pdf>.
- Peter D. Hart Research Associates (2007) *How should colleges prepare students to succeed in today's global economy? National Poll*. Available online at - <http://www.aacu.org/leap/documents/Re8097abcombined.pdf>.
- Peter D. Hart Research Associates (2013) *It takes more than a major: Employer priorities for college learning and student success*. Available online at http://www.aacu.org/leap/documents/2013_EmployerSurvey.pdf
- Sams, D.; Richards, R.A.; Lewis, R.; McMullen, R.; Hammack, J.; Bacnik, L.; Powell, C. (2014) Mentorship as a Value Proposition (MVP) to the Competitive Global Marketplace: Empirical Study. Under review with the Journal of Teaching & Learning Inquiry.



*Mentoring Definitions, Theories
and Scholarship*

What does undergraduate research look like?

Boyer's model (1997) identifies four pillars of scholarship: (1) discovery, which involves the creation of and dissemination of novel ideas within an established field; (2) integration, where research is summarized across disciplines; (3) application, which involves serving one's community and profession; and (4) teaching, where learning theory and mentorship meet. Although the "discovery" arm of scholarship is most often the dominant paradigm, Boyer proposed significant value to educational pursuits when other aspects of scholarship are considered.

The Boyer ethos offers a model for undergraduate research, which takes multiple forms depending on the discipline and the goals – from empirical community service projects to graded classroom activities to intensive creative endeavors and an array

of practices in between. Likewise, the outcomes of mentored undergraduate research range in scope from poster (see Appendix C) and oral presentations to works of art, plays and poetry, musical scores, to journal articles, and so on. The artifacts of research, such as proposals (e.g. research, grant, IRB), surveys, literature reviews, iterative models, etc., are just as important as they demonstrate evidence of scholarship and learning. In addition, a range of methods exist for summarizing and disseminating research, such as implementation of collaborative community-based service projects, multimedia presentations, program reviews, and websites.

Appendices D, E, and F provide a few examples of undergraduate research activities.

What is Mentoring? Who are Mentors?

"The few formal, stipulative definitions provided in the mentoring literature sometimes do not have the coverage or plasticity required for research to move easily to new topics," (Bozeman & Feeney, 2007, p. 721).

In their review article, Bozeman and Feeney (2007) presented an extensive list of definitions of mentoring and mentors. Some common themes emerged: the importance of experience, the sharing of knowledge, the difference in power dynamics, and the notion that mentoring is a deliberate and formal relationship. According to Bozeman and Feeney (2007):

Mentoring is...

- "...a developmental relationship that involves organizational members of unequal status or, less frequently, peers" (Bozionelos, 2004, p. 24).
- "...an intense long-term relationship between a senior, more experienced individual (the mentor) and a more junior, less experienced individual (the protégé)" (Eby & Allen, 2002, p. 456).
- "...a more formal type of relationship between a senior member of an organization and a novice, in part, to address the growing emphasis organizations are placing on formal types of mentoring in the socialization and career development of many professionals" (Young & Perrewe, 2000, p. 613).
- "...a developmental relationship typically occurring between senior and junior individuals in organizations" (McManus & Russell, 1997, p. 145).
- "...[a relationship that] facilitate[s] junior colleagues' (protégés) professional development and career progress" (Tepper, 1995, p. 1191).
- "...a transformational activity involving a mutual commitment by mentor and protégé to the latter's long-term development, as a personal, extra organizational investment in the protégé by the mentor, accomplished by the sharing of values, knowledge, experience, and so forth" (Scandura & Schriesheim, 1994, p. 1589).
- "...[a process that can] provide young adults with career-enhancing functions, such as sponsorship, coaching, facilitating exposure and visibility, and offering challenging work or protection, all of which help the younger person to establish a role in the organization, learn the ropes, and prepare for advancement" (Kram & Isabella, 1985, p. 111).

Mentors are...

- "...a more senior person who takes an interest in sponsorship of the career of a more junior person" (Smith, Howard, & Harrington, 2005, p. 33).
- "...individuals with advanced experience and knowledge who are committed to providing upward support and mobility to their protégés' careers" (Singh, Bains, & Vinnicombe, 2002, p. 391).
- "...a higher-ranking, influential individual in your work environment who has advanced experience and knowledge and is committed to providing upward mobility and support to your career. Your mentor may or may not be in your organization and s/he may or may not be your immediate supervisor" (Ragins, Cotton, & Miller, 2000, p. 1182).
- "... individuals with advanced experience and knowledge who are committed to providing upward mobility and support to protégés' careers" (Ragins, 1997, p. 484).
- "...a senior, experienced employee who serves as a role model, provides support, direction, and feedback to the younger employee regarding career plans and inter-personal development, and increases the visibility of the protégé to decision-makers in the organization who may influence career opportunities" (Noe, 1988, p. 458).
- "...a person who oversees the career and development of another person, usually junior, through teaching, counseling, providing psychological support, protecting, and at times promoting or sponsoring. The mentor may perform any or all of the above functions during the mentor relationship" (Zey, 1984, p. 7).

To this list should be added Chao's 1997 definition of mentoring as, "a supportive relationship established between two individuals where knowledge, skills and experience are transferred from the mentor to the mentee or protégé" (p. 15).

MENTORING SCHOLARSHIP OVERVIEW

Research on the conceptualization of mentoring took off in earnest in the late 1970's (e.g., Kram, 1980; Levinson, Darrow, Klein, Levinson, & McKee, 1978). However, the dissertation work of Kathy Kram (1980) is considered a seminal piece in business mentoring and her 1983 *Academy of Management Journal* article (Kram, 1983) is still the most frequently cited publication on mentoring (Bozeman & Feeney 2007). In 1991 Whitely, Dougherty, and Dreher introduced primary mentoring, defined as an intense longitudinal relationship. Scandura (1992) developed measures for the multidimensional construct of mentoring. Chao, Walz, and Gardner (1992) conceptualized two type of mentoring – formal and informal. By 1997, Ragins introduced the concepts of diversity and power relationships into the mentoring literature, and Eby (1997) expanded the Kram theory by focusing on peer mentoring rather than the hierarchical mentor-mentee model. According to Eby, "Mentoring is an intense developmental relationship whereby advice, counseling, and developmental opportunities are provided to a protégé by a mentor, which, in turn, shapes the protégé's career experiences... This occurs through two types of support to protégés: (1) instrumental or career support and (2) psychological support" (p. 126).

Mentoring is closely related to coaching and apprenticeship. At its foundation, mentoring is the transmission of knowledge from one person to another. Therefore, separating the

operationalization of its function from coaching and apprenticeship presents an interesting challenge. As such, since its early roots in the 1980s, there has been limited progress in the development of theory on mentoring as a unique activity. Between 1987 and 1997, more than 500 articles on mentoring were published in education and management alone; yet, the refinement of underlying mentoring philosophy did not significantly change over time. Russell and Adams (1997) proposed that the absence of theory-driven research is the result of small sample sizes and limited samples with the focus on correlations versus causal explanations.

Woven throughout the mentoring literature is the importance of communication between the mentor and mentee towards advancing mentors' pedagogical expertise (Christophel & Gorham, 1995; Kelley & Gorham, 1988; Kearney, Plax, & Burroughs, 1991; McCroskey & Richmond, 1987), and a necessary condition for effectiveness.

Since 1997, the academic literature has focused on modalities of mentoring (how to; e.g., Abdel-Qader, 2004), the stakeholders (the who; e.g., Colucci-Rios & Briano, 2001), and the outcomes of mentoring (e.g., Cox & Andriot, 2009). Consequently, undergraduate research has benefited substantially both from early literature on mentoring and from new knowledge on mentoring undergraduate researchers.

MENTORING PHILOSOPHIES AND RELATED THEORIES

Socratic Philosophy: Socrates questioned his students in an unending search for truth. He sought to grasp foundational understanding of his students' and colleagues' views by continuously probing until a contradiction was exposed, thus proving the fallacy of an initial assumption. This approach became known as the Socratic Method and is recognized as Socrates' most enduring contribution to philosophy. Pedagogical techniques where an educator engages in questioning versus delivery of content is considered Socratic. The desired outcome is for the student to arrive at an understanding through reflective response or to deeper awareness of the limits of her knowledge.

Arousal Theory: Arousal theory suggests that people are driven to perform actions in order to maintain an optimum level of physiological arousal. Mentors rely on arousal theory to explain the role of mentor nonverbal immediacy in the learning process (Christophel & Gorham, 1995; Kelley & Gorham, 1988). In one study, Christophel and Gorham (1995) found that proximity aroused students to direct their attention toward learning the content. In this way, students' motivation to engage in task-related activities was enhanced and deeper student learning was achieved.

Keller's ARCS model of instructional design: Keller's (1983, 1987) ARCS model proposes that mentors who make content relevant to students' lives or goals increase students' motivation to learn. More specifically, Keller contends that four conditions must be met for learning to occur. First, the mentor must gain the student's attention (A). Second, the content must be relevant (R) to students' needs. Third, students must have confidence (C) in their ability to accomplish the task; and fourth, students must be satisfied (S) with the results in their efforts. In one instructional communication study, Frymier and Shulman (1995) found support for Keller's paradigm. Their findings indicated that the more effectively mentors were able to communicate relevance in their instruction, the more motivated students were to learn.

Attribution Theory: Attribution theory focuses on the processes by which we construct, interpret, and identify causes of our own behavior and that of others. Kearney, Plax, and Burroughs (1991) used attribution theory to explain students' decisions about resisting their mentor's control attempts. Kearney et al. (1991) found that students selected different strategies for resisting mentors based on their attributions regarding problem ownership – that is, whether students attributed course problems to mentors or to themselves.

Expectancy learning/learned helplessness: This theoretical perspective posits that individuals learn to predict or expect positive or negative outcomes of their own behavior over time. Learned helplessness results when behavioral consequences are random and, therefore, impossible to predict. McCroskey and Richmond (1987) first used this theoretical framework for predicting and explaining communication apprehension, setting the stage for a long line of theoretically informed research on communication anxiety (e.g., Chesebro et al., 1992; Rosenfeld, Grant, & McCroskey, 1995).

Creating the Third Space:

Relationship Pedagogy

Successfully mentored research experiences traditionally engage students in a zone of proximal development (Vygotsky, 1978) where a rich mixture of professional and personal development occurs. Students at the outer edge of this zone begin constructing awareness of signature skills and dispositions as a result of observation. Within the zone, students enter a mentoring third space defined by explorations of inner intellect, self-efficacy and meta-cognition. According to Whitchurch (2008), "...as a

result of blurring boundaries between activities, what might be described as third space has emerged between professional and academic domains" (p. 384). The mentoring third space (Richards, 2012) is the location where the mentee and mentor become partners and where the integration of knowledge moves the undergraduate into the community of practice where optimized academic dispositions are attained (see Figure 1 below).

Figure 1



In this dynamic, the expert exceeds the undergraduate's ability to contextualize knowledge. Over time, the mentorship supports or scaffolds what the undergraduate mentee could not accomplish without guidance while expanding the mentor's ability to build meaningful communication. Academic demands that initially exceeded the cognitive development of the mentee are reduced through direct intervention and mentor. Activities defined within this space constitutes relationship pedagogy (Richards, 2012).

Case Studies:

Defining Mentorship in the Third Space

When mentoring, it is sometimes necessary to take into account the "big picture." How might the following examples enhance your mentoring third space?

Nervous Ned

A student in your class approaches you because he is incredibly anxious about a presentation in class. He does not make eye contact and is fidgety. He does not explain why and asks if he could do anything besides give the presentation in class. After connecting with him and making him feel comfortable, he opens up in conversation and notes he has had several serious personal problems (including a friend committing suicide and his parents having marital problems). These issues have led to feelings of intense anxiety and social isolation which he has never experienced before. In turn, his grades are suffering and he is on the verge of quitting school. This student is very bright and has a glimmer of interest in your field as a first-semester sophomore. What do you do?

Quiet Quincy

A student in your course clearly interested in research/creative endeavors approaches you to discuss working with you as a mentor in the discipline. During your conversation, you find out the following: freshmen GPA is a 2.0, low confidence levels, fear of public speaking. You notice during class that the student is well-read in the subject, is always prepared, and asks insightful questions. Later, you find out through your continued relationship with Quincy that the low GPA was due to serious rebellion against very strict parents and lots of "partying" his freshmen year. Since that semester, he has never made under a B. What do you suggest?

Careful Katie

Some students can be very shy. The social life of a student in college can clearly be a very big part of whether they are happy with college and the program they ultimately choose. Katie is a very quiet girl, but very, very smart. She graduated towards the top of her class in high school and had her pick of colleges. She decided after much deliberation (she is careful after all!) to go to a smaller public liberal arts school instead of a large research university. Katie made great friends her freshman year and all was well until Rush Week her sophomore year. All Katie's friends decided to rush sororities. She did not want to be a part of Greek life, and felt alone and excluded. Although she loved her classes and her professors, she felt like she might have to transfer. If Katie came to you for advice, what would you tell her?

Bored Brenda

You notice a super talented student in an introduction class for your field. She is brilliant (much smarter than the other students that you are used to in your field). You ask her to come by and discuss her academic/career planning options during office hours. When she does, you discover that she has only a 3.1 GPA as a sophomore when she clearly should be a 3.8-4.0. You surmise that she is clearly bored in her classes and therefore not doing well because she is not being challenged. What is your course of action?

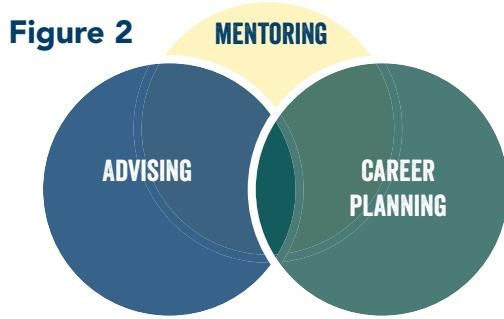
References

- Abdel-Qader, I. (2004). An Undergraduate Research Mentoring Model in Digital Signal and Image Processing, *International Journal of Electrical Engineering Education*, 41(2), 146.
- Bozeman, B., & Feeney, M. K. (2007) Towards a useful theory of mentoring: A conceptual analysis and critique. *Administration & Society*, 39(6), 719-739.
- Bozionelos, N. (2004). Mentoring provided: Relation to mentor's career success, personality, and mentoring received. *Journal of Vocational Behavior*, 64(1), 24
- Chao, G. T. (1997). Mentoring phases and outcomes. *Journal of Vocational Behavior*, 51(1), 15-28.
- Chao, G. T., Walz, P. M., & Gardner, P. D. (1992). Formal and informal mentorships: A comparison on mentoring functions and contrast with non-mentored counterparts. *Personnel Psychology*, 45(3), 619-937.
- Colucci-Rios, J. A., & Briano, J. (2001). Sloan Foundation Scholarship Program: Mentoring undergraduates towards doctoral degrees. *Journal of Engineering Education*, 90(3), 295-298.
- Cox, M. F., & Andriot, A. (2009). Mentor and undergraduate student comparisons of students' research skills. *Journal of STEM Education*, 10, 31-39.
- Chesebro, J. W., McCroskey, J. C., Atwater, D. F., Behrenfuss, R. M., Cawelti, G., Gaudino, J. L., & Hodges, H. (1992). Communication apprehension and self-perceived competence of at-risk students. *Communication Education*, 41, 345-360.
- Christophel, D. M., & Gorham, J. (1995). A test-retest analysis of student motivation, teacher immediacy, and perceived sources of motivation and demotivation in college classes. *Communication Education*, 44, 292-306.
- Eby, L. T. (1997). Alternative forms of mentoring in changing organizational environments: A conceptual extension of the mentoring literature. *Journal of Vocational Behavior*, 51(1), 125-144.
- Eby, L. T., & Allen, T. D. (2002). Further investigation of protégés' negative mentoring experiences patterns and outcomes. *Group & Organization Management*, 27(4), 456-479.
- Frymier, A. B., & Schulman, G. M. (1995). "What's in it for me?" Increasing content relevance to enhance student motivation. *Communication Studies*, 50, 1-12
- Keller, J. M. (1983). Motivational design of instruction. In C. M. Reigeluth (Ed.), *Instructional design theories: An overview of their current status* (pp. 383-434). Hillsdale, NJ: Lawrence Erlbaum.
- Keller, J. M. (1987). Strategies for stimulating the motivation to learn. *Performance and Instruction*, 26(8), 1-7.
- Kelley, D. H., & Gorham, J. (1988). Effects of immediacy on recall of information. *Communication Education*, 37, 198-207.
- Kearney, P., Plax, T. G., & Burroughs, N. F. (1991). An attributional analysis of college students resistance decisions. *Communication Education*, 40, 325-342.
- Kram, K. E. (1980). *Mentoring processes at work: Developmental relationships in managerial careers*. Unpublished Dissertation, Yale University, Cambridge, MA.
- Kram, K. E. (1983). Phases of the mentor relationship. *Academy of Management Journal*, 26(4), 608-625.
- Kram, K. E., & Isabella, L. A. (1985). Mentoring alternatives: The role of peer relationships in career development. *Academy of Management Journal*, 28(1), 110-132.
- Levinson, D., Darrow, C., Klein, E., Levinson, M., & McKee, B. (1978). *The seasons of a man's life*. New York: Alfred A. Knopf.
- McCroskey, J. C., & Richmond, V. P. (1987). Willingness to communicate. In J. C. McCroskey, & J. A. Daly (Eds.), *Personality and interpersonal communication* (pp. 129-156). Newbury Park, CA: SAGE Publications.
- McManus, S. E., & Russell, J. E. A. (1997). New directions for mentoring research: An examination of related constructs. *Journal of Vocational Behavior*, 51(1), 145-161.
- Noe, R. A. (1988). An investigation of the determinants of successful assigned mentoring relationships. *Personnel Psychology*, 41(3), 457-479.
- Ragins, B. R. (1997). Diversified mentoring relationships in organizations: A power perspective. *Academy of Management Review*, 22(2), 482-521.
- Ragins, B. R., Cotton, J. L., & Miller, J. S. (2000). Marginal mentoring: The effects of type of mentor, quality of relationship, and program design on work and career attitudes. *Academy of Management Journal*, 43(6), 1177-1194.
- Richards, R. (2012). "Undergraduate research mentoring," Available online at - <http://www.blogger.com/blogger.g?blogID=1352031052436049626#editor/target=post;postID=2911570489304235294;onPublishedMenu=overview;onClosed-Menu=overview;postNum=19;src=postname>.
- Rosenfeld, L. B., Grant, C. H., & McCroskey, J. C. (1995). Communication apprehension and self-perceived communication competence of academically gifted students. *Communication Education*, 44, 79-86.
- Russell, J. E. A., & Adams, D. M. (1997). The changing nature of mentoring in organizations: An introduction to the special issue on mentoring in organizations. *Journal of Vocational Behavior*, 51(1), 1.
- Scandura, T. A. (1992). Mentorship and career mobility - an empirical-investigation. *Journal of Organizational Behavior*, 13(2), 169-174.
- Scandura, T. A., & Schriesheim, C. A. (1994). Leader-member exchange and supervisor career mentoring as complementary constructs in leadership research. *Academy of Management Journal*, 37, 1588-1602.
- Singh, V., Bains, D., & Vinnicombe, S. (2002). Informal mentoring as an organizational resource. *Long Range Planning*, 35(4), 389.
- Smith, W. J., Howard, J. T., & Harrington, K. V. (2005). Essential formal mentor characteristics and functions in governmental and non-governmental organizations from the program administrator's and the mentor's perspective. *Public Personnel Management*, 34(1), 31-58.
- Tepper, B. J. (1995). Upward maintenance tactics in supervisory mentoring and nonmentoring relationships. *Academy of Management Journal*, 38(4), 1191-1205.
- Whitchurch, C. (2008) "Shifting Identities and Blurring Boundaries: the Emergence of Third Space Professionals in UK Higher Education." *Higher Education Quarterly* 62(4): 377-396.
- Whitely, W., Dougherty, T. W., & Dreher, G. F. (1991). Relationship of career mentoring and socioeconomic origin to managers and professionals early career progress. *Academy of Management Journal*, 34(2), 331-351.
- Young, A. M., & Perrewe, P. L. (2000). What did you expect? An examination of career-related support and social support among mentors and protégés. *Journal of Management*, 26(4), 611-632.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Zey, M. G. (1984). *The mentor connection*. Homewood, IL: Dow Jones-Irwin.



Professional Development

Professional, personal and career development are natural outcomes of the mentoring process. Figure 2 illustrates a simple representation of faculty and staff interactions with students which often involve a vital combination of academic advising, mentoring, and career planning. Determining the most appropriate combination is student-dependent. The projects students work on, the skills they learn, and the contact that they have with you as mentor outside of a traditional classroom space all contribute to post-graduation success (Miller, 2002).



Advising for graduation and advising for success

Undergraduates desire to attain a degree and realize career ambitions. Advising plays a critical role in achieving these goals and the type of advising may differ depending on the desired outcome. As a mentor, you may find yourself engaged in two types of advising: (1) advising for graduation and (2) advising for success.

A common trend in higher education is the development of professional advising centers with a goal to increase undergraduate retention and graduation rates. Some professional advisers oversee transition functions for students, especially those who have not decided on a major. Others focus on matriculation processes. Is the student taking the appropriate courses in the first year? Does the student have enough science credits to fulfill the degree requirements at the university? How many upper division hours does a student need to earn to graduate? Professional advisers with academic advising focus reduce faculty workload in the role of advising for graduation. On the other hand, some centers advise for success by providing a full range of academic and career planning resources and tools to help students make informed decisions to achieve their academic, career, and life goals.

At institutions where the professional advising resource is scarce, faculty assume dual roles of advising for graduation and success. When the student receives psychosocial, academic, professional and career advisement, this might constitute mentoring. Students frequently enjoy advisement from one or more members of the faculty and staff and the nature of the advisement ranges from personal to academic to professional and combinations of each. However, it is the role of the mentor to evaluate and determine the type of advising required by the student to ensure appropriate advisement occurs from the appropriate source.

Post-Baccalaureate Planning

One mentoring consideration is assessment of a mentee's future planning. What activities can she participate in during her first, second, third, and fourth year to plan her placement? Is she taking advantage of summer months to find opportunities related to her plans? If she has to work, what project or work opportunities are available to provide critical experiences to enhance her talents and skills? Does she have a post-graduation plan? Is a graduate program part of the plan? Is that program similar or dissimilar to your area of study? Does she wish to enter the job market?

In a Ph.D. mentorship model, the goals of a mentee may deliberately align with that of the mentor in terms of research interest and career choice. In many cases, students enter graduate programs to develop the requisite experiences, skills and dispositions to create their own pathway. As mentor, your role will be to provoke, stimulate, and support greater expectations and possibilities by your mentee.

The following list includes some general guidelines and considerations for some of the duties and responsibilities mentorship may encompass.

Development of Life Skills

Goal-Setting: It is important that students enter your research environment with "eyes wide open" and receive clear expectations of duties and workload associated with the project (Mickley, Kenmuir, & Remmers-Rober, 2003). Assist your mentees with goal-setting.

Communication Regarding Progress: Have a straightforward conversation about what your student can accomplish and improve upon throughout her time with you in order to better achieve her goals can also be useful. Be explicit. Create collaboratively reasonable benchmarks for progress and deliverables that fulfil your standards and expectations. This may involve having conversations that assess your student's need for improvement in certain areas. These conversations can be professional in nature or personal; professional mentoring often intersects with personal issues. By providing experiences that foster success, you can write an honest, positive letter of reference for your student.

See Appendix H for checklists that can assist your student through self-reflection on areas requiring improvement.

Professionalism and Maturity: Provide experiences for your mentee to grow her professional disposition. What opportunities will she have to interact with peers, faculty, staff, administrators, community members, business industry/government professionals to showcase her craft? What classroom or research experiences are fostering her communication skills? How often does she have opportunities to work in teams and with people who are different from her (diverse)? Create an environment for candid conversations on how to approach a faculty member for a conversation; how to dress professionally; how to craft a professional e-mail; how to communicate in an effective way; how to give a professional presentation; how to address a professional in the field. Many of these skills are not inherent and your students may need specific (and pointed!) instructions.

Leadership Development: In addition to opportunities inherent in the research environment for promoting leadership, find specific opportunities to enhance leadership by your mentees. If you mentor several mentees, peer mentoring, for example, fosters valuable leadership by students. Identify leadership qualities in your mentees and hone this skills by assigning specific tasks and roles.

A Code of Ethics: Promote ethical behavior in your professional environment. Scaffold ethical behavior through implementation of research planning, use of other's work, citation of sources, etc. Be consistent about your code of ethics. As a mentor, your students are looking at you to model ethical behavior. See Chapter 4 for more specific information about ethical mentoring.

Community Service and Engagement: Encourage your students to participate in service learning, that is using their skills, talents and knowledge to serve the community. Provide as many opportunities as possible for your mentees to see their role as productive, socially-responsible citizens of community. Plus, community work not only fosters community building but résumé-building as well.

Presenting Research

Facilitating Opportunities: Awareness of opportunities for students to develop their skills or to present their research and creative projects is a key component of facilitating professional development.

Most opportunities have strict deadlines for submission; in some cases, six to eight months prior to the event. Therefore, timing is critical. For example, how might a specific timeline impact your senior students in terms of travel support requirements if no longer enrolled at the institution? Might the opportunity be more prudent for juniors? Consider options for students at each level of their research development and academic rank. For example, a senior student may be in a position to submit a publication and not a presentation. Often, undergraduate research conferences and smaller regional or statewide conferences have a more reasonable submission deadline for students wishing to present research, meaning that students can have the opportunity to present research without having to complete the project months in advance. In addition, undergraduate research conferences also can sometimes allow for submission of works in progress, where projects do not have to be completed in full in order to be submitted. This can sometimes be a bit of a gamble, but can be a real boon when a student is in the middle of data collection.

Chapter 8 offers a list of resources specific Georgia College for obtaining funding for purposes of presenting student research at conferences and Appendices A and B provide a list of funding and national conferences sources.

Promising classroom projects can sometimes be developed into a conference-worthy presentation – and with adequate planning and preparation, one can make conference presentations a class requirement. Likewise, there can sometimes be much more modest methods of presentation, including formal class presentations and papers, presenting work at a department-wide or school-wide “research fair”, or submitting papers for publication in the school journal (i.e. Georgia College’s “The Corinthian”). By being aware of opportunities, or perhaps creating your own in your classroom and department, you can give student research greater exposure, and act as an ambassador for their work.

Evidence of Research and Creative Endeavor: How can students provide evidence of their work if they have not engaged in specific showcase or dissemination opportunities (conference presentations, exhibitions, productions, publications, reports)? Be creative - provide students with relevant citations of their work from your grants, conference presentations, manuscript submissions or showcase event to assist the development of their professional materials (statement of purpose, résumé, etc.).

Students can sometimes find it difficult to reflect and critically assess their accomplishments while in a research setting. As such, they may not recognize their development during their time working with you. Help them articulate their roles, responsibilities, skills, leadership and professional dispositions acquired as part of their research experience.

As a mentor in the field, you will be familiar with the style résumé that your students need to use to be the most successful in applying for jobs and graduate schools. Since this differs from field to field, specific career advisement from a career center or relevant colleague might be useful. Career centers often offer one-on-one counseling, résumé workshops, etc.

Academic Advising

Scheduling: So much of being successful in college is balance. Most undergraduates do not realize this, so when they schedule their classes they will oftentimes be more worried about the times and days of the schedule than the balance of the subjects. Mentors should always have their students make a list of strengths and weaknesses and try to balance classes based on that list. For example, if your mentee is strong in math in science and weak in History and English you might consider pairing all math classes with English classes to balance (History and Science). Once you finish the core classes it becomes a matter of balancing workload. There are classes within your field that are more work intensive than others—everyone in the field should know which ones they are. Make sure that your mentee does not take too many of those during any one semester.

Obviously every mentor wants their mentee to experience undergraduate research in some form before they leave the university environment. The question is what is the best for the student’s résumé and career plan? The mentor and mentee can decide together what the list of “must haves” would be needed for the mentee’s transcript. Are these specific classes (subject specific) or classes to show skill sets or is this undergraduate research?

Class Selection: Frequently when selection committees are evaluating candidates for places in graduate programs they look at the student’s transcript. One of things they consider is how many classes the student took in her field of study and the breadth and variety of class that took in that field. If you encourage your students to use their electives wisely, please do. It is your job as mentor to ensure that your mentee walks out of your doors prepared for success in graduate school or in the world of work.

GPA: We as mentors do not like to see our mentees viewed as merely as a series of numbers, frequently this happens in the graduate admissions process. GPA is one of the most important factors to any graduating college student, whether they are applying for a job or applying to professional or graduate school. Mentees should know that if they do very poorly in a class, they have the option of retaking the class to modify their GPA. Mentors should also pay close attention to the drop date for classes; if their mentees are doing poorly and have less than 4 Ws (Withdrawals from a class), they should suggest that the student drop the class so there is no academic penalty. A few bad grades on a student’s transcript can rob a student of a scholarship, a job or the opportunity to go to graduate school.

Field-Specific Professional Development

When students wish to go further in your particular area of study and pursue an advanced degree, the mentoring process they might receive often reflects mentoring that you may have experienced in your own academic journey. Students may have questions about which graduate programs would be best for them to apply to, and your advice can be invaluable, as can your professional connections. This is often a much more straightforward mentoring experience, as a student can easily apply their research experience to their application materials.

Once you have a potential mentee come into your office (and your life) you should not take their dedication or love for the subject lightly, but be realistic. If you are in a field that is oftentimes confused by outsiders or glamorized by the media it can be especially difficult for you to separate those students who have a serious interest in the field from those with a passing fancy. Although clearly it is important to share your love for your field with all students, ultimately as faculty it is part of our job to help each student to find where he or she belongs, even if it is not with us. Sometimes this can be the most difficult part of job. Clearly if you are in a field that requires a graduate or professional school a student must be able to earn the grades and test scores to get into those schools. Sometimes this means that we must be candid with students about their grades and chances in our field. Although some doors may close to that student, we must be careful not to close all doors to a student that is truly enthralled with the subject.

You are uniquely suited to help your mentee learn about your field – to demystify the minefields, the trends, the professional connections, jargon, and how to pick an appropriate graduate program. Don't expect students to know these things intuitively, or to pick them up through osmosis.

Encouraging students to engage in activities with discipline-specific pre-professional programs can also be useful, as upper-classmen can show lower-classmen "the ropes." Pre-professional organizations are important for forming study groups, networking (social and professional), and for learning from peers, as well as providing leadership and service opportunities.

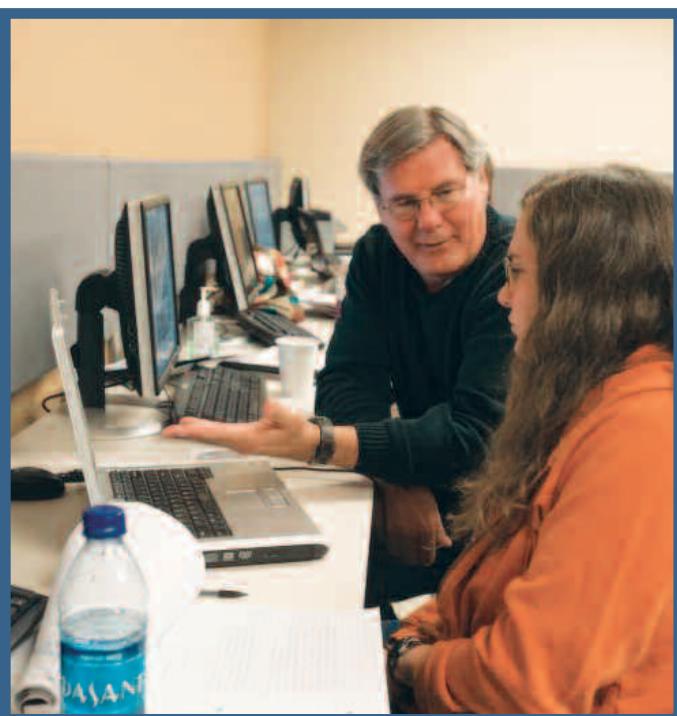
- Do you see the student in question as having a successful experience in your particular area? If not, what could you do to better help them succeed? Would it serve her better to redirect her to an area that would better fit her interests and goals?
- Does your mentee love this subject and really need to be a professional in this field?
- Your insights regarding your field (and academia) can provide students with a sense of context and direction. Be open about the employment opportunities available to professionals with your type of degree, as well as what students can expect to experience during graduate school.

General Professional Development

Unlike graduate programs, not all undergraduate mentees will go on to receive PhDs in your particular area. (In fact, the majority of them will not!) If a student you are working with is not planning on going into your particular area of study, or has decided to go on the job market, you may have to discuss with your mentee about how their experiences doing research can translate to a non-research environment, or another area of study. Generating a list of skills that could be useful in a workplace environment would be one possible approach. Talking with your student about how to verbalize their research experience in terms of more general skills such as critical thinking, responsibility, maturity, leadership, and problem solving (Reilly, 1992) can also be useful.

Clearly when discussing your mentee's future with them, you must discuss all of the possibilities. Graduate school is not for everyone. Especially in today's economy, not everyone is ready to make the jump into the great unknown and borrow tens of thousands of dollars to invest in a graduate education they may or may not be able to use. The student loan crisis of 2012 made many students wary to take out more loans, especially with the economy slow to rebound and growth in the job market slow to non-existent. Mentors need to be realistic with their mentees. Education has its advantages and your degree does make you worth more in the job market. In a bad economic time however, mentors should talk alternative options for some students like part-time programs that allow students who already have jobs to enhance their worth to keep their job security.

Keep in mind that the career center is also an excellent research for résumé development, and they can provide additional strategies for discussing research experience to potential employers.



Graduate School Preparation

Testing, Testing, 1,2, 3...

Starting with a “dry run”: This is probably the most over-looked step in the testing process—but the most critical! Students cannot begin to study for a test if they have no idea where their weaknesses are! It’s a very good idea to require your mentees to take the entrance test they are required to take at least once under testing conditions (quiet, no unnecessary breaks, in the morning) without studying as a dry run. If they take the test more than once, they will get a better idea of the validity of the score. Once you have a base line of your mentees’ “natural ability” on the test, you can analyze with them what they missed and formulate a personalized study plan/ schedule. This is where a pre-professional organization is optimal. Ideally, these organizations will have a study group for each part of the test operating throughout the academic year.

How to study: All of the entrance tests have their “tricks”, whether you are taking the GRE, GMAT, LSAT or MCAT. The one common denominator is you should encourage your mentee to study as much as possible and to start as early as possible. If they start early, the study sessions can be smaller and more relaxed; they can develop a routine of studying for their graduate entrance test and work that routine into their college lives. The longer they wait to start studying, the longer the sessions, the more frequent, and the more intense—this leads to stress which leads to lower test scores.

Study groups: A lot of students in college will tell you that they prefer not to study in groups. In particularly competitive fields this is understandable; we pit students against each other and do not encourage collaboration. We as mentors need to explain to them in college that many pre-professional and graduate programs hinge on group work. Study groups can be a great tool for undergraduates to gain confidence, expand knowledge and garner innovation. Many times students learn more outside that classroom than inside the classroom.

Specialized Study Plan: It is best for every student to know early on what their strengths and weaknesses are and to use those to their advantage. A specialized study plan will focus on utilizing a student’s strengths and addressing their weaknesses. If a few students have components of their plans that are similar in certain areas, we encourage group study.

When should my mentee take the entrance test?

Most entrance tests are offered at least 4 times or so throughout the year (LSAT); some can be taken at any time (GRE). So what is the best time to take the entrance test for graduate school if a student is trying to be admitted in the fall? If you ask this question to ten mentors, you’ll likely get ten different answers. A good rule of thumb is to make sure that you do not like your first score, you have enough time to retake the test (and get the scores back) comfortably before the deadline to apply for schools.

Should my mentee take the test again?

This of course depends on a myriad of factors, finances only being one (those tests can be expensive).

- Is the outcome likely to change? Were there any factors that likely had an effect on the performance of your mentee?
- If the outcome changes, how likely is it to make a significant difference? If your student is only likely to improve marginally and that will not be a motivating factor for the admissions board, she should not take the test again.
- Do they average test scores or take the highest score? This is something your mentee must know about the schools she is applying to. If she takes the test again and the school averages the scores, it might actually be detrimental to her chances of getting into graduate school.

LSAT Preparation Example: Of all of the entrance tests, the LSAT might be the exam that people talk about the most. A recent study of the LSAT indicates it might not even be a valid indicator of future student success in law school (there is only a moderate correlation between high LSAT scores and high 1L grades) (Stilwell, Dalessandro, & Reese, 2011). The ABA has even considered the possibility of replacing the test (Weiss, 2011). However, almost all school requires that applicants take the LSAT to be considered for admissions. Historically the biggest problem for students taking the LSAT is that is not a content-based test. You cannot “study” for the LSAT in your traditional way. Since the LSAT measures intellectual ability and not merely knowledge, it makes preparing for the LSAT very difficult.

We suggest the following for students planning to take this test: increase your reading in subject matter, intensity, amount, speed. This will help on the reading comprehension section of the test. Take a class in critical and logical thinking (these are very often taught in philosophy departments). This will help in your logical reasoning section. If your university offers a legal research and writing class take it to help in your writing section. Most students have the hardest time with the logic games. We suggest that you attempt to retrain how you think about these scenarios—make them games. Many of the scenarios are very similar to brain teasers. Buy a book of brainteasers. Make it a habit to work through a few several times a week. Once they become commonplace, your brain will retain itself to think in a more efficient, logical way to solve the puzzle.

Appendix I provides a related checklist that mentors and mentees can complete together as they talk about specific components of preparing for graduate school applications.

Picking Programs

As mentor, your role will be to assist students in looking at the “big picture” when determining the graduate program of choice. Although the quality of the program is an important factor, your mentees will need help assessing other considerations such as:

- Cost
- Scholarships
- Access to things of importance
churches, schools, theatres
and other colleges
- Crime rate
- Cultural identity of the city/town
- Employment opportunities
- Proximity to family
- Transportation access/ease
- Weather
- Region
- Urban/rural setting
- National/international

Students may need specific advice about the number of program applications to submit, “red flags” to watch for (e.g. lack of professional accreditation or bad reputation), and other discipline-specific contexts. For example, will the student work with a specific adviser or is the student applying broadly to the program as a whole? Will the student receive the training that will advance her specific career goals? Review résumé drafts, personal statements and professional e-mails to ensure that they focus on the goals of the specific programs. When interviews are granted, help your mentee to prepare for the unknown. (See Appendix K for useful interview guidelines).

Letter Writing

It is important that your mentees are aware that simply participating in research does not guarantee they will receive a glowing letter! Work with students to make sure your expectations and standards are clear.

Furthermore, students may be unaware of letter writing protocol. Ensure that your students know your personal requirements for requesting a letter – how much time you need, general etiquette you expect when a student is planning to ask whether you would be willing to write a letter (i.e. “I expect you to make any requests in-person”), and ongoing expectations you have for what the student will provide you while you prepare his or her letter. See Appendix J for some example forms for letter writing.

As a research mentor, you will have unique insight on your students’ strengths and weaknesses. Further, you will be in a position to discuss their intellectual capabilities, research skills, leadership, maturity, written and oral skills, and knowledge about the discipline/topic area and capacity for advanced work.

Case Studies:

Graduate School Mentoring

The following case studies discuss a variety of challenges students face when considering their post-baccalaureate options.

Organized Olivia

Olivia is clearly interested in your field. She is bright, talented, experienced in the field, and highly organized. You decide to grab her up as your undergraduate assistant. She serves in that capacity for one year – helping you organize clubs, mentees, and events for your field. When she starts to apply for graduate school and gets her test scores back, her scores are very low. It looks as if she may not get into graduate school at any of the places she applied. What is your course of action as her trusted mentor?

Cocky Cory

One of your students gets into a top 25 school. There is no scholarship offer. There is lots of prestige, however. He is really excited and thinks this will open doors and make getting a job in his field incredibly easy. He gets several scholarship offers, one of which is from a top state school with a newer graduate program in your field (but still in the top 50). The offer is for a full tuition plus a yearly stipend. What should you advise him to do?

Social Sally

You have a fiercely talented undergraduate assistant. She is bright, organized, talented, and social – maybe too social. During her last semester of undergraduate (when she should be applying to graduate programs) she misses several key deadlines for schools that she should be applying to. You do have pull with some of the schools where she’s missed deadlines, as well as other key schools where she is planning to apply. Due to family issues, she’s absolutely desperate to get funding from a graduate assistantship from somewhere or she will not be able to afford graduate school. What is your course of action as her mentor?

References

- Mickley, G. A., Kenmuir, C., & Remmers-Rober, D. (2003). Mentoring undergraduate students in neuroscience research: A model system at Baldwin-Wallace College. *The Journal of Undergraduate Neuroscience Education*, 1(2), A28-A35.
- Miller, A. (2002). *Mentoring students and young people: A handbook of effective practice*. London: Kogan Page.
- Reilly, J. M. (1992). *Mentorship: The essential guide for schools and business*. Australia: Hawker Brownlow Education.
- Stilwell, L. A., Dalessandro, S. P., & Reese, L. M. (2011). Predictive validity of the LSAT: A national summary of the 2009 and 2010 LSAT correlation studies. *LSAT Technical Report Series*, Law School Admission Council. Can be found at - <http://www.lsac.org/docs/default-source/research-%28lsac-re-sources%29/tr-11-02.pdf?sfvrsn=2>
- Wiess, D. C. (2011). LSAT Would Be Optional Under Possible ABA Accreditation Change ABA Journal, can be found at - http://www.abajournal.com/news/article/lsat_would_be_optional_under_possible_aba_accreditation_change



Ethical Mentoring and Research

Ethical Mentoring

When engaging in mentoring, there are various considerations that should be in place to promote a healthy, appropriate relationship with one's mentee. Establishing and maintaining clear boundaries between the mentor and mentee can be an important first step in the mentoring process. Likewise, mentors should avoid abuses of power – such as exploitation of a mentee's time, resources, and work. Remember, your student's academic future can be deeply impacted by you, which is a considerable degree of power, and must be responsibly handled.

Ethical Research Practices

While interacting with research assistants and mentees, it is important to consider the sort of message you are sending to them about your own research practices, and what you consider to be ethical and unethical. Having frank and straightforward discussions about falsifying data, plagiarism, misuse of research, and mistreatment of participants can be an eye-opener for students who may have heard about some of these issues in a classroom, but must now implement them in a new context: as researchers themselves.

Some things to consider:

- Do you talk about ethical issues? When you do, does it resemble a discussion, a debate, or a lecture? Do you allow for disagreement, conversation or questions?
- How do you handle confidential material?
- How do you handle dangerous equipment?
- How do you keep data secure, and ensure that it is correct?
- How do you talk about the Institutional Research Board (IRB)? What impressions will students have about the IRB from hearing you talk about it? Will they see the value of an IRB, or think about it as a bureaucratic hassle?
- If you use participants in your research, how do you talk about them? Do you give the impression that you respect your participants?
- What are your priorities when engaging in research? If your students had to list the things that they thought were most important to you, would that list include ethical standards?
- What do you say about your fellow researchers in your discipline? Are you dismissive of certain people, perspectives, and theories? Are you contributing to a healthy and productive academic community? Remember – your students may someday consider whether or not to apply to these programs or work for that researcher – and that there's a difference between a genuine and thoughtful disagreement and pettiness.



IRB Preparation

The IRB, or "Institutional Review Board", is a committee that must review all research involving human participant research and approve it before the research can proceed. The standards can change from institution to institution, and certain research (i.e. best practices in a classroom setting, certain class projects) may be exempt. It's always important to check and see whether your research requires IRB approval.

Who is the PI? The Primary Investigator does not automatically have to be the research mentor each and every time. If the project is an independent study or thesis, sometimes it is required for the student in question to be the PI. Having the student listed as the PI (and you as the supervisor) or at the very least involving the student closely in the process of writing the proposal can help to increase the student's agency and ownership of a project, and gain a greater understanding of the process of seeking approval. It may be difficult for inexperienced undergraduate researchers to complete an IRB application successfully on their own. Providing examples and supervising the process is key to reduce strain on the IRB, streamline the process by reducing the need for revision, and increase the quality of the project.

Timeline. Keep in mind that the review process can take between two and four weeks once the supervisor has approved the study. If revisions are required before final approval by the IRB, this could further impede a student's proposed timeline for collecting data. By taking a proactive approach and overseeing IRB submissions, you can make sure your student's research proposal meets all of the requirements from the IRB.

Data Storage. The regulations for data storage differ from institution to institution. It is fairly standard to require that data must be stored securely for a period of five years, and then must be responsibly destroyed. As students are not often equipped to properly store data, and will often be long graduated by the time data must be destroyed, it is the responsibility of the research advisor to provide the storage space for data, and outline how they will help the student fulfill these requirements.

Confidentiality. How will data be collected and stored in such a way to maintain participant confidentiality?

Informed Consent. Requirements for informed consent forms differ from institution to institution. However, there are some fairly standard general pieces of information that students sometimes neglect to provide:

- Contact information for the IRB
- If a specific question makes participants uncomfortable
- Minors: If any participants could be under the age of 18, places for parent or guardian signatures must be provided on the form. If no one under the age of 18 is allowed to participate, the language of the informed consent form must clearly indicate as much.
- Participants can choose to leave the study at any time

Statement of Risk. Remember, there is no such thing as “no risk” – the key that IRB reviewers are looking for is whether the risk participants may experience is no greater than minimal risk: the sort of risk one would expect to experience during the course of a normal day. Sometimes, this may require additional explanation about any possible stress, clarifying that even if a participant may experience discomfort or negative feelings, it would still fall within the range of minimal risk. Furthermore, identifying the efforts the researcher is taking to reduce risk is an important consideration. For instance, making sure participants know that they can skip a question they find uncomfortable, or providing opportunities for participants to talk about their feelings about the study afterwards can alleviate stress experienced during the course of the experiment.

Deception. Studies that use deception as part of the procedure must have a clear statement as to why deception is necessary, and that participants will be informed of the true nature of the study after the fact. In addition, it is standard to limit deception research to studies that are only no greater than minimal risk.

Vulnerable Populations. Minors, prison population, the elderly, and pregnant women are all examples of vulnerable populations, and are thus at a more advanced level of risk. It may be useful to speak with a faculty member who has experience working with these populations who can provide guidance in terms of extra risk considerations and policies.

Relevant Materials. Attaching copies of relevant questionnaires will make it easier for the IRB to assess a study thoroughly. In addition, it is important to provide instructions on the questionnaires, the informed consent form, or both that clearly state that participants may skip questions that make them feel uncomfortable. These instructions should be provided even if you think the questions are fairly benign.

Site Approval. If the plan is to collect research off-site, the student must have formal site approval. For example, if data is being collected at an elementary school, the principal of that school must provide a signed letter that states that the student would have permission to collect data at that location, and this letter will be included with any other IRB materials in the initial submission.

Ethical Considerations for Research Assistants

Although many of our ethical processes for research require us to consider risk to participants (see our section on the IRB above), it is also important to address the risk research assistants are exposed to as part of their experiences.



Safety: Are research assistants properly trained in the safety protocol? Are they aware of what to do in case of an emergency? It is important to consider the safety of researchers under your supervision. This may involve making sure that emergency contact information is easily accessible, that research occurs during hours when staff is on site to provide assistance if needed, and that researchers understand the potential dangers they may encounter during the course of the experiment.

See Appendix G for an example of a “lab manual” that addresses safety issues.

Rights of Research Assistants: Research assistants should also have very clear knowledge of their own rights. For example, it might be beneficial to establish that research assistants have the right to not run a participant if said participant makes them feel unsafe or uncomfortable. If this isn't established ahead of time, research assistants may feel obligated or responsible, and thus may expose themselves to unsafe conditions unnecessarily. Likewise, it might be useful to give research assistants a “hotline” system where they know who they can tell if they feel as if something unethical is happening in the research lab (i.e. department chair, legal department, IRB), to establish that it is important to report unethical behavior and that transparency is valued. At Georgia College, for example, it is standard to include the phone numbers for the legal department and the chair of the IRB on all informed consent documentation for participants to report practices that they believed to be unethical – but although it's explicit for participants, it may not be something research assistants know is a duty and moral responsibility unless they are explicitly told. Lastly, it is important for research assistants to know that they can “opt out” of working on research that goes against their belief systems, or makes them feel uncomfortable.

Authorship and Intellectual Property

Who gets credit?

The Institutional Review Board (IRB) provides definitions, expectations, and policies concerning authorship and intellectual property. As far as authorship, several things must be considered in deciding the proper division of credit between investigators of a project. Besides IRB expectations, most journals have policies that state which participants should be listed as the author of a paper. Most journals agree that it should only be a person who made a direct and substantial intellectual contribution to the design of the research, the interpretation of the data, or the drafting of the paper, although specific journals vary in their policies.

The list of authors establishes accountability as well as credit. An author who is willing to take credit for a paper must also bear responsibility for its errors or explain why he or she had no professional responsibility for the material in question.

Researchers need to become very familiar with the rules governing the fair and proper use of ideas. All authors/researchers need to be aware of their intellectual property rights of being in control of patents and copyrights. In some cases, benefiting from a new idea may require establishing intellectual property rights through patents and copyrights. Intellectual property rights give researchers, nonprofit organizations, and companies the right to profit from a new idea. In return, the property owner must make the new idea public, which enables others to build on the idea.

Researchers conducting patentable work may have special obligations if there are sponsors of that work or it takes place at an institutional facility or during employment work hours. U.S. patent law provides clear criteria for whom would be the inventor, and it is important that all who have contributed substantially to an invention be included in a patent application. Copyrights protect the expression or presentation of ideas, but they do not protect the ideas themselves.

Most research institutions have policies that specify how intellectual property should be handled. These policies may specify how research data are collected and stored, how and when results can be published, how intellectual property rights can be transferred, how patentable inventions should be disclosed, and how royalties from patents are allocated. This is why the IRB process should be involved before any human subjects research is conducted.

Some things to consider:

- Am I giving this student authorship only to help her career, or because she contributed significantly to the paper or presentation?
- Have a conversation with research assistants about authorship is typically determined and what it implies in advance of working on a project
- Have students who work in groups decide authorship order, and talk about their process
- Make your expectations for authorship clear, discuss the order of authorship and what you'd expect them to provide at each "level"

- When it comes time to determine authorship for a project, be transparent about the process and involve your students in the discussion

Case Studies:

Ethical Mentoring

What sorts of ethical pressures are the students under in the following scenarios? What about the mentors? How might you as a mentor navigate through these scenarios?

Transfer Tina and Tenacious Tim

Tina started a year-long project with you and did a substantial amount of collaborative work to develop the research idea and collect the data. You promised Tina second authorship on the manuscript due to her efforts. Tina ended up transferring at the end of the semester, and when you contacted her, expressed that she was "too busy" to devote additional time to the project, despite the fact that it requires major revisions and additional data collection. Tim, your second research assistant, has been able to provide some much-needed assistance in the later stages of this project. What should you do about authorship? (Adapted from Banja, 2011)

Non-Significant Nancy

Nancy is in the process of completing her undergraduate degree in Professor X's lab. She very much wants to go on to graduate school, and was depending on an advanced final project to get her admitted to the program she had in mind. She was also counting on Professor X, who was pretty well known in the field, to write her a nice letter of recommendation.

Unfortunately, the project yielded no significant data. When Nancy approached Professor X with the findings, he said she would have to write a report on this project and that he wouldn't have a report come out of his lab with no significant findings. He told her to go on a "fishing expedition" and run a bunch of post-hoc analyses in the hopes of finding some correlations that were significant. If Nancy approached you with her concerns, as a professor she trusted for a second opinion, what advice would you give her? (Adapted from Banja, 2011).

Plagiarizing Pete

You have a promising sophomore in your research methods class who seems bright, interested in the subject material, and has expressed an interest in graduate school, and participating in research with you. You are disappointed and dismayed to see that he has copied several lengthy passages from a source without indicating they are direct quotes, and without properly citing the source. What should you do?

References

Transfer Tina

Banja, J. (2011g). RCR case studies: Deciding First Authorship. CTSPEDIA retrieved March 8, 2013 from <https://www.ctspedia.org/do/view/ResearchEthics/CaseStudiesRCR>

Non-Significant Nancy

Banja, J. (2011f). RCR case studies: Data Torturing. CTSPEDIA retrieved March 8, 2013 from <https://www.ctspedia.org/do/view/ResearchEthics/CaseStudiesRCR>



Inclusive and Undergraduate-Specific Mentoring

Inclusive Mentoring

While engaging in mentoring practices, it is important to consider the sort of environment you create for potential and current mentees. Is it an environment that encourages inclusivity? How can you as a mentor work to connect meaningfully with mentees who may come from a variety of backgrounds?

- The literature shows significant and particular benefits for women, racial/ethnic minorities, and first-generation college students including increased retention and continuation (Burke McKeen & McKenna 1994; Gonzalez, 2006; Ishiyama, 2007; Whiteley, Dougherty & Dreher, 1991)
- Ideally, mentoring should be student specific and holistic in nature. Inclusive mentoring recognizes differences as part of the picture.
- Research suggests that socio-emotional support weighs more in importance than expertise support (Campbell & Campbell, 2007; Cruz & Crisp, 2009; Ishiyama, 2007)
- Students with an overwhelming amounts of other responsibilities cannot always make research a priority
- Sensitivity must be extended to the changing needs of students throughout the research process

| MALE PERSPECTIVE: | FEMALE PERSPECTIVE: | FIRST GENERATION STUDENTS: | CONTINUING GENERATION STUDENTS |
|---|---|---|---|
| 1. Expert in Field 2. Accessible 3. Helpful with Project 4. Communicative about Goals and Plans 5. Friendly 6. Personal Concern | 1. Accessible 2. Helpful with Project 3. Expert in Field 4. Friendly 5. Communicative about Goals and Plans 6. Personal Concern | 1. Expert in the Field 2. Accessible 3. Communicative about Goals and Plans 4. Helpful with Project 5. Personal Concern 6. Friendly | 1. Expert in Field 2. Accessible 3. Helpful with Project 4. Communicative about Goals and Plans 5. Friendly 6. Personal Concern |

Table 1: Good characteristics of mentors from the following perspectives (Ishiyama, 2007)

Resisting the Mentorship Process

Faculty often complain that students are unwilling to take their advice, are passive-aggressive, or otherwise exhibit "resistance to mentoring". This is often interpreted as meaning that the student "doesn't care", and is the source of disappointment and resentment on part of the faculty member.

Resistance to being mentored might result many sources and situations, sometimes including genuine lack of interest on the part of the student. Stereotype threat is also a well-documented predicament that might make a student skeptical or distrustful of the research mentor. However, other psychosocial issues may induce resistance to being mentored. As mentor, ensure that you provide an open environment that is welcoming to all students. Work on eliminating "micro-aggressions" from the research or creative environment.

It is also important to consider the other side of the coin, which is "resistance to mentoring others", in which the might-be mentor actually resists mentoring the protégé, or sees mentoring in a very narrow way that inhibits or precludes effective mentoring.

Tips for building interpersonal respect and trust

- Be sensitive to the changing needs of students through the research process
- Communicate that the student's work is a priority for you
- Create an open environment for questions and informal conversation
- Cultivate approachability and patience
- Offer positive responses: "I like how you approached that problem. Can you discuss your thinking on this one?"
- Provide a physical space for student work and/or set aside office hours specifically for UR consultations
- Provide precise/direct and timely feedback

(Gonzalez, 2006; Watkins, 2005)

Culturally Responsive Tips

- Accept that your way may be right for you, but might not be right for your mentee based on sets of internalized values, ethics and customs.
- Be honest when you examine your own prejudices and stereotypes.
- Differences in culture are opportunities to understand more about the world we all live in and how it has been shaped. This truly is a learning experience that both can learn from.
- It is important to understand the common threads that bind you, for instance a shared vision of reducing poverty can be enough to help start a process of overcoming cultural barriers.
- Remember that our culture is like a well-worn suit; it hangs just right and feels so comfortable that we are often barely aware of wearing it. When we are wearing a new suit and it feels uncomfortable we may feel uneasy and 'obvious'. It's okay to feel like this as long as you understand that your discomfort is because of the ill-ease, which may simply be prejudices coming to the fore for examination.
- Try to identify how common biases can come into being and the history that surrounds these – remember in history there is often no such thing as 'fact' simply perspective and it is often written from the perspective of the 'winner'



Undergraduate Specific Considerations

Mentorship, especially of undergraduates, is crucial for their success. By the time students make it to graduate school they have a very clear life roadmap; many undergraduate students enter their faculty mentor's offices as blank slates. Mentoring undergraduates can be a daunting task, riddled with significant challenges. There are developmental considerations, potential generational conflicts, and resource allocation issues, which threaten to interfere with the success of the mentor-mentee relationship.

Most traditional undergraduates are between the ages of 18-24 years old. Research on the theory of identity development (Chickering & Reisser, 1993) suggests that persons in this age range experience seven factors, later called vectors, of development during college. These are:

- Developing Competence
- Developing Integrity
- Developing Mature Interpersonal relationships
- Developing Purpose
- Establishing Identity
- Managing Emotions
- Moving through Autonomy toward Interdependence

These vectors need not be handled in a specific order nor individually – a student can work on more than one vector at once and frequently will revisit vectors as her experiences lead her to do so. To achieve what Chickering and Reisser (1993) call "identity", students must find a way to work through these vectors in some order at least once. Chickering and Reisser (1993) postulated that seven external forces contribute to a student's ultimate identity development -- who they are. The seven external factors are: institutional size, institutional objectives, curriculum, teaching, student development programs, friendship and student communities, and (last but not least) student-faculty relationship. Thus, when you consider your research environment, it becomes clear that as an undergraduate mentor, you can have a profound impact on a student's ability to develop the factors associated with identity.

Further, for your mentor-mentee relationship to be successful, several obstacles must be overcome. One barrier is the developmental difference between you and your mentee. A traditional undergraduate aged 18-24, for example, may be developmentally quite different to you. Therefore, you may experience common frustrations you're your undergraduate mentees, such as:

- Mentees are immature
- Mentees exhibit lack of focus
- Mentees focus on the wrong things
- Mentees lack basic knowledge of the field
- Mentees miss appointments

Similarly, undergraduates may find working with faculty mentors a difficult undertaking. They may report that the faculty mentor is:

- A bad fit for the mentee
- Impatient with questions they deem trivial
- Too busy to mentor properly
- Too formal
- Too narrow-minded to see things in new ways
- Uncaring about the student's personal life

There are portions of mentoring, especially psychosocial mentoring, that may not be as successful due to a mentor and mentee having developmental and generational divides. Here's a list adapted from Baizerman (1994) that illustrates some of the perceived challenges and assumptions that can be present when there are generational and power differences at work between teachers and mentors (who are most often adults 30+ years of age) and students in an undergraduate environment (who are most often adults 18-25 years of age).

1. Mentors know what's best for mentees; mentees know what's best for themselves.

We as mentors have to "put on the brakes" sometimes and realize that undergraduates are old enough to make decisions for themselves. There may be times where we want to parent, or to coerce them into decisions that we believe are the best for them. Ultimately, they have to be the masters of their own destinies.

2. Mentors have experience and mentees want experience (don't want to be treated like they're idiots).

Part of being a good mentor is showing a student how to do something and then knowing when to get out of the way!

3. Mentors want to take some time and think it over, and mentees want to do it yesterday.

This has to do with the differences in experience. Undergraduates want to spend very little time on the preparation stages of any project; they simply want to begin! Mentors with experience in the field realize that preparation is key to the success of any type of research or project and without good preparation you are doomed to fail.

4. Mentors want to talk (use words) and mentees want to act (do it).

Mentees operate with a language of action and Mentors operation with a language of words. Without an interpreter or very patient mentor and mentee this can become an automatic problem. Of course this is clearly a generational issue as well. We are all aware that as the generation gap grows between mentor and mentee there is a greater possibility for a communication complication. Each generation has their own communicative style and these are not always compatible. For example, methods of communication that were commonplace and comfortable for Generation Xers (telephone, face-to-face) are not the norm for Generations Y or Z.

5. Mentors think about consequences and mentees think about now (or tomorrow or next week).

We know because of our extensive research on the mechanics of the adolescent brain that there are significant differences between the adolescent and the adult brain – and furthermore, that the brain continues to grow and develop through the early 20s. Most traditional college students are developmentally classified as "late-stage adolescents" rather than young adults (Erickson, 1968). The National Research Council's 1999 Forum on Adolescence states that "one (of) the most remarkable findings in neuro-biology of the last decade is the extent of change that can occur in the (adolescent) brain..." This indicates (for the first time) that the adult brain and teenage brain are physiologically different.

Giedd et al. (1999) found the most significant changes in the adolescent brain to be in the frontal lobes or prefrontal cortex. It is these areas, among other things, which control impulses, calm emotions, provide an understanding of the consequences of behavior and allow reasoned, logical and rational decision making processes. These "executive functions" do not fully develop until the early twenties.

6. Mentors think they have to be in charge, and mentees want a chance to be in charge.

Undergraduates are experimenting with their place in the world. Since most do not yet have any idea what they want to do, it is to their distinct advantage to "professionally experiment." Perhaps the best way for students to figure out their permanent destination is if they are allowed to navigate the ship. Students who research with their mentor, especially if it is student-driven research, will quickly be able to decide for themselves if they have chosen the correct field of study.

7. Mentors can 'hang in there' longer than mentees, who get bored easily and quickly and want a change of task or job.

Undergraduates, especially those new to the research in their perspective fields, must learn the pacing of academics.

Sometimes projects that seem simple in their design take months and/or years to reach completion because of resourcing and staffing issues, IRB complications, funding inconsistencies and the like.

8. Mentors think that it will be too expensive" and that mentees don't understand this, while mentees believe that mentors can get the money if they want to.

Just as undergraduates may not understand the pacing of research in their fields, they might not understand the hidden costs associated with research projects as well. Determining the actual cost of a research experiment is a science in and of itself. Workload is an issue that is currently not fully considered when determining costs. Is the faculty member that is researching going to be released from all activities (teaching, mentoring other students, advising, service to the university, etc) and who is going to pay to have those activities covered?

9. Mentors really don't respect mentees, but expect mentees to respect them.

Respect is truly is two-way street. Many times faculty mentors assume that mentees should respect them automatically yet make mentees earn their respect. What lesson does this teach our students? Does this teach mentees that respect is only to be given away based on age? Rank? Or that they have innate worth?

10. Mentors think that they know how to work on a project with mentees and mentees think they don't know how to work on a project with mentors.

This is simply an issue of the mentor/mentee coming at the issue with differing perspectives or points of view. If we as a university community can train our mentors and mentee to strip themselves of expectations coming into the mentor/mentee relationship this problem will resolve itself. It does help to have past mentees of a faculty mentor discuss the process with a future mentee. This former mentee might even serve as a second resource or mentor for the current mentee, thereby creating a recent mentorship network.

Case Studies:

Inclusive Mentoring

How might you as a mentor work to create an inclusive environment? How can you address students' needs who may be from different backgrounds than your own, or from other students you work with?

Lonely Lenny

Lenny comes to you after having had several classes with you and asks if he can have a personal conversation with you. He says he is very interested in the field and has loved his time at your institution, however, is not having any luck dating as he is gay and your LGBT community is not strong and organized at your small university. He wants to discuss the possibility of transfer to a bigger school, or an internship to widen his possibilities. He also wants your opinions of where he should go to graduate school. What is your course of action as a mentor?

Vic the Veteran

Sometimes, non-traditional students do not get the same relationships with faculty that traditional students do. We know that opportunities do not often present themselves to non-traditional students in the same manner that they do traditional 9-5 students. What sorts of additional challenges may non-traditional students encounter? You are an advisor for an academic team at your university. This team helps teach and polish skills and is key to the field that you represent. You have a non-traditional student approach you who has never had a class with you and who wants to join the team. There must be some accommodations if Vic is to be allowed on the team, as he works full time Monday through Friday 9-5 which means that the team will most likely have to meet at night and on the weekends. What is your course of action as a potential mentor?

Angry Andy

Andy has been identified as having a learning disability coexisting with Asperger's Syndrome. This combination often creates challenges, particularly in relation to social situations and change. Andy recognized that he had the right to not disclose his information, and thus, did not receive a formal list of accommodations to distribute to his professors. Over time, his disability began manifesting itself through soft signs such as the inability to follow through on small tasks (i.e. cutting decorations neatly for bulletin boards, uploading assignments, following procedures). Other students in his cohort interpreted his behaviors as lazy and began pulling away, especially during group projects.

On one occasion, Andy had an explosive response to a request to redo a "one-day" failed lesson plan. He yelled at the mentor leader until he was asked to leave the office. After leaving, Andy continued following his mentor down the hallway, screaming and kicking objects along the way. The mentor leader was baffled by the intensity of anger resulting from a simple request to redo a one-day unit. Should you cut Andy loose from the teacher education program?

Bold Bonnie

Bonnie is a bright and promising African-American student who wants to go on to graduate school. She has a distinctive style of dress that is fashionable and colorful, and wears her hair in a natural afro as part of her overall look. You have a good rapport with her, as she has worked with you on several projects. While discussing graduate school, she asks you whether you think her natural hair style will make her appear "unprofessional". How might you advise her?



References

- Baizerman, M. (1994). Adolescents and Adults: why working together seems impossible. *The Child Care worker*, 12(8), 6-8
- Burke, R. J., McKeen, C. A., & McKenna, C. (1994). Benefits of mentoring in organizations. *Journal of Managerial Psychology*, 9, 22-32.
- Campbell, T., & Campbell, D. (2007). Outcomes of mentoring at-risk college students: gender and ethnic matching effects. *Mentoring & Tutoring*, 15, 135-148.
- Chickering A. W. & Reisser, L. (1993). *Education and identity* (2nd ed.). San Francisco: Jossey-Bass Publishers.
- Cruz, G., & Crisp, I. (2009). Mentoring college students: A critical review of the literature between 1990 and 2007. *Research in Higher Education*, 50, 525-545.
- Erikson, E. H. (1968). *Identity, Youth and Crisis*. New York: Norton.
- Forum on Adolescence (1999). *Adolescent development and the biology of puberty*. The
- National Research Council. Can be found at -<http://www.rcgd.isr.umich.edu/garp/articles/eccles99r.pdf>
- Giedd, J. N., Blumenthal, J., Jeffries, N. O., Castellanos, F. X., Liu, H., Zijgenbos, A. ... Rapoport, J. L. (1999). Brain development during childhood and adolescence: a longitudinal MRI study. *Nature Neuroscience*, 2(10), 861-863.
- González, C. (2006). When is a mentor like a monk? *Academe*, 92(3), 29-32.
- Ishiyama, J. (2007). Expectations and perceptions of undergraduate research mentoring: Comparing first generation, low income white/Caucasian and African American students. *College Student Journal*, 41, 540-549.
- Watkins, P. (2005). The principal's role in attracting, retaining, and developing new teachers. *The Clearing House*, 79(2), 83-87.
- Whiteley, W., Dougherty, T. W., & Dreher, G. F. (1991). Relationship of career mentoring and socio-economic origin to managers' and professionals' career progress. *Academy of Management Journal*, 34, 331-351.



Group and Cohort Mentoring

Group Mentoring

Peer and Cross-Age mentoring: Programs that see issues with faculty mentors may decide to implement peer mentorship programs. Peer mentorship programs pair similarly minded (and aged) mentors and mentees in hopes they will learn from each other in the collegiate setting.

This seems to be very helpful for some mentees as they have reported that there are many questions they would not be comfortable asking a faculty mentor. For the purposes of this handbook when we refer to peer-to-peer mentoring, we are referring to students with the same status, {i.e., both are underclassmen (freshmen and sophomores) or upperclassmen (juniors or seniors)}. Peer-to-peer mentor has shown great success in some areas, especially in those related to social situations as to feelings of belonging and inclusiveness (Weresh, 2010).

Cross-age mentorship is an idea that has been used in the elementary school setting for quite some time (Karcher, 2005). The premise is that students want to emulate people that are slightly older than themselves; peer-to-peer mentoring is successful, however, if the peer is slightly older, it might be even more successful. With undergraduates in particular this mentorship pairing can be really successful. Upperclassmen clearly have a fresh, recent perspective on what lowerclassmen have gone through and this enables them to give advice that faculty mentors might not be able to give.

Function:

Group mentorship can operate in much the same way as traditional mentor/mentee relationship. It is designed for one mentor to serve as a guide for a group of students with the same interests and is particularly useful in smaller schools in programs without the resources to have traditional mentor/mentee relationships. Although some might think that this type of mentorship is not as rewarding for the mentee as the traditional model, sometimes it proves to be more effective because it provides both faculty and peer mentoring simultaneously. Studies have shown that peer mentorship (specifically cross-age peer mentorship if you can count upperclassmen and underclassmen in that category) can be more effective in certain areas than traditional mentor/mentee relationships.

Benefits:

Unfortunately sometimes faculty overextend themselves. No one can know when entering into a mentoring relationship exactly how much time it will require. Mentees are like snowflakes, no two are alike—therefore no two mentorship relationships are alike. To prevent burn-out on the part of involved faculty, group mentorships can be very helpful. We suggest that the group maintain some secure way to communicate frequently and easily. Many groups use closed, private Facebook groups to communicate. The information is disseminated in a timely manner, anyone in the group can ask questions or add to an ongoing conversation and they can swap information instantly.

Example - Mock Trial: Georgia College has a fairly large Pre-Law Society relative to the size of its student body. At any one time there are approximately 65-75 people who are involved in this organization. Mock trial (approximately 18-20 students), an academic team maintained by the society, has a Facebook group. There is only one Mock trial coach for two teams (all of the students). She meets with the team throughout the week, but as they have questions, they post them on the Facebook group. If they can be answered by another member of the team(s), they are—if not the coach will answer them as soon as possible.

Example: Georgia College School of Education Cohort Mentoring:

At Georgia College, the Early Childhood, Middle Grades, and Special Education cohort programs have an action research requirement in the senior coursework. Action research has been defined as, the attempt by teachers to study and improve their practice as a result of classroom experiences (Connelly & Clandinin, 1988).

Numerous studies have indicated that practicing teachers conducting action research as part of their graduate education programs can improve teaching and enhance student learning (Burnaford & Hobson, 1995; Johnson & Button, 2000; Sax & Fisher, 2001). Action research requires all senior cohorts to look at their placements. The cohort students are asked to reflect on improvements that need to be made. This process starts with the cohorts questioning and reflecting on the effectiveness of methods being implemented with students who are showing a lack of progress with their academics or behavior. The first step in the action research cycle is problem formulation. Once a problem is identified, the cohorts investigate alternate evidence-based practices that could possibly be

implemented to improve the behavior or academics of a student or group of students. Following some intense investigation of alternatives, the cohort selects one that they feel would be most practical and effective to implement in their placement setting. Once the method is selected, a final question is defined.

Along with the final question, the cohorts then develop a method of implementing and measuring progress or lack of progress. These methods must include a pre-test or documentation over a period of a week of the present level of performance. Once the baseline is established, the student provides a well-documented list of intervention procedures over a period of several weeks. The length of time required to implement and collect data will vary. A post-test is administered following several weeks of intervention, which leads towards the analysis of the data collected. This is where various themes, issues, or patterns are identified. This is followed by the cohort reflecting over the results and developing some conclusions based upon the results of the data analysis. All of these steps are reported in a research report completed in the APA format.

In the college of education all cohorts are required to complete the requirements of an action research project under the direction and guidance of a mentor leader. The mentor leader is the person responsible for periodically meeting with the cohort candidates to monitor and give advice over the research process. The mentor is also responsible for the cohort maintaining confidentiality and making sure that each project is approved through IRB. This would also include obtaining the building administrator's and host teacher's approval for the project as well as parental consent for students under 18 years of age.

A cohort leader needs to also make sure that confidentiality of subjects is strictly maintained and follows the IRB's policies. Each department in the College of Education maintains their own specific requirements for evaluation of each study, but adhere to IRB's policies and procedures. It is the mentor's responsibility that these policies are followed precisely.

Case Studies:

Group and Cohort Mentoring

How might mentoring a group present unique challenges? What can you do to encourage cohesiveness and effectiveness?

Rotten Rita

Rita is a negative influence within the cohort. Although she makes decent grades, her drama and gossip are toxic, and her overall attitude is rubbing off on some of her cohort (and rubbing others within the cohort the wrong way). How might you address this issue to the benefit of both Rita and her fellow classmates?

Eager Edgar

Edgar is part of a group of students you are mentoring, but he dominates a great deal of your time. He raises his hand a lot in group meetings, writes you e-mails several times a day about fairly trivial matters, and insists on meeting with you one-on-one apart from the rest of his group. How would you balance Edgar's needs with that of the group, without extinguishing his eagerness?

Polly the Pushover

You find out through a third party that one of your group members, Polly, has been doing the lion's share of the work while the rest of her group members slack. Polly hasn't said a word about the extra workload, and she clearly cares a great deal about her performance in the class. What should you do?

References

- Burnaford, G., & Hobson, D. (1995). *Teachers doing research: Practical possibilities*. Mahwah, NJ: Lawrence Erlbaum Associates
- Connelly, F. M., & Clandinin, D. J. (1988). *Teachers as curriculum planners: Narratives of experience*. New York: Teachers College Press.
- Johnson, M., & Button, K. (2000). *Connecting graduate education in language arts with teaching contexts: The power of action research*. English Education, 32(3), 107-126

- Karcher, M. J. (2005). *Cross-age peer mentoring*. In D. L. DuBois, & M. J. Karcher (Eds.), *Handbook of Youth Mentoring* (pp. 266-285). Thousand Oaks, CA: Sage Publications.
- Sax, C., & Fisher, D. (2001). *Using qualitative research to effect change: Implications for professional education*. Teacher Education Quarterly, 28(2), 71-80.
- Weresh, M. (2010). *I'll start walking your way, you start walking mine: Sociological perspectives on professional development and influence of generational differences*. South Carolina Law Review, 61.





Mentoring and Workload

Managing Workload

Managing workload is always a challenge. In the world of academics, workload and what should be considered when determining faculty workload is always a hot topic. When you add the functions of a fulltime mentor to the workload of a fulltime faculty member, successfully managing that workload can be challenging. For our purposes, workload includes all functions involved in your mentoring and teaching roles, while serving the institution, and while pursuing your interests through research and other creative endeavors.

The Elements of Workload

While school, colleges, departments and programs may differ slightly in their definitions of workload, elements of a mentor's workload may include the following:

Work with Students

- Advising: degree planning
- Career counseling
- Counseling about graduate programs of study
- Directing students to university resources — learning annexes, Women's Center, Disability Services, Counseling Services
- General university orientation; program orientation
- One-on-one learning assistance and tutoring
- Recruitment of students to the university and from the university to a specific program of study
- Student retention

Work within the Institution

- Areas of study
- Creating and advising of pre-professional organizations
- Creation of policy
- Departmental governance
- Service on committees
- University-wide governance

Work within the Geographic Community

- Collaborations with businesses, government agencies, not-for-profits, academic institutions

Professional Development

- Be aware of new scholarship in the field
- Create experiential learning opportunities for your students
- Continuing workshops or classes in the field
- Develop new expertise in your field
- Develop resources with creative or academic merit
- Maintain expertise in your field
- Present/participate at conferences or workshops related to your field
- Undergraduate research

Work as an Instructor

- Assessment of learning outcomes
- Continued education regarding best practices
- Course development and improvement
- Instruction in the classroom

A good resource on faculty support and managing workload was published recently by the Council on Undergraduate Research.

N. H. Hensel and E. L. Paul (editors), Faculty support and undergraduate research: innovation in faculty role definition workload, and reward, Council on Undergraduate Research Publications, 2012.

Measuring Workload

For many universities using traditional techniques, mentoring workload boils down to an archaic function of credit hours multiplied by number of mentees. So, if a mentor informally mentors a student and there is no academic credit associated with the mentorship, there will probably not be any (or very little) workload consideration for that mentor.

Considerations

What sort of support does your institution offer for mentors of undergraduate researchers? Does your institution value and reward mentoring? How can you document your time and energy spent mentoring in a way that is useful for tenure and promotion purposes?

Tips for Managing Mentoring Workload

- Develop ‘blended’ web-based studies that you can lead or oversee but that allow students working at a distance to work together
- Develop learning activities that don’t impose unreasonable burdens on yourself, and encourage students to engage in self-assessment
- Develop study group approaches to topics of routinely high demand
- Faculty in the sciences would find themselves spending much more time in traditional researcher roles with their mentees than faculty in the arts
- Just say no! Talk to your dean or director about managing your workload, and don’t hesitate to say no to colleagues so you will not be overwhelmed with students
- Manage the expectations of students and colleagues. Students should come to see, from information sessions onward, that they will be expected to study in many different ways. Colleagues should be made aware of your limits
- Preserve your professional development days. Mentors are expected to devote four days a week to their work with students and colleagues. No doubt, the work expands to fit the time available. Use your professional development days to develop professionally
- Recruit and train tutors to supplement your own work within your area of expertise
- Some pre-professional advisors send much more time than other faculty mentors discussing testing taking techniques and tips
- Watch out for signs of Mentor Overload

Case Studies:

Managing Workload

How do we balance our own needs with that of our students?

Frazzled Fran

Fran is a junior, pre-tenured faculty member who appears to have bitten off more than she can chew. She’s ambitious, well-meaning, and aims high, but she has taken on a number of undergraduate research assistants right off the bat, and unfortunately, you’ve heard complaints from her students about her lack of responsiveness and disorganization. What advice would you give to Fran?

One More Oscar

Oscar is a middling student who has some interest in your field and shows some promise despite his poor grades, and you suspect that with a mentor, he could really shine. He requests to be added to your research lab despite the fact that you are at capacity. What should you do?





Georgia College Resources

Georgia College is a mid-sized public liberal arts college located in central Georgia. The institution is the liberal education flagship of the Georgia system. There are approximately 5,700 undergraduates currently enrolled, and the student/faculty ratio is 20:1 (gcsu.edu).

Mission

As Georgia's public liberal arts university, GC offers undergraduate programs of study to talented and motivated students in a residential college setting. Georgia College also provides, at multiple locations, graduate and professional studies that support the needs of the region and create pathways to individual success and personal fulfillment. Its academically engaging, student-centered programs often take learning beyond the traditional classroom and develop the intellectual, professional, and civic skills and dispositions that enable graduates to thrive in an information-intensive and diverse global society. Through its teaching, research, and service, Georgia College enriches the lives of students and their local and global communities (gcsu.edu).

Funding Sources for Georgia College

Proposal writing is an invaluable skill for both faculty and students to acquire during their time at Georgia College. Writing for grants is uniquely different from the style used for academic papers and like any skill, must be practiced to perfect. In addition to practical skill development, funding will make undergraduate research more feasible and improve graduate school admissions for our student through fellowships. There are a number of internal and external funding opportunities available for the faculty and students. To see a list of opportunities, look to Appendix A.

Undergraduate Research & Creative Endeavors (URACE) was created to build a culture of undergraduate research across disciplines. URACE is responsible for the annual Student Research Conference, liaison with the Council for Undergraduate Research (CUR) and funding undergraduate research activities, including the following opportunities:

URACE Implementation Grants, \$7,500: To support academic programs and departments that have made progress in integrating undergraduate research across the curriculum, but need additional support to deepen their activities.

URACE Planning Grants, \$5,000: To support academic programs and departments that want to integrate undergraduate research across the curriculum, but need to develop a plan of action.

URACE Student Travel Grant, \$500-\$1,000: To support undergraduates whose papers/projects have been accepted at national, regional, or State research conferences.

URACE Student Group Travel Grant, \$2,500: To support undergraduates whose papers/projects have been accepted at national, regional, or State research conferences. Preference may be given to paper presentations or academic or creative competitions over poster presentations or panel participation. Group consists of five (5) or more members presenting original research/creative endeavors and grant funding cannot exceed \$500 per group member and NO more than \$2,500 for any one group.

URACE Summer Research Grant, \$4,500: To support faculty-student research projects in which a) students pursue independent research scholarships with faculty mentorship or b) students provide substantial assistance to a faculty member's summer research. Student researchers will receive a \$2,000 stipend as will the faculty mentor. The remaining \$500 can be used for materials, equipment, travel or other research related expenses.

Center for Engaged Learning, Teaching and Scholarship (CELTS) – on behalf of the Office of Academic Affairs, CELTS conducts a semiannual competition for Faculty Research Grants. These grants are for full-time faculty to conduct scholarship, with priority given to working with student over individual scholarship. Funding may not be used for personnel costs.

Student Government Association (SGA) SGA collects student fees and distributes them through a number of funding mechanisms.

- SABC Special Funding Request - <https://orgsync.com/4505/forms/28993>
- Academic Travel Fund Committee (ATFC) - The Academic Travel Fund provides limited financial support (80% but only up to \$400) to students who are presenting scholarly research or a project presentation at an academic conference or workshop.

STEM Mini-Grants: In 2007, the Georgia Board of Regents launched the STEM Initiative in response to a dire need to increase the number of STEM and STEM education graduates. A STEM Mini-Grant Program offers grants to stimulate innovative projects that improve instruction and student learning in STEM disciplines and in programs that lead to initial teacher certification in these disciplines (stem.gcsu.edu).

Student Green Fee: The Georgia College Student Green Fee was initiated in 2010 to develop collaborative research between students, staff and faculty that will make our campus more sustainable and promote sustainable practices in our community.

Student Technology Fee Grants: Technology fees are charges to all students at Georgia College and are used to support and supplement normal levels of technology spending. The focus of student technology fees should be on technology related to either academic outcomes or instructional objectives and should be used for the primary benefit of students by:

- Directing expenses to assist students in meeting educational objectives of their academic programs;
- Leveraging with other funds to yield greater resources for students; (Technology fee revenues may be combined with another funding source(s) to make purchases that will enhance technological resources provided to students).

Showcase Opportunities for Georgia College Student Scholars

Appendix B includes a list of national and regional conferences for undergraduate research, as well as discipline specific conferences. In addition to presenting research at national and international research conferences, students have access to regional, statewide, and local conferences.

COPLAC Southeast Regional Undergraduate Research Conference: Students at COPLAC institutions have the opportunity to present the results of their undergraduate research at regional conferences where they can meet and discuss their work with peers and faculty members. Undergraduate research projects span the disciplines and afford students the prospect of intellectual engagement beyond the formal classroom setting.

Georgia Undergraduate Research Conference: This statewide conference is a colloquium designed to showcase the depth and breadth of creative scholarship occurring throughout the Southeast. This conference is for undergraduate researchers in all disciplines, and provides a venue for students to present their work to a wide audience and encourages all to become active in professional conferences.

Georgia College Student Research Conference: Student research in this context is interpreted as any scholarly or creative activity ranging from scientific experimentation, to service-learning, to literary criticism, to case-study design, to artistic expression, and so on. As such, students from all disciplines are invited to submit their work to be showcased at the GC Student Research Conference.

The Corinthian: The Journal of Student Research at Georgia College - This scholarly journal, published every spring, recognizes student achievement in research by providing publishing opportunities for undergraduate and graduate GC students from all disciplines.

The Peacock's Feet: The Peacock's Feet is a yearly journal published by Georgia College, and showcases the literary and artistic talents of people from Georgia College and beyond. Our 2013 publication was the magazine's 36th edition, and included some of the finest stories, poems, and art the school has to offer. The Peacock's Feet takes art and literary submissions every year up until December.

Women's Studies Student Symposium: This event aims to bring together young scholars from across disciplines at Georgia College and beyond for a day of intellectual and creative exchange centered on issues pertaining to Women and Gender. Research papers and creative projects such as fiction, poetry, posters and artwork relating to the Women and Gender from a national or global perspective, are welcome.





Appendices

RESEARCH FUNDING AND PRESENTATION

Appendix A: External Sources of Funding

Appendix B: List of Undergraduate and Discipline-Specific Conferences

Appendix C: Sample Poster

STUDENT RESEARCH ARTIFACTS

Appendix D: Laboratory Notebook Instructions

Appendix E: Action Research Activity Instructions

Appendix F: Research Lab Syllabus

Appendix G: Student Researcher Safety Guide

PROFESSIONAL DEVELOPMENT

Appendix H: Professional Skills Checklist

Appendix I: Graduate School Mentoring Checklist

Appendix J: Letter of Recommendation Form

Appendix K: Interview Guidelines

APPENDIX A: EXTERNAL SOURCES OF FUNDING

External Federal Funding

Air Force Office of Scientific Research

- Research Interests of the Air Force Office of Scientific Research

Bureau of Educational and Cultural Affairs

- Open Competition for Professional Fellows Program

Bureau of Justice Assistance

- BJA FY 13 Second Chance Act Adult Mentoring and Transitional Services for Successful Reentry Program
- FY 13 BJA Visiting Fellows Program

Department of Commerce

- Fiscal Year 2014 National Sea Grant College Program Dean John A. Knauss Marine Policy Fellowship

Department of Education

- Office of Special Education and Rehabilitative Service (OSERS): National Institute on Disability and Rehabilitation Research (NIDRR): Research Fellowships Program

Department of Energy

- Nuclear Energy University Programs - Fellowship and Scholarship
- Office of Science/Office of Workforce Development for Teachers and Scientists (WDTs) - Science Undergraduate Laboratory Internship (SULI) program

Department of Transportation

- Dwight D. Eisenhower Fellowship Program

Environmental Protection Agency

- EPA Greater Research Opportunities (GRO) Fellowships For Undergraduate Environmental Study

NASA Headquarters

- ROSES 2013: Fellowships for Early Career Researchers
- Experimental Program To Stimulate Competitive Research - EPSCOR
- Langley Aerospace Research Summer Scholars (LARSS) Program

National Institute of Food and Agriculture

- Agriculture and Food Research Initiative (AFRI): NIFA Fellowships Grant Program
- Agriculture and Food Research Initiative - Childhood Obesity Prevention

National Institutes of Health

- Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral MD/PhD and Other Dual Doctoral Degree Fellows (Parent F30)
- Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellows (Parent F31)
- AHRO Individual Awards for Postdoctoral Fellows (F32) National Research Service Awards
- Ruth L. Kirschstein National Research Service Awards (NRSA) for Individual Senior Fellows (Parent F33)
- Short-Term Research Education Program to Increase Diversity in Health-Related Research (R25)

National Institute of Justice

- NIJ Graduate Research Fellowship Program
- W.E.B Du bois Fellowship Program

National Institute of Standards and Technology

- Graduate Student Measurement Science and Engineering (GMSE) Fellowship Program
- Summer Undergraduate Research Fellowship (SURF) NIST Boulder Programs
- Summer Undergraduate Research Fellowship (SURF) NIST Gaithersburg Programs

National Science Foundation

- Research Experiences for Undergraduates (REU) – database of sites by discipline, keyword or location
- NSF/FDA SCHOLAR-IN-RESIDENCE AT FDA
- Documenting Endangered Languages
- Grant Opportunities for Academic Liaison with Industry
- Robert Noyce Teacher Scholarship Program
- Education and Special Programs
- Workforce Program in the Mathematical Sciences

Office of Naval Research – Educational Activities for Undergraduate and Graduate students

- Naval Research Enterprise Intern Program (NREIP): This 10-week intern program is designed to provide opportunities for undergraduate and graduate students to participate in research, under the guidance of an appropriate research mentor, at a participating naval laboratory.
- Science, Mathematics and Research for Transformation (SMART): The SMART Scholarship for Service Program has been established by DoD to support undergraduate and graduate students pursuing degrees in science, technology, engineering and mathematics disciplines.

US Agency for International Development

- Health System Strengthening Project
- Leadership Initiative for Good Governance in Africa (LIGGA) Annual Program Statement (APS)

U.S. Department of Agriculture

- Roman L. Hruska U.S. Meat Animal Research Center

State Department

- Young Turkey / Young America: A New Relationship for a New Age

Council on Undergraduate Research

- Student Research Opportunities

Discipline Specific Funding

- American Association of Medical Colleges: Summer undergraduate research programs in medicine
- American Economic Association: Summer Study, Research, and Presentation Opportunities
- American Physiological Society: The society provides fellowships and awards to encourage excellence in physiology education
- American Psychological Association: Summer Science Fellowship
- American Psychological Society: Student grant program
- American Society for Microbiology: Opportunities for UGR fellowships and student travel grants
- American Society for Microbiology: This organization offers fellowships for underrepresented students for summer research programs
- American Society of Plant Biologists: Summer Undergraduate Research Fellowship
- Annie's Homegrown Inc.: Sustainable Agriculture Scholarships
- Beta Beta Beta Foundation Research Scholarship Application: to support undergraduate research by awarding cash scholarships annually to students conducting student research
- Botanical Society of America: Opportunities for UGR research awards and student travel grants
- Emergency Nurses Association Foundation: Undergraduate Scholarships
- Fast Web Free Scholarship Search: Link to a list of national scholarships available to undergraduates
- Geological Society of America (GSA): Student travel grants
- Graduate Student Funding Opportunities
- Institute for International, Comparative, and Area Studies (IICAS): The institute offers research and travel grants primarily in the social sciences and humanities
- National Strength and Conditioning Foundation: Student research grants and scholarships
- National Wildlife Federation: Campus ecology programs
- Psi Chi, the National Honor Society in Psychology: Numerous awards & grants
- Society for Integrative and Comparative Biology: This scholarship provides assistance to students to take courses OR to carry on research on INVERTEBRATES at a marine, freshwater, or terrestrial field station

- Society of Physics Students: The SPS summer internship program offers 10-week positions for undergraduate physics students in science research, education and policy with various organizations in the Washington, DC area. All internships include paid housing, a competitive stipend, a commuting allowance, support to attend a national physics meeting in the year following the internship, and transportation to and from Washington, DC.

- Strauss Foundation: Research fields eligible for funding include health, education, law, the environment and more
- UNCF/Merck Science Initiative: Scholarships and fellowship at the undergraduate, graduate or postdoctoral levels in a life science, physical science or engineering program

UGR Student Opportunities at Federal Agencies

- Centers for Disease Control and Prevention, Career Training Fellowships
- Centers for Disease Control and Prevention, Public Health Training Fellowships
- Department of Energy, Science Undergraduate Laboratory Internships
- Environmental Protection Agency, Fellowships and Scholarships
- National Aeronautics and Space Administration, Undergraduate Student Research Program
- National Institutes of Health, Other Summer Programs @ The NIH
- National Institutes of Health, Summer Internship in Biomedical Research
- National Institutes of Health, Undergraduate Scholarship Program
- Smithsonian Institution Internships *please note this is a great opportunity for all disciplines

APPENDIX B:

LIST OF UNDERGRADUATE AND DISCIPLINE-SPECIFIC CONFERENCES

Undergraduate Research Conferences and Publications

Conference of Research Experiences for Undergraduates

Student Scholarship - This conference is for students who demonstrate the successes of the REU program in general either through broadening participation, encouraging undergraduates to pursue scientific and technical careers, or outstanding research accomplishments.

COPLAC Southeast Regional Undergraduate Research Conference

Conference - Students at COPLAC institutions have the opportunity to present the results of their undergraduate research at regional conferences where they can meet and discuss their work with peers and faculty members. Undergraduate research projects span the disciplines and afford students the prospect of intellectual engagement beyond the formal classroom setting.

CUR Posters on the Hill - It is increasingly important that the undergraduate research community works to ensure that those in the U.S. Congress who provide funding for research and education have a clear understanding of the programs they fund and why these programs are important.

CUR Undergraduate Journal Clearinghouse - This website lists journals of professional organizations, academic journals and institutional publications that accept submission from undergraduate researchers.

CUR Undergraduate Presentation Opportunity Clearinghouse

Clearinghouse - This site lists a variety of opportunities by discipline or region that URaCE student can present their work.

CUR Undergraduate Research Highlights - a database that consists of brief descriptions of recent (past six months) peer-reviewed research or scholarly publications in scholarly journals. These publications must be in print and must include one or more undergraduate co-authors. Highlights selected for inclusion are published in the CUR Quarterly either in print or included in CURQ on the Web.

Georgia Undergraduate Research Conference

a colloquium designed to showcase the depth and breadth of creative scholarship occurring throughout the southeast. This conference is for undergraduate researchers in all disciplines and provides a venue for students to present their work to a wide audience and encourages all to become active in professional conferences.

Metamorphosis - First published in 2009, Metamorphosis features scholarly and creative work at COPLAC member institutions across the United States and Canada. The journal is interdisciplinary by design, highlighting work in the natural sciences, social sciences, humanities, arts and professional programs.

National Conference on Undergraduate Research

The mission of the National Conference on Undergraduate Research (NCUR) is to promote undergraduate research scholarship and creative activity done in partnership with faculty or other mentors as a vital component of higher education.

Student Research Conference - Student Research in this context is interpreted as any scholarly or creative activity ranging from scientific experimentation, to service-learning, to literary criticism, to case-study design, to artistic expression, and so on. As such, students from all disciplines are invited to submit their work to be showcased at the GC Student Research Events.

The Corinthian - The Journal of Student Research at Georgia College - This scholarly journal, published every spring, recognizes student achievement in research by providing publishing opportunities for undergraduate and graduate GC students from all disciplines.

The Peacock's Feet - The Peacock's Feet is a yearly journal published by Georgia College, and showcases the literary and artistic talents of people from Georgia College and beyond. Our 2013 publication was the magazine's 36th edition, and includes some of the finest stories, poems, and art the school has to offer. The Peacock's Feet takes art and literary submissions every year up until December.

Women's Studies Student Symposium - This event aims to bring together young scholars from across disciplines at Georgia College and beyond for a day of intellectual and creative exchange centered on issues pertaining to Women and Gender. Research papers and creative projects such as fiction, poetry, posters and artwork relating to the Women and Gender from a national or global perspective, are welcome.

Discipline specific conferences:

ACS (American Chemical Society) National Conference

ACS Meetings organizes two of the most respected scientific meetings in the world. Our National Meetings offer scientific professionals a legitimate platform to present, publish, discuss and exhibit the most exciting research discoveries and technologies in chemistry and its related disciplines. Furthermore, our national meetings facilitate networking opportunities, career development and placement, and provide companies an opportunity to exhibit products and services to a targeted audience.

American Anthropological Association

Annual Conference - Anthropologists have long been engaged with diverse publics and with other social sciences. The influence of anthropological methods, concepts and research is growing, as witnessed by the fact that over half of us are now employed outside the academy. Our journals are experimenting with new formats to link research to contemporary concerns. We engage with rapidly changing media technologies to reach diverse audiences and explore different pathways to activism, collaboration, and scholarship. By locating the human at the center of its inquiry, anthropology through all of its fields provide crucial methodological and political insights for other disciplines.

American Economic Association (AEA) - Several economics associations invite undergraduates to present essays at their annual meetings and some award prizes for the best essay. Other organizations invite participation by undergraduates and provide summer and other opportunities for college students to pursue their interest in economics.

American Physical Society - Students are invited to various professional sessions including a chance to participate in an open discussion with a panel of working physicists representing diverse career paths—national lab research, science policy, and industry.

American Psychology Association – annually the APA holds a national conference that welcomes students.

American Public Health Association Annual National Student Meeting

Student Meeting - The purpose of this meeting is to bring students together to discuss innovative advancements in public health. Professionals along with student group leaders have been invited to speak about health issues, wellness and prevention, and professional development

Association Psychology Science - The Society for a Science of Clinical Psychology (SSCP) hosts an annual student poster session at the APS Annual Convention and the APS Student Caucus sponsors two research award competitions for students each year at the convention: the Student Research Award and the RISE Research Award.

Council for Exceptional Children - The Council for Exceptional Children (CEC) works to improve the educational success of children and youth with disabilities and/or gifts and talents.

Middle Georgia Diversity Conference - The Student Diversity Conference Committee is soliciting proposals from students and faculty for presentation sessions or poster sessions. Diversity issues may include topics such as race, ethnicity, gender, ESOL, sexual orientation, special needs, and socio-economic impacts on education. Conference is coordinated through Fort Valley State University and Georgia College, therefore the link is updated yearly.

National Undergraduate Literature Conference - The

NULC is your opportunity to present your best critical and creative work to an audience of like-minded students from campuses across the country. You'll also hear some of the most important writers in contemporary literature.

National Women's Studies Association - NWSA's annual conference regularly draws more than 1,500 attendees and is the only annual meeting in the US exclusively dedicated to showcasing the latest feminist scholarship.

NOBCChE - The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers: NOBCChE (pronounced No-be-shay) was incorporated in 1975. NOBCChE's Mission is to build an eminent cadre of people of color in science and technology

Southeast Conference for Undergraduate Women in Physics - SCUWP's goal is to help undergraduate women continue in physics by providing them with the opportunity to experience a professional conference, information about graduate school and professions in physics, and access to other women in physics of all ages with whom they can share experiences, advice, and ideas. Our program includes research talks by faculty, panel discussions about graduate school and careers in physics, presentations and discussions about women in physics, laboratory tours, student research talks, a student poster session, and several meals during which presenters and students interact with each other.

Southeastern Psychology Association - This is an annual meeting that includes many sessions and events for undergraduates. Student Research Paper Awards and the Psi Chi Undergraduate Research Program are just two of the specific events among the professional sessions available.

The Congress on Research in Dance Conferences - This conference invites a reflection on the impact that these developments are having on dancers and dances, and the ways in which practitioners and scholars understand dance practices in political, cultural, and historical terms. Pursuing these reflections, the Society of Dance History Scholars (SDHS) and Congress on Research in Dance (CORD) will hold a historic joint conference that also commemorates the 20th anniversary of the Ph.D. in Critical Dance Studies at the University of California, Riverside. Papers, panels, roundtables, and non-conventional forms of presentations (including performative papers, performances, and workshops) might examine how dance and choreographic attention to movement, flows, stops, pauses, turns, improvisation, and the like inform us

Undergraduate Literature & Creative Writing Conference - Undergraduates from Susquehanna and other universities around the country share their scholarly and creative work at this annual conference. Panels of three or four students are organized around various literary themes and cultural issues. After reading their work aloud, student panelists and the audience of aspiring writers, teachers, and scholars join in a discussion.



Title Goes Here

Author Name(s)

INTRODUCTION

In this section, the goal is to provide some background for your topic, and then to present your research idea and hypotheses in a straightforward and concise manner. (approx. 250 words). You should include the following:

Background research

Provide a context for your particular topic by briefly discussing previous research. It should be concise – about 3-4 sentences is ideal. You should cite sources from peer-reviewed journals (or other appropriate sources) while discussing relevant background research. Use APA 6th edition guidelines when citing sources.

It is not appropriate to use direct quotes from other sources in a poster. Space is at a premium, so think about simple summaries of background research rather than detailed descriptions (i.e. “Previous research has demonstrated...”).

Research question

Provide the main point of the research you are presenting. What is the purpose of your study? Try and keep this part simple and straightforward.

Hypotheses

Present the specific pattern of results you hope to find in your study. If you have multiple hypotheses, use bullet points or numbers to keep them distinct. Your poster may only be presenting part of a study, or only some of the study's hypotheses. Make sure that you avoid sidebars or extraneous and potentially confusing information.

METHOD

Participants/Subjects

If working with a human population, identify the number of participants. Typically, it is appropriate to identify how many males and females were participants, as well as the mean age of participants, and any other demographic information that is pertinent to the research question. If working with a non-human population, identify species and, if possible, the number of subjects of each gender.

Materials & Design

Identify the various conditions in your study, as well as the study's basic design. In addition, identify the various measures participants completed. If a measure is commonly used, you should provide the name of the measure. If the measure was created by you for the purposes of the study, briefly describe the measure and provide one or two sample items. It is also appropriate to provide indicators of reliability for the measures (i.e. Cronbach's alpha). You can also briefly describe any other relevant materials. It may be appropriate to include pictures of your stimuli.

Procedure

Briefly describe the procedure of the study. What did each condition participant experience during the study? Try to avoid unnecessary information that may not be central to the research question.

RESULTS

The purpose of this section is to briefly summarize your results. Identify which tests were performed on the data (t-tests? One-way ANOVA? Chi-Square?), and report all relevant statistics, including degrees of freedom, mean and standard deviation values for the various groups, p-values, and effect sizes. It would be appropriate to include one or two figures illustrating your results. Use APA style formatting for any figures. Your study's results section should reflect your hypotheses. If you specify that you are expecting a certain pattern in your hypotheses, test that pattern and report it in your results section. If presenting a study proposal, present expected patterns of findings rather than actual findings.

DISCUSSION

Sample Stimuli/Table/Figure Here

The discussion section should be approximately 200 words long, and should address the following:

Summary of results

Briefly summarize your results and address whether your hypotheses were supported.

Implications/Future research

Use your discussion section as an opportunity to briefly discuss the broader implications of your study, and future research. What can be learned from the study? What other research can this study generate? What is the “next step”?

REFERENCES

You can provide all references cited in the poster formatted using APA style. This is optional, if there is enough room on the poster.

AUTHOR CONTACT

Provide the e-mail information for the first author here.

APPENDIX C: SAMPLE ROSTER

APPENDIX D: LABORATORY NOTEBOOK INSTRUCTIONS

The Principle of Autonomous Replication

The goal of writing in a laboratory notebook is to create a record that anyone can use to perform the same procedures and obtain the same results—using only your laboratory notebook. This is known as “the principle of autonomous replication.”

Indications that you have fulfilled the requirements for the principle of autonomous replication include:

- Drawings, figures, and tables are encouraged. They must contain enough information that another scientist can interpret them without extensive reference to the text.
- Jargon, personal shorthand, and personal abbreviations should be kept to a minimum (unless you have a list of abbreviations in the notebook).
- The level of detail should be high enough that you can go back at any time and troubleshoot your procedures if, for some reason, a procedure does not work or yields questionable results.

Writing in a Laboratory Notebook

This is an outline of the minimum information required in a laboratory notebook. *Italicized* portions are suggestions. You may, however, want to arrange and organize your notebook in your own way. You must write in your lab notebook as you perform the procedure. Your memory is not reliable. Experiments without sufficient documentation must be discarded. The results cannot be disseminated!

- A. **Date.** Date each page of the notebook. It is imperative that you record everything in your notebook as you do it.
- B. **Aims and purpose.** This is a thumbnail sketch of the reason you are performing the protocols and experiments for the day. It should stand alone as your rationale. In other words, anyone should be able to open your notebook to any experiment and understand the “why” of the laboratory work performed. State (or restate) any hypothesis or expected results here. This acts as a framework from which you can build your analysis (below).
- C. **Materials.** All materials should be listed. This helps you, and anyone reading the notebook, repeat procedures with the same supplies.
- D. **Procedures and protocols.** This should be a comprehensive, accurate, and detailed step-by-step accounting of your procedure. Even if you are repeating a protocol without any changes, write out the exact steps.
- E. **Results.** The description of any results must be comprehensive and accurate. Primary data (numerical values, photographs, printouts, and all observations) should be listed first. Anything taped into the notebook must be dated and initialed. Primary data can later be sorted or organized into tables, graphs, charts, or diagrams. Any reader should be able to read the results of an experiment and know exactly what happened.
- F. **Analysis and interpretation.** An objective and balanced analysis must be documented in the laboratory notebook. Even if the results indicate a simple “yes” or “no” answer, it is important to state that in this section. Report any unexpected findings or problems during the course of the experiments. This can act as a rationale for additional experiments, for changing the protocol or materials, or for changing the path that your research has been following. Interpretation of data can sometimes be subjective, but your reasons for a particular interpretation must be stated here.
- G. **Future plans.** On the basis of your interpretation of the data, you should end each experiment or day of recording in your notebook with a short outline of your next step or steps. The rationale for this should be clear in your “analysis” section and does not necessarily have to be restated. This will lead you and the reader into the next procedure with a clear idea of the short- and long-term goals of your work.

The Big Picture

When scientific data are published, the source of the data (namely, the laboratory notebook) belongs to, and must be retained by, the laboratory for at least seven (7) years. The notebook should, therefore, be a document that can be read and understood for years to come even if, and especially when, science moves on from the point of discovery outlined in the notebook.

It is a good idea to number and initial each page as you complete your write-up.

APPENDIX E: ACTION RESEARCH

ACTIVITY INSTRUCTIONS

Action Research Project Evaluation:
120 Points towards final grade

1. Statement of the problem: 15 Points

(No more than two good sized paragraphs)

- Should include some or all of the prompts below
- Why is it an important issue to address?
- What is your knowledge or experiences with the issue?
- How has it been handled previously in your placement or with this student(s)?
- What interventions/procedures have been used before to address this issue/problem?
- Your writing should:
- Contain concise information
- Flow logically and not ramble
- Not be in the "first Person" (I, me, my, we, etc)

2. Review of the Literature: 40 Points

Include more than three (3) peer-reviewed articles as sources.

- a. You will research current literature to convey what is currently known about that what EBP can be used to increase or decrease the problem or need for your selected student(s). Of these EBP ideas the method or technique that you select to "test" will be the independent variable. (No less than one healthy paragraph, and no more than two healthy paragraphs) It is best to be concise, and avoid rambling and going into too much detail.

In the design of experiments, an independent variable's value or strength is controlled or selected by the experimenter (you) to determine its relationship to observed phenomenon (i.e., the dependent variable - behavior you are changing). You can also mention the controlled variables, which are also important to your experiment. They are the variables that are kept constant to prevent their influence on the effect of the independent variable (method) on the dependent variable – change in behavior. (Examples: Time of day, similarity of presentations, consistency of presenter, materials, group, etc.) Every experiment has controlling variable(s), and it is necessary to not change them, or the results of the experiment won't be valid.

- b. You will also include a review of the current literature relevant to the solution or activity (independent variable) that you are going to try or implement. How will this method affect the dependent variable, how much your subject will learn or change their behavior? (No less than one healthy paragraph, no more than two healthy paragraphs)

- c. Select your technique or method (dependent variable) based upon the pros and cons you have found in your research reading. Review which state-

ments from which sources agree that this is an effective technique – method – procedure. (One concise paragraph.)

Your problem statement should include a research question, research statement, or hypothesis.
Perhaps something like.....

The purpose of this study is to determine the effect of _____ on _____ for (describe your setting or students).

Also consider:

- Accurate citation of sources, no plagiarism
- Organized flow of information
- Thorough coverage of research

3. Methods: 30 Points

- Describe intervention
- Describe participants
- Describe setting
- Describe your procedures
- Define any terms that require clarification. For example: What does "acts out"
- Describe how you will assess your intervention. How will you collect data?
- mean?
- What variables are you holding consistent?
- What will you be doing?

4. Results: 20 Points

- Describe the data you collected
- Quantify your intervention--give your numbers
- Reference the charts, figures, or graphs in your text
- Use charts, figures, or graphs to illustrate your data
- Analyze your data
- Explain the data
- Explain what the numbers mean
- Were there increases or decreases?
- When or where did they occur?

5. Discussion: 15 Points

- What are your interpretations of the data?
- What does the data you collected mean?
- Was it successful? Why or why not?
- What are the implications of these findings?
- Could it have an impact with other students or classes?
- What are the next steps following this research?
- Implement in another environment?
- Implement with other classes or students?
- Observe long term?

APPENDIX F: RESEARCH LAB SYLLABUS

PSYC 3999, 4999, 4990: Advanced Research Topics

Instructor: Caitlin Powell
Office Hours: T, R 9:00-10:00 AM; M,W 2:30-3:30 or by appointment
Office: 1-11 A&S
E-mail: caitlin.powell@gcsu.edu
Phone: 445-1626
Prerequisites: Permission of the instructor

Weekly Lab Meeting: Once a week, we will get together as a lab. We'll use this opportunity to discuss current research, cover advanced research topics through a combination of lecture and discussion, and discuss how any current research projects are coming along.

Weekly Team Meeting: Once a week, you will meet with me in my office in smaller groups. These groups will develop and work on research projects throughout the semester. We will be working on both lab research (in my area of social comparison and social emotions), and other social psychology research that individuals will develop. If you are a 3999 or a non-capstone 4999, you will help out with senior projects, and work on one of the lab research projects we'll all be doing together. During the first half of the semester, time will be spent generating pilot data materials, developing new study procedures, and writing proposals for the IRB. During the second half of the semester, we will work to collect and analyze data.

Capstone: The senior capstone for research is now designated as a 4990. If you are taking a capstone with my lab, you must inform me if you plan to complete this capstone in the fall or spring semesters. A capstone project will involve several components:

- You will be primarily in charge of developing an IRB proposal based on an original idea.
- You and your labmates will collect data.
- You will analyze the data and present it in one of two forms: either as a poster during the semester poster presentations, or written up as an APA style paper. In addition, you will present your findings in an oral capstone presentation at the end of your designated semester.

Students that are taking research with me in the fall who plan to finish their capstone in the spring will be designated as 4999 for fall and 4990 for spring. During the fall semester, you will work with me to develop your capstone project.

Running sessions: During the course of the semester, will be asked to commit to three hours a week to run participants. I will try and make this as equitable as possible, and will make sure that it is a time commitment that works with your school and extracurricular schedules. If you want to run participants for more than three hours a week (especially if it is your own project!), that is fine.

Journal Readings: One of the goals of this class is to explore the variety of Social Psychology research that is currently being published in the field. To that end, you'll be reading one journal article from a current social psychology publication each week, talk about it in your weekly journal entry, and present a brief summary of it to the rest of the lab. There is a list of Social Psychology journals below that you can choose from. Most of these journals are published monthly, so you should have no difficulty finding new material each week.

I expect you to draw from the most recently available edition of each journal in question – so if the most current issue of JPSP is from January 2011, I expect you will look at that issue for an article that interests you. Most of the journals listed below have articles that are accessible online in PDF form. Some of the journals have a 1-year or 6-month delay – so the most currently accessible issue in September 2012 may be from December 2011 or August 2012. I don't mind, as long as you use the most current issue of that periodical that you can access. Finally, three of the journals are available only in hard copy form at GC&SU's library.

I suggest you look up the most recently available issue from a journal, and read all the titles/abstracts of that issue. Find one that covers a topic that looks like it might be interesting to you, and see what you think about it. Please read the ENTIRE article – not just the abstract.

I anticipate that some of the articles might be tough for you to work through. If you are having extensive problems, you can always chat about the article with me, before lab, or you can switch to another less hairy study.

Here are the journals you can use:

- Journal of Personality and Social Psychology (online)
- Personality and Social Psychology Bulletin (online)
- Journal of Experimental Social Psychology (GC&SU library)
- Journal of Research in Personality (GC&SU library)
- Social Psychology Quarterly (online, but 1 year delay)
- Journal of Applied Social Psychology (GC&SU library)*
- Basic and Applied Social Psychology (online, but 1 year delay)*
- Journal of Applied Psychology (online)*
- Cognition and Emotion (online)
- British Journal of Social Psychology (online, but 6 month delay)
- European Journal of Social Psychology (online, but 6 month delay)
- Social Neuroscience (online, but 1 year delay)

*If you are interested in I/O Psychology, these journals might be useful for you to explore.

Log entries: Each week, you need to write a log entry that discusses your weekly reading answering the questions below, as well as the progress of the research projects that you are working on. You can use this as an opportunity to expand on lab meetings, to discuss issues you may have experienced while running subjects or developing materials, etc. I anticipate these log entries to be about 1 page long. Log entries are due at each weekly lab meeting, and can be submitted in "hard copy" form at the meeting. NOTE: If a Friday lab meeting is cancelled or you must be absent, you are still expected to submit a log entry for the week, either through e-mail or placed in the box outside of my office.

Questions to answer about weekly reading in log entry:

- What is the main hypothesis studied in the paper?
- What is the basic procedure of the studies presented in the paper?
- Can you briefly summarize the main findings of the study?
- According to the Discussion section, what were the overall implications of the study?
- What is your general opinion on the paper? Did you have difficulty understanding parts of it?
- What do you think about the author's conclusions, how they ran their study, and how they described their reasons for doing the study?

Additional Readings: As we go through the semester, I will assign additional readings that cover topics in advanced research methods techniques, research ethics, and social psychology that you will be asked to read as a class. I will assign these readings 1 week before they are due, and will post them in PDF form on Georgia View. Be prepared to discuss them in class. You will not have an additional reading to do every single week, and during the weeks when I have not assigned a reading, you are still expected to do your independent journal reading for class.

Grades: 3999, 4999: Each week, I'll give you 1 attendance point each for the Friday meeting and the small group meeting, and 1 point for writing your log entry. If you miss more than 6 points in whatever combination, you will get a grade of "U" for the course. 4990: You will be graded based on completion of your senior project.

Running participants: I expect you to commit to three hours a week to run participants in experiments.

Letters of recommendation: A letter of recommendation is not automatically guaranteed, it is earned. If you would like a letter of recommendation, you must let me know two weeks in advance of the letter being due. Please remember that I will be asked to talk about your professionalism, leadership, maturity, and responsibility in a candid manner when writing said letters, so be sure that your lab behavior models the report you would like me to give.

APPENDIX G: STUDENT RESEARCHER SAFETY GUIDE

Lab Manual PSYC 3999, 4999, 4990
Participant-focused Research

Our first responsibility as researchers is to our participants. This includes respecting our participants' rights and agency, minimizing any harm they experience, and maintaining their trust. One way we respect our participants is by respecting their rights to be informed, decline participation in the experiment, decline use of their data, and to have their questions answered.

NIH Certification: All people enrolled in lab must complete the NIH certification for human participants in order to participate in lab activities.

Informed Consent: This part of the process is very important for research purposes. During the process of informed consent, participants read through a document that describes the purpose of the study, the length of the study, any compensation they may be given, and their right to withdraw from the study without penalty. The informed consent form also provides contact information for the primary investigator, as well as for the IRB.

Filling Out the Form: Participants must be given as much time as needed to read through the document, must be given the opportunity to ask questions about the document. It is also important that they sign and date the document to indicate that they read the information provided, and by signing, agree to participate in the research experiment.

Additional Copy: Participants must receive a blank copy of the informed consent form once they have finished the experiment. This ensures that should they have any issue with the experiment, that they will have access to a copy of the form they originally filled out, as well as the contact information of both the experimenter and the IRB. Participants with potential complaints could then go straight to the IRB with their issues, which provides transparency and gives participants personal agency.

Informed Consent Storage: For confidentiality purposes, we store the informed consent form (and other forms with identifying information, such as permission to use data form) separately from any other type of data collected, whether it be questionnaires, responses on a computer, or other forms of data. In addition, we do not collect identifying information such as names or social security numbers on our questionnaires. This means that participants' names cannot be linked to their responses, which ensures confidentiality. All forms with identifying information are typically placed in their own designated folder, separate from other data. These forms should also be stored in a secure room (i.e. my office or one of the lab rooms).

Debriefing: Whenever studies use deception, we must debrief the participants in order to fully inform them about the nature of the experiment. This is another very important portion of the experiment. During the debriefing session, participants are given information about the true research question, as well as why the deception was necessary. Finally, they complete a permission to use data form.

Filling Out the Form: Participants must be given as much time as needed to read through the document, must be given the opportunity to ask questions about the document. It is also important that they sign and date the document, to indicate that they read the information provided, and by signing, agree to let us use their data.

Permission to Use Data Storage: For confidentiality purposes, we store the permission to use data form with the informed consent form, as both include identifying information.

FAQ:

- Q:** Help! There aren't any copies of the informed consent form/permission to use data form!
- A:** There are usually blank copies of both forms in the "copies" folder of any experiment. You can take this form to the Psychology Department office (1-03) and request that copies be made. If the Department office is closed and I am not in my office either, you must cancel the session and give the participant credit for showing up.
- Q:** I forgot to give them an extra copy of the informed consent form at the end of the study.
- A:** Let me know, and I will e-mail them a copy.
- Q:** My participant did not sign the informed consent form because he/she did not wish to participate.
- A:** If the person in question has read the form and decides not to sign it, he or she has not participated in the study. The person is free to leave. Make sure the person understands that as they chose not to participate, they will not be receiving credit.

Q: My participant changed his/her mind halfway through the study, and has decided to withdraw from the study prematurely.
A: The participant can leave the study at any time without being penalized. Thank them for their time, and tell them they are free to leave. As this situation can be different from case to case, I would prefer that you e-mail me informing me of what has happened, and I will contact the participant and handle their debriefing and credit hours myself.

Q: My participant checked that they did not want their data used in the experiment.
A: You must make sure that you destroy their data. If I am not in my office, walk the participant to the Psychology Department Office (A&S 1-03) and hand over any data (questionnaires) to Brenda, and ask her to shred them for you so that the participant sees that the data has been destroyed. If it is a computer program, go through the steps of deleting their file from the research experiment in front of them. Only shred or delete the data. Do not destroy the informed consent form or permission to use data form. Please inform me if any participant declines the use of their data.

Other Participant Respect Considerations: We respect our participants by showing up on time to run sessions, by completing sessions by the time they are expected to end, by addressing them in a polite manner, by being professional in demeanor, and by addressing any questions they have. We have a responsibility to be good stewards of research, and the best way we can do that is by remembering the responsibility we have to our participants.

FAQ:

Q: I cannot be there to run a session.
A: There are many ways you can address this, depending on how immediate your conflict is. If you know enough in advance, you can arrange for a labmate to take over your session. If it is last-minute, contact me so that I can let the participant know that the session has been cancelled, or run the session myself. Use common sense, be responsible, and plan ahead. If you miss a session for any reason, even if you have made arrangements to have the session covered by a labmate, please e-mail me to let me know.

Q: My participant appears to be angry/dissatisfied with their research experience.
A: Attempt to address any questions or concerns they have in a respectful manner, and e-mail me to let me know what has happened.

Participant and Researcher Safety: Sessions are always run during normal business hours (9-5), which means that faculty and staff will be in the building. Your first step when dealing with a potential safety issue is to see whether I am in my office. The second step is to contact the Psychology department main office and see if Mrs. Deal or Dr. Gillis can provide assistance. If none of us are immediately available in an emergency situation, the next person to contact is Terri Pope in the Dean's office. You can also contact campus police.

Phone numbers:

My phone: 478-445-1626
Mrs. Deal's phone: 478-445-4574
Mrs. Pope's phone: 478-445-4441
Campus police: 478-445-4400

Here are a few additional things you might need to think about:

- If a session has to stop because of an issue outside of your control (i.e. a fire drill, bad weather, an unexpected health incident), your first priority is the safety of both the participant and yourself. Once the issue has been resolved, if you can resume the session and finish in a timely manner, ask the participant if he or she would be willing to do so. In these cases, it is standard that the participant will receive credit regardless of whether the session has been completed. Furthermore, if it was not possible to fully debrief the participant or have him or her sign a permission to use data form, let me know so that I can make sure these steps take place.
- If at any time you feel unsafe due to a participant's behavior during a study, remember that your safety is important too. You have the right to stop a session early, tell the participant that that he or she will receive credit for participation, and ask him or her to leave.
- If a participant's behavior makes you uncomfortable before the session begins, you have the right to deny them participation and cancel the session before it starts. Likewise, if a participant appears to be under the influence, please cancel the session. Have them contact me if they have questions regarding credit.

Lab Duties and Responsibilities

Scheduling: You are required to designate 3 hours a week to run participants. Your schedule should be fairly consistent from week to week. If you have a conflict that emerges part way through the semester that impacts your running time, let me know and I will alter your hours.

Sometimes, it may be necessary to switch running times with a lab-mate for a session. Please let me know if you've switched with someone else for the week. Try to keep switching down to a minimum, and make sure that arrangements are made as far in advance as possible.

Running sessions: When you run an in-person session, you are responsible for a few different components of the session:

- 1) Checking on sona systems: Make sure that you check sona systems to see whether you have a participant, and what the participant's name is. Participants can sign up for sessions up until 2 hours before their session begins, so I would strongly recommend coming to the lab at the designated session time to double-check whether your session has filled.
- 2) Set-up: Make sure you're in the room 10 minutes before a session begins in order to set up the materials properly, determine which condition the participant is in and prepare accordingly, and assess whether there are enough copies of all research materials (two informed consent forms for each participant, permission to use data forms, questionnaire packets) for your session. That way, any technical difficulties/shortages of materials can be dealt with in plenty of time.
- 3) Keeping an eye out for participants: Check when you arrive and before the session begins to see if participants are waiting. If there are a group of people waiting in the hall, you can call out the participant's name to see if he or she is one of the people waiting. If you see a participant waiting before the session is due to begin, you can inform them that they are waiting in the appropriate place, and that you will be ready to start the session soon. If the participant has gotten into the 1-63 rooms before the session, tell them to wait in the outside hall until you are ready.
- 4) Running the session: The key to running a good experimental session is consistency. Make sure you go through all of the steps listed on the script, and that you've covered the most important points (informed consent form, debriefing, permission to use data form).
- 5) Data coding: Once a session is done, it is very important to check off the condition from the designated list so that the next session runs with the appropriate condition and does not have a repeat. Likewise, it is also important to code the data with the appropriate number and letter designations so that the data can be matched to the appropriate condition number.
- 6) Data storage: Make sure that informed consent and permission to use data forms are stored in a separate folder from the data.
- 7) Giving the participant credit: As soon as the session is complete, you are responsible for updating the participant credit. This is best dealt with sooner rather than later, and I would very much like for Dr. Bendersky to not have to send any e-mail reminders to me about updating credit.
- 8) No-Show participant: If the participant is a no-show, designate it in sona and e-mail me to let me know what has happened.
- 9) Check copies of all research materials for the next session: Make sure that the next session has enough copies. If it does not, e-mail me.
- 10) Data entry: if there is any data to be entered and you have a no-show or remaining time in your session, please enter data during that time and put the entered data in the designated folder.

Timeliness: Give participants a 5 minute "window" to show up for an experiment. I would prefer we run sessions rather than turn away participants, but it is important to both reinforce promptness as well as finish sessions in the time indicated on sona. If a participant shows up too late to be able to complete the session on time, you cannot run the session. If a session is run with more than one participant, once you have waited for five minutes and have started giving directions, the session is officially closed to participants and any latecomers cannot join the session. Tell any late participants that you've turned away to e-mail me, and I will handle their credit hours/rescheduling.

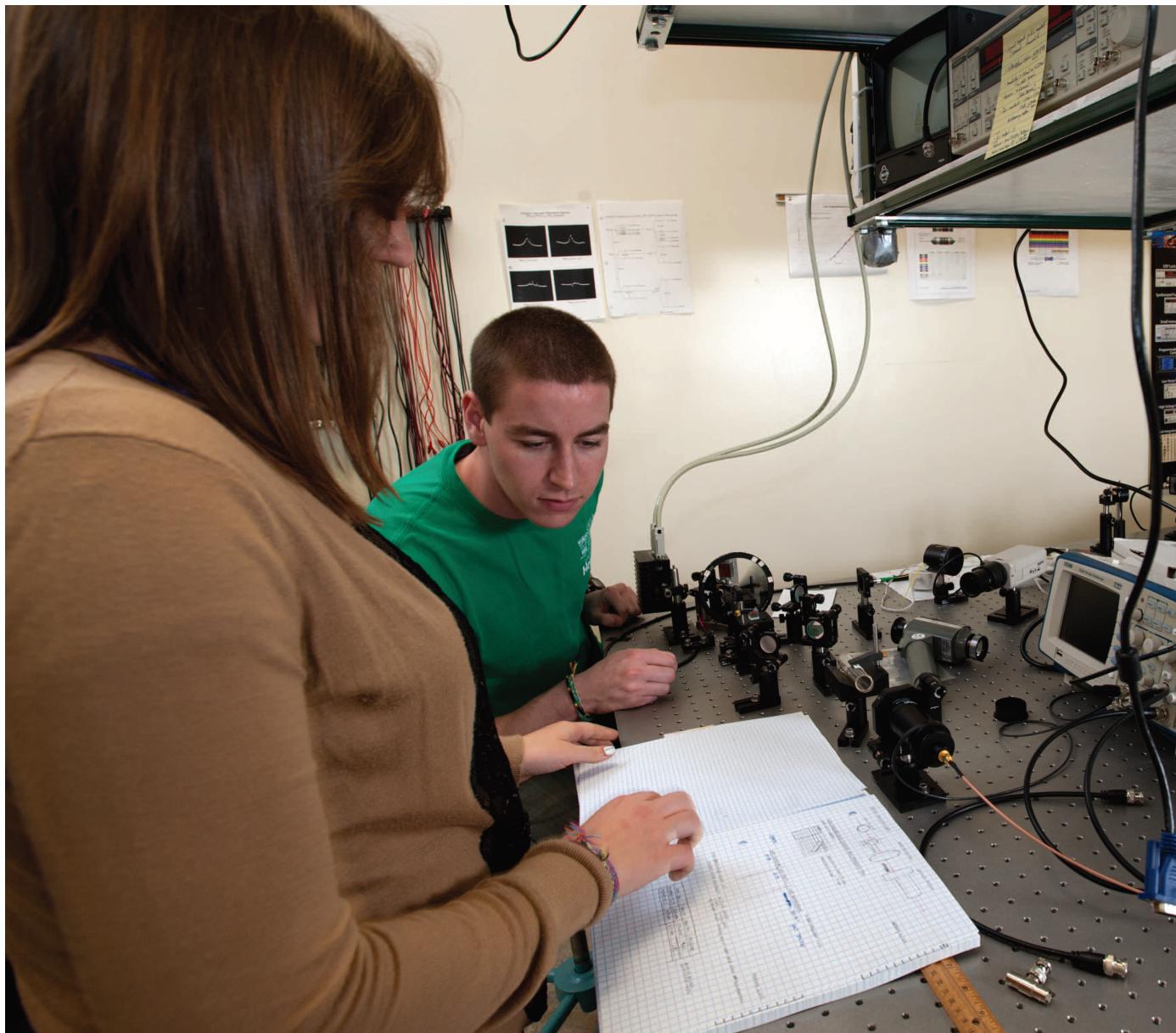
Appearance: I expect that you will be dressed appropriately for your designated sessions. I do not expect that you will be wearing professional outfits for your sessions, but keep in mind that you are representing this lab. To that end, you should not wear overly revealing clothing, and should not use excessive perfume or cologne. Use common sense, and think about whether your appearance would distract participants unnecessarily. When you represent our lab in research talks or presentations, I expect your appearance to be business-casual and professional.

Computer sessions: Some sessions have computer-based components to them (i.e. medialab). There are extra considerations with computer-based research.

- 1) The computer may require additional time to start and set up. Make sure you have enough time to get the computer program running before the session begins.
- 2) Make sure that you enter in the proper condition as designated on the conditions sheet
- 3) When entering the participant number, make sure that it matches the conditions sheet
- 4) Check off the condition from the conditions sheet once you're done
- 5) Make sure that any coding of paper data matches the information entered into the computer.
- 6) If any technical difficulties happen during the session, you may have to restart the computer or move to another computer and begin the session again. In that case, make sure that the new session number is marked on the conditions sheet.
- 7) If you are unable to finish the session due to technical difficulties, make sure the participant is properly debriefed, and we will use whatever data has been collected.

Online sessions: Likewise, with online sessions, there are certain things to keep track of.

- 1) Make sure participants are given credit.
- 2) If the online sessions have conditions, make sure the conditions are posted in the appropriate order and check off the condition from the conditions sheet.



APPENDIX H: PROFESSIONAL SKILLS CHECKLIST

Common Rating Items for Recommendation Letters
Department of Psychological Science

The items below reflect common student traits faculty members are requested to assess when completing graduate recommendations. This form is not an indication that the faculty member will write you a letter of recommendation. Please officially request letters of recommendation in person.

Instructions: Please rate yourself on the items based on how you think the faculty member would rate you. Do not base your ratings on how you see yourself.

| Category | Upper 5% | Upper 10% | Upper 25% | Upper 50% | Lower 50% | No Basis to Judge |
|---|----------|-----------|-----------|-----------|-----------|-------------------|
| Intellectual Ability | | | | | | |
| Oral Expression | | | | | | |
| Written Expression | | | | | | |
| Motivation/Initiative | | | | | | |
| Cooperation | | | | | | |
| Emotional Maturity | | | | | | |
| Professional Appearance | | | | | | |
| Organization | | | | | | |
| Dependability | | | | | | |
| Creativity | | | | | | |
| Open-Mindedness | | | | | | |
| Flexibility | | | | | | |
| Ability to Reason | | | | | | |
| Ability to Work Independently | | | | | | |
| Attendance/Promptness | | | | | | |
| Meets assignment deadlines with quality work | | | | | | |
| Maturity | | | | | | |
| Accepts constructive feedback about performance | | | | | | |
| Positive Attitude | | | | | | |
| Honesty | | | | | | |
| Leadership | | | | | | |
| Mathematical/Logical Thought | | | | | | |
| Time Management | | | | | | |
| Potential as a Teacher | | | | | | |
| Potential as a Researcher | | | | | | |
| Overall Potential | | | | | | |

APPENDIX I: GRADUATE SCHOOL MENTORING CHECKLIST

Field of Study _____

Type of Mentorship: Traditional: Group (Name of Group) _____

Career Planning: _____

Graduate School Counseling:

- Appropriateness
- Quality of Program
- Scholarships
- Employment Opportunities
- Cultural identity of the city/ town
- Crime rate
- Access to things of Importance...Churches, Schools, Theatres, and Other Colleges
- Region
- Proximity to family
- Urban/ Rural Setting
- Transportation Access/ Ease

Academics: GPA

Schedule (Term, Year) _____

Suggested List of Classes:

Improvements?

Résumé (Attach a copy if applicable)

Notes?

Testing:

Test: _____

Date of Dry Run _____ : Score _____

Date of Dry Run 2 _____ : Score _____

Date of Dry Run 3 _____ : Score _____

Suggestions for Course of Study:

Personalized Study Plan:

Study Group:

APPENDIX J: LETTER OF RECOMMENDATION FORM

LETTER OF RECOMMENDATION FORM

Recommendation for graduate school or for a job position from psychological science faculty. Return this form to the department secretary, Ms. Deal (1-03 Arts & Sciences). Note: Speak with your individual letter writers about envelope and stamp needs.

Section 1 (please type)

Name:

| | | |
|--------------------------------|---------------------|----------------------------------|
| Permanent Phone Number: | Todays Date: | Expected Graduation Date: |
|--------------------------------|---------------------|----------------------------------|

GC Email:

Personal Email:

Faculty Advisor:

| | |
|------------------------------|------------------------------|
| 1st Major: | 2nd Major: |
| 1st Minor: | 2nd Minor: |

| Name of Letter Writer | Courses you have taken with them | Semester taken | Grade | How long have they known you |
|------------------------------|---|-----------------------|--------------|-------------------------------------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |

Section 2

Check one:

- I waive my right to review a copy of this letter at any time in the future.
 I do not waive my right to review a copy of this letter at any time in the future.

- I asked all of my designated letter writers to write me a letter of recommendation.
 All my designated letter writers have agreed to write me a letter of recommendation.
 I understand that a letter writer may ask me for additional information.
 I am submitting this form 3 weeks prior to my first letter of recommendation deadline.
 I give my permission to the designated letter writers listed on this form to write a letter of recommendation to the schools to which I am applying. Each letter writer has my permission to include data from my academic record, including but not limited to class grades and GPA, in this letter.

I have read and understand all the statements above. I also understand that it is in my best interest to have a faculty mentor assist me in the application process.

Student Signature

Date

Adapted from Georgia College Department of Psychological Science

Section 3 - Please type. For each school you are applying to, type the following information:

Institution Name and full mailing address (even if letter is to be emailed)

| | |
|-------------------|-----------------|
| Institution Name: | Mailing Address |
|-------------------|-----------------|

| | |
|-------------------|-----------------|
| Institution Name: | Mailing Address |
|-------------------|-----------------|

| | |
|-------------------|-----------------|
| Institution Name: | Mailing Address |
|-------------------|-----------------|

Program of Work contact person(s) with their title:

Exact name of program or job position:

| | | | |
|---------------------------------------|-------------|-------------|-------------|
| Degree, if applicable (circle) | PhD | MS | EdS |
| | PsyD | Med. | JD |
| | EdD | MSW | MD |
| | MS | MFT | MDiv |

Application Deadline: _____

Additional Forms Required? Yes No

Letter Instructions (snail mail, email, online)

Adapted from Georgia College Department of Psychological Science

APPENDIX K: INTERVIEW GUIDELINES

Campus Interview Guide





Other Useful Accessories

- Comfortable shoes
- Consider a couple extra copies of your resume
- Copy of interview schedule and map of school/town
- Hidden sheet about program and faculty (and their research)
- Hidden sheet of talking points about your research/classroom/internship experiences
- Portfolio/bag with pen and blank sheets of paper for notes

STANDARD INTERVIEW QUESTIONS PREPARED

What made you apply to this program?

They are trying to assess fit

- Answer truthfully
- Highlight your strengths and the qualities that make you a desirable candidate

What are some of your strengths and weaknesses?

They want to know that you are growth-minded and have taken time to self-reflect

- Don't give a BS answer for your weakness
- Outline your plan to work on your weakness and the steps you have taken so far to address it
- Avoid overly personal issues like illness, hardship, or substance abuse

What are your hobbies?

They want to make sure that you aren't some workaholic who will alienate everyone and burn out

- Avoid anything sketchy or too fringe here

Can you tell me about your research?

- Be prepared to defend/explain the methodology and statistical procedures that you have used
- Brush up on the work you have done so far and how it relates to the work being done at that school

Stress Questions:

Example: How many quarters you would have to stack to be as high as the Empire State building?

- Designed to see how you respond under pressure
- Stay cool, smile to yourself, and be glad you've already prepared for it

Other common questions:

- Who has been your greatest mentor? Who has deeply impacted your life/professional goals?
- Why did you apply to this school?
- Why counseling/ school counseling/ experimental psychology?
- Why do you want to be a _____? (Hint: don't just say "I want to help people.")

Come up with various insightful questions to pose to different people, and take notes on their responses

- Questions for program coordinator/ professors
- Questions for current graduate students

GEORGIA COLLEGE EFFECTIVE MENTORING TEACHING CIRCLE

The Mentoring Teaching Circle at Georgia College promotes mentoring as a pedagogy of engagement for creating graduates equipped to successfully solve 21st Century global challenges. The circle is devoted to disseminating best practices that provide faculty with tools for effectively mentoring undergraduate research students.

Larry Bacnik, Ph.D. is full time instructor at Georgia College in the John H. Lounsbury College of Education where he mentors and trains undergraduate teacher candidates in becoming special educator instructors. Bacnik specializes in mentoring undergraduate students in evidence-based research strategies for tiered learning in P-12 classrooms. Email: bacniklarry@gmail.com

Jennifer Hammack, JD is associate professor of Criminal Justice and Political Science at Georgia College. She joined the faculty of the Department of Government and Sociology in 2001 and became the University's Pre-Law advisor in 2011. Professor Hammack is founding faculty coordinator of Georgia College's Pre-Law Society and Mock Trial teams. Her Legal Writing students have assisted with research on cases for multiple Public Defenders' offices in the state. Professor Hammack holds a Master's degree in Criminal Justice as well as a Juris Doctorate from the University of Alabama. Email: jennifer.hammack@gcsu.edu

Robin S. Lewis, MPA,CRA is director of the Office of Grants and Sponsored Projects at Georgia College. She has 18 years of progressive experience in all areas of sponsored awards and is recognized by the Society of Research Administrators as a Certified Research Administrator (CRA) with a special interest in training students at all levels in grantsmanship. As a founding member of the Undergraduate Research Initiative at Georgia College, Ms. Lewis provides research, expertise, resources and training to prepare undergraduates for graduate school and the global workplace. Email: robin.lewis@gcsu.edu

Rebecca C. McMullen, Ph.D. is associate professor of Education in the John H. Lounsbury College of Education where she mentors and trains teacher candidates planning to become special educators. Dr. McMullen specializes in training undergraduates to conduct research on evidence-based language strategies for students with language and literacy impairments in P-12 classrooms. As a member of the National Council for Exceptional Children (CEC), she serves on Georgia's CEC Executive Board and is known as Georgia's Student CEC Advisor for Colleges and Universities. Email: rebecca.mcmullen@gcsu.edu

Caitlin Powell, Ph.D. is assistant professor of psychology at St Mary's College of California. Prior to this, Dr. Powell was assistant professor of psychology at Georgia College. The undergraduates she has mentored have presented their award-winning research at local, regional, and national conferences. Dr. Powell has published research regarding effective teaching practices in social psychology, one of her teaching areas. Her Bachelor of Science degree was earned from Drake University and she obtained her Ph.D. in Experimental Psychology from University of Kentucky. Email: cap9@stmarys-ca.edu

Rosalie Richards, Ph.D. is the first Kaolin-Endowed Chair in Science and Georgia Eminent Scholar at Georgia College. As kaolin chair, she is founding director of the Science Education Center. Dr. Richards is professor of chemistry and serves as lead for the Undergraduate Research Initiative. Together, she and her undergraduate research students explore metalloporphyrin synthesis, soil quality analysis, and issues in chemical education. Prior to Georgia College, Dr. Richards was the MIE postdoctoral scholar-teacher and assistant professor of chemistry at Spelman College. She holds a Bachelor of Science degree in chemistry with physics from the University of the Virgin Islands and a Ph.D. in chemistry from the University of Southern California. Email: rosalie.richards@gcsu.edu

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