

Tips for the preparation of your PhD-defense

First off, the defense is NOT something that “just happens to you” and that you do not have any control over “because you do not know the questions that will be asked”. Like job interviews and grant application interviews, you can really prepare yourself. Here are some tips and advices on how to do so:

* It REALLY helps to phrase a good series of possible questions yourself (or ask others to prepare a few) and to think about the possible answers to these questions, maybe to even write these out in detail. You need to know the committee members and their work, and why they are invited to your defense: what is their relation to your studies, and what could they possibly ask given their view on things and their interests, favorite topics and hobby horses (which is apparent from their own published work). Really phrasing full answers to these questions will help you to get in the right frame of mind. It is maybe not likely that the exact questions will also be posed at the actual defense, but you will certainly be able to use parts of the prepared answers to answer other questions. Preparing such answers means that you have parts of answers, and lines of reasoning, already prepared: you won't need to come up with those spontaneously at the defense (i.e., when you are nervous and maybe not your nimble witted self). It also helps to prepare a few good, general examples, that are based on previous literature: you can just toss these off whenever appropriate: “For instance, the psychiatric disease depression is a great example of... Especially because depression is one of the most common disorders (provide numbers) and fairly easy to study compared to e.g. autism and schizophrenia, ... It therefore makes for an excellent example disorder in the context of ... Especially for this disease, we wonder... This disorder thus also makes the perfect study object because ...”.

* A trial defense, in which you practice your time-restricted talk and have 50 minutes to answer questions prepared by colleagues that you did not see beforehand, can also really help you to enter the right mindset. You get to practice a bit with having to come up with answers right there on the spot, to questions that are maybe not really clearly phrased, or that are hidden in a very very long story (some opponents will jump on the opportunity to show off their own ideas when they get the microphone), questions that are very hard, and very unexpected (things you never thought of in that manner). It will tell you what you still need to prepare, and it will again give you the opportunity to (later) phrase the full answers to these questions so that you have some example answers ready for the actual defense.

The following tips are meant to help you prepare for difficult questions during your thesis defense, i.e., questions that you do not understand or that you do not know the answer to, and will help you prepare for the defense ceremony.

* It is important that you have your research studies clearly in mind to avoid situations like "... did we do that?... why did we do that again? ... did we not write something about that somewhere?... what again was the conclusion here?...". It is really convenient to have your own research results and research process (i.e., decisions you made with respect to design, covariates, statistical tests) readily in mind: it makes it much easier to talk about your studies and your work as a whole, especially when questions are tough. Also, it makes a bad impression if you can't remember the details of your own work. Do not underestimate this: the period between conducting your actual studies and defending your thesis can be > 2 years; you might need to freshening up. Also try to create a metaview of your work: it generally is a small contribution to a larger field; you need to be aware of the latest developments in the field and the place of your work within it. Having the recent literature at least partly ready also makes it easier to answer questions concerning the importance and limitations of your own studies.

* If a member of the committee asks multiple questions simultaneously, start with the questions to which you know the answer, in the meantime you can think about the other answers: "I'd like to start with your third question...".

* If you don't quite understand the question, rephrase it "Am I correct that you ask... that you wish me to elaborate on...". The rephrasing gives you time to think besides verifying the correct interpretation, and also conveys the impression of being in control; it's not that you do not know the answer, but you first want to verify the exact question.

* If you do not immediately know the answer, repeat or rephrase the question and e.g. put it into context / add some of your own information/interpretation; this shows that you understand why the question is relevant ("this question is particularly of interest given...", "the question concerns an interpretation from the tradition of..."). If you really do not know the answer you can simply answer "Difficult question! I'm afraid I cannot really answer it right now" but then you should add (which then more or less makes up for the fact that you do not know the answer) *why* the question is difficult to answer and how you would proceed to answer it if you had the time/resources. "To answer this question I'd need to know whether... this I could study using... depending on the results of that study, I'd say that...".

* Formulating the type of research that would need to be done in the future also shows that you are aware of the current status of the field and the limitations of your own studies (you can only study as much in 4 years!), that you can think ahead, have ideas about where the field should be going, and have ideas about the choices that you made before and would make now, with your current knowledge (i.e., why certain things were not included in your studies, even though this seems completely obvious with the current knowledge). "At the time of study, it seems important to first investigate..." In hindsight it might have been more sensible to...however, at the moment it seemed most relevant to first ... that is why we decided to ...". This shows that you made your choices knowingly and consciously, and that your research was not something that "happened to you" but was actually the result of a plan/theory. It is seriously important to not make the impression that you were just a puppet following the decisions/orders of your supervisor; even if that is what happened in practice, you at least need to understand (and be able to defend) why certain decisions were made. You are of course allowed to disagree with those decisions, but if you do, don't say anything remotely like "this was all my supervisor's decision, I was totally opposed to it". You are the responsible researcher defending the thesis: this is not the time to blame your supervisor for anything. The most you can say is "these decisions seemed best at the time, because of xxx and xxx; in hindsight, I sometimes wonder whether it might have been better to ... because ...". This shows that you have the ability to think scientifically, and avoids you transferring all responsibility to others. You need to make clear that there was a plan. The plan can turn out to be flawed, but there was a plan. That you encountered major problems, or got lost in the woods while pursuing it is ok: many researchers will recognize that. Of course, it is then important to also show that, with your current knowledge, you would have chosen differently.

* If a question is really difficult, rephrase it emphasizing the part that you do know, i.e., the part that you can talk about. You can spin the question such that you respond to a detail of the original question. In the meantime you can think of the question as a whole. "You ask me why... It is important to realize in this context that ..."and then fire away about things you do know. This will at least give you something to talk about and avoids the uneasy situation in which you just do not know anything to say. By reasoning aloud you might actually stumble upon the answer to the actual question, or a good reason why that answer is very difficult and what is needed to answer it.

* It is ok to not know the answer, and it is also ok to take a minute to silently think about the answer. It is, however, very uncomfortable to fall silent when you really do not know the answer, can't think of anything to say, and can also not think anymore (black-out). To avoid this, and the panicky feelings that come with that, it is really preferable to start talking "... I have to admit that I do not know the answer... difficult question!" and then explain why you find it difficult "you ask me to ... however, to answer this, I need ... and I do not have that now. I think that ... but I'm not sure." Doing this, you create a dialogue: the committee member can actually chose to add information to help you a bit, sketch a context, and you at least avoid an actual black-out. Also, you show the committee that you are capable of scientific discourse; not only sharing of knowledge but also sharing of doubts and questions.

* You have to realize that the **defense is a dialogue**: the committee members are not always right, their questions do not always make sense, they may also not know the answer to their own question, they may overlook important details that complicate their question very much, etc. By creating dialogue, i.e., asking questions yourself, or asking for further specification or phrasing why you think the question is impossible to answer or even irrelevant, you show that you are capable of scientific thinking.

* It is always good to show that you know your research and the process and the decisions involved: why you did this and not that, etcetera, and what are the implications of these decisions and of the results of your studies. It shows that you know the field, the possibilities, what others did, what still needed to be done when you started your project, what needs to be done yet. Your own research forms the stage of the defense, and you need to know that research well! You can be frank about the research being a process with certain unfortunate decisions, as long as you can tell why the decisions seemed relevant at the time.

* Do not only look at the person that asked you the question, but also look at the other members of the committee while you answer your questions. You speak to the entire committee; this conveys control (like you are explaining to a class of students), and it also avoids that you get stuck in a tunnel with that 1 person, that one committee member that looks nasty and does not sometimes nod encouragingly.

* This is your moment to show what you have been working on like a crazy person for 4 years. This is the time to show what you learned (can also be all kinds of things that did not end up in the thesis!), and to show what you think should be studied next. Do not hesitate when you need to explain anything to start at the beginning: don't just answer "yes, you are right", or "no, I don't think so"; explain why you believe that the opponent is correct, and take your time doing so. Very short answers do not create dialogue, you do show the committee what you know, and you put the opponents in the position to just fire away with more and more questions. The more questions, the more overwhelming the defense can be. If you take your time to explain things, you not only show what you know but also avoid an endless series of questions. As long as you are talking, you are in control!

* When you do not know the answer, you can say something like "Difficult question! I do not know the answer at this time. Considering this and that I would assume XXX, but it could also be that xxx. At this time, I can only speculate. The actual answer might need a study that looks like this: ...". You show that you do not know the answer but do know how to obtain it. Opponents do not always know the answer to their own questions: some questions are indeed really "knowledge" questions while other questions are meant to learn "how the dr-to-be thinks about these things".

Finally, the defense is meant to be a scientific discourse, not a scientific cross-examination!

You need to realize that the defense is not about “the opponents ask questions and I need to know all the answers straight away”; the point is that you show that you are knowledgeable about your work/your topic, that you are familiar with the field you have been working in, and that you can think in a scientific fashion; you have developed a metaview of your own research; know its context, know the field, and are capable of thinking in terms of problems and solutions, and how to obtain solutions (i.e., you know the available designs and methods). You need to show that after 4 years, you are capable of independent scientific thinking and decision making within your field of study.

My father always told me to think of things like a defense and important job/grant interviews as great opportunities: not a scary thing that you would rather avoid, but an opportunity to talk about what you know well, about topics that you have developed opinions on, and to talk about all the hard work you did. It is also an opportunity to ventilate your own opinion about things: after the defense you are supposed to be an independent researcher: you can now show that you have your own ideas, theories and reservations. Thinking about the defense as an opportunity to show what you learned, know and believe, i.e., in a positive way, helps you to get in the right frame of mind.

After all, the defense will probably be one of the most important milestones in your life: it is the ceremonial conclusion of a 4 year (or longer) period of hard work, long hours, setbacks, mishaps, doubts and emotional ups and down (“the experimental effect is super large!! ... oh no, it’s all because I conducted the experiment incorrectly and have to redo these 3 months of experiments ...”). The ceremony marks the start of the rest of your life: worthy of celebration and certainly not only something to dread and fear!