

Rhetoric and Affect in Undergraduate Research: A Diary Study

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Abstract: In this article, we examine undergraduate research as a site of rhetorical development by listening to undergraduate researchers narrate and reflect upon their work as it unfolds. We draw from diary entries and follow-up interviews with eighteen undergraduate researchers at two different institutions, analyzing the rhetorical and affective elements of undergraduate research. Connecting undergraduate research with the concept of meaningful writing, we conclude by offering recommendations for teachers, mentors, and administrators.

We start with undergraduate student researcher, Molly, reflecting on her experience during an intensive summer research program. We replicate her reflections on her archival, Spanish to English translation project as they appeared in her diary entry:

To end [this diary entry] on an exciting note, I'll recap the story of how a financial document from the Philippines written in Spanish in the late nineteenth century wound up in the hands of a small Christian university in [State]. According to Professor Anonymous [her research mentor and Spanish professor], some rich guy in Texas bought an old desk from the Philippines. Finding a secret compartment within the desk, he came upon the manuscript, which he returned to Silliman University in the Philippines. Lacking Spanish speakers, they subsequently passed the document on to us to have it translated. After spending hours poring over this manuscript this summer, I hope to come away with a heightened understanding of the translation process and the many different approaches one can take towards [sic] it. Feeling like a part of a real-life *National Treasure* movie certainly helps with motivation.¹

Molly touches on hallmarks of any kind of research, especially undergraduate research: serendipitous events that lead to ever-evolving research questions, the palpable excitement that comes from new findings, and the hope that from the mess of research coherent results will arise.

We begin with her writing because of our commitment to centering student voices when we study literacy and learning in higher education. Undergraduate research has been recognized as a high-impact educational practice for over twenty years, and an excellent body of scholarship demonstrates the positive outcomes associated with participation in undergraduate research and outlines best practices for mentoring and program structure. Among the learning gains regularly associated with undergraduate research are written communication, critical thinking, and information literacy skills—all outcomes associated with rhetorical education (Bhattacharyya et al., 2018; Collins et al., 2017; Kilgo et al., 2015; Kistner et al., 2021). Yet what is missing from this work are the voices and lived experiences of undergraduates, the practices and processes and events that produced a

Across the Disciplines

A Journal of Language, Learning and Academic Writing
10.37514/ATD-J.2022.19.3-4.04

wac.colostate.edu/atd

ISSN 554-8244

Across the Disciplines is an open-access, peer-reviewed scholarly journal published on the WAC Clearinghouse and supported by [Colorado State University](http://colorado.edu) and [Georgia Southern University](http://georgia-southern.edu). Articles are published under a [Creative Commons BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/) (Attribution-NonCommercial-NoDerivs) ISSN 1554-8244. Copyright © 1997-2022 The WAC Clearinghouse and/or the site's authors, developers, and contributors. Some material is used with permission.

particular outcome. Over 75% of the scholarship on undergraduate research addresses outcomes for students (Haeger et al., 2020, pp. 66–7), but students too often serve only as vehicles for validating practices or pedagogies; they too rarely are partners in building theories of undergraduate research.

In this article, we examine undergraduate research as a site of rhetorical development not by assessing outcomes at the end but by lingering in the middle, by listening to undergraduate researchers narrate and reflect upon their work as it unfolds: What do students think and feel as they undertake the quantitatively (and perhaps qualitatively) largest projects of their academic careers? How do they negotiate rhetorical and intellectual challenges in their work? How and why do they stay engaged through demanding semesters and intense summers? We believe that listening and lingering reveals challenges and even failures left unreported on surveys, reveals elements of rhetorical development reported simply and vaguely as growth in written communication or critical thinking, and reveals the rarely addressed affective experience of undergraduate research.

Undergraduate research, which the Council on Undergraduate Research (2022) defined as “a mentored investigation or creative inquiry conducted by undergraduates that seeks to make a scholarly or artistic contribution to knowledge,” has developed into a robust, meaningful element of the undergraduate experience.² Its status as a high-impact practice has been affirmed by research that reveals positive outcomes for participating students. Students with access to well-structured, equitable programs have higher retention and graduation rates, develop a stronger sense of belonging in college, demonstrate higher levels of academic engagement, and benefit from mentoring relationships with faculty (Little, 2020; Lopatto, 2006). These benefits are disproportionately strong for students traditionally underrepresented in higher education (Finley & McNair, 2013), and institutions across the United States are developing innovative internal programs to bolster undergraduate research participation among these students. Compared with other high-impact educational practices, undergraduate research is positively associated with educational outcomes related to the liberal arts—critical thinking, positive attitudes toward literacy, need for cognition, and intercultural effectiveness—and serves as a powerful programmatic tool for student learning (Kilgo et al., 2015, pp. 517–20). Students who complete undergraduate research report having grown as critical thinkers, researchers, writers, and speakers.

Understanding the importance of undergraduate research, writing studies scholars have created rich opportunities for undergraduates to hone and showcase their work. Students may publish in journals such as *Young Scholars in Writing* and *Queen City Writers*; present at the Conference on College Composition and Communication; or attend the Naylor Workshop on Undergraduate Research in Writing Studies. Faculty have studied and theorized these experiences, exploring the way in which undergraduate research helps students develop authorial identities (Grobman, 2009), the natural home for undergraduate research in university writing centers (Fitzgerald, 2022), the benefits of undergraduate research for adult learners at a historically Black university (Fulford, 2022), and the role of English graduate students in mentoring traditionally underrepresented undergraduate researchers (Franz et al., 2022). In a series of essays recently published in *Pedagogy*, undergraduate researchers and faculty mentors wrote together about their experiences. These writing and literature researchers shared projects with wonderful outcomes—personal growth, publications, presentations, graduate school acceptances—but they also offered glimpses of the process behind these outcomes. They revealed ethical quandaries around the publishing process (Trapp & Doz , 2022), feelings of linguistic discrimination in scholarly venues (Herzl-Betz & Virrueta, 2022), and an unsuccessful struggle to recruit research participants (Fishman et al., 2022).

Behind every research outcome is a story, and here undergraduate researchers tell their stories. We begin by describing the diary study methods used in this project and our motivations—both practical and theoretical—for employing those methods. Turning to the undergraduate researcher experience, we outline the rhetorical and affective dimensions that shaped the research experience. These

dimensions are the focus of our findings not only because we are writing researchers but also because undergraduate researchers told emotional stories shaped by exigence and purpose, audience, and their emerging researcher identities. Finally, we take up the question of why undergraduate research is especially powerful in fostering outcomes associated with the liberal arts and rhetorical education. Kilgo et al. (2015) speculated that undergraduate research is uniquely powerful because it “contains characteristics of good practices, such as student-faculty interaction outside of class... [and allows] students to integrate their learning across multiple levels and domains” (p. 521). Working from the undergraduate experience, we add another factor: undergraduate research has the potential to be what Eodice, Geller, and Lerner (2017) defined as meaningful writing. The undergraduate researchers in our study reveal how the rhetorical and affective experience of research provides the opportunity for meaningful writing.

Diary Study Methods

Understanding the undergraduate researcher experience was our primary goal for this project, and we wanted undergraduate researchers to share their experiences on their own terms. We aimed to listen authentically to undergraduate researchers and to gather contemporaneous data, looking closely at the lived experience of research. In *Engaging Student Voices in the Study of Teaching and Learning*, Drummond and Owens (2010) made a powerful statement that inspired our work: “It is shocking how little faculty know about what happens for students during the act of learning” (p. 176). One counter to this claim, authors assert in *Engaging Student Voices*, is engaging student voices in curricular design, implementation, and assessment. As undergraduate Flannery (2010) wrote in her co-authored chapter in the same collection, “students can offer something to the process of education—a different perspective. Students have unique insight into what it is like to actually be this particular student trying to learn and make meaning of this particular subject and this particular time in this particular course” (p. 11). In the same way, we turn to undergraduate researchers to help us understand what it is like to be a particular researcher trying to make sense of a particular project. As writing researchers, we were certainly interested in undergraduate research as a site of writing practice and potentially rhetorical development, yet we wanted our methods to leave space for participants to decide what was significant about their research experiences.

Our methods were inspired by diary studies, which are used in a variety of fields to understand how participants use their time, use objects or technologies, and feel during an activity. Researchers have asked medical students to keep audio diaries of their first clinical experiences (Wijbenga et al., 2021); hospital chaplains to record the content of and their satisfaction with patient encounters (Idler, 2015); classroom teachers to rate the extent to which they experience different emotions (Lavy & Eshet, 2018); and college students to report their level of academic engagement and positive emotions (Rodríguez-Munoz et al., 2021). Some diary studies track participants over a longer period, with less frequent reporting requirements, and others address only one week, with the requirement to report several times per day. Some studies ask participants to reflect on their activities when they desire or when something important happens, and others ask participants to take a survey at regular intervals. We turned to diary methods to capture in-the-moment information about the research and writing process: what kinds of activities are undergraduate researchers doing, and how do they feel about their work in the moment?

By conducting a diary study, we hoped to see what Micciche (2017) described as “the beautiful mangle of practice that defines writing as an activity” (p. 47). In another project, we interviewed college graduates about their undergraduate research experiences, and they regularly look back fondly and appreciatively—even on the challenges they faced. Yet we suspected these memories have glossed over realities of the research and writing process, perhaps replicating an “affective script” that “associates writing with good feeling” (p. 49). Discourse about scholarly writing suggests that

writing should be associated with positive feelings, and these feelings are especially pronounced when writers finish a project: “Once the writing is over, the world appears promising and full of possibility, at least for a time, contrasted with the quicksand-like reality of writing in progress, which often feels like descending lower and lower into uncertainty with no clear way out or up” (p. 47). Because “feelings are rooted in time” (p. 26), we wondered if contemporaneous diary entries would reveal a broader range of feelings and if undergraduate researchers would choose to record their feelings about writing and research.

The undergraduate researcher words and experiences we analyze in this article draw from an IRB-approved study conducted simultaneously at a small, religiously affiliated liberal arts university in the Midwest and a large, regional comprehensive university in the South. We recruited undergraduate researchers who were participating in semester-long, mentored research projects (typically senior thesis or honor thesis projects) or intensive, mentored summer research programs. When developing parameters for the study, we attempted to balance our desire to obtain contemporaneous data with the reality of undergraduate life. Although we were inspired by the system Wardle and Clement (2017) used in their study—the participant texting the researcher any time she encountered a rhetorical challenge and saving all documents related to the task—we kept the expectations for participating in the study reasonable enough that undergraduate researchers during busy semesters would participate.

First, we asked participants to write at last once per week during the research period. With these instructions, we also encouraged more frequent writing: *The idea is to capture—in real time—what your research experience is like. You are also more than welcome to write an entry any time you want.*

Participants received an email reminder each week; they composed their entries in an online survey form, which included these instructions:

You are welcome to describe what was most interesting or exciting about your research and writing in the last few days or to offer any other reflections about your research. Here are some questions you can use to get started:

- If you are excited about something happening in your research, what happened?
- If you discovered something interesting, what did you discover?
- If you are puzzled, what did you encounter that you found odd or confusing?

Eighteen participants completed the diary study. Some undergraduate researchers wrote more than once per week when something important happened, and others simply wrote when prompted; they always wrote about events that had happened in the last seven days—certainly not always in the moment but close to the experience. Participants were equally distributed between the two institutions, and they represented the humanities, the social sciences, and the natural sciences. Two participants identified as Latinx, one as Hispanic, two as Asian, and one as an adult military veteran; five participants were supported by the McNair Scholars program, a federal TRIO program for first-generation students with financial need or who are members of a traditionally underrepresented group in graduate education.

Second, we invited participants who completed the diary study for a thirty-minute interview. We asked participants to prepare for this semi-structured interview by reading their compiled diary entries. Intending to forward the undergraduate researcher experience and to invite participants to represent the research experience on their own terms—and inspired by Prior and Shipka (2003), who asked research participants to draw their writing processes—we began the interview with this question: *I would like you to be the tour guide to what you’ve written this summer or semester. As you look back at your diary, what is one of the biggest or most important moments for you? What moment*

sticks out to you, and why? Seven participants agreed to be interviewed, and they were generally positive about their experiences. With some distance from the project, they identified critical moments in their projects and expressed gratitude for what they learned about the scholarly discipline and about themselves.

Although the undergraduate researchers in our study represent diverse academic and life perspectives, our study is constrained by this critical factor: all students persisted through several years of college and accessed undergraduate research experiences. Many accessed these experiences through the college honors program (indicating their academic success before and during college), and others located and successfully applied for summer research programs. All students were academically motivated enough to seek out an honors program or research program, and all were academically successful. Across U.S. higher education, however, only twenty-two percent of students participate in undergraduate research, and those who do are more likely to be White or Asian, younger than twenty-five, not first-generation students, and enrolled in college full time (National Survey of Student Engagement, 2020). Traditionally underrepresented or nontraditional students may not know that research experiences exist on campus, and the cultural norms around approaching faculty may be unfamiliar; they may also need to work for more or better pay. At the same time, faculty who participate in undergraduate research—often despite pressures on their own research production—may choose to work with students who are already academically successful and who have prior research experience. We return to these issues of access and equity in undergraduate research at the close of this piece, and at this point we note that the research experiences in our study are certainly not universal because the experience itself is accessible only to a limited population of students.

Rhetorical and Affective Elements of Undergraduate Research

The diary studies produced approximately 17,000 words and the interviews approximately 31,000 transcribed words. With the goal of allowing undergraduate researcher words and experiences to direct our conclusions, we first independently coded the diary entries using In-Vivo methods (Saldaña, 2015). Several themes from this round of coding happened to align well with the constituents of the rhetorical situation as Grant-Davie (1997, p. 266) described them: exigence, rhetor, and audience. Participants wrote frequently about finding the exigence for their work, constructing their ethos as a member of a scholarly discipline, and negotiating the expectations of their audience. Another theme that emerged was feeling or emotion; nearly every diary entry named feelings or expressed feelings about the research process. We thus identified four categories for a second round of structural coding—exigence, ethos, audience, and feeling—and finally used those categories to code the interview data. Undertaking the longest, most complex research projects in their college careers, the undergraduate researchers in this study thought deeply about their rhetorical situations. And as they negotiated these situations, they experienced positive feelings of promise and possibility and negative feelings of frustration and uncertainty.

Finding Purpose and Making Meaning

The longstanding definition of undergraduate research from the Council of Undergraduate Research (2022) made a clear statement about rhetorical exigence: undergraduate research is “an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline.” Grant-Davie (1997) explained that exigence addresses what the discourse is about, why the discourse is needed, and what the discourse should accomplish (p. 266). Thinking about exigence extends from simply characterizing the “most apparent topic” for a piece of writing to making an argument for “why the issues are important and why the questions it raises

really need to be resolved” (p. 268). The CUR definition prescribed the topic and the purpose of undergraduate research: the work must make an original contribution to knowledge—and it must do so within an academic discipline. Although the point is well—and rightly—contended in conversations about undergraduate research (Greer et al., 2020), undergraduate research is regularly held to the sine qua non of scholarly production: the work is needed because it resolves a disciplinary exigence in a new way. The participants in our study wrote more about exigence than about any other rhetorical constituent, and their entries reveal deep, engaged thinking about exigence. They struggled to define topics and pose meaningful questions while working on the quantitatively largest and qualitatively most consequential research projects of their lives.

Undergraduate researchers wrote about identifying topics for their projects, a process that almost immediately raised for them questions about scope, complexity, and purpose. When they questioned if their topic was too simplistic—one element of exigence—they also questioned if their purpose—another element of exigence—was meaningful enough and if it resolved authentic questions. A secondary math and Spanish education major, Maya conceptualized and proposed her senior honors thesis shortly before the COVID-19 pandemic began. She originally aimed to study the proportion of English to Spanish used in high school Spanish classes, acknowledging that “my research relies heavily on human interaction and a traditional school setting.” The move to remote instruction forced new questions: “Unfortunately, much of that has changed. I am brainstorming ideas around this issue...I could pursue the question of how the COVID-19 pandemic affected the way that a language is taught. How has online learning or hybrid learning or even social distancing changed the way that we students language or that a teacher would use language in a classroom?” What seemed meaningful in one context was no longer meaningful, and Maya realized that she had to ask new questions about exigence to address the most authentic questions about language instruction in this new context.

As Tania and her fellow psychology researchers were adding measures to their study, they thought about concerns on campus. They added measures for eating disorders and obsessive-compulsive disorder, with Tania explaining that “we would like our research to take this route because of the prevalence of disordered eating among freshmen college students that we’ve seen in previous literature. Data gathered from our measurement would help us determine the prevalence of disordered eating on campus and between classes of students.” Tania made a decision about exigence that was represented in several other diary entries; she looked to her own campus and to her own experience to resolve a disciplinary question and—as we discuss below—to serve the campus community through her research.

One undergraduate researcher, Brooke, wrote for weeks about the process of identifying the research question for her senior thesis. She entered the project knowing that she was interested in water quality and environmental science, but she was also “daunted” by the prospect of carrying out a major research project. Her first diary entry expressed these fears, and she concluded that “if I can find a project that I find meaningful or purposeful, it might not feel so daunting.” When she met with her research mentor and with another professor on campus several weeks later, she reported that “I am still worried about finding a good enough ‘reason’ for my project...I hope in the end for my topic to have some kind of purpose behind it, but in the meantime, it is encouraging to see the outlines of a project underway.” After another week and another series of meetings went by, she had found her exigence: “We have a research question! Or at least mostly. I was able to meet with my research mentor again, and he told me what he had learned from another professor on another campus. I still need to do some literature research...but at the very least, I have a decently strong heading and I am quite honestly looking forward to seeing where this ends up.” These diary entries spanned five weeks, and throughout, Brooke thought constantly about exigence. She had decided quite in the process that her project would involve testing water—the subject of the discourse would be runoff contamination—she worked to find her purpose. In her entries, the words *reason*, *purpose*,

meaningful, and *purposeful* all revolve around exigence, and she would not settle for a meaningless project. Finding her exigence was key to overcoming her fears about research and committing to the work, which she successfully finished the following semester.

When we asked Brooke to identify important moments in her diary entries, she talked to us about her struggle to find exigence and the long process of identifying a research question. Pointing back to her entry about finding a “reason” for her work, she reflected on how pressing the question was for her:

But my biggest concern with a lot of this is like whether or not the project actually had some sustenance behind it. I guess I just felt like—you know—I didn’t want it to be this science fair kind of project where it’s like, oh, you know, I’m just testing plants and they grow in light or not. I didn’t want it to feel like that. I was just so worried that my reasoning behind doing the project, or just the project in general, would just feel flat. That was just a really, really big concern.

She of course found a focus and a reason for her project, and in her interview, she credited a conversation with her research mentor. Brooke described how they were talking about her ideas, and “he took that moment to say, ‘okay, is this what you want to do? This isn’t you just listening to somebody telling you what to do?’ That has meant the world to me, actually asking, ‘this isn’t just an assignment—is this something that you really want to do?’” She found a research question that was meaningful for her, and reflecting on the experience, she said, “if I had just found something that I didn’t know enough about or could not care less about, it would probably end up just kind of getting dropped or end up dead in the water. It made me better to think, okay, is this something that I truly want to look further into?” It was exigence that enlivened her research, and the conversations with her mentor pushed her to think about exigence and to recognize—even if she was doing so implicitly at the time—that scholarly research hinges on finding a purpose that is meaningful both to the researcher and the scholarly community.

Fostering Researcher Identity

Implied in the linguistic shift from student to undergraduate researcher—a shift we make intentionally in this article—is a shift in ethos. Undergraduate researchers are indeed undergraduate students and novices in the discipline, but they are researchers and producers of disciplinary knowledge. For the participants in our study, the rhetorical situation of undergraduate research called for an ethos they had not yet developed in their college coursework. Grant-Davie (1997) distinguished between the way in which rhetors often speak in different capacities (such as volunteers or parents or professionals) and the way in which “new rhetorical situations change us and can lead us to add new roles to our repertoire” (p. 270). Participating in undergraduate research led our participants to foster two new identities: they first cast themselves in the role of researcher, and second, they envisioned themselves as members of a scholarly discourse community—not simply students reading sources but as actual participants in the conversation.

Working with research participants pushed undergraduate researchers to develop their ethos as researchers. Because they had to ask people for time and participation, they had to cast themselves in a position of authority over their project and their subject area. Maria conducted a psychological research project with survey and interview components, and she wrote in her diary about the challenge of connecting with “Latinx-based organizations on campus” during a COVID-19 semester. After receiving IRB approval, she worked with the president of the Latin-American Student organization on one campus to publicize her survey and with student organizations on other campuses, “joining online meetings so that I can reach out to more people.” She ultimately recruited

enough participants, and in her entry describing the interview phase of her research, she reflected, “I’ve learned a lot through my interviews, and I have found a lot of themes across the individuals I interviewed. It was really great having my participants trust me and be vulnerable with me. I feel that this information will really contribute to the incoming Latinx students.” For Maria, making connections in the Latinx student community and having those students trust her was personally and professionally formative. As she went on to present her research at an undergraduate conference and defend her thesis, she carried her ethos as a researcher with her. She trusted not only that her results were valid but also that her work would serve Latinx students.

For another researcher, the process of recruiting participants required adopting a researcher ethos to communicate with an audience of local teachers. Maya was an education major and aspiring teacher, and without enough teachers willing to open their classrooms and give of their time, she could not initiate her senior honors thesis. Recruiting Spanish teachers required her to articulate not only the purpose of her project but her ethos as a researcher—a researcher who was active in conversations about language teaching. Maya wrote two successive diary entries about composing her recruitment email:

My next step is to draft and send an email requesting their participation in my project. How do I pitch myself and my project to a prospective teacher? This year is already crazy enough and I do not want to add to the busyness of the year; however, I still need to complete my project. This part is also making me excited and making the project more real to me...Today I drafted an email to send out to request their participation. In this email, I feel like I need to pitch myself. It is a little nerve-wracking.

The “nerve-wracking” feeling expressed in these entries relates to the pressure Maya felt to “pitch herself” and with the weight of her new researcher ethos. If the email were ignored or if local teachers found the requirements for participation were too intense, she could not execute her project; if teachers did not find her project meaningful or her ethos compelling, she could not execute her project.

Maya identified writing recruitment email as a significant moment of her research process, and in her interview, she reflected again on the rhetorical challenges of composing the message. The process involved negotiating several competing aims: “laying out what the project is about...telling participants the project does require some participation...making the project sound like a partnership...giving [participants] all the details they would need without overwhelming them with all the information that’s necessary at this point.” Maya shared that, when she initiated contact with the teachers, it felt like a “really big move” because “it was not just me and my own little bubble anymore. Asking for participation in my project was a big moment for me, and then waiting for those responses.” The ethos work involved in recruiting participants was also formative for Maya who, after she took the step of “putting herself out there,” was more confident talking about her research ideas with her participants and her mentors.

Working scholarly sources also pushed undergraduate researchers to develop their ethos as researchers but specifically as members of a scholarly discipline. The exigence for their projects certainly originated in their own interests, questions, and communities, but their purpose for doing the work was also grounded in their emerging identity as members of a scholarly discipline. Indeed, the idea that researchers participate in a scholarly conversation is something that students encounter in first-year writing courses, but for the researchers in our project, the idea was meaningful in a new way because they saw themselves differently. They were not students completing a course assignment but researchers making knowledge. Comments throughout various diary entries reveal that engaging the scholarly literature was not cursory but critical to defining the project:

What's more is that reading so many related articles is even helping me refine my own project.

When comparing certain useful older articles with some newer ones I'd found just that week, I was surprised at how much initially inconspicuous information suddenly seemed relevant.

But hopefully, after my annotated bibliography is complete, I will have a better idea of what I am looking for and from what angle to approach my project from.

[My literature review] was a massive pain to write, but as I expected, it did help me a tremendous amount in understanding my topic and fine-tuning the details of my research question.

Beyond recognizing that the scholarly literature could be authentically useful, undergraduate researchers also realized that the literature helped them understand themselves and their purpose. In her previous course assignments, Brooke admitted, "whenever I've done an annotated bib before, it was like, 'Oh, you have five sources, you know, it will be this little like assignment or whatever.' You know, you're reading it, you're like, 'I don't even understand the summary.'" Her thesis research, however, "forced me to really read those papers to really understand what it is that I was looking at. I was able to kind of tweak my own research question...That's where I really started to feel like I was understanding what it was I was doing." What she was ultimately doing was contributing to the body of knowledge about water quality. Locating her ethos in a community of scholars helped her understand what she could contribute and consequently why her exigence for the project was meaningful.

Sean wrote a senior honors thesis in psychology, studying the relationship among resilience, belongingness, perceived burdensomeness, and suicidal ideation. In his diary entries, he wrote almost entirely about his frustrations with Qualtrics and SPSS, programs he depended on to distribute his survey and analyze his data. Yet in his interview, he identified the process of writing his literature review as a pivotal point in the project. When he read research articles, he "related what I was reading to the research I wanted to do and to took [the articles] as guidance toward doing my work." The research articles helped him refine the exigence for his research, but he also saw the articles as models for his writing because he believed they were doing the same disciplinary work. Sean shared that he "read probably fifty or sixty different papers and wrote annotated bibliographies. I read the paper, I took the main points, and then each annotation was a one or two pages long, depending on where I was in my project when I was writing the entry." As he got deeper into the research, "the entries were getting two about two pages long because I was learning what information to analyze, but most students don't do that in depth." Like Sean, many participants contrasted "typical" course-based research with undergraduate research. Some described the contrast in terms of attitude and others in terms of depth, but we suggest this shift originates in ethos. When these researchers saw themselves as members of the scholarly community—when their researcher ethos became aligned with the discipline—their relationship with the sources changed. They became participants in the conversation rather than observers, producers of knowledge rather than consumers.

Serving Real and Imagined Audiences

The audience for scholarly research conventionally includes members of the discipline, a reality reflected in the way undergraduate researchers envision themselves as members of a scholarly conversation. In the rhetorical situation of their projects, these researchers also negotiated audience

as a motivating factor that inspired their work and as a constraining factor that shaped the entire project. Grant-Davie (1997) noted that audiences are not simply “a homogenous body of people who have stable characteristics and are assembled in the rhetor’s presence. A discourse may have primary and secondary audiences, audiences that are present and those that are yet to form, audiences that act collaboratively or as individuals, audiences about whom the rhetor knows little, or audiences that exist only in the rhetor’s mind” (p. 271). Some researchers had concretely real audiences—often stakeholders on campus—whom they understood as a critical part of how their research would achieve its objectives. Other researchers were required to imagine their audience with little concrete information, and defining the audience was the difficult, rhetorical crux of the project. As a factor that exerts influence throughout the research process, audience asked undergraduate researchers to employ sophisticated rhetorical thinking and to revisit questions about exigence and ethos.

For several undergraduate researchers, the idea of audience converged with exigence: they were motivated to do their projects—they found meaning and purpose in the work—because they believed they were serving a concretely real audience. Alexis conducted psychological research on depression and anxiety in college students, and she wrote about sending the results of her study to the university counseling center. Summarizing her results, she wrote, “what I found interesting in our research is that year in school did not effect [sic] anxiety or depression. I thought this would be a factor that would contribute to anxiety and depression more than it did.” The results were somewhat surprising, but it was the idea of audience that caused a shift in her tone and purpose: “I think it will change how we can reach out to all students despite what year they are in and not focus on a particular year such as incoming freshman. All students need to be aware of mental health and mental health services, and no one is immune to the effects of anxiety and depression.” Her research summary turned to a discussion of how to help students on campus; the audience for her work shaped how she saw and interpreted her results. In her last entry for the semester, she reflected on her project: “I’m excited to use what we found to benefit the counseling center. I am truly grateful for the research experience. The hardest thing was time management with the classes I was in. But overall, it was a great experience and definitely worth the stress and time!” For Alexis, the exigence of the project and the audience for the project were nearly indistinguishable: her project was worth it because it would benefit the counseling center and students on campus.

Kayla worked on a project analyzing the construct of womanhood in evangelical culture, and she similarly believed that her work would help an audience. Early in her summer research program, she wrote an entry describing how her mentor gave her a book to read on direct sales. She finished the book in one day: “I get so fired up about direct sales. I get excited about it because it’s something most people know about but don’t think twice about. It’s hurting so many women, and they don’t even know it. I’m so happy to be a part of this project to help women who don’t know they’re being hurt.” Although Kayla had to imagine her audience more than Alexis did, she nonetheless was motivated by the idea that real woman would be materially and emotionally edified by her work. In other entries throughout the summer, she referred to this overarching purpose as something that carried her through long week of research and emotionally difficult material.

Researchers were motivated by concretely real or authentic audiences, and for another researcher in our study, determining the audience was the most challenging and influential rhetorical element of her project. Molly and another undergraduate worked with a faculty member to translate a nineteenth-century Spanish manuscript—a financial document related to the Manila Mint—written in the Philippines during Spanish colonial rule. Her research team intended to write a critical edition of the 400-page handwritten document and imagining the audience for the translation was the linchpin of the project. They could not make decisions about balancing Spanish fidelity and English readability until they identified the audience. In an early diary entry, Molly constantly thought about audience: “Often, the biggest question I face in translation is whether it’s better to make an English

translation with good rhythm and cohesion or to maintain Spanish syntactic structures even at the cost of some readability in English.” The next week, she still struggled to conceptualize her work because the audience was not yet imagined: For me, not having a clear picture of the goal of our project or an image of how the Critical Edition we’re working towards is supposed to look has proved to be problematic when doing the translations. Knowing who the intended audience for our critical edition is will go a long way towards helping us with our word choice problem.”

During her interview, Molly identified the most important moment in her research as the “important, albeit somewhat ambiguous moment” when the team “defined an audience for our translation and critical edition.” She explained that they “emailed with Silliman...and they never gave us a clear answer of who they really wanted it written for. *So, we just decided to assume we’re writing for people with more specialized interests, but not necessarily a high degree of Spanish knowledge* [emphasis added].” Defining the audience “was big,” but that decision also meant revising translations the team had already completed. She reflected on her thinking after the audience for their work was defined:

I think I was writing it more for myself initially...the sentence structure was really confusing. And it didn’t bother me as the person that was translating it because I knew what the original meant. And then the specialized terms, those aren’t anything that I was familiar with in the beginning, but as we did more research into minting and the colonial Philippines, then it became something that I was a bit more aware of, and that was on my radar...For the layperson that might be reading this or somebody was interested in the topic, but not such a high degree of antiquated Spanish knowledge, it might be best to modernize it in one in some ways, but not at all.

As Molly and the team became more familiar with the Spanish text and its historical context—and became unintentional experts on the process of coin minting—they thought deeply about the audience and the contextual knowledge that audience may (or more likely, may not) share. The idea that discourse “defines and creates contexts for readers” (Park, 1982, p. 250) became real during the project as the team debated how different choices could invite or disinvite audience members. And although the decision to identify an audience was a decision to imagine an audience, the implications of that decision were consequential and an object of continuing discussion throughout the project.

The Affective Experience

The rhetorical situation of undergraduate research stretches researchers to find meaning and (re)define themselves as researchers, and the diary entries demonstrate that the research process has a strong affective component. Undergraduate researchers expressed strong positive and negative emotions in their entries, as represented by language we coded as positive (e.g., *excited, fired up, enjoy, confident*, and sentences with exclamation marks) and as negative (e.g., *nervous, frustrating, discouraging, overwhelmed, anxiety, worried*). Admitting when “this week was a bit of a drag...since the shine of a new and exciting job has worn off” and celebrating when a “breakthrough made me feel like I am in the right place and a helpful contributor to the project,” they wrote candidly about imposter syndrome and apprehension, exhilaration, and relief. Every collection of diary entries displayed a series of emotional highs and lows, and several collections revealed the same emotional arc: researchers moved from initial anxiety and worry over the course of weeks or months to excitement and ultimately pride.

Most participants successfully finished their projects, and their final entries included positive emotions—relief that they were finished and surprise at how much they accomplished. One researcher, however, stopped writing after only four entries, and her entries were highly negative. Delaney expressed the typical combination of nervousness and excitement in her first entry: I haven’t

actually started my research project yet. I'm not 100% settled on a topic. I think I have an idea. I'm pretty excited about it but also nervous that some real adult researcher will have already done it and then I won't be able to use it. I'm 40% excited and 60% apprehensive/terrified my thesis will be garbage." She noted in the next entry that she had changed her topic, which made "the idea of a research paper seem less depressing than it has in the past few weeks." Yet her final entry several weeks later was bleak:

I'm very bad at research because of procrastination. Once I have the information, I can bang out a paper real quick, but the gathering of sources and stuff is the hardest. I'm so bad at it. It's on my to-do list every day. And I just don't do it. The semester is halfway over, and I've barely done anything. Not good stuff...Not being productive. Am overwhelmed. Feel like a failure. Really don't want to write this thesis.

These entries reveal the relationship between the rhetorical situation and the affective experience. Delaney was not unique because she worried about the exigence for her project. However, she did not develop a researcher ethos that perhaps would have given her more authority over her work. She contrasted herself with "real adult researchers" and understood research as a process of "gathering sources" and "bang[ing] out a paper real quick." We cannot know if her negative emotions were compounded by her inability to locate herself in the scholarly community or if her inability to locate herself in the community produced negative emotions, but we observe how rhetorical turning points in the research have emotional components and emotional turning points have rhetorical components.

Every undergraduate researcher we have quoted in this article expressed emotions around their pursuit of meaningful exigence or their new researcher ethos as confusion and worry alternated with clarity and excitement. Brooke documented her search for a research question, which we have framed as a search for rhetorical exigence. It is perhaps easy to claim that Brooke struggled to find her exigence and ultimately did, but her entries—which we present in chronological order with emphasis added—reveal the back and forth, the competing positive and negative emotions for weeks on end:

In all honesty, I'm beyond *nervous* and *confused* for this semester.

The idea of research has always seemed *daunting* to me. But now that I have the beginnings of a topic that is of interest and importance to me, I am actually *looking forward* to seeing what doors this project might open.

I am still *worried* about finding a good enough "reason" for my project.

We have a research question! Or at least mostly. I've said this multiple times, but I am still *worried* about my topic being too simplistic. So, while I'm feeling a little *overwhelmed* at the moment, I just need to make sure I do what I can to keep moving forward.

I'm still *worried* about my topic being too simple, but we will see what happens to it over the rest of the semester

I finally presented my research proposal!!! Doing a talk like that on my topic made me feel really *excited* to being doing the work.

These concerns about rhetorical exigence had a strong emotional component, and the long arc from confusion to excitement encompassed smaller oscillations. Even after Brooke identified an initial

research question, her doubts about exigence—about complexity and meaning—prompted her back into feelings of worry and overwhelm that did not end until the project was nearly complete.

Amelia entered her senior honors thesis project intending to analyze ten English translations of the Spanish Golden Age play, *La Vida es Sueño* by Pedro Calderón de la Barca. With majors in English and Spanish and interests in linguistics and literature, she wrote several diary entries about determining the analytical methodology for her project. The decision about methodology would define the exigence for the project and would define her place in a particular scholarly community. Her first entry began with these words: “I didn’t realize the amount of mystery there was in the future of this project. I knew what I wanted to find out, but I don’t know how I’m going to go about finding it out.” She was thankful that her mentor gave her “small achievable goals each week,” and she hoped that “focusing on the short term will help reduce my frustration.” These early feelings of frustration continued as she asked questions about exigence and researcher ethos:

I understand the importance of making a space for my own work in the field, contextualizing what I’m doing in the realm of translation theory, but I’m not entirely clear on what context I should be putting myself in. Should I be trying to find other authors that have done the same style of study that I’m trying to do? Should I be trying to find the translation theories that the translators are using? Should I be trying to understand the timeline of translation theory and fitting both my work and the translations inside of it?

After several weeks of entries with similar lists of frustrated questions, the question marks became exclamation marks: “This week I have been more impressed with myself and this project than I expected to be! I wrote ten pages last week, and I feel like I have good work written that I can revise. I haven’t quite gotten to the best stuff yet, but there’s still more to discover and I’m excited to get to it!” The next week she resolved her major methodological question: “I have found a methodology that I would like to use! I’m excited about finally having a theoretical framework that I could use to provide some valid conclusions about my gut feelings!” Although we would not argue that worry and anxiety are necessary parts of undergraduate research, we note how most participants persisted through and into difficulty and uncertainty. Struggling to negotiate the rhetorical situation (and the frustration and anxiety accompanying this struggle) may lead not only to rhetorical growth but also to excitement about the research itself.

Stories of Meaningful Research

Stories of undergraduate research in higher education research are positive because their outcomes are positive. Told in aggregate form, these stories link the practice of undergraduate research not only to retention and persistence but also to critical thinking, problem solving, oral communication, and written communication (Kistner et al., 2021, pp. 6–8). In a longitudinal study of 2,000 students at 17 institutions, Kilgo et al. (2015) found that undergraduate research—compared with other high-impact practices such as learning communities, writing-intensive courses, and service learning—had a significant, positive relationship with cognition and literacy (p. 518). Graduating seniors who had participated in undergraduate research showed significant gains from their first semester of college on the Need for Cognition scale. Those who score high on this scale report that they pursue and enjoy the process of thinking, preferring complex problems and long-term projects and finding satisfaction in deliberation and abstract thinking (Cacioppo et al., 1984, p. 307). Graduating undergraduate researchers also showed significant gains on the Positive Attitudes Toward Literacy scale, which Pascarella (2022) developed to measure enjoyment of literacy activities. The brief scale includes the questions “I enjoy expressing my ideas in writing,” and “After I write about something, I see that

subject differently.” Kilgo et al. (2015) argued that the skills and dispositions represented in these scales are associated with the practice of lifelong learning. We would note that these outcomes are also associated with rhetorical education: the practice of writing and research helps students pursue complex problems and long-term projects, find satisfaction in intellectual deliberation, learn through writing, and even enjoy expressing their ideas.

The undergraduate researchers in our study offer insight into the undergraduate experience, and their stories provide layers of information that the aggregate data on undergraduate research does not. Arguing for the value of case study research in writing program administration, Saidy (2018) examined how one “seemingly smooth and uncomplicated” transition from high school to college writing was actually “complex and nuanced,” uncovering the inequitable ways in which students experience institutional policies and structures” (p. 29). As we have noted, nearly all participants in our study completed their research projects, graduated from college with honors, and even looked back with pride upon their work. Their stories are in that sense smooth and uncomplicated, aligning well with what they may have reported on the National Survey of Student Engagement or other measures of their college experience. Yet we believe the nuance and complexity in their stories does not challenge the aggregate story as much as it suggests why undergraduate research is positively associated with critical thinking, complex problem solving, and communication ability. We suggest that undergraduate research fosters these outcomes because its rhetorical and affective elements create the context for meaningful writing.

In *The Meaningful Writing Project*, Eodice, Geller, and Lerner (2017) described what constitutes a meaningful writing project. Aiming to understand the undergraduate experience more deeply, they developed a definition of meaningful based only on what college seniors shared in surveys and interviews. Meaningful writing projects offer students “the opportunity for agency; for engagement with instructors, peers, and materials; and for learning that connects to previous experiences and passions and to future aspirations and identities” (p. 4). Although undergraduate research receives only brief mention in the book (p. 64), we believe that two characteristics of meaningful writing apply particularly well to undergraduate research: undergraduate research promotes engagement and affirms agency, and it does so both rhetorically and affectively.

Meaningful writing is first engaging, offering students the opportunity to engage—often deeply so—with content and information, faculty and peers, other audiences, and the writing and research process itself. Students found writing projects engaging when the content and/or the research and writing processes presented new challenges—new research methods, new genres, and new bodies of knowledge kept students interested and motivated (Eodice, Geller, & Lerner, 2017, pp. 63–7). Students also looked back on meaningful writing projects with a sense of accomplishment, often because the project was significant in terms of scope, length, or time to complete (p. 65). The rhetorical situation of undergraduate research, and in particular its demands on exigence, engages students in the research and writing. We would even pose this question: does undergraduate research leave students space not to engage? For the undergraduate researchers in our study, the high standard for exigence demanded a high level of engagement. The process of finding exigence was a new challenge; undergraduate researchers had never worked so hard to ask a meaningful question, contribute to the discipline, or simply say something interesting. When Brooke struggled to define her research question and Tania wondered if conclusions in the scholarly literature would be true on her campus, they were deeply engaged in the research process. Undergraduate researchers also looked back on their work with a sense of pride and accomplishment, and their diary entries reveal the other feelings implicated in this sense. Amelia felt that she wandered for a long time without fully conceptualizing the purpose of her project, and she was excited when she saw her progress and saw that purpose coalesce. In our study, part of what made undergraduate research

engaging was the struggle and frustration and uncertainty; the final feeling of accomplishment came not only from the final product but also from persisting through the process.

Meaningful writing further affords students agency, and Eodice, Geller, and Lerner (2017) suggested that agency is an outcome of engagement (p. 55). When students engage in meaningful writing, they gain agency by interacting with other actors; many students found projects meaningful because they worked with community members or shared their work with wider audiences (pp. 39–40). Serving an audience, public or scholarly, convinced undergraduate researchers that their work mattered and that they were contributing. When Alexis realized that her project could benefit the university counseling center, her diary entries became more enthusiastic as she assumed greater agency over the project. Kayla weathered the personal and intellectual challenges of her project by remembering that her work could help women. Students also gain agency over their present and future selves when writing projects help them build their personal, professional, or academic identities (Eodice, Geller, & Lerner, 2017, pp. 41–3). Casting themselves (or being cast) in the role of a research ultimately helped undergraduate researchers in our study build and expand their identities. When Maya recruited participants, she built her identity as a researcher although she was still a preservice teacher, and when Sean located himself in the scholarly conversation, he built an identity as a psychological researcher. The sense of accomplishment these researchers felt at the end of their projects was grounded in a strong sense of agency over their projects. By completing the project or working through an impasse, undergraduate researchers begin to see new possibilities for themselves.

Exigence, ethos, audience, and feeling—these rhetorical elements matter. Diary entries from undergraduate researchers tell us that these rhetorical elements matter to engaging in meaningful research, and the diary entries tell us how these rhetorical elements matter. When we read contemporaneous diary entries, we better understand how undergraduate research produces the positive intellectual and emotional positive outcomes that the American Association of Colleges and Universities, the Council on Undergraduate Research, and scholars in writing studies have forwarded. We understand how undergraduate research uniquely puts students in a situation for rhetorical growth and personal growth. For more students to have the opportunity for such growth, however, higher education must address the systemic inequity currently present in undergraduate research. Traditionally underrepresented and nontraditional students participate less, and institutions can better publicize research opportunities and work to demystify the culture of research. Yet we would emphasize the importance of structural approaches to this gap, which include integrating undergraduate research experiences into college courses and changing faculty and institutional incentives around undergraduate research.³ The former democratizes undergraduate research and makes possible replicating our study across a broader range of students; the latter encourages faculty to work with undergraduate researchers, especially students with little experience or average academic preparation. Naming undergraduate research in institutional Diversity, Equity, Inclusion, and Justice plans further encourages structures that open more and more equitable pathways into undergraduate research experiences.

When we read these diary entries, we also read them as mentors and teachers. The experiences shared in our study first encourage research mentors to name explicitly elements of the rhetorical situation—to discuss audience, researcher ethos, and purpose. Such discussions are natural in writing courses, and they can also become a productive part of mentoring meetings and research courses, giving undergraduate researchers a vocabulary for their goals and their struggles. The experiences shared in our study also highlight the importance of helping undergraduate researchers manage uncertainty and negative emotions. Although the well-cited list of ten salient practices for undergraduate research mentors (Shanahan et al., 2015) rightly included “balancing rigorous expectations with appropriate emotional support” (p. 4), the undergraduate researchers in our study

either needed or benefited from emotional support. Mentors might offer this support by (re)orienting students to the larger vision of the project and assuring them that they are working in productive directions. We offer this support by saying that struggle is normal, that negative emotions in research are a feature rather than a bug. And we offer this support by sharing stories—our own and those of the undergraduate researchers whose experiences should animate our mentoring practices. Let's turn to more stories, told by more undergraduate researchers, as we continue to learn how our students struggle, succeed, and make meaning through undergraduate research.

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Notes

- 1 This multi-institutional study was conducted under IRB #20–016 at Calvin University. All participants consented to participate in the diary study, to be interviewed by the researchers, and to have their words replicated here with a pseudonym.
- 2 In Spring 2022, the Council on Undergraduate Research revised its definition from “an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline” to “a mentored investigation or creative inquiry conducted by undergraduates that seeks to make a scholarly or artistic contribution to knowledge.” Here we quote the new definition, and later in the article, we refer to the previous, longstanding definition that shaped the research experiences and programs examined in this study.
- 3 Laura Behling (2022) offers an excellent discussion of actions that institutions can take to support more accessible, equitable undergraduate research experiences.

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Complete APA Citation

Johnson, Kristine, & Rifenburg, J. Michael. (2022, December 30). Rhetoric and affect in undergraduate research: A diary study. *Across the Disciplines*, 19(3/4), 225-242. <https://doi.org/10.37514/ATD-I.2022.19.3-4.04>