PLMW Feedback

Contents

1 Introduction

PLMW provides students from all over the world with a unique opportunity to travel to PL conferences, and to learn about the field of programming languages and what it is like to do research in it. PLMW has given me the opportunity to attend POPL when I did not have a paper there, just as it has done for hundreds of other students. I am grateful to its organizers and speakers for all the hard work they put into creating interesting presentations and mentoring events in which students can get to know and interact with the best researchers in our field, who might otherwise be difficult to approach. It is clear that huge efforts are involved in organizing the workshop, into making it diverse and inclusive, and encouraging students from various backgrounds to pursue a PhD.

I am sure that being motivating and inspirational is the foremost goal of PLMW, and I wrote this document because I believe that unwittingly, some of the talks have, at least for me, been in parts more discouraging than encouraging.

I am writing this document because I believe that the discouragement to stay in academia was not a deliberate result. Rather, it was an unintentional side effect that resulted from

- an over-attempt to encourage everybody to do a PhD, and

- a misrepresentation of the PhD as a result of survivorship bias.

Before analyzing the different types of PLMW talks, I would like to note that this document is based on my limited experience with three SPLASH and one POPL workshop. I did not analyze the content of any other workshops. The ideas in this document are based on my perception and opinion, and should be taken with a grain of salt. More objective information can be found in surveys such as Taulbee [1], Berkeley's graduate well-being report [2], and Nature's PhD survey [3].

Even though this document contains suggestions on how to improve the workshop, it is in first place a personal essay about my subjective experiences at PLMW. A document with advice and recommendations to speakers and organizers can be part of a separate line of work that needs to be based on more research and be written by people with more knowledge on organizing this type of events.

I would also like to thank all the professors and students at MPI-SWS, the University of Waterloo, and elsewhere who provided valuable feedback and ideas that helped improve this document tremendously.

1.1   Main Ideas

PLMW is already a fantastic workshop that I would recommend to any student starting in PL. However, I believe that the workshop can be significantly improved by

1) **depicting the PhD in a realistic, non-sugarcoated way:**

   i) addressing *difficult problems*: mental health, work-life balance, job prospects (Section 2),
      - because these problems are hardly acknowledged, but common;
   ii) aiming for more *concrete* and *objective* advice (Sections 3, 4.4),
      - because being specific requires facts, which makes a talk realistic, whereas general statements can be made about anything;
   iii) inviting *speakers who withdrew from their PhD* program (Section 4.2),
      - because it provides a balance to the survivorship-bias that results from inviting only researchers who completed the PhD and stayed in academia;
   iv) focusing on *informing* students about the PhD *rather than encouraging* them to do it (Section 6),
      - because prioritizing encouragement forces the speaker to filter out the good parts of the PhD, which allows them to neglect the bad ones and results in an unrealistic portrayal;

2) **centering the talks around the audience, rather than the speaker and their career:**

   i) analyzing the audience (Section 4),
      - because it is necessary in order to address their interests and needs;
   ii) refrain from advocating for passion, love, and total dedication to research (Sections 2.2, 4.4.2),
      - because even though it might represent the speaker's feelings, such an attitude is unnecessary for a researcher, and therefore can be intimidating or discouraging
   iii) removing or limiting the number of life-story talks (Section 4),

- because the life-story format intrinsically focuses on the speaker's persona rather than on the audience, which is hard to overcome.

This document discusses four types of PLMW talks: PhD 101 (Section 2), grad skills (Section 3), life stories (Section 4), and technical talks (Section 5).

2 PhD 101: Advertisement vs. Reality

PhD 101 talks provide students with a general idea of what it's like to do a PhD, and why do it in the first place. This section discusses the ways how the PhD is represented in current PLMW talks, proposes three more topics to address at PhD-101 talks in the future (Sections 2.1 to 2.3), and suggests a way to present these difficult-to-address topics (Section 2.4).

The best PhD-101 talks I have seen are "Grad School: A Survival Guide" by Matt Might and "Why do a Ph.D. and how to pick an area?" by Yannis Smaragdakis. I like these talks because they

- depict a *genuine* picture of the PhD, by portraying it as a challenge, without glorifying it, and

- give *specific*, non-obvious advice.

A few quotes from Matt's and Yannis' PLMW talks are presented in the left column of Table 2.1. Each quote is contrasted with "encouraging" statements that other PhD-101 presenters have made about the PhD.[1] The rightmost column contains forward-references to problems that come up during the PhD, as supported by studies.

The problem with the encouraging statements is not just that they are vague, but that they provide an unrealistic portrayal of the PhD experience. In an attempt to encourage more people to pursue a PhD, the speakers depict the PhD simply as the most satisfying of all jobs, because they believe that academia allows one to work on more interesting problems than industry.

By contrast, Matt's talk not just acknowledges, but centers around failure: "Pushing at the boundary of human knowledge mostly consists of failing. . . . Failure is the dominant mode of operation for academics." Matt describes different types of failure in the PhD (see Table 2.1) and proceeds to discuss how to deal with them. I find that such realistic depictions, even if negative, and specific advice, create a strong ethos in the speakers, which inspires trust.

Matt's and Yannis' acknowledgment of the troubles that come with the PhD actually made me feel motivated about grad school. I perceived the problems they described as a challenge, as things I felt compelled to overcome.

The rest of this section focuses on three specific aspects concerning the lives of PhD students: mental health, work/life balance, and job prospects. I will examine how these topics are, and how they could be addressed at PhD-101 and other PLMW talks.

2.1 Mental Health: Stigma vs. Support

I recently met a PhD graduate who, when I told him that I was doing a PhD, asked me: "So, are you already past the major depression in your PhD?" I remembered the time when I was so worried about a problem I had at work and about the uncertainty of my future that I could hardly think of anything else. I would wake up in the middle of the night, constantly thinking about my work-related problems. I became less motivated to make progress on my work, felt worthless, and considered quitting the PhD.

So at first I thought yes, I am over that most depressing phase. But then I realized that it could always get worse: after all, my PhD is still going on.

Mental health is unfortunately a wide-spread problem for many PhD students. According to numerous studies, every second PhD student/academic develops mental health problems [4, 5, 6]. For example,

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[1]Because some talks were not recorded, I was not able to find exact quotes for some of those statements. The table depicts what I remember being said.

Table 2.1: PhD Experience Portrayals

	Genuine portrayal (Matt and Yannis)	Superficial encouragement	Studies
Reasons to do a PhD	• "If you want to figure out what it's like to extend the [boundaries] of human knowledge, you're gonna enjoy grad school regardless of what follows"	• "All of you should do a PhD"	
What it's like to do a PhD	• "Failure pervades every aspect of your academic life, whether you're coming up with ideas, whether submitting papers, whether you're trying an academic job" • "the time of disillusionment" • "the time of insecurity"	• "Graduate school and academia is the most fulfilling career path! Go for it!" • the life of the mind	• lack of work/life balance, burnouts (Section 2.2) • twice as likely to develop mental health problems (Section 2.1) • insecurity about finances and future
Job prospects	• "Wanting to be a professor is not a realistic reason to get a PhD" • "Most people who get a PhD will not become a professor"	• [There are good prospects of getting an academic job;] our department has four openings this year!	• poor job prospects (Section 2.3); • in 2016, only 14% of PhD graduates in PL were hired as tenure-track professors, and 11% as Postdocs [1]

according to a graduate-student well-being report conducted at Berkeley in 2015, 42 to 48% of PhD students in engineering scored as depressed, while a previous study in 2005 showed that 10% of PhD students contemplated suicide [2]. Table 2.2 shows the frequency with which PhD students suffered from various mental-health problems, as opposed to other highly educated people [4].

The numbers might seem too high. From talking to students at my own university, research group, or at PL conferences, I would not expect half of them to be depressed. However, from my own experience, I have usually found out about problems such as depression and anxiety in other students only after getting to know them more personally. It is usually unexpected, especially with people who look happy, outgoing, social, etc. I have recently found out that a PhD student that I know, whom I would describe with all those qualities, has been considering quitting his PhD because of an insufficient number of publications, and has been talking to friends about killing himself.

I myself have also encountered several of the problems in Table 2.2. I have been able to solve some of the work-related problems by openly talking to my advisor, and finding solutions together with him. But most importantly, I have been able to get through the most difficult times of the PhD by seeking counseling.

Unfortunately, according to a 2017 Nature PhD survey, 52% out of the 1,574 students who listed mental health as one of their highest concerns did not seek help for anxiety or depression during their PhD [3].

I believe that one reason for that is the stigma associated with psychological counseling. Research has shown that public stigma against counseling affects the willingness to seek psychological help [7].

If mental health is such a wide-spread issue in academia, and if there were no stigma attributed to the

Table 2.2: Prevalence of common mental health problems in PhD students compared to the highly educated general population in Flanders in 2013 [4]

	PhD students %	Highly educated general population %
Felt under constant strain	40.8	27.5
Unhappy and depressed	30.3	13.6
Lost sleep over worry	28.3	18.1
Could not overcome difficulties	26.1	12.0
Not enjoying day-to-day activities	25.4	13.1
Lost confidence in self	24.4	8.0
Not playing a useful role	22.5	9.2
Could not concentrate	21.7	10.7
Not feeling happy	21.2	11.1
Felt worthless	16.1	5.3
Could not make decisions	15.0	6.0
Could not face problems	13.4	4.3
Risk of a mental health disorder (due to 4 or more symptoms)	31.8	14.0

topics of mental health and counseling, then we would surely discuss these issues at the PhD-info talks at PLMW. However, I have not seen these problems addressed at PLMW in any way. PLMW presentations did not talk about mental health neither in explicit terms, nor even simply by giving students advice on what to do during psychologically difficult times. In my opinion, ignoring this devastating aspect of academic life is indirectly contributing to the stigma against seeking help during the depressing moments of the PhD.

It is important to support students in overcoming mental-health issues, not just because happiness and subjective well-being have a positive effect on health and longevity [8]. Overcoming anxiety and depression and being happy also leads to increased productivity [9], creativity and motivation [10], attention [11], and collaboration [12].

Only half of students suffers from mental health issues, so why do we need to address this awkward topic, one might think. But an even smaller number of students in the audience will be able to ever become a professor, and yet the freedom, fulfillment and greatness of an academic career are recurring topics at the workshop. Helping students overcome mental issues that arise in their PhD is therefore more relevant and useful in practice than glorifying the job that almost none of them will be able to get. I believe that a talk about how to deal with anxiety over one's job prospects is no less important than a talk about how to choose an advisor.

If doing a PhD in computer science were physically dangerous, and half of students received work injuries, we would constantly stress the importance of visiting a doctor when we develop certain symptoms. Given the high numbers of mental-health problems, anxiety and depression can be considered psychological work injuries which are acquired at a rate of 50%. The need to address mental health in PhD students is best formulated at the end of Berkeley's graduate-well-being survey [2]:[2]

> [I]t is important to balance economic measures of societal progress with measures of subjective well-being, to ensure that economic progress leads to broad improvements across life domains, not just greater economic capacity. . . . [A]n argument could be constructed that raising subjective well-being leads to positive externalities or spillover effects across a number of policy domains, ranging from health to traffic safety. Given the tangible benefits to individuals

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[2]The survey additionally contains a detailed section on the objective benefits of happiness on health, work, and social behaviour.

and societies of moderately high well- being, it is imperative that we act to effectively put well-being at the heart of policy and generate the conditions that allow everyone to flourish.

It would be useful if at PLMW, we could combat the stigma against mental-health issues, by acknowledging that the PhD is psychologically challenging. We could mention what types of problems can cause anxiety and depression, such as lack of research results and ideas, impostor syndrome, financial insecurity, problems with advisors, etc. We could say that having those problems and feeling affected by them is normal, and that there are many other people who experience the same. This could be part of a separate type of talk, discussed in Section 2.4.

2.2 Work/Life Balance: Work/work balance vs. Time management

One of the recurring impressions I have gotten at PLMW is that a successful researcher values work above all else. One must sacrifice or simply lack other interests, in order to fully dedicate their life to research. There is neither space, nor a need for a work/life balance. However, I believe that these assumptions are incorrect and the underlying messages are unnecessarily discouraging.

The idea that research has to be the most important thing in life has come through at PLMW explicitly, through comments and responses to audience questions about work/life balance, and implicitly, through a lack of discussion of the topic.

When a student in the audience asks a PLMW presenter or the panelists about work/life balance, at first, there is silence. If it's at a panel, nobody wants to go first. Then, they start answering. I remember three types of responses/advice relating to work-life balance, one more, and two less useful.

1) *Get enough sleep, exercise, and eat healthy.* I have found this the most useful response, because it acknowledges that PhD students are allowed to care about something other than work, and gives the most meaningful interpretation to the concept of work/life.

    However, I think this advice is also problematic exactly because of its narrow interpretation. According to the Oxford Dictionaries, work/life balance is the "division of one's time and focus between working and family or leisure activities". The advice of leading a healthy lifestyle has little to do with spending time with family and friends and having hobbies. I appreciate that in this case, the presenter is actually caring about the well-being of graduate students, and wishes them to be healthy. Speakers should definitely keep stressing the importance of leading a healthy lifestyle.

    However, even though healthy eating, sleeping, and exercising habits are not part of "work", they are also not what I understand by "having a life". Equating work/life balance to a healthy lifestyle unfortunately also conveys the impression that in grad school, there is little room for other things in "life".

2) *When [some important event] happened, I prioritized that event over my work.* At one PLMW panel I attended, two panelists' answers were about a sacrifice they had made on the day or during the time when they or their spouse had a child (the other two panelists' type of answer was (3)).

    I understand that the message here should be that there are things that are clearly more important than research and work. However, if the only example of such a thing is a life or death situation, then again, what it actually means is that work has the highest priority over everything else, except for emergency situations.

3) *My work is my hobby.* This type of response suggests that the distinction between work and "life" is redundant. Rather than addressing the audience's question, it talks about the love of the presenter/panelist towards their work. Yet again, this gives the impression that in order to be successful, our work should consume all of our life, and it becomes shameful to have even asked the question.

In one way or the other, all three types of advice convey the message that work is the most important thing in life. The first assumes a limited notion of work/life balance by equating having a life with being

healthy. The second defines work/life balance as allowing time off work for extreme life situations. The third defines work/life balance as a balance between work and more work. In all three, there is no room for other fun activities and time with family and friends.

One PLMW speaker explicitly says that the PhD is not a 9-to-5 job, and that it requires an "intense" interest in research. "If you're not intensely interested, why are you even here?", they ask.

I do not see why the PhD cannot be a 9-to-5 job for anyone. To me, even six hours of focused, concentrated work can be perfectly productive; moreover, after that time of undistracted work I feel tired enough that I need to rest.

To me, work/life balance is about every-day life (as opposed to only the days of childbirth or other major life events). It is about the conscious decision I have to make to prioritize my family and friends over my work, to allow time for them and myself even when I *want* to work, because I know that it is necessary for my health, my relationships, and finally, my own productivity.

In my experience, after working long hours, on evenings and on weekends, I can get more done for a limited period of time. But after a few weeks or months, depending on the work intensity, I become exhausted. As a result, I lose motivation, care less about work, and start procrastinating.

I learned that I need to put an extra effort to set boundaries for work and forcefully switch to other activities that have nothing to do with it. Taking time off, spending time with friends and on my hobbies gives me the energy and motivation to resume my work, and makes me more focused and efficient at work.

Numerous studies have also shown that maintaining a healthy work-life balance is crucial to happiness, health, and productivity [13, 14, 15]. Research suggests that spending more time at work does not necessarily lead to getting more work done; in fact, there is a correlation between higher productivity and lower working hours [16, 17, 18, 19].

In Nature's PhD survey, 14% of PhD students listed the difficulty of maintaining a work/life balance as their biggest concern since starting a PhD [3]. The only two higher-ranked concerns were both related to job prospects after the PhD. The following is a quote by a PhD student taken from the Berkeley graduate-well-being survey [2]: "The work-life balance is terrible, and there is a culture of silence around how we feel as graduate students. I feel much better after talking with counselors at the Tang Center, but it is a little ridiculous that I have to go to therapy simply to have someone ask me how my day was or how I'm feeling."

By refusing to acknowledge the important aspects of work/life balance, we solidify the stigma that we already have against enjoying activities outside work. This is one of the reasons why I have felt intimidated by academia when I attended PLMW the first few times (later I became used to it). I believe that this attitude can scare away capable and talented people, who are interested in PL and academia, but who do not share this attitude towards work.

In my opinion, the problem we need to solve at PLMW is not how to prioritize research to life, and not whether the PhD is a 9-to-5 job. Instead, we need to address two other issues:

1) How to be most productive and efficient during the limited time we have for work?

2) How to make the most out of the limited time we have for rest, so that we can be productive again?

The first question needs to address how to actually get into a focused, undistracted mindset during working hours. How can we get rid of the email, social media, and other internet distractions that affect many of us?

Instead of suggesting that in the PhD, it is required to work overtime, it would be very useful to focus on time-management practices, or talks on how to avoid procrastination. For example, in his talk Matt Might mentions the approach of Getting Things Done [20] and distraction-blocking browser extensions; he has plenty of other advice on his blog. I have also seen a Time Management talk in the program of another PLMW which I did not attend. I believe these are important topics, and it is great if PLMW can keep having such talks in its program.
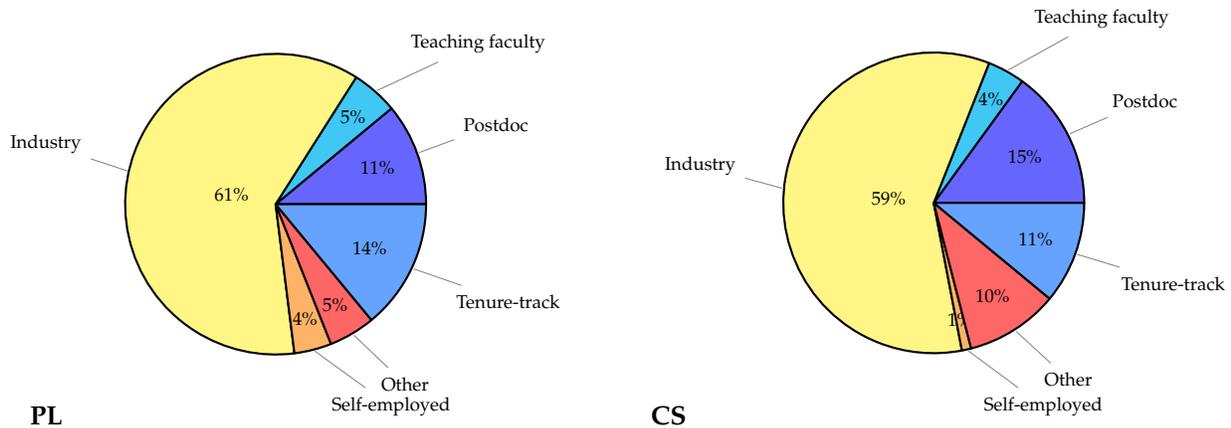
Figure 1: Employment of new PhD recipients in the field of programming languages (left) and computer science (right) in 2016. "Other" includes government, unemployed, and unknown. For full results, please refer to Table D4 of the Taulbee survey [1].

The second question requires us to actively promote a fulfilling life outside academia and work, to encourage students to rest, spend time with closed ones, have hobbies, and take vacations.

The work culture in our field is not PLMW's fault, and it is not PLMW's mission to change the world. But we do not need to contribute to the existing problems, either. We could make a first step towards shifting the work/life scale towards "life" by acknowledging that a life outside the office should exist.

2.3   Job Prospects: Academia for everyone vs. Prepare for alternatives

PLMW's goal is to encourage students to pursue academic careers in PL. The benefits of being a professor are explained at every workshop, and they are clear. One presenter even suggested that academia is the most fulfilling career path and encouraged everybody in the audience to become a professor.

Unfortunately, the few available professor positions are rarely addressed, and the topic of the academic job market becomes the elephant in the room. According to this year's Taulbee survey, only 14% of PL graduates landed a tenure-track position in 2016 (11% in computer science overall, see Figure 2.3) [1].Unsurprisingly, in Nature's 2017 PhD survey, 38% of PhD students listed the post-PhD career and availability of professor jobs as the areas of most concern [3]. For 52% of interviewees, academia was "the most preferred sector to work in". Additionally, according to Berkeley's graduate well-being survey, career prospects were the highest predictor of overall student well-being [2].

In addition to the low number of available academic positions, university prestige plays an enormous role in faculty hiring, which makes becoming a professor even harder for the majority of PhD graduates. A study in 2015 showed that in computer science, 25% of institutions produce 80% of tenure-track faculty, and that only 9 to 14% of faculty members get hired at universities that are more prestigious than their doctorate, revealing a "steeply hierarchical structure that reflects profound social inequality" [21].

Given the poor academic-job prospects and the anxiety that students feel about their future, it would be very helpful if PLMW could dedicate some time towards discussing alternative career paths, while acknowledging that such careers can be intellectually engaging and interesting. For instance, it would be useful to hear from people in industry whose work consists of a combination of development and research. I know little about the existence of such jobs, and would be very interested in knowing more about them. At several PLMW's I remember a student asking about what happens if somebody decides to quit their PhD, and the only thing that was said was that quitting is okay and that they can make more money in industry.

It would be also great to give students a realistic depiction of the academic job market, so that they can make an informed decision about whether it is worth to pursue an academic career. Some students may want to do a PhD regardless of whether they will get a professor job in the end, but given that at least half of PhD students want to stay in academia after graduating, it would be great if they were presented with an honest portrayal of the low chances of becoming a professor.

2.4 Interactive Seminar

It might be difficult for a PL researcher to talk about topics like work/life balance and time management, mental health, and other issues that arise in the PhD, because these topics are simply outside their area of competence. We could therefore invite a counselor, psychologist, or social worker who specializes in these topics and can give the students advice.

For example, it could be an interactive problem-solving seminar in which students form in groups to discuss solutions to specific problems that commonly arise in the PhD; after that, the groups discuss their ideas under guidance of the speaker, who is professionally trained to give advice on the issues of interest. Even if the problems that are discussed do not come up in everybody's lives, this activity still indicates that human, non-technical problems are important, they need to be addressed, that the PL community encourages people to seek support for their problems, and to openly speak about them.

3 Grad Skills: the Vague vs. the Concrete

Grad-Skills talks give advice on how to do well in a specific activity that is required from a PhD student.

Two incredibly valuable and memorable grad-skill talks I have seen are "How to Write Papers so People Can Read Them" by Derek Dreyer and "Unaccustomed as I am to Public Speaking" by John Hughes. The talks give practical, concrete advice on how to write a paper and how to present a talk. I like how both talks illustrate on live examples what mistakes to avoid in writing and presenting, and how to fix those mistakes. Both talks influenced the way I write papers and give presentations to this day.

Given how useful these talks have been, I would find it great to have more grad-skills talks at PLMW.

4 Life Story: Survivorship bias vs. More viewpoints

A PLMW life story is an autobiographical talk that aims to demonstrate how doing a PhD can lead to a successful academic career path.

Life-story talks are given by accomplished PL researchers who usually walk the audience through a timeline of their research career. They describe where, when, and with whom they worked on their main research problems and which results came out of that. Throughout the talks, the presenters also insert pieces of advice to the students, relating to the particular topic they discussed. The talks often relate to the audience by showing that the researchers, even though now they are successful, went through difficult periods of failure, which they were eventually able to overcome to get to where they are now.

Life-story talks show the human side of researchers. They provide a refreshing break from the overload of new technical information at the conference. They are interesting to listen to. But from my experience, entertainment has been the only value of these talks. In particular, the talks suffer from two problems that are inherent to the talk's format:

- *self-centeredness*, because the story focuses on the speaker's persona and does not address the interests of the audience (Section 4.1);
- *survivorship bias*, which makes it impossible to extrapolate the speaker's personal experiences and advice to a general audience (Section 4.2).

In my opinion, it is so difficult to avoid these problems that it might be better to remove life-story talks from the program entirely. If getting rid of life-story talks is not an option, in the following three subsections, I would like to propose approaches to combat the life-story-format problems. In Section 4.4, I will illustrate my points through an overview of two example life-story talks that I attended at PLMW.

4.1 Focus on audience instead of self

It is probably possible to make a life-story talk useful and insightful to the audience, but the format of the talk makes it hard. Life-story talks are inherently about the speaker, and it is difficult to make them relatable to the audience. Public-speaking guides usually emphasize the importance of making a presentation relevant to the audience, for which the speaker needs to center their talk around the interests of the listeners, as opposed to focusing on their own persona. For example, Stephen E. Lucas writes [22]:

> What do people want to hear? very simply, they usually want to hear about things that are meaningful to them. People are egocentric. They pay closest attention to messages that affect their own values, their own beliefs, their own well-being. Listeners typically approach speeches with one question uppermost in mind: "Why is this important to me?" . . . You must relate your message to your listeners – show how it pertains to them, explain why they should care about it as much as you do.

In order to prioritize the audience's interests, the speaker cannot focus on themselves [23]:

> When trying to connect with others during a presentation, you have to remember that it's not all about you. Audiences detest arrogance and self- centeredness. . . . Instead, embrace a stance of humility and deference to your audience's needs. Begin the presentation from a shared place of understanding. Make it about the audience. . . . When you're presenting, instead of showing up with an arrogant attitude that "it's all about me," your stance should be a humble: "it's all about them."

It might be difficult to avoid turning a talk about the PL researcher's successful career into a story of their achievements and successes. I do not know how to devise a universal strategy of making anyone's life-story talk useful to the audience. But I think that the talks can be improved if the speakers consider the following questions when planning their talk: who is my audience, what are they interested in, what moments in my life can they relate to, and what decisions did I make that can inspire them?

4.2 Avoid survivorship bias by inviting people who withdrew from PhD

It might seem that accomplished researchers are the best people to provide insights into how to be successful: after all, they applied those insights themselves, and it "worked".

However, concentrating on the insights of successful people, while overlooking the perspective of the rest, is exactly the reasoning that defines survivorship bias. We do not know what brought the presenter to where they are now. It was likely a combination of great interest in the field, talent, and luck, but these are the circumstances of the speaker; it is difficult to derive what resulted from the speaker's character, particular circumstances, and coincidences into useful takeaways for a whole audience of students with different backgrounds. For example, if the speaker went to grad school after working in industry, they might say that this is the best career path because one gets to learn about problems in the real world first. And if the speaker went to grad school directly after their undergraduate studies, they will advertise that path because it does not waste time, and because choosing to be poor after earning lots of money is difficult.

Perhaps the best way to counteract survivorship bias is to invite people who decided to quit their PhD. I would find it very interesting to hear from them and learn why they decided to quit.

Somebody who decided to quit the PhD can have insightful and specific answers to how to do well in the PhD, because they know what situations to avoid [24]. They can also provide details into what

happens when somebody wants to quit the PhD, which is important because half of PhD students across different fields withdraw from their programs [25], and the question of quitting is often brought up by students at PLMW, but rarely properly answered.

Finally, inviting such a person would lessen the stigma that we have against quitting the PhD. I think that people who quit their PhD deserve utmost respect, because additionally to having the skills and interests necessary to become a PhD student, they had the courage and understanding of their own desires, which allowed them to quit the PhD and move on, in spite of the negative reputation of quitting.

By giving people who quit their PhDs a say at PLMW, we allow students to get a better and more realistic picture of the PhD, which can help them make an informative decision.

4.3 Talk about personal challenges, add details

Even if we look past the survivorship bias, there is another problem: in order to give advice based on a story, the story needs to contain a problematic situation, like a conflict, or a personal challenge. For example, the most common theme in PLMW-life-story talks is the "ups and downs" of research: presenters try to convey the idea that even they, who are now successful, went through problematic and unsuccessful stages in their careers. But it is difficult for the speaker to relate any details of their personal struggles, especially in front of a large audience of colleagues, and when it requires mentioning problems with specific people. As a result, the advice drawn from personal stories is often superficial (e.g. "work hard", "love what you do") and supported by vague examples, if any. I find that merely stating that one had their high and low moments provides few insights. Instead of giving advice that is likely very general or biased, perhaps it might be more effective to talk in detail about some challenging moments in the speaker's career, about how they felt during that time, and what they did to overcome those problems.

4.4 Example talks

To illustrate this section's ideas, I would like to discuss two example-life-story talks in more detail.

4.4.1 "My 25 years in OO"

The best Life Story talk I have seen is "My 25 years in OO" by Jan Vitek. I believe that given the constraints of life-story talks, it is difficult to make something that is better than this talk. It tells the story of Jan's research career. It walks us through the universities where he worked, the people he collaborated with, and the papers he wrote. The talk is funny and entertaining, and is full with little pieces of advice: as an example, he discusses paper rejection, explains that rejection happens to every researcher, encourages us to treat paper rejection as a an opportunity to improve our research and especially its presentation: as Jan puts it, every paper is "1% inspiration, 19% perspiration, 80% communication".

At the same time, I believe that instead of encouraging or teaching the audience about academia, parts of this talk deliver a different, unintended message. I also believe that this is a direct result of the life-story format: the talk is inherently focused on information about the presenter, and does not allow us to extrapolate this information onto our own lives.

Here is an example of an unintended message in the talk: Jan mentions having a difficult relationship with his PhD advisor. He tells the story of how once, after a long absence with little or no communication, the advisor enters Jan's office. The advisor asks "How is your PhD going?", Jan says: "it's going well', and the advisor leaves.

Jan compares their relationship with the interaction between the movie director Werner Herzog and Klaus Kinski, a lead actor in Herzog's movies. There is a slide with the following quote by Herzog: " I did not love him, nor did I hate him. We had mutual respect for each other, as we both planned each other's murder. "

I enjoyed this part of the talk, because it is funny, and because incidentally, Herzog is one of my favourite movie directors. I felt happy to see a famous PL researcher giving this quote from a rather obscure documentary – maybe there is space for more than PL in a PL professor's life, after all.

However, what is the message behind this story? I am sure it is intended to be an inspiring one: even a successful researcher can have obstacles on their career path; in spite of having a hard time with an advisor, one can still finish the PhD, write great papers, and become a professor.

But I find that the story is lacking details (Section 4.3), such as: what was the problem with the advisor? did the advisor not provide any guidance to Jan? how did Jan resolve those problems? As a result, what I actually concluded was that Jan is a brilliant researcher who managed to finish his PhD on his own, without any help. I know that I, by contrast, require my advisor's help in my PhD. Do I need to be able to do a PhD on my own, without my advisor's help? If so, I worry that I am not suited for academia.

Another unintended message appears throughout the talk: Jan points out that many of the collaborators during his research career are people whom he met at his first conference. Those people are highly accomplished, famous researchers such as Luca Cardelli and James Noble. This should encourage us to go meet people, talk to them, and find collaborators at the conference: "The first workshop you attend may shape your entire research career, as it did here. These people provided inspiration, advice, acted as reference, and offered employment", says Jan.

But I was interested in how he met those people. Was it because he proposed them interesting ideas for a collaboration? How did he approach these people? Did they approach him? Without knowing this, all I know is the information that the speaker collaborates with great people, but what can I derive from that for myself (Section 4.1)?

4.4.2 "Love, Marriage, and Happiness"

Another PLMW talk I would like to cover is named "Love, Marriage, and Happiness". The talk conveys a deep fascination with programming languages, and aims to encourage us to pursue our biggest interests, as opposed to prioritizing trendy topics and lucrative careers. I can relate well to this idea, and completely agree with it. At the same time, I wonder how well it achieves this goal.

Before seeing the talk, I thought that the talk would be about balancing work with family life.[3] However, the words "love", "marriage", and "happiness" in the title relate to programming language research, and not to a person, as do the 31 occurrences of the word "love" mentioned in the talk. From its abstract: "Wanting to go into research in programming languages must feel like falling in love. Working on your PhD is going to be much more like being in love. So, as you are about to embark on your PhD studies (or wondering whether you should), I suggest you keep this analogy in mind. " Another quote from the talk:

> Falling in love is when your body dumps out hormones from 200 to 400 days and you're out of control. That's falling in love; that's the English phrase "falling in love", as opposed to "being in love", which comes afterwards. That's why I said "you have fallen in love with programming languages" and it may not work for the rest of your life . . . cause that's about being in love. You have to create a sustained relationship with what you're going to do."

I find the emphasis on having to "love" work, just as the necessity to have an "intense" interest in it (Section 2.2) intimidating. It is okay for the speakers to describe their subjective feelings towards work as a strong emotional attachment, but I find questionable whether these feelings should be presented the required attitude towards work.

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[3] On that topic, the talk contains the following remark: "Being in love can be pretty bad. Things can not go well sometimes, things will not go well, I promise you, especially with a kid, when you're into grad school." I am unsure whether it was intended, but to me it sounded like advice against having children in grad school, which I perceive as a strong message against having a work/life balance, and prioritizing school over everything else.

I am not sure that, especially at the beginning of grad school, every PhD student is driven by intense love. For example, strong interest can be related to knowing a subject well and having the freedom to work on one's own ideas. But at the beginning of grad school, many students work on projects that are proposed to them by their advisors. They might not know enough about a field to be strongly interested in it.

As if to confirm this point, in the same talk, the speaker admits that PL research does not always start with love: "They had to drag me into this area, kicking and screaming. Types? Who wants to work on types? I mean for heaven's sake, what a boring idea. And then, a little later, [I realized] that is actually pretty cool!"

And even after one develops a strong interest, it is unnecessary to demand of somebody to "love" the field. Even somebody who feels enthusiastic, excited, and interested about PL can get intimidated by this rhetoric. When I heard the sentence "if you're not intensely interested, why are you in grad school?", I felt like an impostor.

A possible purpose of the talk is to convey the speaker's interest in the field to the students. However, a great way to do that is to present interesting PL problems and solutions, since they will speak for themselves; and that can be done in a technical talk (Section 5). Explicitly stating one's passion does not pass on the "love". On the contrary, I find these overt expressions of enthusiasm intimidating. They make me wonder whether by not being able to describe my attitude as passion I am missing the prerequisite for being a researcher.

A last example of how the talk relates more to the speaker than to the students: a key takeaway from the talk is that we should follow our biggest interest, as opposed to simply pursuing a hot topic or making money: "That's a research career. Sorry, that's a research engagement with a topic. Not a career. Not a career. A career falls out of that. That is my idea. I don't go for a career." Even though it might be true, I find it easy to say "I don't go for a career" *after* one made a successful career. But how many members of the audience can afford to say the same with that level of confidence? As a result, instead of encouraging us to pursue topics that genuinely interest us, the statement simply tells us something about the speaker (Section 4.1), and what attitude happened to work out for them in retrospect.

5   Technical Talks: Self Advertisement vs. Interesting Problems

The technical talks at PLMW provide overviews of specific sub-fields within programming languages. The talks typically cover the speakers' area of research. I believe that technical talks can be useful to students who are getting started with PL research and want to learn about the various areas of PL.

I find technical talks at PLMW most helpful if they:

- provide an *introduction* to an area of PL research,
- cover a *broad* subfield of PL: this will give the students an opportunity to learn about a wider range of problems and prepare them to understand more at the conference.

The technical talks I have seen at PLMW usually fall into one of two categories: a broad introduction to a field, or a narrow focus on the speaker's research. In my opinion, the more useful talks fall into the first category; they encompass a broader subfield of the presenter's research, rather than focusing on their current paper.

An example is my favourite technical talk, "Two Notions of Beauty in Programming" by Robert Harper. This almost philosophical talk discusses the intersection of algorithms and language design. It presents the problem of combining the first field, which focuses on efficiency, and the second, which centers around abstraction and composition. It covers broad problems in PL and automatically conveys a fascination with the field, without the need to talk about feelings.

I find that the other category of centering the talk around the speaker's narrow field of research should be avoided. Given that the mentoring workshops are co-held with major PL conferences, PLMW

attendees already have the opportunity to visit a number of specialized technical talks. However, most of them presume existing knowledge of a field and are too short to give a thorough background and motivation, which makes them difficult to understand for someone outside the field. That is why PLMW can provide a great opportunity for introductory, accessible technical talks.

Furthermore, because PLMW is aimed at beginning graduate students, if the talk focuses just on the narrow area of the presenter, it sometimes looks close to a self-promotion or student-recruitment talk (for example, at the end of one talk the presenter said: "Now some shameless advertisement: if you're looking for PhD positions, we're hiring").

I think that giving interesting technical talks is the best way to convey excitement for PL. There is little other reason to do a PhD than being interested in the field, so all the encouragement should originate here. By contrast, the other attempt at getting students interested in PL by discussing one's love and passion for the field (Section 4.4.2) is only focusing on the presenter's feelings; it does not apply in any way to the audience and is therefore of little use. I believe that a technical talk is a subtle and the most objective, informative way to encourage students to do a PhD. The encouragement is subtle because it is implicit: rather than stating how great the PhD, PL, and academia are, we allow the students to think for themselves, after seeing an interesting technical talk: "This topic looks exciting to me, and working on open research problems sounds cool, maybe I should consider doing a PhD!"

6 Should we encourage the PhD?

Given the psychological and financial insecurity that comes with the PhD, plus the poor job prospects for PhD graduates, is it a good idea to universally encourage students to do a PhD?

Even if the answer is: "Yes, it is a good idea to keep encouraging everyone to do a PhD", then there is still space for improving PLMW to achieve this goal: from my experience, the only working PhD encouragement came from technical talks (Section 5) and from a realistic portrayal of the PhD in two specific talks (Section 2). All explicit encouragement was either too vague (Table 2.1), or actually discouraging (Section 4.4.2).

Another answer is: "No, not everybody needs to stay in academia, and it is fine if some students decide that it is the wrong career path for them. PLMW should encourage the "right" students to stay, and discourage the rest." If that is our answer, we just need to understand who these students are.

A natural criterion for selection would be the students who are interested in PL. But because this is difficult to quantify, we could let accomplished PL researchers describe how excited they feel about their work, and choose the students who can identify with those feelings. They (the researchers, and thus the right students) "love" programming languages and are willing to dedicate their lives to the field.

Perhaps PLMW is already achieving this goal, and perhaps it is indeed the purpose of the workshop to attract only the students to whom work is their hobby, or to whom research is the most important thing in life (Section 2.2). If so, it is fine to demonstrate that this dedication is what it takes to be a PL researcher (Section 4.4.2). Then the undesirable, less passionate students can choose to stay out of academia. Additionally, this might disillusion students about fitting into this work culture, and decrease the overly high ratio of graduating PhD students to available academic positions (Section 2.3).

I have written this document under the assumption that none of these answers are right, and that nobody should be *encouraged* to do a PhD, but rather *informed*, and I propose to accordingly replace the word "encourage" in PLMW's purpose statement. Focusing on informing rather than encouraging will help make PLMW's advice more concrete and genuine. It will motivate us to honestly address existing PhD problems that we don't talk about (Sections 2.1 to 2.3), but which many students relate to, and for which they need support.

We should not be afraid to bring up the problematic sides of the PhD because it might discourage students to pursue it. First, we are already discouraging students by intimidating them with love-and-passion-for-PL rhetoric, and a realistic portrayal of the PhD is more useful discouragement than suggesting that everybody has to have certain intense emotions about the field. Second, it is great if

knowing something that is true about the PhD will make a student decide that they do not want to sacrifice themselves to research. If that happens due to PLMW, then the workshop will have achieved a great purpose, because it prevented disappointment, health problems, and an overqualified PhD without a job.

Informing, not encouraging, will help students make informed decisions about whether to pursue a PhD, rather than encouraged decisions that came from a person talking excitedly about a great life in academia. And enabling students to go into academia in our field, if that is what they really want, is after all what PLMW is for.

Marianna Rapoport
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