Senior Thesis Advice from Those Who've Done It

General Advice & Morale Boosting

The most important piece of advice that I received from an alum, which certainly kept me going as I sat in my basement carrel continuously drinking tea, was: work hard on your thesis, do a good job, but remember it does not have to be perfect -you will not cover everything and you will have mistakes and that is OK. The thesis is way more about the process than the final product, so try to have fun along the way!

The biggest discovery I made as I worked on my thesis was that it did not have to be the culmination of all of my academic work and interests throughout my time in college. While you want to pick a topic that interests and engages you, and builds on the interests you've developed during your time at Haverford, the thesis will not be exhaustive, and may not necessarily tie every single one of your interests together. It can be easy to put pressure on yourself, and to feel like the thesis needs to be the best piece of work you've produced in college, and the work that most represents you (at least academically), but this pressure will most likely be detrimental to the actual process! While the process can be immensely rewarding and stimulating, I found it useful to treat mine like it was just a longer paper than I'd had to write before, rather than an entirely separate pursuit with entirely different expectations and standards. As you work on the thesis, it will develop and expand naturally, so by the end it will stand apart from other papers you've done, but hopefully minus the internal pressure that it must do so. In other words, if your thesis isn't your favorite thing, or you don't feel like it's the best thing you've ever done, that's OK! Try to remind yourself along the way that this doesn't need to be the be-all, end-all—recognizing this will probably help you create a better final product anyways!

Defining a Topic and Doing Research

It's natural to be swimming in information and possible ideas during the first one, two, or even three months of your research. It's OK to let yourself swim. The fact that your topic does not feel as though it has reached some sort of solid 'ground' for a few months is not a problem. If you can continue to work on your thesis -- even before it feels as though it has its spine -- you will avoid a lot of anxieties that seniors commonly face.

Start early when it comes to picking a topic and narrowing your argument. You don't need to have written the first forty pages of your thesis when you come back from winter break but if you have a really solid idea of what your topic is and what you will be arguing you will be in a pretty good spot. What you don't want is to use the first month of the spring semester sorting out exactly what your topic is and then realize two weeks into February that you have a month to write 60 pages before your rough draft is due.

Don't be afraid to write a lot and edit it down later. One thing you may find with your thesis is that the nature of the larger project requires that you continue researching and redefining your

argument as you write (something that happens less often with shorter papers). That often means that you will have to cover more ground in your writing so that you have a foundation from which to pursue a number of arguments later on. As you narrow your argument and pick specific ideas that are important you can then go back and cut out what you don't need. This type of writing is slightly more inefficient but it is also par for the course on a project of this magnitude.

Do not pick a topic out of thin air. Use previous themes, ideas, research experiences, and work from other classes to formulate your research question. This ensures both that you will have something to work off of and that there is a faculty member equipped and interested in guiding you along through the process. The better your grip is on the field and the central texts and resources you will need to consult in crafting your thesis, the more time you will have to write and the smoother the process will be.

When I began the thesis project, I thought the hardest part would be actually writing the thesis. In hindsight, in some ways the writing was actually the easiest part. What required the most effort and organization was the "prep" work. Obviously, if you are writing a science thesis this makes sense: lab work is the very crux of your project. In the humanities and social sciences, however, this is not immediately obvious (at least it was not to me). During your research, do yourself a favor and take the time to find a consistent organization system. Take rigorous notes (preferably on a computer so you do not lose them and can easily search them); if you're doing a thesis that requires numerous sources you don't want to have to reread these materials numerous times, so try to write notes that are fully comprehensive. Create your bibliography as you go (trust me, do not leave this until the night before your draft is due). Find one place to keep all your materials, especially articles (electronically, in your carrel, in your room, etc.). If you put the time and effort into the research stage of your thesis, the writing should be a lot easier because all of your materials and notes will be at your fingertips. Additionally, if you jotted down your thoughts and ideas as you took notes, you will have already begun the process of synthesising the pre-existing literature and developing your intervention.

If you're having trouble picking a topic, try diving into research and see where it takes you. When you have a vague idea, or a very broad area you think you want to focus on in your thesis, it can be intimidating and difficult to hone in on what your particular focus might be. While it may seem important to pin down your area of focus before beginning research, it's important not to get stuck in this phase, as it's not the most productive. When your ideas are still pretty broad, it's also daunting to start researching because it may not be clear where to start, which can be another roadblock. My suggestion here is to just pick something more particular and start reading about it—choose something to focus on within your general topic, and see what you think of it. This doesn't have to mean you're choosing this as your definitive focus, but rather gives you somewhere more particular to start researching, and that then will help you develop a sense of where your interests within a topic lie. Beginning to read will also help you feel like you're starting to make progress and accomplish something, which is an important psychological boost to have towards the beginning.

Working with your Advisor

Maintain open lines of communication with your advisor and be clear about what you need from them in order to succeed during this process. For example, if your advisor does not set fixed turn-in dates throughout the semester, create a schedule together to ensure that you are on track and getting adequate feedback. If you are panicking about a short section you just wrote, ask if she might have time to read it even if it doesn't correspond with a turn-in date. If you need to meet outside of a regularly scheduled meeting time, ask to meet. Although you should be reasonable with regard to meeting and requesting feedback, there is no way for your advisor to know that you are struggling or feel as though you are not receiving adequate guidance unless you take responsibility and vocalize it.

The other crucial component of the thesis project that will make the actual writing easier is managing your relationship with your thesis advisor. Maybe your advisor is really on top of their stuff, provides consistent and helpful feedback, and is always available. Awesome. But do not expect this to happen. Try to get your advisor to meet with you on a regular basis at a regular time and develop deadlines that work with both your schedules. You want your advisor to be involved at every step of the process (including research) so they do not turn around in April and say that you need to do new research or rethink your entire argument from scratch.

It's useful to think about how best to communicate with your advisor. While many people already know and have a relationship with their advisor, some people are working with a professor they haven't worked with before, and additionally, even if you know your advisor well, working with them on the thesis may be different from the relationship you had with a professor in a typical class. This is just to say that it's worth taking some time to think about what you hope to get out of the advising relationship, what kind of advising style works best for you, and how you think you can shape this relationship to be a meaningful one. I discovered that I could process written feedback on my thesis more easily than verbal comments, so though in-person meetings were useful and important, I really benefited from having extensive written comments on my writing, as I needed some time to process the feedback and liked being able to return to it. This might be the kind of thing you already know about yourself, or something you discover during the process, but it can be very helpful to be attentive to this.

Writing and Revising

Think of each thesis chapter/section as its own shorter paper. Have an introductory paragraph and a "thesis statement" that ties back to your overall argument. Have a conclusion that reinforces your argument and indicates where you are going next. This not only makes writing a thesis more manageable, but keeps you organized and focused as you write. It also is easier for your reader to follow and connect back to your overall argument.

It is almost inevitable that you will have to cut. Heavily. Not just words, sentences, and paragraphs, but pages and sections, sometimes ones that you labored over arduously and that you really like. Be disciplined and don't be afraid to ax parts that do not contribute to your overall

argument or are substantially weaker. It is important to draw out the richness and complexity of your argument, but not take the reader in an entirely different direction. Reserve as much time as you can to think through which parts are essential and which can go. These decisions can be just as time-consuming as the actual writing of your thesis. (And of course, create a separate document to keep all of the parts you cut out so they are not gone for good).

Take breaks. When you finish a section, move on to another and wait several days or even a week to go back to it. It is very difficult to approach something you've written with a clear head and critical eye when you have been immersed in it for days on end. Before you attempt to make changes or completely scrap parts you don't think are good enough, give yourself time and distance so that you can be a better judge of your own work.

Navigating the Emotional Dimensions of the Thesis

You will likely become very fatigued and disillusioned not only with the thesis process, but also with your thesis topic and research, the more substantive aspects you thought you cared about so deeply. When you pour yourself into something as intensely as you do when writing a thesis, this is a perfectly normal feeling. But push through it. Try and hold on to the reasons or experiences that piqued your interest or sparked your passion in the topic during the days when you averaged more hours of sleep and were not yet in a panic about getting it all done. Remember why your work holds meaning for you, and why you think it matters within the overall scholarly debates in your field. Maintaining a sense of purpose (beyond needing a passing grade to graduate) is key.

Writing a Thesis in Biology and other Sciences +Math + Psychology
Biology

Make a conscious decision about whether you want to present your results in chronological or logical order. It is tempting to go on autopilot and narrate your experimental process entirely chronologically (then I did this and it didn't work, and then I did this and it kinda worked, and then...) but sometimes there is another order based on logic that is both more accessible to readers and does a better job of highlighting the thinking your did as a scientist designing and guiding your own project. Chronological presentations do have the advantage of being very transparent and honest which is something you do not want to lose, but don't feel entirely bound by chronology.

Remember to always include your initial expectations. What you found is most interesting/significant in relation to what you thought you would find - even if this raises an unexplained contradiction. Often by contrasting expectations and results you generate a narrative which makes your thesis both more clear and more interesting to read. Reporting science is telling several stories: both the story of your process and the molecular/chemical/physiologic story that you are discovering.

Focus on the transitions. Not the transitions between segments (you don't need to make an effort to segue from materials and methods to results) but rather the transitions within each section (from describing the results of one experiment to the next, for example). I would try making an outline with just transitioning statements, making sure you have a nice series of them that flow, connected either by logic or chronology. Focusing on transitions lets you highlight the interpretation and experimental design work that you did throughout your project which really displays how you took intellectual ownership of your thesis, something your professors would like to see.

Don't get stuck in a passive rut. The passive voice does sound "scientific." This is because for years, many disciplines encouraged reporting science in the passive voice. However, these standards have changed. Many prominent journals in biology now actively ask that you avoid the passive voice. Go through your thesis and make sure the actors are apparent: the cells did not place themselves in the incubator - you did! Including the experimenter in the scientific narrative is not introducing subjectivity or bias - it is just being honest! You were there, so write yourself in.

Psychology

In psychology, the lit review serves as the rationale for doing your study. Make sure that everything in your intro section serves to explain and lead up to your study and provide explanation and justification for where you got your research questions, why you are doing the present study, and what you hope to add to the field. Clarity is key in the methods and results sections; these should be very linguistically straightforward. If you have questions about how to report certain things or run certain statistical tests, ask your adviser! When reporting and analyzing results in your discussion section, remember to be clear and focus on what is most important and most interesting. You might end up with dozens of results and exploratory tests that you ran, but be careful that it doesn't become a jumble of reported results with equal weight on each one - choose the results that are really the meat of your thesis and focus your analysis there.

Math and Physics

The following advice reflects my experience in applied mathematics and theoretical physics, but I suspect it may be true for other fields as well. It is primarily about the importance of actually understanding what you are talking about when you are writing your thesis, and is not really about the actual writing process, except insofar as a writer can only give a clear exposition about a topic that he or she understands clearly.

The difference between a pretty good thesis and an excellent thesis is that whereas the structure of a pretty good thesis reflects the author's frantic fumbling for all the pieces necessary to write the story, the structure of an excellent thesis reflects the author's ability to discriminate between those parts of the narrative that are necessary, and those parts that can be abridged. This difference arises as a result of the author's knowledge and preparation. A

pretty good thesis represents the sum total of the author's knowledge about the field, and is therefore not aware of its own scope, whereas the author of an excellent thesis possesses a knowledge that extends far enough beyond the strict confines of the specific work that the author is able to constrain the scope of the thesis in a way that gives a sense of self-containment and completeness.

If you want to write an excellent thesis of the breed that I have defined above, you have to approach the task of writing the thesis with the intention of becoming fluent in the language of the field. At the beginning of the process, if you take the foremost review article in the field, the chances are (at least in physics) that if you open it to a random page you will not understand it at all. To write an excellent thesis, you need to have an understanding of the context within which work is done in the field, which means that you should be able to open to any page in the review and, without too much work, articulate what it is that is going on and how it pertains to work in other parts of the review. The process of writing your excellent thesis will be similar: at every step, you have to figure out what the connection is between what you are writing about and the field as a whole, and you need to articulate it for your reader; and likewise, for every detail you choose to omit in your excellent thesis, you need to be able to articulate a good justification for why you chose to omit it.