

# Personal Statements: A Secret Family Recipe

by Dan Margalit

Personal statements are hard to write, especially if you don't have any examples to work from, or don't know what the reader is looking for. What follows is the recipe I have given to many undergraduates for writing personal statements for their graduate school applications. Everything here is my opinion. There are lots of different approaches that can be successful.

*Scannability.* The most important thing to know about your personal statement is that it is likely to be scanned by the reader, not read. This means you should make your main points stand out as much as possible.

*The seven deadly sins.* The most common missteps in personal statements are: (1) telling your life story, (2) using quotations, (3) being cheesy, (4) writing flowery prose, (5) giving too much math detail, (6) writing chronologically, and (7) making excuses.

(1) It's great that your grandparent taught you about trigonometry when you were a kid sitting in his lap (as mine did for me), but this has very little to do with your qualifications for graduate school. Also, by the time the committee members get to the 40th application that starts with a story about childhood, it feels stale.

(2) Quotations do not add to your statement. It is easy to Google "inspirational math quote" and copy and paste. I want to hear what *you* have to say, not Google.

Items (3) and (4) are similar. Scientists tend to write in straightforward prose. Put away the thesaurus and get your point across as simply as possible. Analogies, metaphors, jokes, etc. distract from your main point, namely, why you are a good candidate.

Item (5) is important. You might think that every senior mathematician must know everything you know, and therefore you can explain Lemma 7.2 in detail. What you should do instead is explain the big idea of your project, give some flavor of what went into it, and describe as much as you can without getting technical. Do not overestimate the reader.

As per item (6), chronology is not important. The reader wants to know why you are qualified for graduate school, and so you want to hit them with your best accomplishments up front. These are usually different from the things you did earlier in your life.

Item (7) is a general rule of thumb about excuses. Sometimes there is something in your transcript that needs to be explained. Just be mindful of how your explanations will seem to the reader.

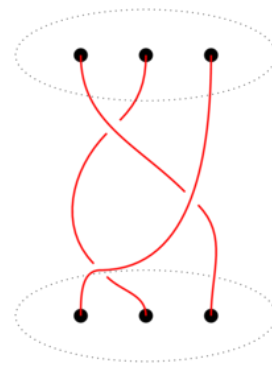
What follows on the next page is a sort of template one can follow to write a statement. Your actual statement should be two pages instead of one, but this should give the flavor.

# Personal Statement

Dan Margalit

I am a graduating senior and math major at My University. I have taken many of the courses in my department, including complex analysis, algebraic topology, and Galois theory. I have done two independent studies, in probability and numerical analysis. I also participated in the 2023 CUBE REU program at Georgia Tech, working under the mentorship of Dan Margalit. As part of the REU we wrote a paper that was published in *Involve*.

*REU.* My REU group proved several theorems about the braid group. The picture shows a braid on 3 strands. We specifically studied the level  $L$  subgroups of the braid group, introduced by Brendle–Margalit. One of our results is the determination of the quotient group of the braid group modulo the level  $L$  subgroup. This generalizes work of Artin (the  $L=2$  case) and Stylianakis (the case of  $L$  prime). With my postdoc mentor Wade Bloomquist and my groupmates George Burdell (GIT) and Tom Brady (Michigan), we wrote a paper called “On the level subgroups of braid groups,” which was accepted by LRM.



My specific contribution to the REU project was to perform computer calculations for the simplest cases. This involved implementing the Reidemeister algorithm for finding generating sets for subgroups, and also some combinatorial topology. Once we had the output from the program, we plugged the results into GAP, and we were able to see the pattern for what the quotient should be. I then worked with the group to formulate the plan and execute it.

*Independent study.* In my senior year, I did an independent study with Prof. Harry Styles. Together we worked through the book *Introduction to Numerical Linear Algebra* by Dr. Seuss. The main topics we covered were conditioning, stability, and eigenvalues. I did all of the exercises in the first five chapters and wrote up the solutions carefully in LaTeX. I also discovered on my own a tractable open problem and worked to find a partial solution. I presented this work at MAA’s MathFest, and won an award for *Outstanding Poster*. The joy from this process convinces me that a PhD program is the right choice for me.

*Teaching and Outreach.* I have been a committed member of the math department and broader community. For example, I have been the president of the math club. As president, I increased participation twofold and also organized a Calculus Carnival that is now an annual event. I also was a tutor for all four years at My, working one-on-one with students who struggled in Calculus. Finally, I volunteered at many local Science nights, covering topics such as fractals and soap bubble geometry.

In summary, I have taken advantage of many of the opportunities afforded to me at My University (and beyond). I have greatly enjoyed my experiences with math research and am eager to continue at the next level. My goal is to become a research mathematician at an R1 research university, and I am looking forward to the next steps in this journey.  $\square$

Some commentary on the sample statement:

The first paragraph is very important. As with anything you write, you should assume exponential decay in readership. So you should front load the executive summary to the first paragraph. If you had a minute or two to explain to the Director of Graduate Studies why you should be admitted, what would you say?

Each paragraph that follows should be about one “thing” that you did, starting with the most relevant and going from there. Use clear and direct first and last sentences, since that is what a (human) scanner will most likely see. I suggest starting with a simple topic sentence that says what the paragraph is about, and ending with a specific, deliverable accomplishment.

Save teaching and outreach for the end. If you are applying to an R1 math department, they want to find the best researchers they can. Outreach and teaching are important parts of the job, but the more you can distinguish yourself as a researcher, the better.

Notice in my second paragraph that (I think) you can get a lot out of the paragraph without knowing anything about braid groups. You also get a sense that I care about you, the reader (pictures = caring) and that there were specific things accomplished.

I don't talk about too many soft aspects in the statement. Saying that you enjoyed a class is usually not so impactful. I prefer to hear about hard facts. One might argue that this is just repeating what is in your CV. On the other hand, you do want to hit the graduate committee over the head with the good things you've done, and you can also add a little bit of color and background in the personal statement (see the “joy” in the sample).

Notice I did not say anything about the school I am applying to. Whether or not you do this depends on the school and your reasons for applying. Telling Harvard that you really like their location probably won't help. On the other hand, if you have one or two specific people you want to work with, a brief discussion of this can be helpful. But don't write anything shallow that results from a 30 second look at someone's web page. Maybe you have met Prof. X and/or talked to them, or you did a project based on one of their papers, etc.

In my sample statement, I tried to include as many “money phrases” as possible. These are sentences that make sense independently of the mathematics, and support your candidacy. Examples are: generalizes work of Artin, accepted to *LRM*, etc. As much as possible, synthesize your application for the reader; don't expect them to do it.

Notice the paragraph headers. A quick scan of the page already says a lot, and a quick scan of any one paragraph should give you a quick idea of what is going on.

I like having an ending to wrap things up, summarize your case, and leave the reader on a positive, uplifting note. With that in mind, I wish you luck with your personal statement and look forward to reading it!