

SENIOR THESES:

CREATING A COMMUNITY OF SCHOLARS FOR ORIGINAL, AUTHENTIC RESEARCH

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After many years of having a loosely structured thesis seminar for our senior majors, the Tri-College Linguistics Department recently re-designed our program to offer students a highly scaffolded environment in which to complete their capstone requirement, which has led to improved outcomes. We argue here for the benefits of asking students to write a senior thesis and carry out original, authentic research on a topic of their choice. We describe our seminar design and its key components – frequent incremental assignments, peer and instructor feedback leading to repeated revisions, and intentional community building – and how the program might be implemented, in whole or in part, at other institutions with similar pedagogical goals.

Keywords: theses, writing across the curriculum, authentic research, undergraduate capstone requirements, peer review.*

1. INTRODUCTION. Many undergraduate linguistics programs require a culminating exercise or project for majors in their senior year, and writing a thesis is a common way to fulfil this requirement. This paper describes the one-semester senior thesis seminar taught each fall in the Linguistics Department shared among Bryn Mawr, Haverford, and Swarthmore Colleges, as an innovative case study and possible model for use by other linguistics programs looking to develop similar courses. Our seminar has a dual focus: helping students investigate a linguistic issue of their choosing (usually by carrying out original, authentic research), and creating a sense of support within a community of scholars. Here we describe our course structure and the reasoning behind it, discuss strengths and weaknesses of this structure, and make suggestions for how it might be implemented in full or in part at other institutions.

2. BACKGROUND. We begin with a discussion of the benefits of a senior thesis, pointing the reader to pedagogical studies and discussing the general benefits we see in our own approach. Then we describe the context of our own department and our reasons for believing that the innovations described in Section 3 are effective.

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2.1. WRITING AND RESEARCH IN THE UNDERGRADUATE CURRICULUM: THE BENEFITS OF A SENIOR THESIS. First, we must explain what we mean by *writing a thesis*. It is to be interpreted in this paper in a broader way than just putting pen to paper to produce a manuscript. As student expectations and demographics change and as the world of work they are to enter changes, a wide range of pedagogical approaches are essential (Beetham and Sharpe 2007, Mintz 2020), as is an emphasis not just on research, but on practice (Evans et al. 2020). A typical thesis is a 25—35-page paper with a clear research question answered through supporting data and argumentation. The type of research question can vary widely, and projects have included formal theoretical analyses, socio- or ethno-linguistic studies, language documentation and description, psycho-linguistic experiments, historical reconstructions, pedagogical proposals, corpus studies, and critical literature reviews, to name a few. (Senior theses dating back to 2001 are available at <https://www.swarthmore.edu/linguistics/student-research>.) That said, we are also open to other types of culminating projects, including for example those whose main content is a software implementation, with brief accompanying documentation and justification. Universal design and accessibility for all students is an important goal (Curry 2003), one that we have shared since our program began in 1987. We have occasionally had students take the position that writing in a narrow sense is a detriment to their ability to complete a culminating project that would successfully reflect the quality of their work, and who have accordingly presented their theses orally or in ASL, supported by data visualizations.

Thus, our seniors produce a variety of culminating projects. Counseling students to follow their own interests and passions in choosing a topic to investigate and what kind of project to undertake supports personal wellbeing, which is linked to happiness and satisfaction not just in college, but in their career and in life (Gallup 2014, Johnson 2016). Producing a culminating project is a creative act, a prolonged one that ‘belongs’ to the student in a way that assigned course papers on particular topics cannot replicate. If students choose topics that they are genuinely interested in, if they ask questions they truly want to know the answers to, they are likely to be more strongly motivated in doing the work and thus more creative and fulfilled in doing it (Hennessey 2000). Being ‘free to pursue their own take on their own problems’ makes some scientists, for example, do superior and more innovative work, and feel more joy in that work (Adelson 2003:163); this is true of seniors completing culminating projects, as well. The

opportunity to pursue a topic that is potentially beyond the scope of any scheduled course, or even outside the expertise of the department's faculty, is a valuable one.

Crucially, we have designed flexibility into our senior thesis seminar to ensure that, regardless of modality or topic, all culminating projects are carried out in a way that allows the student to participate fully in the seminar. A primary benefit of the seminar to the student is that it includes both faculty and peer mentoring, a factor that builds community while promoting inclusivity (Ewing et al. 2007). Together, the seminar participants engage in a generative process through which they find themselves to be thinkers and producers.

While critical literature reviews are an option, most of our students choose to do original work. In this research, they define their own questions for investigation, formulate hypotheses based on their initial work, and test the hypotheses against more data or with further investigation. To engage with the existing literature is a first step; to question the results of previous research or to find puzzles that no one else has solved before is a necessary subsequent step for a college student to become a producer, rather than a mere consumer, of knowledge. Learning to ask questions that lead to deeper understanding and better answers is a valuable experience with benefits beyond college regardless of career trajectory.

In doing original work, students learn to express their reasons for asking particular questions or challenging received wisdoms, and to offer their own findings and conclusions with persuasion. Our students come to the senior thesis seminar with prior research experience from papers and projects in lower-level courses, but their culminating project differs in that they are truly in the driver's seat, in charge of an original research project whose scale and expectation are unparalleled by anything they have yet done.

We guide students through the process of finding and redefining their topic, so they can learn first-hand what it means to 'think and work like a scientist' (Colabroy 2011:196). Authentic research-based experiences, rooted in tools and methods appropriate to the field, are being used across the country in STEM disciplines (Burnette and Wessler 2013; Spell et al. 2014; Linn et al. 2015; and many earlier works), and, while evaluating their effectiveness is complex (Brownell et al. 2013), that effectiveness is recognized enough that New York University launched the NYU Survey Service to support the development and administration of surveys of all types, one important goal being undergraduate learning through research (Phillips et al. 2011). The field of linguistics offers a wide range of opportunities for original research, and

a senior thesis seminar offers a place for doing it in a sustained, scaffolded, and supported way. Students have a whole semester to define their research question, work with the data, rethink, and revise; they gradually assume the role of expert, and learn how to examine the strengths and weakness of their approach. In the process, students gain confidence in and respect for their ability to see value in their own discoveries.

Focus on writing in the undergraduate curriculum has a relatively long history, with perhaps its strongest initial thrust being the writing-across-the-curriculum movement, which finds strong support in the Boyer Commission Report (1998). Critical thinking and problem solving are key elements in a liberal education, and writing-intensive courses can play a valuable role in ensuring those keys belong to all students (McLeod and Miraglia 2001). Examining one's approach to problem solving and then revising that approach is a major benefit of writing-intensive courses in all fields. Developing courses that teach and hone communication skills, oral and written, both across the curriculum and inside disciplines is recognized as important from small colleges to large universities and in a growing number of countries (Harper and Vered 2017). Writing also has the benefit of giving voice to those at the margins, who might participate less in class discussion. The institutional infrastructure surrounding writing courses – writing centers, peer review, discussion forums, final projects, and poster sessions, for example – helps to make students better communicators, and many different pedagogical approaches can promote academic literacy (Defazio et al. 2010). We stress in that list the importance of peer review, which can elevate the student's role in pedagogy to one of leadership (Weaver et al. 2008, Walkington et al. 2017). Still, we contend, the experience of completing a prolonged piece of work, the topic of which is chosen by the student and may not fit squarely into the confines of any established course in the curriculum, offers benefits beyond those of standard writing-intensive courses and courses with final research projects, and that are critical to a liberal arts education.

Writing gives a lasting realization to the writer's thoughts, allowing them to be 'seen' without vanishing upon utterance. Certainly, any written assignment allows such reflection, but the more complex and intertwined our thoughts are, the more we have a need to reflect upon them at length, looking for connections, and recognizing complexities (Manson 2001). Writing a thesis, an investigation that extends over several months and is thus necessarily complex, can help students find a way to understand what they think in a way that can be applied throughout

their lives to complex situations and problems as they arise. The Earlham School of Religion, for example, has established a program called Writing as Ministry, in which theology students are trained to help parishioners work their way through problems via writing about them – a process that helps them to understand their own thoughts (Earlham School of Religion 2020). The recognition of one's thoughts afforded by writing can help to distinguish what is knowledge from what is not. In this way, writing can tell writers things they didn't know – or didn't know they knew – before they put pen to paper (Smith 1994). Writing is a form of learning in and of itself, and it can lead to a refinement of both thought and knowledge as the writer rewrites, developing ideas, discerning subtleties and searching for more appropriate words to express them (Bean 2011). Thus, writing a thesis can contribute to life-long critical-thinking skills.

Furthermore, the organization of knowledge is an issue not just at the institutional level (in library and information sciences, databases, computer sciences, and the like; Hjørland 2008), but at the personal level. Putting knowledge into words that can be reread, reconsidered, and reordered offers an effective way to organize both general and personal knowledge, particularly if that knowledge is complex and not immediately transparent. Seniors in college have been amassing knowledge in their major, often without understanding whether or how that seemingly disparate information coheres. By pursuing their thesis research, students build on their existing frameworks in a way that aligns with classwork and stretches beyond it, pulling together previously unrelated threads and giving a much-needed architecture to their knowledge. Within the spirit of writing programs, we note that further development of this architectural entity is unlimited; between identifying one's thoughts and learning how to organize knowledge, one can learn the skills to organize a worldview. Some students report that they found their thesis to be life-altering, sometimes revealing to them the career path they were most drawn to, as with a recent alum who wrote her thesis on discourse analysis of the Bill Cosby trial and recently began a graduate program in Forensic Linguistics, one whose thesis fieldwork in the Pacific fed directly into her current doctoral work, or another who discovered over the course of her thesis that experimental psycholinguistics was in fact not her path and is pursuing ESL praxis instead.

In sum, the primary benefits of 'writing a thesis' in the context of a seminar such as the one we will describe in depth in Section 3 are as follows.

1. Students learn to select and refine a topic worth exploring, and gain in-depth mastery of a subject of their choosing.

2. Students learn to organize their thoughts and their arguments to clearly communicate them to others.

3. Students learn to engage with the existing body of knowledge and to see other authors as interlocutors in an ongoing conversation rather than fonts of unquestioned knowledge.

4. Students get the experience of authentic research, with all the challenges and rewards that entails, by working through from initial conception and design to analysis and writeup.

5. Students learn how to constructively critique the work of others and how to incorporate feedback into their own work, refining and revising through multiple drafts.

6. Students do all of the above independently, confirming themselves as self-motivated learners, though in a supported and collaborative environment.

These same benefits are gleaned to varying degrees from other courses, but many students will have encountered only some of them prior to the senior thesis seminar, and not in great depth. The thesis is where these pieces all come together, and for most students it is the only place in their college career where such a synthesis occurs. The length of the seminar, a full semester, allows students to change direction and re-focus their (research) questions as they learn more about their topic, which is not possible to the same degree in a shorter project or course final paper. These skills prepare students both for continued self-directed academic work in graduate school and for any other trajectory involving critical thinking, evidence-based argumentation and writing, collaborative engagement, maintaining extended projects, or data analysis. **The seminar qualifies as a high-impact educational practice (Kuh 2008) in that it is writing-intensive, involves undergraduate research, emphasizes critical inquiry and collaborative learning, creates a learning community, and, finally, serves as a senior capstone, making it fit well into the Association of American Colleges & Universities (AAC&U) recent educational change initiative, LEAP (AAC&U 2011).**

We have thus designed a senior thesis seminar in which students ‘write theses’, in a culture of knowledge sharing and self-determined creativity, with a cohort of supporters, mentors who become colleagues, and incremental improvement. We present this as a possible model for other institutions with similar pedagogical goals.

2.2. OUR INSTITUTIONAL CONTEXT. Swarthmore College hired a full-time linguist for the first time in 1987. Since then, the discipline has flourished there and expanded to become a

department, shared among Bryn Mawr, Haverford, and Swarthmore Colleges. Over the years more than 50 linguists, including visiting and part-time faculty, have guided undergraduate seniors through their culminating projects and contributed to what eventually became the program we outline here. We are indebted to all of them.

The seminar structure described here is relatively new, having its origin in the old model that underwent a major revamping in 2017, and quantitative measures of its effectiveness are not yet available. While the academy faces demands for accountability and transparency, and definitely should have assessable goals and strategies to meet them for all kinds of learning experiences, including writing (Condon and Rutz 2012) and research (Corwin et al. 2015), we believe that simply completing a coherent culminating project with a demonstrated sense of satisfaction is the most meaningful and objective benchmark we can offer at this time. Measures of effectiveness in these programs are hard to come by. For example, students choose or not to go on for a graduate degree in linguistics based on multiple factors that go far beyond the thesis. Professors' delight in the content of a culminating project can range from admiration of audacity to appreciation of understanding of theory to surprise that the student was able to tie such a tangential topic into their foundational coursework. Anonymous student surveys can report an assessment of skills gained and honed through the process that reflect personal and subjective ratings of satisfaction with the experience, rather than judgments of quality of work (Weston and Laursen 2015). Thus, grades, faculty evaluations of quality within a well-defined rubric, and student surveys may not reflect effectiveness in an entirely objective way.

The program we describe here, however, has proven to be workable: students generally complete culminating projects they are satisfied with (as measured by anonymous surveys) in the required amount of time, with fewer bumps in the road (such as requests for extensions, long periods of no communication, or poor drafts) as compared with our prior, less tightly structured seminars. We find the culminating projects readable and comprehensible, and many constitute real contributions to the field. Thus, we are committed to this program as a positive teaching tool, and offer it in that spirit.

The program calls for a commitment of resources on the part of the institution, as the thesis advisors receive teaching credits. Still, modifications on the methods below would allow programs to reap many of these benefits with a less substantial outlay, a point we return to at the end of Section 3 and in our conclusion.

One important piece of context here is the fact that our Linguistics department is shared across three institutions. This is in no way crucial to implementation of the thesis program, but explains some quirks in its setup. Bryn Mawr, Haverford, and Swarthmore colleges have long been linked in a Tri-College Consortium (Tri-Co) through which students may take courses at any of the three campuses. In 2011, the colleges merged their linguistics offerings into a single department, with consistent policies and requirements, shared governance, and extensive movement of students across campuses. With the creation of the Tri-Co Linguistics Department, our senior thesis seminar, previously offered only on the Swarthmore campus, split into multiple course sections at different locations working from the same syllabus and set of expectations, and with students often based at a different campus from that of their thesis advisors and seminar classmates. This is both enriching and challenging, and we find that judicious use of distance-learning tools such as Zoom for one-on-one feedback meetings can help keep students engaged while reducing the need for unnecessary inter-campus travel.

3. THE SENIOR THESIS SEMINAR EXPERIENCE. We begin first by describing an option that students have in their junior year, which can support the culminating project. Then we describe the structure of the senior thesis seminar and how the development of the thesis progresses. A detailed syllabus, as well as in-class handouts and instructions for the written assignments, are included in the Supplementary Materials.

3.1. THE JUNIOR SEMINAR. Since spring 2015, we have offered an Advanced Research Methods course, commonly known as the Junior Seminar, designed to give students optional additional preparation for the culminating project in their senior year. We see this course as increasing equity by providing students who want it with more instruction in research techniques and writing skills prior to the thesis. The course is offered every spring, and aimed at students in their junior year. Course topics include academic writing in linguistics, experimental design, data elicitation, the ethics of working with human subjects, basic statistics and data presentation, and the history of linguistics as a field. One important contribution of the Junior Seminar is reducing student anxiety by helping them pick and begin to develop a viable thesis topic. In the first month students choose a general research area; over the course of the semester, they write an annotated bibliography in that area, then a squib, a presentation, and finally a 12-page research

proposal. They turn in preliminary drafts and revise after peer review, which many report never having done before. Students can switch their research focus at any point, but most continue with a version of the same topic throughout the course, and this generally becomes their thesis subject as well. Those students who keep their topic start the senior thesis seminar having already done a good portion of their background reading and data collection, and with existing writing that they can draw on when constructing future drafts.

This course is not required for the major, as we try to keep our major requirements as flexible as possible to maximize inclusivity. Many of our students study abroad in the spring semester, when the Junior Seminar is offered, and are therefore unable to enroll; others feel well prepared by their previous coursework for diving into a culminating project and have other classes they are eager to take instead. About 40% of majors enroll in the Junior Seminar. Preliminary data show that on average, students who take the Junior Seminar score higher than their peers on all of the areas assessed by our faculty rubric, and students who have taken the course report feeling better prepared to write a thesis. Enrollment in the Junior Seminar is not, however, directly predictive of success – some students struggle nonetheless, and many students do not enroll and still excel in their thesis.

3.2. THE STRUCTURE OF THE SENIOR THESIS SEMINAR. With a few exceptions, all linguistics majors are required to complete a one-credit thesis (culminating project) in the fall of their senior year. (Honors students at Swarthmore College take the seminar for two-credits. Double-majors may petition to have their thesis requirement waived if they do a linguistics-related culminating project in the other major.) Seniors register for the thesis seminar as a class, offered during a three-hour timeslot on Friday afternoons over the 14-week semester. Faculty are assigned to teach the seminar based on the number of theses to be written that semester, and get teaching credit, equivalent to one regular course, which gives them the time to devote to regular feedback and meetings with their advisees.

Typically, each faculty member serves as the primary advisor for five students and as second faculty reader for five other students. The primary faculty advisor bears the major responsibility for overseeing the student; the second reader's role is more limited, with feedback requested for fewer assignments and only optional meetings during the semester, though some second readers choose to be more deeply involved.

Advisors are assigned based on several criteria. The primary consideration is topic, as advising is most effective when the faculty member has expertise in the subject area. This is not always fully feasible, for two reasons. First, students have broad leeway to choose any thesis topic in which they have sufficient interest and background, and there is not always a faculty member assigned to the thesis seminar (or even present in the department) with background in that area. In these cases, we take the position that we all have sufficient linguistic training and research experience to adequately advise an undergraduate project in any area, even if the match is not ideal, so long as we do extra preparatory reading ourselves. Similarly, when too many students want to write in a particular advisor's field, some must be assigned to other faculty to maintain an equal distribution of advising load. Other factors, such as the existence of a prior working relationship between student and advisor or home campus, can also play a role.

Second faculty readers are assigned by the same criteria, though the match of thesis topic to faculty expertise tends to be weaker. When there is strong reason to do so, the second reader may be a linguist not otherwise assigned to the thesis seminar or a faculty member in another relevant department, though we try to minimize this to avoid uncompensated work.

Running thesis advising as a class, rather than through individual meetings, ensures that material common to all, such as research skills and writing strategies, can be taught efficiently. There are seminar sections held on each of the three campuses; students attend the section (co-) taught by their primary advisor.

The class format also creates a sense of cohort that students do not gain otherwise. In the Tri-Co system, a student might join a linguistics course in their junior year and say, 'Where have you been all my life?' We have structured our requirements for the major so that, with careful planning, such a student can manage to construct a major at that point. Required courses are offered every semester, and most have no prerequisites and so may be taken in any order. The flat structure of the program, dispersal over three campuses, and wide variety of electives means that the majors of a given year might never have met or been in class with certain other majors in their cohort.

Having the seniors together in the seminar also helps them learn how to be good colleagues to each other in a community of scholars, a critical skill in any field they choose to pursue. Toward that end, each student is paired with two student peer readers from their section, labeled A and B, who alternate giving feedback on drafts of the thesis. The peer-reader

assignments are symmetric, such that two students will be each other's Student Reader A, etc. Students give feedback on each other's in-class presentations, and other activities also require group discussion. Because each section is comprised of the advisees of a small number of faculty members, the theses of the students in that section tend to share commonalities in subfield, language family, or theoretical approach. This way, students can recognize the progress that others are making and extend support by offering more sophisticated comments and questions as the semester progresses. Because each student knows which areas several others are working on, we encourage them to form the habit of feeding each other relevant materials when they come across them. Students learn from reading each other's work in terms of organization, data handling, argumentation, and aspects of the analysis, and bring this back to their writing. This combination of frequent feedback leading to revisions and learning by example is a cornerstone of the course.

3.3. WRITING THE THESIS. While scholars work in a variety of ways, we urge students to try one particular way, that of writing draft after draft, expanding and filling in details from one version to the next – that is, incremental progress. Within the structured seminar, we see the most important thing of all to be that every student receive regular attention. (For details of scheduling and assignments, see the course syllabus in the Supplementary Materials.) Our major innovation is that this attention comes through feedback and accountability from a variety of sources (individuals and groups; library staff, faculty, and students within the seminar and outside it) on a variety of assignments (written and oral; short and extended). In this way our very diverse range of students can all thrive.

ADVANCE WORK. The process of preparing to write a thesis begins in the spring of the students' junior year. This shift to choosing a topic in the preceding spring, rather than at the start of the thesis semester, requires minimal extra resources but has been high-impact in improving student experience and outcomes. For those who take the Junior Seminar, the work of topic choice takes place in a curricular setting. For everyone else, preparation begins in April, when students are asked to fill out a topic declaration form, listing two potential research questions or topic areas, each supported by two preparations, usually courses or research experiences. We are flexible about what these preparations may be, and they can include relevant

courses in other departments, but we find that requiring students to list them helps them to choose a topic on which they are prepared to do advanced work – for example, a student who has not taken Sociolinguistics lacks the background to write about identity signaling through lexical choice on Twitter, as interesting as that topic may be. Students may request to work with a particular advisor; these requests are taken into consideration but are not guaranteed to be fulfilled. We hold group meetings to talk to students about what to expect from the thesis process and how to choose a good topic, and get them started on brainstorming as necessary. (A brainstorming exercise is included in the Supplementary Materials.) Student preparedness at this stage varies widely. Some are already armed with a focused research question partly underway, and may chafe at having to propose a Plan B, while others have only a vague idea of the subfield or language family they want to examine. Once advisor assignments are made in late April or early May, faculty reach out to their advisees to help them further develop their topic as necessary and, if appropriate, make summer research plans.

We recognize that summer thesis work is not possible for all students, and while the extra time is often useful, it is not a prerequisite to a successful thesis. The extent to which students actually do research over the summer varies widely, based on their interests and personal circumstances, as well as the needs of their project. Some students come back from study-abroad programs with data in hand already. Others participate in summer research experiences, working as research assistants on campus, attending REUs, or undertaking college-funded independent projects that can form the basis of their thesis. There are several funding opportunities within Tri-Co which pay students a stipend for their research, including fellowships earmarked for students from under-represented groups, and we work with students to help them obtain such financial support. Still others engage to varying degrees with the published literature over the summer while having unrelated summer jobs or activities, and a good proportion do nothing thesis-related at all. Faculty also take a variety of approaches to summer advising, often tailoring them to the needs and interests of the particular students – ranging from requiring monthly reading reports from students, to doing close advising of IRB proposals, to simply being available for questions. Students who do advance work over the summer break can hit the ground running when it comes time to start writing in the fall, but such advance work is by no means a prerequisite to a successful thesis.

If a student's culminating project requires running experiments or gathering data from speakers/signers, we especially encourage them to complete that part before the start of fall classes if possible, though these activities can take place as late as Fall Break. It is especially important to begin IRB applications early, as approval can be slow and a one-semester thesis schedule leaves little room for delays. This is one area where real problems can arise: if students put off their IRB submissions or the approval process is held up, any experiments, interviews, or elicitation must be postponed, sometimes to the point where there is not adequate time for data analysis during the semester. This can lead to a rushed final product or necessitate an extension into the next semester for work to be completed, both stressful outcomes which we prefer to avoid.

This early push for topic choice means that most students arrive at the first seminar meeting in the fall with a good idea of what they will investigate, but there are always a few who have not yet landed on a topic. Plans fall through, previous research ideas turn out to be less interesting or feasible than hoped, students decide at the last minute to convert their linguistics minor to a major, or they simply haven't engaged with the process yet. Students report that picking a topic is one of the most intimidating parts of the thesis process, which can lead to avoidance. However, even students who feel stuck often have a number of topic ideas, and a one-on-one conversation with faculty can help them recognize which are promising and narrow them down to workable research questions.

GROUP MEETINGS. To build a sense of cohort and give students extra support during the early stages of their projects, each section of the seminar meets as a full group for the first four weeks of the semester. After introducing the semester's plan and setting expectations for the process and finished culminating project, these meetings focus on teaching our students skills necessary to conduct an extended project.

As all good research requires engagement with existing literature – even research of an entirely novel sort, since the recognition of the need for it comes from discerning its absence from the literature – we devote two class meetings to finding, vetting, and critically approaching written sources. The former is covered during in-class library workshops. Subject librarians at each institution instruct the students on how to best use library resources, including database searches and other ways to find scholarly resources. Students are asked to email the librarians

ahead of time with a short summary of their topic, so that the content of the workshops can be customized accordingly. Though library searches may seem like something seniors should already be adept at, on their end-of-semester survey the students often rate this workshop as one of the most useful parts of the seminar.

Because students have limited time to vet sources for their usefulness, we explicitly teach them how to skim. Our students mostly report having little experience skimming articles, a valuable skill when trying to survey the literature to get a handle on a new topic and decide what sources will be relevant and therefore worth taking the time to read carefully. We use this as a jumping-off point for discussing ways to approach the literature and how to read both receptively and critically, getting students used to challenging the ideas of scholars they read rather than simply accepting them as established fact.

Significant class time is devoted to having students read and critique two theses written by seniors in previous years, as a class and in small groups. This serves three purposes: It reinforces lessons on critical reading of sources, lets them practice giving peer feedback, and familiarizes them with what a finished thesis looks like, giving them a model for their own work. In analyzing what these theses did well and what could be improved, students identify strategies to apply to their own work and also recognize that even good research can still have flaws, counteracting some of the self-imposed perfectionist pressure many of them feel regarding the final product. We are mindful to pick examples for this exercise which are understandable to readers with a variety of backgrounds, and which provide a positive example without being intimidating.

Most of our students have never written a paper of this scope before, so we spend a portion of a class discussing strategies for long-form writing. This includes a workshop run by a representative of the campus Writing Center, focusing on the process of writing, common hurdles, and strategies for getting unstuck. The workshop is complemented by discussion among faculty and students about successful tools we and they have used for overcoming procrastination and sustaining productivity, including forming writing groups, chunking tasks into bite-sized pieces, writing sections out of order.

Finally, part of a class is spent teaching skills for presenting work, including giving research talks and designing slides and handouts. We discuss and demonstrate best practices for giving a talk, building from Geoff Pullum's (2004) six golden rules of giving an academic

presentation, as well as faculty (and student) experience. We continue to build in opportunities for critique, as students get a collection of handouts and slides from recent conference talks and are asked to point out strengths and weaknesses in each and suggest improvements.

STUDENT PRESENTATIONS. Two additional class meetings are devoted to students' in-class presentations of their own work, in Weeks Five and Eleven. In Week Five, students give a preliminary 10-minute presentation of their work so far. Most will not yet have well-developed analyses, so the focus is on framing the research question, giving context and overviews of previous work, and discussing existing data and plans for further development of the topic. In Week Eleven their research is much farther advanced, so more conclusions and analyses can be included. Presentations require students to articulate their ideas in a more widely accountable way than a draft that will be seen only by their advisor and a peer reader, and give them another modality in which to do so. They are encouraged to talk about the challenges they're facing and where they're getting stuck, so that the group can offer ideas for how to move forward. By watching their peers' presentations, they get to see more of the breadth of research topics being tackled, and learn from others' approaches. Students and faculty fill out feedback forms for each presentation they watch, asking them to comment on strengths and weaknesses, and offer questions. Each presentation ends with a short Q&A period, allowing for discussion and clarification. Doing these presentations in small groups by advisor keeps the sessions to a manageable length; we have found that asking students to sit through a full three-hour class session of presentations is ill-advised.

WRITTEN ASSIGNMENTS AND FEEDBACK. The thesis seminar is predicated on the idea that steady incremental progress is a likely approach for success, so we start students actively producing on day one with an initial written assignment and continue with frequent deadlines. In the first portion of the semester, while we are still meeting as a group, the written assignments are short and due weekly. The two main goals of the writing assignments at this stage are 1) to get students thinking concretely about what they currently know about their topic, where they want to end up, and what the path from A to B looks like, and 2) to have them start putting those thoughts in writing, so that later drafts can incorporate these reflections, easing the common pain of 'how to begin.'

Another benefit is that each assignment gives the advisors a chance to check in on the student's progress, offer guidance, and recognize any red flags early. Each assignment gets feedback (though not a grade) from the faculty advisor, and most get peer feedback as well. The second faculty reader is invited to give feedback on the prospectus, bibliography, and second and final drafts. We also require that each student bring their work to the Writing Center twice during the semester. This frequent and extensive feedback, given from a range of peer and faculty viewpoints, helps students learn to incorporate criticism into their writing process and to consider their reader's point of view, and encourages knowledge-sharing throughout the process.

During the very first class meeting, students write a short, one-to-two page prospectus and task breakdown. By writing together in this limited time frame with such a minimal amount required, the student bypasses the all-too-common feeling of panic that can stall the writing process before it begins. The prospectus lays out their thesis topic, justifies its importance, and describes any progress they have made so far and plans for moving forward, followed by a list of research tasks to be done over the course of the semester and a timeline for completing them. The task breakdown helps students to split their work into manageable chunks, which helps to make it feel more approachable and helps them to think concretely about how to distribute those subtasks over the available time. The prospectus is a useful tool for advisors to see where each student stands in the planning-and-research process, and to catch students who may still need help finding or refining their topics. It also means that students now have a germ of writing to build from, and need not be faced with a blank page again. After receiving advisor feedback, students will revise and expand this into a longer prospectus, further specifying their ideas.

Continuing the theme of taking stock, students write a data report due at the second class meeting. This assignment asks students to describe the data they will need for their analysis and give an accounting of what data they already have and what data they still need to collect. Students are asked to make a plan for how and when they will gather and organize their data, using their task breakdown as a starting point. Writing a data report makes students think concretely about what constitutes data for their project, whether it relies on experimental or survey results, a corpus of social media posts, morphological paradigms from published literature, fieldwork or interview transcriptions, or something else, and clarifies their path forward for any remaining data collection.

The first piece of required written research is the annotated bibliography, due in the third week of class. While research can initiate in many ways and we encourage students to initially think about their chosen topic free from influence of other scholars, all researchers need to become familiar with the literature in order to contextualize their work, and to avoid reinventing the wheel or wandering down paths that have already been shown to be dead ends. Compiling an annotated bibliography makes students accountable for digging into the literature from the very beginning, and allows us to evaluate whether they're headed in a productive direction with their readings. It provides students with a way to structure and consolidate their note-taking, and a place to keep track of authors' arguments, as well as data, quotations, and tables or charts that they intend to use in their analysis. Though the focus is ostensibly the reading, it's also a stealthy way to get them to produce more writing – once the bibliography is compiled, chunks of it can often be pasted directly into a thesis draft as the skeleton of a literature review.

Beginning in Week Six, we transition to a writing/review/revision cycle in which students work independently and then meet for feedback after each draft is due. The syllabus (included in the Supplementary Materials) states the due date for all written drafts, so students can plan accordingly. Drafts are turned in with a completed Peer Review Cover Sheet (see Supplementary Materials), which outlines their aims for the draft and what feedback they're most looking for. Student readers and primary faculty advisors give written comments on the draft ahead of time, then meet one-on-one during the regularly-scheduled class time to ask questions, clarify, and discuss in person. In the process of explaining feedback, new points can often emerge.

The first extended chunk of writing, Draft Zero, is due in the fifth week of the semester. Draft Zero is five to six pages long, designed simply to get students writing. Students may write any section(s) they like, and expectations of quality content or clean style are low. In many cases, students have never written a paper through multiple drafts before, and they often spend so much time trying to get everything right on the first pass that it becomes paralyzing. Draft Zero is predicated on the idea that the first draft should be quick and messy (advice given for many kinds of writing in the classic works of Elbow 1976 and Lamott 1995; see also Heard 2016), providing a base of material that can then be edited into coherence.

Draft One, due in Week Eight directly after Fall Break, is the first major draft of the thesis, 15-pages long and focused on analysis and previous literature. Students may draw on their

writing for Draft Zero, incorporating peer and faculty feedback, as well as from their annotated bibliography, revised prospectus, and presentation notes. Many are surprised how much material they already have to pull from in these earlier assignments, making the writing process less onerous and intimidating than they expected. While we encourage students to have completed primary data collection by this point and to focus Draft One on the meat of their analysis, in practice some are still working on data gathering.

Draft Two, due in Week 12 just before Thanksgiving Break, is intended to be a full draft of the thesis, though in practice this often isn't the case. The more a student has written for this draft, the more chance they have for feedback to improve the final version, and so we urge them to get through as much as possible. This deadline often serves as a wakeup call, bringing students' awareness to how much they have left to do in the limited time remaining.

The defense version of the thesis (discussed below) is due on the last day of classes, in Week 15.

The weeks with no scheduled feedback meetings are reserved for independent work. Because the classrooms are reserved for the seminar, we make them available to students as a writing space, where students may choose to work in company with their peers. Advisors are often available in the space – this can be productive writing time for us as well – and snacks may be provided. Some students take advantage of this space; others find their time better spent in other settings, either writing or performing other research tasks. We make a point of organizing a day-long write-in, with snacks and coffee, on the day before the Defense Draft is due; this is usually the best-attended write-in of the semester, and gives students a chance to ask last-minute questions of their advisors as they make their final writing push. Students also frequently organize their own group write-ins, at whatever hours work for them, taking advantage of group accountability and support.

Individual faculty members vary in their approach to this portion of the semester, and students' needs vary. Some seniors prefer to attend only the mandatory post-draft feedback meetings and otherwise continue mostly on their own, reaching out via email or office hours as necessary. Others benefit from weekly check-in appointments outside of the class period and frequent discussions of their work.

The long stretch between Draft One and Draft Two is generally where problems begin to crop up, where students can lose confidence or enthusiasm and get discouraged or run into

legitimate research hurdles, such as a failed experiment or an analytical dead end. Early warning signs of a struggling student often appear as a late or inadequate Draft One, missed meetings, or failure to respond to emails. Some students merely need a pep talk, a chance to talk through their ideas out loud with an advisor, or reassurance that setbacks are a normal part of the research process. A nudge down another path may be necessary, and, given all the writing and research skills gained by then, is typically not as daunting as the initial phase of the abandoned topic. Other problems require more serious interventions, writing tutors, or discussions with student support services. The sooner a problem is noticed the better, especially in the case of students who tend to hide from advisors when they get stuck rather than seeking help, so we find it is worth erring on the side of reaching out more often rather than less if a potential warning sign arises.

While the premise of the seminar structure is one of incremental progress, improvement rarely proceeds at an even pace. It frequently takes until Draft One for a student's ideas to begin to cohere, and we find the biggest jumps in quality of writing and analysis going from Draft One to Two and from Draft Two to the Defense Draft. Drafts and assignments, though required for completion, are not graded, in order to lessen the pressure during the first half of the seminar as students are still finding their way. A consequence of this is that we require a completed thesis at the end, and do not grant course credit for incremental work alone without a finished product. While the senior seminar is viewed as the culminating project of the major, the final thesis is the culmination of the senior seminar, and the final grade is based primarily on that output.

THE DEFENSE. The Defense Draft of the thesis is due on the last day of classes. For the defense, the student meets with their two faculty readers for 20–45 minutes to discuss their work. We frame these as a friendly conversation, not an adversarial grilling; this is the student's chance to show off their work and what they've learned in the process. The defense generally opens with a five-minute summary by the student of their project and its conclusions, followed by questions from the advisors. These questions may be to clarify points brought up in the thesis, to explore the broader implications of the analysis, or to push a student to consider and respond to possible critiques of their work from other theoretical stances. We often ask students to reflect on their research process, and comment on what they wish they had known at the start of the process, what they would do differently in hindsight, and where they would take their project next if they

had another semester to continue working. Asking students to reflect on their growth throughout the semester and engage in meta-cognition about the process helps to cement the broader lessons learned.

At the conclusion of the defense, the first and second faculty advisors confer to fill out the departmental rubric, assign a grade, and decide on any revisions they'd like to request. Revisions can be as small as addressing typos, or can include substantive changes, depending on the circumstances, and they may or may not affect the final grade assigned. The timeline for completing revisions is determined in consultation with the student; depending on the scope of the changes and student workload and preferences, the final version may be due anywhere from a few days later to the start of the spring semester. In general, however, revisions are minor and completed by the end of exam period. With the student's permission, the final copy is posted on the departmental website; Tri-Co libraries also request a copy to host on their repositories.

EXCEPTIONAL CASES. In most cases, students will write and defend a passable thesis on the normal timeline or near to it, but occasionally this is not possible. In some cases, such as a recent student whose online experiment got caught in IRB limbo, the final deadline can be extended to the start of the following semester and all will be well. Sometimes, however, a student is struggling more deeply with the process, and needs more extensive faculty guidance and more time to put together a final product that can pass. We try to keep these timelines as short as possible, to minimize the burden on faculty, who are teaching a full load while advising these struggling students. While the one-semester schedule can sometimes feel tight, the December due date leaves plenty of leeway for these exceptional cases to finish and graduate on time.

Other exceptions arise, and we try to be as flexible as possible to support students in completing a fulfilling thesis that meets our learning goals. For example, we recently had two students who had developed an idea together in an earlier course and wanted to do the thesis together on that topic. The topic required running an experiment that was time-consuming and, thus, particularly appropriate for collaboration, so we allowed a joint thesis, though this is not usually permitted. In another case, a student submitted an article based on her independent research to an academic journal and received a revise-and-resubmit decision; her thesis consisted of completing those revisions and resubmitting to the journal. (The paper was accepted and

published.) Another recent senior spent the Fall semester as a full-time student teacher for his double major in Education, and wrote his Linguistics thesis in the spring instead.

3.4. THE BENEFITS OF THE SEMINAR SUMMARIZED. The crucial components of the seminar are listed here, where all could be adopted even outside the seminar structure, and thus do not necessarily require extra institutional support. We begin with the three important factors that help build strong scholars and a strong community. Then we list the core assignments to achieve and monitor progress towards the thesis. The student benefits from:

1. Choosing a topic that is of true interest to them and determining a mode of presentation that offers the opportunity to shine.

2. Processing and incorporating feedback from multiple sources (faculty, other students, librarians, writing center staff).

3. Giving feedback to other students, both in a swap situation (on Drafts One and Two) and in a presentation setting.

4. Completing several discrete writing assignments and drafts with deadlines spread across the semester. Below is our full list, though this could easily be winnowed to accommodate other institutional exigencies.

(a) a quick (one or two-page) prospectus with what they know about their topic, what they want to figure out, and what they think they'll need to do in order to figure it out;

(b) a data report, describing what data they have so far, what type of data they need to collect, and how to collect them;

(c) an annotated bibliography;

(d) an initial draft due about a third of the way through the semester that is short (five to six pages) and expected to be of poor quality, just to get them going;

(e) a more extensive draft (~15 pages) due shortly after the middle of the semester (Draft One);

(f) a draft of the entire thesis (of any length) due late in the semester (Draft Two);

(g) a final draft due at the end of the semester, with possible revisions.

4. POTENTIAL ADJUSTMENTS TO THE COURSE STRUCTURE. Implementing this structure in full requires a considerable allocation of resources on the part of the institution. Faculty need to

have the time and energy to spend on student advising, and the larger number of intermediate drafts and other assignments requires more time spent on reading and commenting. This is why our department gives teaching credit for thesis advising – the workload is comparable to that of any other course. We believe that the investment is worthwhile in terms of improved outcomes, while also recognizing that we are privileged to have such resources to allocate.

Even at institutions where wholesale implementation of this kind of seminar isn't possible, selective adoption of those aspects of the course which are feasible can still be valuable for student learning, keeping in mind the list of benefits at the end of Section 3. For programs which can only implement portions of this setup à la carte, some powerful interventions which can nonetheless be easy to implement on their own are 1) early topic selection, so students begin the semester ready to get started; 2) frequent, small, concrete milestones with substantial feedback and revision towards a final product; 3) the opportunity to read past successful theses, to provide examples and demystify the process; and 4) cohort and relationship building, whether through communal write-ins, one-on-one or small group meetings, or other avenues. We urge that the collective accountability and support aspect of the structure we outlined be maintained, as this has been key to our success.

Other adjustments are possible depending on a given program's needs. A peer review system is the foundation to creating a community of scholars, and can be implemented regardless of whether one has the apparatus of a course. Students writing a thesis can be required to serve as a peer reviewer and to hand in written comments on another student's thesis work at regular intervals.

Second faculty members could be asked to participate much less, perhaps only at the Draft One and Defense Draft stages. Further, those second faculty members could be invited from other relevant departments or institutions, reducing the burden on the linguistics program proper. In earlier years, we did this often, and we still have occasion to do it now and then. Such interaction can build bonds that benefit the students, departments, and institutions.

Instructors can draw on other institutional assets, such as writing centers and subject librarians, to lighten their teaching load, expose students to the range of resources available to them, and, again, develop that sense of a wider community of scholars with shared goals. Many staff members have expertise and experience that they might be delighted to share with others.

Reaching out can benefit all in multiple ways and can instill in students a broad sense of how a body of knowledge grows.

The seminar outlined here does not rely on face-to-face encounters in the classroom. In Fall 2020, with classes taught remotely due to the pandemic, the thesis moved to a Zoom-based online modality. On the whole, the seminar in Fall 2020 proceeded online very much as it would have in person. Seminar meetings, write-ins, presentations, and feedback sessions continued as in a normal year, but over video calls rather than in person. Some students organized their own weekly Zoom write-ins and a group chat, which further helped strengthen a sense of community and accountability, especially key in the remote setting. One significant adjustment was the cancellation of the second presentation, as the semester was one week shorter than usual and students were under extraordinary amounts of stress arising from the challenges of the moment. The problems we encountered in the remote-teaching environment stemmed primarily from matters endemic to the larger situation, including differences in students' access to adequate technology, time zones, challenging family and living circumstances, and the mental and emotional stresses of the pandemic and political/social climate. Due to these factors, a larger number of students than normal extended their writing an extra month or two and plan to defend early in the spring semester of 2021. One benefit of remote teaching was that students could invite people such as family members to attend their presentations and defense. Perhaps once we return to face-to-face teaching, this benefit can be integrated into the seminar via Zoom.

5. CONCLUSIONS. The seminar structure described above in all its details was first implemented in 2017, and has undergone minor adjustments every year since. In the five years prior to that, the thesis seminar was much less structured, with no advance topic selection, fewer incremental assignments and no group meetings after the fifth week of class. We undertook this redesign of the seminar to address the shortfalls we perceived in the quality of the theses being submitted and the aspects of the task that we saw our students struggling with. Our departmental rubric for thesis assessment (see Supplementary Materials) was new enough when we redesigned the course that meaningful quantitative before-and-after comparisons aren't possible, but the quality of theses has clearly improved, and the students are finding the process smoother and getting stuck less often.

This is not to say that the process is problem-free. Every year, a few seniors find themselves overwhelmed, behind schedule, unable to articulate a coherent research question or analysis, and/or struggling with the writing process. For these students, extra one-on-one attention and increased engagement with the campus Writing Center can help, but for some it is an uphill climb regardless. These problems seem to stem from the students' preparation over the preceding three years – we are looking into additional interventions elsewhere in the curriculum to address them – and their impact is reduced under the course design described here.

We hope that our thesis seminar can serve as encouragement for other undergraduate linguistics programs, who can adapt it for their needs and continue to improve upon it.

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