Understanding How to Design a Social Computing System That Helps PhD Students Collectively Navigate Mistreatment or Abuse in Advising Relationships

Iane Im

imjane@umich.edu University of Michigan USA

ABSTRACT

People in power causing harm to those with less power is a long-standing problem across organizations. Academia is no exception. When advisors mistreat or abuse PhD students, how could a digital platform help affected PhD students connect with each other for collectively exploring solutions? To understand if there is a need for such a system, and how to design it, we conducted interviews with 10 PhD students. Our findings showed participants were overall positive about the high-level concept of a system for connecting PhD students to address problematic advising. Participants emphasized various social and technical features needed for comfortably using such a system. Simultaneously, participants had different preferences on how they would use it, based on their risk levels. We conclude by reflecting on the importance of centering users' consent in nuanced ways when actually building the system.

CCS CONCEPTS

• Human-centered computing \rightarrow Collaborative and social computing.

KEYWORDS

Mentoring, PhD advising, consent, academia, abuse of power, mistreatment, academic bullying, power dynamics, rankism.

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1 INTRODUCTION

Rankism, which is an "abusive, discriminatory, and/or exploitative behavior towards people because of their rank in a particular hierarchy" [8] is a common problem across organizations. When looking at workplaces, in both North American and European contexts, at least 10-15% of the workforce has been exposed to hostile, aggressive, or abusive behaviors, so called as "workplace bullying" [4, 38].

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Kentaro Toyama

toyama@umich.edu University of Michigan USA

A recent study suggests the rates are also non-negligible for countries underrepresented in research, such as those from South America, Asia–Pacific, and Middle Asia regions [17].

Unsurprisingly, such problems also exist in academia, which is based on an apprenticeship model that involves faculty closely advising and/or mentoring PhD students [5, 13]. Mentoring could be an impactful way to positively influence (or even transform) people—for both mentees and mentors [32], but sadly, there exist deep-seated problems of faculty mistreating or abusing PhD students [12, 13]. In this work, we aim to understand how to design a system that encourages PhD students to collectively navigate situations of mistreatment or abuse in advising—which we define as harmful, unethical, and unprofessional behavior that a faculty member shows toward an advisee. Abuse refers to egregious cases and mistreatment indicates subtler ones (e.g., ghosting, exploitation).

While there exist socio-technical systems that are aimed to address such problems, they often fail to repair or prevent harms. Many organizations, including universities, have anonymous online forms for reporting, but they are not frequently used. The Equal Employment Opportunity Commission reported in 2016 that only 6 to 13% of people who experienced harassment at work filed a formal complaint [6]. The reasons include anticipated risk to personal safety and reputation in one's career [11].

An alternative to directly reporting alone would be to seek remedial steps in a *collective* manner. That is, people who have been harmed could try to first identify others who have experienced similar problems. But, as the #MeToo movement has shown us, this does not happen easily [11]. The main reason is that it requires people to trust one another to share information in a high-risk situation—which is even more difficult when people do not know each other's identity [2]. Oftentimes, the sharing of information happens through whisper networks—private, informal channels of communication for exchanging highly sensitive information [26].

When a faculty member mistreats or abuses a PhD student, could a well-designed digital platform help affected PhD students identify and connect with each other for collectively exploring potential solutions? To understand if there is a need for such a system, and how to design it, we conducted interviews with PhD students. These interviews served as the first formative study for a system we plan to build for addressing the problem of advisors' abuse or mistreatment of PhD students. Specifically, our research questions are:

 How do PhD students perceive of using a digital platform to connect and share experiences with each other, in cases of advisor abuse or mistreatment? What kind of features do PhD students need for trusting such a system, and each other, to the point where they can begin taking meaningful action?

As a first step, we conducted 10 semi-structured interviews with PhD students. Our findings showed that all participants were positive about the high-level concept of a digital platform that would enable them to connect with one another to discuss advising challenges. The interviews revealed social and technical features that are needed for PhD students to trust the system, as well as other users. Results also showed that participants with different risk levels had varying preferences on how they would use the system—which highlights the degree to which user consent in engaging with the system is essential [14]. While we focused on advising relationships, these findings are likely to be applicable to contexts where PhD students face challenges with other faculty who are not one's advisor. Our findings also have broader contributions to the design of social computing systems that help people with less power to collectively navigate rankism and abuse of power.

2 BACKGROUND AND RELATED WORK

We first review research on employee mistreatment in workplace settings and advisors' mistreatment or abuse of PhD students in academia. Then, we discuss social computing systems that tackle problems relevant to power structures in academia.

2.1 Employee Mistreatment in Organizations

Problematic behaviors caused by people in power targeting those with less power—referred to as workplace bullying [21] or employee mistreatment [23]—have been extensively studied in organizational studies and business management [4, 16, 19]. The following definition of workplace bullying is commonly used by researchers.

"[Workplace bullying is] a situation in which one or more persons systematically and over a long period of time perceive themselves to be on the receiving end of negative treatment on the part of one or more persons, in a situation in which the person(s) exposed to the treatment has difficulty in defending themselves against this treatment." [21]

This definition shows that workplace bullying is not limited to obvious physical or verbal attacks—they are often subtle in nature and deeply embedded in workplace practices, such as the victim being isolated from their peers [20, 39].

While there exist differences in how researchers define the required frequency of the behavior (e.g., more than once a week versus less than once a week) and timeframe (e.g., at least six months versus within the last six months) in order to determine whether a behavior is bullying [37], efforts to synthesize results from various studies show that bullying is a non-negligible problem [38]. A meta-analysis of published papers suggests that in Europe, at least 10% of employees in many organizations experience bullying—which includes those happening less often than weekly and of a duration of less than six months [38]. Without a strict frequency and timeframe, and by only asking participants if they think they were bullied (after giving them a definition), the number of employees who perceive they experienced negative behaviors, such as being yelled at, teased, or humiliated, increased up to about 20% [38]. Researchers have pointed out that these numbers could be

underestimates, as there would be participants who do not report their experiences [16].

One large gap in the space is finding ways to come up with solutions, including both formal (e.g., codes of conduct) and informal (e.g., positive norms) ones [4]. While there are decades of work on understanding bullying, there is a long way to go to design comprehensive interventions that leverage those findings [29]. As of now, common interventions are "No Bullying" policies and training [4]. In this work, in the context of academia, we explore the idea of designing a system that helps people affected by mistreatment to connect with one another, as the first step toward finding a solution.

2.2 Mistreatment or Abuse of PhD Students in Advising Relationships

Similar to what is discussed in Section 2.1, researchers often use the phrase "academic bullying" to refer to problematic behaviors perpetrated by people in power in academia [5, 24]. Recently, Cohen and Baruch proposed a conceptual model to explain faculty's abuse and exploitation of PhD students based on a thorough literature review [5]. The authors frequently use expressions such as "bullying" and "abuse and exploitation," but have also provided a concrete list of PhD advisors' behaviors that can be labeled as problematic.

"Previous studies have identified various ethical problems in supervision including incompetent and inadequate supervision, supervisor abandonment, imposition of supervisor views, abusive and exploitative supervision, bullying, encouragement to commit fraud, and authorship issues (Löfström & Pyhältö, 2020). Ethical issues may also take the form of abuse, exploitation, misappropriation of a student's work, harassment, and racism (Martin, 2013). Dual relationships are also problematic; supervisory connections consisting of deep friendships and therapeutic or intimate interactions are emotionally and psychologically confounded supervisory connections (Löfström & Pyhältö, 2020)." [5]

In this work, we consider a wide range of such harmful behaviors listed above. But, because there is a difference between egregious harm and more subtle harm, we use "mistreatment" to refer to less serious but still problematic advising, such as unprofessional behaviors (including dual relationships mentioned in [5]), exploitation, and mishandling of credit. We use "abuse" to refer to more obvious harm, such as sexual assaults and racial harassment.

Studies that show the exact frequency and degree of faculty's misbehavior across fields are rare, which is probably due to academia not questioning problematic advising [5, 31]. One exception is a study by Jacob et al. (2019), which shows 24% of PhD students at a European institution self-reported experiencing some kind of abuse of power by faculty [15]. While not focused on abusive advising relationships, a survey study with 5,700 doctoral students worldwide showed that 23% of the participants replied they would like to switch advisors if possible [35]. Other studies consistently show strong relationships between advising and PhD students' mental health [7, 18, 25] or success in the program [12]. Specifically in Human-Computer Interaction (HCI), a recent qualitative study has shown that graduate students perceive advising relationships as one reason for stress in graduate school [28].

A major difficulty PhD students face after experiencing abuse of power or mistreatment from one's advisor is making sense of what to do next. An interview study with doctoral students shows that many perceive the process of switching to another advisor, or deciding to switch at all, is difficult due to power differentials [12]. The study revealed that in some cases, abusers made it difficult to find new advisors [12]. This compounds the negative impact of problematic advising on a PhD student's trajectory; a study has shown that PhD students who have greater control over switching advisors perceived less disruption under high-stress situations [3].

2.3 Systems That Tackle Problems in Academia Related to Power Dynamics

Developing systems to mitigate abuse of power in academia is relatively less explored in HCI. The closest work has been mainly about making communication between mentors and mentees, or teachers and students, less burdensome [9, 10, 36]. Xie et al. (2022) created StudentAmp, an interactive system for instructors to get feedback about teaching and students' self-reported demographic information [36]. The system lets instructors understand the challenges students face, especially those experienced by minoritized groups [36]. Another example is Garg et al. (2023)'s work on Orchestration Scripts [10], although the authors' focus was not on mistreatment. Orchestration Scripts leverages programmable technologies to encode work situations in workplace software while considering an organization's own way of working, and surfaces relevant strategies at the right time [9, 10]. A deployment study showed that Orchestration Scripts helped research mentors become more aware of situations they did not always keep tabs on [10].

3 METHOD

As a starting point to answer our research questions, we conducted semi-structured interviews with 10 PhD students in December 2023.

3.1 Participant Recruitment

Using mailing lists, we recruited 10 participants from two PhD programs within an R1 institution in the United States. All participants were PhD students in computing and information-related fields. To ensure participant confidentiality, we did not collect demographic information. Participants' year in the PhD ranged from first year to sixth year, with the average being 3.8 years. All participants were compensated \$20 per hour via an Amazon gift card or a check.

3.2 Initial Design Ideas and Rationales

In this section, we describe the initial designs that we showed our participants and our rationales behind the designs. First, we explored the idea of the system having a *feature for documenting and selectively sharing their experiences with a customized audience* (Figure 1-a). This could sound similar to a public forum, but is very different in the sense that a user can share one's experiences with nuanced levels of visibility. For example, a PhD student can decide to make one's post visible to only other students who chose the same keywords describing problematic advising dynamics (e.g., ghosting, authorship issues) or the same faculty member. The far end of the spectrum would be to make the post public to all PhD students on the system. The rationale for including this feature is that we hypothesized PhD students would want to share and learn from each other's experiences in a careful way. Research on privacy

and social platforms has shown that individuals have different preferences on how to share information online [22, 33, 34]. It is thus likely that PhD students have different comfort levels on how to selectively post their experiences in a high-risk context.

Next, we included a *messaging feature* for relatively private and smaller scale conversations (Figure 1-c). Research suggests that direct messaging is often more used for developing and maintaining relationships [27]. We envisioned that direct messaging would be helpful for PhD students who discover another student and want to give or ask for more detailed information in a private way.

We also included a *feature for submitting or/and posting names* of relevant faculty (Figure 1-b). This is because faculty names are key information in connecting PhD students who have experienced similar problems regarding the same faculty member or faculty who know each other well (e.g., close collaborators). Faculty names are also needed in order for solutions to be fleshed out, especially those from the administration side. We gave participants three different options—1) submitting a faculty member's name privately to the system, 2) posting information about the faculty member on a page dedicated to each faculty member—without tying one's account, and 3) publicly referencing the faculty member's name in their post (which is tied to one's account). We did not specify what would happen to the submitted names and kept it open-ended.

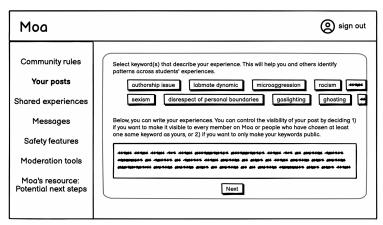
Lastly, we were interested in implementing an *information escrow* on the system. Information escrows allow people to submit information to a trusted agent, who forwards the information to the right person or group if pre-specified conditions are met [2]. However, we did not delve deep into escrows in this phase of the study, other than the possibility of matching students based on faculty names, due to the length and complexity of the interviews.

3.3 Interview Protocol

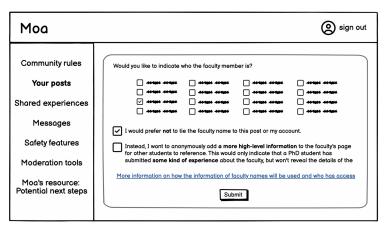
Our goal was to enable participants to feel comfortable enough to candidly give feedback on our designs. Because of this, we deliberately did not ask for their experiences, which could be triggering. Furthermore, if we elicited participants' own experiences, we thought that could discourage PhD students from signing up for our study, especially those who experienced particularly challenging advising situations. Instead, for this phase of the interviews, we showed participants a hypothetical scenario to ground the interview questions. We chose a scenario depicting a faculty member's advising that is not too egregious, but problematic to some extentan advisor requesting a PhD student to spend around 10 hours per week on non-research tasks in an unbending manner (scenario is included in the Appendix). This is because less serious but still problematic behaviors are more common. Furthermore, if we showed an egregious scenario, we expected participants to give (almost) the same answers. Our study was exempt-approved by our institution's Institutional Review Board.

Only the first author, a PhD student, conducted the interviews. We first asked for participants' thoughts on the scenario, especially focusing on what would they do, if they were the student. Then, we gave them time to read a high-level scenario about the system we aim to build. Next, we asked them a series of questions that involved showing mockups of potential designs we had in mind (Figure 1).

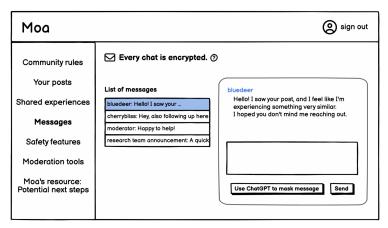
 $^{^1\}mathrm{We}$ plan to conduct subsequent interviews that delve into participants' experiences.



(a) PhD students can anonymously write their experiences with varying degrees of visbility.



(b) Feature for indicating who problematic faculty are, with varying levels of anonymity.



(c) Encrypted messaging feature.

Figure 1: Example mockups for interviews that show a system for enabling PhD students to connect around advising challenges.

We gave participants time to observe each mockup and nudged them to think aloud their thoughts. We also asked prepared questions for each mockup (included in the supplementary materials). All interviews lasted around an hour.

3.4 Data Management and Analysis

All interviews were recorded with the consent of participants. The first author listened to each interview and manually corrected the Zoom's auto-generated transcript. We note that some participants

disclosed their negative experiences with their prior or current advisors or other faculty members. The first author redacted such information while transcribing. On average, this took about four hours per interview. The first author then sent the transcript to each participant, asking if they were okay with it. Once the participants confirmed, the first author deleted all audio and video files (the second author, who is a faculty member, did not have access to them throughout the process). All cleaned transcripts were uploaded to our institution's cloud storage.

Then, the first author read each transcript multiple times and analyzed them using inductive coding [30]. During the process, the two authors met three times to discuss the themes. We used a Google Sheet to keep track of the themes, sub-themes, and excerpts from participants. In total, we came up with 26 themes and 155 sub-themes. The themes included participants' perceptions of the idea behind our system, perceptions of PhD advising relationships, desired social and technical requirements for trusting the system and other students, perceived usefulness of and feedback on the system's features described in Section 3.2, perceptions of anonymity, wanting to be fair to faculty, how broad connections between PhD students should be (same PhD program, university, research area/field), and thoughts on moderation on the system.

4 FINDINGS

4.1 Importance and Difficulty of Connecting With Other PhD Students About Advising

All participants were positive about a system for connecting PhD students regarding advisors' abuse or mistreatment. Two participants were skeptical at first, saying that they already have PhD students whom they could reach out to—but later changed their mind after thinking about egregious abuse. For example, P4 said "I'm starting to change my mind on that for the private messaging thing [system's messaging feature], so it could also be used for, like [let's assume] my advisors — he did some bad thing." Simultaneously, they said they find more value in a system that helps PhD students or applicants find good advisors, as compared to a system for finding solutions only after mistreatment or abuse happens.

Many participants emphasized the importance of supporting each other when navigating problematic advising dynamics. But while hearing about other PhD students' experiences with their advisors was common, learning about how others resolved their situations was relatively rare. The quote from P7 describes this nicely-"...because you know everybody has problems with their advisor. You hear about them a lot. But it's less obvious, like how people resolve them and what's worked for people in the past. And then be like, specifically, here's what I said, or specifically who I pulled in ...in the department." While many participants mentioned they have other students whom they chat with about advising relationships, some acknowledged that it is still difficult to connect with others going through the same or similar experience. P6 said "...let's say it's the same department, but [the PhD student is in] some other lab, and I've never interacted with the person before. The chances of us connecting over that experience is very low."

It is worth noting that while seven participants preferred having only PhD students on the system, three participants also wanted to connect with faculty because they have insights that PhD students do not. For example, P2 said "From my experience, connecting with students who have the experience is good, but they're only thinking from the student perspective. So, professors can provide a different perspective, and have more experience on those types of issues."

4.2 Preferences Around How to Connect

Participants were interested in connecting with other PhD students via the system in different ways—which largely seemed to depend on how risk-averse they were. Many participants perceived the feature for selectively sharing to a customized audience or a completely public forum (described in Section 3.2) to be useful for quickly getting advice from a wider audience and raising awareness.

However, a couple of participants said they would feel less nervous using the messaging feature because they did not want their post to become viral. A few participants said they would also message if they thought the topic was highly sensitive. P3 said "I think if I were in a similar situation, I would probably send an anonymous message rather than posting publicly, because it is a very sensitive thing. [...] if my understanding is correct, [in the post they said] 'My advisor is falsifying data.' So maybe they are doubtful and want a second opinion. So this is a case where I would probably message them for additional details." Some participants also said they would find messaging useful for getting more context about the other student. P6 said "I view the [messaging] system as more like a jumping-off point. So it provides context, like a common grounding for people to share what they are going through, where they need help."

Interestingly, three participants described ideas of an escrow system before we prompted them about one, where the match could happen based on keywords about advising dynamics, faculty's names, or other types of information. Two participants mentioned the possibility of having PhD student moderators doing the matching. P6 said "...like a moderator, could be helpful in trying to map students together. Like, if I have reported, you know, associated my advisor's name." However, one participant preferred having an algorithm doing the matching, due to the sensitiveness of the topic.

4.3 Perception of Features for Writing Experiences and Faculty's Names

Many participants wanted PhD students to be clear about what they want when posting their experiences (e.g., wanting advice versus wanting a space to vent). Some participants emphasized that they want other PhD students to be specific and give enough context in their posts. This was because vagueness hinders others from giving concrete advice, and it could be a signal of just complaining, which participants perceived as unproductive. Simultaneously, however, many participants noted the difficulty of being 100% anonymous in a small PhD program or research group. P7 said "I think the biggest risk really would be around small departments, because, like no degree of or whatever is gonna effectively anonymize in a small department."

Many participants were open to a feature for explicitly identifying faculty names—but only when it was guaranteed their identity would not be revealed (unless they were submitting on behalf of a friend or colleague). The reasons included wanting to show and receive mental support that they were not alone, quickly resolving high-risk contexts (e.g., sexual abuse), informing faculty-specific intervention, and improving PhD programs for new students.

4.4 Design Requirements for Using the System and Trusting Other PhD Students on It

We report what participants described as important for deciding to initiate or participate in conversations on the system.

4.4.1 Social signals. When asked what would enable them to trust other students on the system enough to interact with them, participants described indications of genuinely trying to troubleshoot their situation (as opposed to only making vague complaints), having a respectful tone, and being balanced (e.g., encouraging and careful at the same time). For example, P8 said "You don't want to sound like you are just complaining all day, you know?" Participants also said they would more likely reach out via messaging if a student shares the same problem and/or is in a serious situation.

4.4.2 Technical implementation. Participants also expressed wanting to have a secure authentication and verification process for ensuring users are students. All participants except one wanted anonymity, which echoes prior work [1]. Although, this one participant said they would be fine with anonymity as long as there was a way to verify all users are PhD students. Many participants commented on wishing to have ways to quickly destroy their data or limit the visibility of their posts. One participant recommended enabling users to have multiple identifiers, instead of having one user ID.

4.4.3 System creator/maintainer's credentials and affiliation. Five participants said it is important to understand what kind of organization is managing the system for deciding whether to use it. This is because it has implications for how their data would be managed. For example, P5 said "I think the one big consideration that I have is whether the research team has any affiliation or collaboration with the university or department. So whether they're like the policy or decision maker, I think that would affect my willingness of participation." A few participants noted that understanding the personal motivation behind developing the system is also important.

4.4.4 Existing user base of system. Some participants emphasized that they want the platform's atmosphere to be positive and users to be modeling vulnerability. For example, P5 said "I would feel safer if the [platform] itself [has] already like a positive, like vibe, that people help each other, I will feel like more comfortable posting on it." Some participants also said they would probably trust the system more if they learned many students were already using it.

4.5 Potential Abuse of the System

Many participants brought up worries about the system being abused by bad actors—which include both faculty and PhD students. Participants expressed concerns of abusive faculty members trying to penetrate the system, and stated wanting strong security measures. For instance, P1 said "So Jane, look. Even the anonymous person could be [a] faculty [member]" and emphasized wanting institution email verification to ensure users are PhD students.

Simultaneously, participants were aware that abuse can come from students, such as spreading false information about a faculty member. For example, P10 said "Sometimes the abuse can come from the advisee's side, although that is rare. So, they (PhD students) need to be fair. They need to understand that multiple things can go wrong."

All participants mentioned the importance of being fair to faculty, without our prompting them to think about faculty's perspectives.

For both cases, participants showed positive reactions when we showed mockups of moderation tools and safety features for the system. Participants agreed moderation would be essential to quickly remove misleading information or ban bad actors.

5 DISCUSSION AND FUTURE WORK

Overall, participants were positive about connecting with other PhD students about problematic advising dynamics via a digital platform, and some also noted that such a platform will be useful for navigating challenges with faculty in general (i.e., not just advisors). We found that participants wanted the connections to be safe but also productive. However, there is a tension between safety and productiveness. Revealing more information about oneself when posting or messaging gives valuable signals to other PhD students about whether further conversing would be productive. But, doing so increases the possibility of revealing one's identity, which risks one's safety. To make matters more complicated, the interviews showed that participants have different preferences in terms of sharing experiences and connecting with other PhD students.

Considering all of these complexities, thinking about users' consent becomes highly crucial for designing and building systems for high-risk contexts involving power differentials [14]. That is, how should the system ask for and get consent from users about what can be revealed, to whom, and under what conditions, with respect to different kinds of data, their identities, and potential next steps? As a concrete example, consider a situation where more than two PhD students have identified one another's comments as a basis for future interaction. How should the system be designed with respect to facilitating what the students might do next? Is there a sequence of anonymously shareable information that would encourage the students to reveal their identities to one another? How much can be done without that identification? And, so on.

Furthermore, many of the consent issues, especially around sensitive data, are inseparable from whether the system has ties to institutions. If the end goal is to create a sustainable change within academia, it becomes important to let PhD programs know about some of the issues raised on the system. But, this requires the system to have communication channels with relevant academic institutions. The interviews revealed conflicting views about this-some participants wanted to give at least some kind of high-level feedback to faculty. However, two participants emphasized that they do not want the system to be affiliated with any PhD programs at all, due to risks of sensitive information being leaked. If some students explicitly express they want submitted faculty names to be handed over to PhD programs, what should happen next? Does it require a connection between the system and PhD programs' faculty and/or staff members? These are all questions that we aim to explore—we are currently conducting more interviews with PhD students from other institutions in order to develop the system.

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A SCENARIO USED IN INTERVIEWS

Let's say there's a PhD student who is solo-advised. The student's advisor regularly asks them to take on administrative tasks for the lab, such as organizing talks, writing up meeting notes, and updating the lab webpage, all of which takes the student more than 10 hours a week. The student has raised the issue with the advisor on two occasions, but the advisor wasn't very open to the feedback. The advisor grumbled about the student not appreciating the time they were investing in mentoring the student, and told them that they need to trust their advisor more. The student then went to the Associate Chair for Students. The dean was sympathetic and understanding, but ultimately only provided advice about how to approach the advisor - all advice that the student had already tried. In effect, the student was out of options that they could apply on their own.

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