**Structuring the argument of a theoretical paper in the social sciences: 2. Why**

A guideline for presenting original ideas convincingly to colleagues in humanities and sciences[Richard Parncutt,](file:///D%3A%5C%5CDaten%5C%5Chomepage%5C%5Cindex.html) University of Graz, revised 2020 April

*This document is divided into two parts, subtitled “how” and “why”. This is the “why” document. It explains the motivation behind this approach to writing a theoretical paper.*

“The essence of the independent mind lies not in what it thinks, but in how it thinks.” Christopher Hitchens, *Letters to a Young Contrarian*, 1968.

"To reason logically is so to link one's propositions that each should contain the reason for the one succeeding it, and should itself be demonstrated by the one preceding it. Or at any rate, whatever the order adopted in the construction of one's own exposition, it is to demonstrate judgments by each other."

Jean Piaget, *Judgment and Reasoning in the Child*, 1928

 “A theory is something nobody believes, except the person who made it. An experiment is something everybody believes, except the person who made it.”

Attributed to Albert Einstein

**1 Introduction**

* 1. **Being cited**

Writing a student essay may seem like an end in itself, and the guidelines given by teachers may seem arbitrary. The following guidelines try to avoid that. They have a specific intention: to help students who are aiming for a career in research. Although many students do not fall into that category, many would like to keep their options open, and others can still benefit from acquiring research skills.

Today’s academics need to “publish or perish”. That means regularly publishing in good journals. (Incidentally, to find out if a journal is “good” or not, look it up in [www.scimagojr.com](http://www.scimagojr.com).) But even that is not enough. The work must also be frequently cited in later years. Academic papers that are not cited have no *impact*, which is what you need for a successful academic career.

According to Google Scholar, Darwin‘s *Origin of Species* as been cited at least 44000 times. You can look up every single citation! Why is this dusty old book still being cited with astonishing regularity in the best international journals by the best researchers? Darwin had a great idea that had enormous impact, and he made it plausible by carefully presenting a lot of evidence. The idea was also controversial (and how), and in some quarters the controversy still has not subsided.

How do you write a paper like that? Well that is really a big question, and if I had a simple answer then the whole system would collapse. We cannot predict what ideas will be of lasting value and relevance, or what researchers will think of or discover in the future—just as we cannot predict next year’s biggest pop song or coming developments in the stock market. The authors of frequently cited papers nevertheless somehow manage to predict what people in the future are going to be talking about, just as Mozart predicted in the 18th century what kind of music people would like to hear in the 19th, 29th, and 21st.

Trying to predict the future is a risky business. Imagine you are writing a paper based on your PhD thesis. In the paper, you are making a claim that you know to be controversial. What if it turns out in the future to be incorrect? Perhaps you missed an important piece of evidence, or perhaps a future study will contradict it. The history of science is full of embarrassing mistakes (Bryson, 2003). If you are considering an academic career, that is a risk that you will have to take. If you always play it safe, your work will be uninteresting.

Papers that are frequently cited are generally two things: *new and good*. They are new in the sense that they present ideas that were not presented before, or at least not in a given special way or in a given context. They are good in the sense that they are perceived to be correct or at least promising by researchers in relevant disciplines, especially in the long term.

To write something that is *new* you might need to find the courage to present an idea that some colleagues will not like. A claim is especially interesting if it seems to contradict what many experts currently think. I am talking about a small version of the “paradigm shift” idea of Kuhn (1962): not some kind of intellectual revolution, but an idea that will change the way experts think about a specific issue. If you succeed in doing that, your article will be cited a lot. At the start, perhaps some will find your idea too surprising, radical, crazy, or even distasteful. Perhaps your idea won’t feel right for them, but they can’t explain why. But if your idea turns out to be a useful or promising, their resistance will disappear and the idea will become part of mainstream knowledge.

Being *good* means knowing the details of relevant disciplines and covering the main aspects of your question or claim thoroughly. Often that means a lot of work, but if you are successful, it will be rewarding in the end. If a paper is still being frequently cited long after publication, its ideas have stood the test of time. That does not mean its ideas were necessarily “correct”: Ancient philosophical ideas are still being discussed because they are intellectually challenging although many have been rendered obsolete by modern science. In the mid-20th century, philosopher Theodore Adorno argued that jazz and popular music are inherently inferior to classical music, because they are part of the capitalist culture industry and so not authentic. Today, few musicologists would support such a claim. Many cite Adorno all the same, because his arguments were interesting and his knowledge of relevant literature comprehensive.

Some people think it’s OK for a bachelor’s thesis to summarize a body of research in a given topic. I beg to differ. Summarizing is what a high school essay might do (*Fachbereichsarbeit,* *Vorwissenchaftliche Arbeit*). A bachelor’s thesis should go a step further than that. It’s time to start writing like a researcher. You are now in the business of inventing, developing, adapting, evaluating, and questioning new ideas. If you want to pursue a research career, you have to learn how to do that, and you can’t learn it in a day. You need to “learn by doing”.

These guidelines will help you formulate a quasi-original claim (“thesis”) that is more than a mere summary of other people’s ideas—an idea that might be considered interesting by international experts. This ability is one of the foundations for a successful academic career, should you decide to choose that path.

Let me be a little provocative and ask a direct question. Do you want to do *Wissenschaft*? Do you want to be a *Wissenschaftler/in*? Do you want to get into the business of constructing new knowledge? Might that be an interesting career for you? If so, this guideline is for you. If not, choose something easier.

Students can be excused for choosing the easy path and avoiding extra work. But studying at university is surely also about challenging yourself. With that in mind, the following guidelines are for ambitious undergraduate and graduate students in the social sciences—those who would like to rise above the ordinary. The guidelines aim to help you develop the skills you will need in the future to write papers that are frequently cited because they make interesting, original, controversial claims.

This document also has a more modest goal: to help you write a coherent, well-structured essay. You can use it to present a body of existing literature from a new perspective, focusing on one controversial point that you believe is consistent with most relevant research or other evidence. That makes for more interesting reading than a mere summary.

* 1. **Communicating clearly**

What is the most important thing that a student learns at university? The answer is surely the ability to think and communicate clearly, critically, and independently, and to shed light on difficult issues by constructing a convincing argument based on the best available sources of information. Since research is a fundamentally social endeavor, the process invariably includes constructive self-criticism and openness to suggestions from relevant experts. A related skill is to think constructively and critically about the arguments of others, highlighting their good points and identifying and avoiding logical fallacies.

Why do universities exist? One reason is to train students to think. University students and teachers are responsible for maintaining and defending a long tradition of independent and critical thinking. If we don’t do that, the universities will turn into vocational colleges. Vocational colleges are important and have their place, of course. But their function is different.

There are many differences between universities and other educational institutions. Consider this one: In high school you learn how to summarize the results of research by reading books based on that research (secondary sources) and writing an essay about a given topic. If you can do that well, you are ready to study at university. But university is different, or it should be different. It is about learning to do research yourself. You learn that skill gradually, in stages. You get started at bachelor level where you learn the foundations of your chosen academic discipline. In the master’s, you learn about advanced research in that discipline and do a small research project of your own. Finally, in the doctorate you go into a specific question in detail and in that way make a significant contribution to current research.

If you are considering the possibility of a research career, you need to have something to say that experts in the same area will find interesting. That “something” is often called a “thesis” (or claim, or hypothesis), which is why advanced essays and dissertations are often called “theses”. Of course, this also applies outside of academia, but we will focus here on academic applications.

Knowing the foundations of your discipline is not enough. Nor is it enough to get grade “A” or “very good” for every course you attend, because you can do that merely by learning what your teachers taught you, like a parrot. No offense to parrots, but it would be naïve to believe that all the information and opinions presented by all your university teachers in all your classes are somehow “correct”. In fact, your teachers often *deliberately* say things that are debatable or challenging. Often there are arguments on both sides of a claim and your teacher only presents one side—perhaps because she wants to save time, or is unaware of the opposing arguments, or has good reason to disagree with them. As a student you need to be aware of this uncertainty and take it into account.

Besides, you can be successful without good grades. Some of the greatest geniuses were bad at school. This apparently includes Thomas Edison, Albert Einstein, Winston Churchill, Charles Darwin, and Steven Spielberg, although I haven’t studied the details. The same applies to non-academics: probably Bill Gates, Mark Zuckerberg and Richard Branson fall into a similar category. Incidentally, lists of this kind usually involve men, perhaps because it is presumably life is less forgiving toward women in a patriarchal world.

More important than good grades is the ability to develop, present, and defend your own ideas. You can do that within or outside of your academic discipline. You will also need the social skills that are needed to present your ideas to an expert audience. You should be well on the way to acquiring these ideas and skills by the end of your bachelor’s. They are the foundations for studying advanced courses in the master’s and then going on to your own research in the doctorate.

**1.3 Writing in English**

In most academic disciplines, English functions as the international language. Most leading research is written in English. But there are interesting exceptions. In the area of romance languages and literatures, for example, the international language may be French or Spanish.

English is not somehow better or more appropriate than other languages. On the contrary: different languages have advantages and disadvantages for specific purposes, although the differences are surely small. English is dominant simply because more people who can work in that language, especially as a second language (after their mother tongue). The ultimate reason is the size and global political power of the USA and (previously) the British Empire.

If you write your work in English rather than another language such as French or German, it will be read and cited more often. It may also be harder to get published in a good journal, because more people are competing for space in English-language journals, and because the editors of such journals have access to a larger number of specialist reviewers who might see through your arguments and reject them (again, simply because more researchers can work in English). But it is worth the extra effort because the number of you will get many more citations. You may put twice as much work into writing in English, but get ten times the citations.

So if your aim is to reach a large number of international colleagues, you know which language to choose. It’s a purely pragmatic decision, even if it does have some unavoidable additional political implications. Esperanto would have been better, but unfortunately that battle was lost long ago.

**1.4 Choosing a supervisor**

Today, for better or for worse, the easiest way to find good research on a given question or topic is in Google Scholar. This platform will also tell you how often a given paper or book has been cited. As a broad general rule, papers that have been cited more often (relative to their age) are more likely to contain interesting information; otherwise, others would not have cited them. Of course, there are exceptions to every rule, so this tip should be taken with a grain of salt.

Google Scholar can also be used to evaluate the academic performance of a researcher. Whether it should be used for that purpose is debatable, but the tendency is hard to avoid. Successful researchers address issues that are of interest to large numbers of other experts. They come up with ideas (theses, theories, approaches, solutions) that are widely considered plausible or useful. You can find out if a given researcher is doing that by looking up the citation frequencies of their best publications. The older the researcher, or the long she or he has been active (keeping in mind that bringing up children slows down research activities, especially for women), the higher should be her or his total number of citations (or Hirsh index).

One might argue that colleagues whose work is hardly ever cited are failing to contribute to international research and should perhaps consider a different profession. If you choose a seldom-cited colleague to supervise your bachelor’s, master’s or doctoral thesis, you are unlikely to acquire the skills you need to become a successful academic. You may feel a personal affinity, and the ideas of your supervisor may seem interesting to you, but if they are not interesting to the average international expert in the same specific discipline, they will probably soon be forgotten—just as the most of the Mozart’s contemporary Salieri was largely forgotten. In the absence of some kind of academic God who decides what research (or music, for that matter) is good and what is bad, there is only one way to find out: ask a large number of international experts. But that is quite difficult to do, so instead we rely on citation frequencies.

Citation frequencies can be problematic, of course. They are typically higher for the sciences (by comparison to humanities) and articles in English (by comparison to other languages). That doesn’t necessarily mean the research is better! Articles in English are cited more often simply because more people can read English. Articles in the sciences are cited more often because the literature lists of scientific articles and books are typically longer and easier to find and read automatically.

Citation frequencies nevertheless have *some* meaning, especially when compared within an academic discipline and among papers written in the same language—and this is often a comparison that you can make as a student when evaluating possible supervisors. Every time an academic paper is cited, a real person has included it in their literature list, and that list has been published in a real academic journal. These people, papers and journals really exist. Google Scholar simply documents and counts them, and makes it possible to check who those people and journals are.

**1.5 Why develop skills of argumentation?**

Those islands of independent thought known as “universities” have always contributed significantly to human development - otherwise they would not exist. Universities are especially important in an age of existential threats to humanity, such as continuing global poverty and human rights violations, intercultural conflict, the thinning ozone layer, deforestation, climate change, ocean acidification, genetic manipulation of disease, proliferation of nuclear weapons, religious extremism, terrorism and so on.

These are political problems, so solutions will always depend on power relationships. But it also helps if the people involved (i) genuinely want to solve the problems, (ii) are well informed about the opinions of recognized experts and the results of the best studies, and (iii) have a good command of knowledge and argument construction. A theory of argumentation should be applicable to both politics and academic research, comparable with the approach to higher education developed by Wilhelm von Humboldt in the early 19th century. That is the practical, general level at which I would like to pitch the theory.

Given the central importance of argumentation, you would think that every student would study the underlying principles. But most are too busy learning the details of their chosen discipline, which is invariably full of busy scholars and researchers trying to publish a constant stream of new (or seemingly new) ideas. As the volume of literature grows (apparently it doubles every 20 years), students are increasingly stressed out, trying to get a grasp of at least some of it. Their professors are under pressure to write new research and expect their students to study it, so they can claim that their teaching is research-led. No wonder there is little space left in the curriculum for timeless topics of perennial importance or reflection on bigger issues such as: Why are we doing this at all, if the future is so uncertain? Students feel increasingly powerless to rise above the detail and see the big picture: where their discipline is going, what it is for, what are the main issues, what kinds of mistakes can be made by even the best researchers, and so on. One aim of this document is to give students that power back.

Seeing the big picture and evaluating the literature—separating the more important things from the less important, and being able to explain the difference—are essential skills of any student in any discipline. These skills are particularly important when it comes to doing original research. They are not easy to acquire; they must be applied repeatedly to different questions, and students must be prepared to learn from their mistakes.

In our traditional academic system, the first time a student does research that is internationally recognized as “original” is usually at doctorate level. Therefore, students should be acquiring general skills of argumentation *before* they start the doctorate. They should be learning general principles of theory construction, and applying them to central problems in their own field, during their Master's course. This process can begin at the end of a Bachelor's program, when students write a Bachelor's thesis. In many disciplines, the Bachelor's thesis is supposed to cover and interpret a body of literature on a given topic. That is an excellent opportunity to get started on the academically and pedagogically central task of structuring a theoretical argument. The Master's curriculum should then provide several opportunities to improve these skills, before the doctorate begins.

At present, to my knowledge, general principles of argument construction and critical thinking are studied only within the discipline of philosophy. There is remarkably little work of this kind going on in other disciplines. Philosophy students also study the historical development of philosophies of knowledge and knowledge construction. The history of philosophy is important for its own sake, but it is not a prerequisite for understanding the kind of argumentation theory that students need in other disciplines.

We need a modern approach to argumentation theory that is geared to the needs of tomorrow's academics in a post-industrial knowledge society. The terminology should be expressed in everyday language so that no philosophical or mathematical background is necessary. The theory should be written in a way that is easy to understand across contrasting disciplines, including humanities and sciences. There is a need for university course units within all academic disciplines (not only philosophy) that:

1. Present *general principles*of clear, constructive, critical thinking, argument, and persuasion that apply to qualitative arguments in any discipline;
2. Apply those principles to current research issues in specific disciplines;
3. On that practical basis, allow students to theoretically appraise and revise the general principles, regardless of the specific question or discipline; and
4. In that way, put doctoral students in a good position to make a significant and valuable contribution to their specific discipline (or to several disciplines, in an interdisciplinary project), and to society in general, as well informed, caring citizens.

The aim of the present guidelines is to develop students’ skills in academic writing (in preparation for future dissertations and publications), helping you to communicate effectively with international experts in your area. If you are considering an academic career, those are the readers you should be thinking about! More generally, the guidelines aim to develop your critical thinking.

This is not a popular approach. Humanities readers may find it too scientific (a bad thing, apparently), while scientists may find it too close to the humanities for comfort (ditto). But my goal will have been achieved when I can convince leading scholars on both sides that the contrasting approaches of humanities and sciences are complementary and not contradictory. Beyond that, I hope to convince colleagues that this academic process is related to global political processes of conflict resolution. Interdisciplinary collaboration can be promoted for its own sake, with the goal of improving academic standards; or it can be promoted as a model for constructive collaboration, as part of a more general pacifist orientation.

Non-English-speakers please note: I am using the word “scientific” in the usual English sense of positivist research and scholarship, as opposed to (equally important) the relativist research and scholarship of the humanities. Positivist research searches for quasi-absolute truths, whereas relativist research holds that truth always depends on context, whether it be social, political, historical, or cultural. Depending on definition, “sciences” may include natural sciences (physics, chemistry, biology), social sciences (psychology, sociology) and formal sciences (mathematics, computer science). Humanities include history, geography, anthropology, archeology, philosophy, and the academic study of languages and the arts (literature, music, painting and so on); depending on definition, they may also include disciplines such as religious studies, law, politics, theoretical sociology, and economics. To some extent, it is possible to study humanities subjects with a positivist scientific approach. Conversely, it is possible to study scientific subjects with a relativist humanities approach.

**1.6 Theoretical presentations at scientific conferences**

Academic communication happens not in articles, books, chapters and so on. It also happens at conferences. How do the ideas presented here apply to conferences?

Scientific conferences (that is, conferences in the natural, social and formal sciences) often distinguish between two kinds of paper: empirical and theoretical. An empirical paper is a report on an empirical study and often comprises four sections entitled introduction, method, results, and conclusions. A theoretical paper presents and evaluates a claim (or series of claims) and/or a theory, and comprises introduction, central sections (with topics corresponding to aspects of the question or theory) and conclusions. The present guideline is primarily intended for theoretical papers. It may also be interesting for authors of empirical papers, which typically contain arguments of the kind presented here in their introduction and discussion sections.

There are many different guidelines for writing empirical papers in the literature, so students and young researchers have a lot of materials to choose from. By comparison, there is not much out there about writing a theoretical paper. In many disciplines (including my own discipline, music psychology) there seems to be an undue emphasis on empirical work at the expense of theoretical work, and sometimes colleagues seem unsure how best to approach purely theoretical work, or how to evaluate it.

These guidelines are intended to fill that gap. The idea is to be as systematic and comprehensive in theoretical work as we already are in empirical work. A broader goal is to highlight the equal importance of empirical and theoretical work, and the balance that should exist between them.

The idea is not to follow the guidelines rigidly, but instead to think about whether your presentation contains the key elements listed in the guideline and incorporate them appropriately. The result should be a presentation that experts in your chosen question will find interesting, because it addresses a question of current interest (perhaps even a “hot topic”) and in that way attempts to expand the boundaries of knowledge. You can do that by asking questions that do not yet have clear answers, and developing possible answers (theses) that are not trivially true. They should, of course, be *probably* true, and it is your task to convince the experts of that.

A talk based on these guidelines is fundamentally different from an introduction to a topic that is intended for non-experts. The difference will usually be clear from the title of the paper. An introduction for non-experts may have a short title; examples from systematic musicology might include “Music and emotion” or “Counting pitch-time patterns in musical databases”. A theoretical paper for an expert audience generally has a longer, more specific title that alludes to a specific question or thesis and distinguishes it from other papers in the literature on that topic. For example, it could be entitled “The role of articulation in the expression of basic emotions” or “The changing frequency of occurrence of suspended triads in European vocal polyphony from the 13th to the 19th centuries”.

**1.7 The role of metacognition**

These guidelines are an example of metacognition: cognition about cognition, or knowing about knowing. The idea is to think about processes of argumentation and critical thinking. This can help us to become more skillful. Of course, we also need to practice formulating real arguments.

Metacognition includes knowledge about how to solve problems: what strategies are necessary and when they should be applied. Students who can explain how they are setting about solving a problem are displaying metacognitive skills. Metacognition is what students need when searching for answers to central questions and writing about those questions and answers in a theoretical paper. Research on teaching and learning shows that students with better metacognitive skills learn more efficiently.

When students are asked to theoretically appraise general principles of argument construction, they are being asked to think and talk about metacognition, which could be called meta-meta-cognition. That sounds complicated, but in my experience it lies well within the capabilities of typical Bachelor's or Master's students in all disciplines, if the material is presented clearly and appropriately.

**1.8 Avoiding logical fallacies**

Clear thinking includes identifying and avoiding logical fallacies. Philosophers have identified many different kinds of logical fallacies and applied a lot of somewhat dry names to them [(link](http://en.wikipedia.org/wiki/List_of_fallacies)) ([link](https://thebestschools.org/magazine/15-logical-fallacies-know/)). For example, “appeal to authority” is a common fallacy. Just because a famous person said something does not mean it is correct. If the quotations at the start of this article are somehow “correct” it is not because their authors are well-known or did other interesting things.

It would be nice to study the various categories of logical fallacy, but it is more important to be able to spot logical fallacies wherever they occur, just by thinking critically about what you are reading or hearing. For a good, accessible, general introduction to logical fallacies from the point of view of natural sciences, watch to Colin Frayn's video on [Understanding Science Lecture 8: Logical Fallacies](https://www.youtube.com/watch?v=9XnLpRh7XOE). For a more political approach, study the internet page entitled [Thou shalt not commit logical fallacies](https://yourlogicalfallacyis.com/).

If you identify the main conclusion of an article as a logical fallacy, the best solution is simply not to cite it. Focus instead on the other literature. If you think an article is interesting but may contain a logical fallacy, discuss the problem in a positive way that might eventually solve the problem. These are important aspects of the critical evaluation of research literature, and more generally of critical thinking.

**1.9 Political issues**

Structuring a convincing argument is not a dry, abstract task. It is a central human skill that has always been part of the human condition - especially in politics. In a democracy, people vote for people whom they believe are presenting the right ideas and supporting them with the right arguments. But what, in general, is the "right argument"? Considering the following quotes:

Die Wahrheit ist dem Menschen zumutbar. (Ingeborg Bachmann, 1959)

The first step towards nonviolence, which is surely an absolute obligation we all bear, is to begin to think critically, and to ask others to do the same. ([Judith Butler, 2016](https://www.brainpickings.org/2013/06/07/judith-butler-mcgill-2013-commencement-address/))

I think what we mean by reason can be defined by three characteristics. In the first place, it relies upon persuasion rather than force; in the second place, it seeks to persuade by means of arguments which the man (sic.) who uses them believes to be completely valid; and in the third place, in forming opinion, it uses observation and induction as much as possible and intuition as little as possible. (Bertrand Russell, 1935, p. 56)

Of course people can reasonably expect to be told the truth, as Austrian poet and author Ingeborg Bachmann pointed out. Evidently, we are often not told the truth. Sometimes that is because people are lying: deliberately withholding, distorting or changing the truth for personal gain. Sometimes the truth is so complicated that even well-meaning, honest, intelligent people have trouble formulating it. That is where the theory of argumentation comes in.

The quote by Judith Butler is politically interesting. Researchers often try to present themselves as politically neutral. But by merely trying to find out the truth about something and to convince others by peaceful means—that is, by negotiation, which is the best way to resolve any conflict—researchers are indirectly supporting the idea of nonviolent conflict resolution. It is surely a truism that every war in history could have been stopped if the leaders on both sides had thought more clearly, critically and openly about the relevant issues.

The quote by British philosopher Bertrand Russell is part of an attempt to understand the rise of fascism and (to a lesser extent) communism in their historical context, and develop democratic-socialist alternatives. Russell regarded the emerging political movements and doctrines of 1930s Europe as “anti-rational” revolts against reason, reasoning and reasonableness. Authoritarian structures had been created to promote utopian, fundamentalist ideologies, and to deny their evident moral and practical flaws by suppressing open discussion. To understand and overcome anti-rationality, Russell reconsidered the nature of reason.

Each of Russell's three points is relevant to the present approach to structuring the argument of a theoretical paper in the social sciences:

* *Focus on the argument itself - not the person presenting it or the scholars being cited.*Students should not be convinced by lecturers or professors simply because they have more power or charisma. Within the teaching hierarchy, lecturers should not be convinced by professors for that reason. In the absence of such power games, academic communication relies heavily on skills of persuasion. These skills can be learned! Students can learn to discuss and argue with their superiors as if they were peers, in order to create a level playing field and a foundation for academic democracy - while at the same time appropriately acknowledging differences in expertise and experience.
* *Systematically evaluate and compare different possible arguments, theories, and claims.* Students should believe and demonstrate that their arguments are more consistent than other feasible or possible arguments. This idea is implemented systematically in these guidelines by a comparative evaluation of different possible “theses”, regarded as answers to a “main question”.
* *Ground arguments in systematic observation and transparent reasoning.* Russell refers to processes of observation and induction. In the social sciences, these correspond to empirical methods and theoretical work respectively. A theoretical paper typically refers to a mixture of empirical and theoretical studies. Theoretical studies are particularly important in cases where empirical evidence is scarce or inconsistent. Intuition is also important, but in work of this kind it should not be allowed to take a front seat, unless little or no empirical evidence is available. By intuition I mean spontaneous insight -- knowledge acquisition without conscious reasoning or inference, or without reflection on the thought processes (aka metacognition) that lead to a given idea, conclusion or hypothesis. Intuition is an important aspect of creativity, but if taken too seriously and not intersubjectively controlled (e.g. by democratic expert processes such as peer review) it can lead to unnecessary conflict.

**1.10 Personal factors**

It can be useful to think of theories, theses and arguments as having independent existence (Karl Popper's "objective knowledge" or World 3). But in reality theories are always created by people, and people have different qualifications, reputation, experience, power, connections, attitudes (e.g. to morality), beliefs (e.g. religious), interests, motivation (driven by emotion), and so on. Arguments can be affected, distorted, or biased in their content or presentation by personal factors. These factors may reduce our ability to think critically or objectively, or to reflect in an honest or reasonable way on our own subjectivity.

Acknowledgement of the qualification and expertise of an author or discussant can play an important role in clear critical thinking, especially if you do not feel sufficiently qualified to decide whether a given statement is true or not. Experts are necessary to solve difficult problems. It is important to avoid appealing to the authority principle – when experts cannot give reasonable explanations.

A classic modern case of failure to recognize expertise is climate denial. Climate deniers may misunderstand the function of anonymous peer-review procedures used by climate scientists to guarantee scientific quality, often because they never participated in one. While peer-review procedures are not perfect and can be biased, they remain the best available way to check the validity of purported facts, observations (data), and arguments. In that regard they are far superior to any other source of information that might be available to a typical climate denier. Climate denial is just one of many forms of scientific denial (tobacco-cancer denial, HIV-AIDS denial, CFC-ozone denial, evolution denial, vaccine denial). The deniers often have something to gain (often financial) from contradicting facts reported by qualified experts, or opinions based on those facts.

Power relations often distort the way people talk about important issues, so the ability to recognize and interpret power effects is another important aspect of clear critical thinking. Journalists can't always write the truth if the media are owned by Berlusconi or Murdoch. It may be difficult to contradict large powerful corporations (Google, Microsoft...) or religious authorities (Christianity, Islam...), especially if the critic depends in some way on the organization. In many countries, journalists and artists who openly criticize their government risk serious consequences. I am lucky not to live in such a country.

Emotion is another important issue. On the one hand, clear thinking should depend on logic and evidence; it should not be distorted by emotion. On the other hand, it is normal and indeed necessary for people to be emotionally attached to their beliefs, if only because we are more likely to remember something if it has emotional significance for us ([LaBar & Cabeza, 2006](http://www.nature.com/nrn/journal/v7/n1/abs/nrn1825.html)). A classic example is the question of the existence of God. For millennia, philosophers and theologians have tried to prove the existence of God, but their proofs were never completely watertight. If you look behind those arguments, you find two considerable sources of distortion: the power of the Catholic church (which for two millennia made it dangerous to question the existence of God) and the positive emotional consequences of believing in an omnipresent, all-knowing, all-loving God (which presumably still influences thinking on this subject today). This is an extreme example, but there are many other examples in which emotion clearly plays a role: parents may believe in homeopathy because they are convinced that it cured their child's disease, lonely people may believe in astrology because they are convinced it can help them find a partner, and so on. An interesting source on such issues is [Skeptics Society and Magazine](http://www.skeptic.com/).

**1.11 Further features of a good theoretical paper**

**Relevance.** It may seem obvious, but it is important to address a topic that really matters. As a researcher you should be able to explain to other people why your topic matters—as if you were applying for a large amount of money to perform the research. A grant agency will not support a project unless they are convinced there will be interesting, useful outcomes. Perhaps the most important research topics of all, at least from a human-rights perspective, are those with life-and-death implications for millions or even billions of people. The world would be a better place if more people academics applied this criterion. Your paper should in any case address an issue that is important for many people. For example, a musicologist might analyze the work of a long-forgotten composer—learning on the way about the social, cultural and historical context of the composition, which is also interesting outside musicology. Another criterion is the history of your topic. If you know that people have been addressing the same problem for a long time, and you think you have a useful new angle, that is a good reason to address it. You are at least likely to get an appreciative audience. Perhaps you have good reason to think people in the future will consider your topic important, even if they do not yet think it is important today.

**Clarity and directness.**A good academic essay or theoretical paper is not self-gratifying, important sounding “blabla”. Instead, it is written in a clear and honest fashion, striking a good compromise between clear everyday language and more rigorously defined academic terminology. The text is written with a given group of readers in mind - often the author's peers, researchers in the same area in other places. The writing style should help the target readers understand the material quickly and easily. That gives them the power to criticize it, come up with alternative ideas, and test those ideas in some kind of hermeneutic or empirical process. Good academics are generally open to criticism of this kind (e.g. in peer-review procedures), and many even go out of their way to get it. Poor academics may develop unnecessarily complex or unclear terminology or arguments in an attempt to “blind their audience with science” and in that way to hinder criticism by their peers or students.  Karl Popper’s principle of *falsification* is relevant here. If it is not logically possible to falsify or disprove a theory, it unlikely to be true. Therefore, the idea in question is not even a “theory”. For example, you cannot disprove the existence of an invisible ghost behind you: the invisible-ghost theory cannot be falsified. Therefore, it should not be regarded as a scientific theory. In practice, a theory may be regarded as “valid” if counterarguments exist and can be convincingly refuted (rebuttal), based on clear observation, a reliable evidence, or logical argument.

A theory that is expressed in clear language is not necessarily more likely to be true. However, clear language facilitates open critical discussion, so the process of trying and failing to disprove the theory (formulating falsifications and rebuttals) is more likely to come to a clear conclusion in the subjective interpersonal world of research. Therefore, it is important to express your ideas clearly and concisely. Truth distortion (aka bullshitting) is very common in academe, and one of the most important things that students should learn at university is how to spot it and avoid it.

In quantitative disciplines such as economics or psychology, in which statistics play an important role because measurements and predictions are often quite uncertain, researchers may obscure their arguments with mathematical jargon that even expert reviewers are not sure they understand rather than addressing the main issues from a subjective viewpoint. The mathematics may indeed be necessary—but it is also possible that both the authors and the reviewers are hiding behind a cloak of pseudo-complexity.

**Focus.** A good piece of academic writing is an attempt to push back the boundaries or knowledge, or expand existing ways of thinking. Changes in the culture of knowledge and thinking usually happen in small steps, and sometimes small steps have large implications. We should therefore refrain from trying to change the world and instead focus our writing on a specific issue, looking at the issue in depth from a number of different angles. Often, this means formulating and testing a thesis. We then focus all parts of the text on the question of whether, or under what circumstances, the thesis may be valid. The materials below show in detail how this can be done effectively.

**Interdisciplinarity** is anathema to [fundamentalist](http://www.uni-graz.at/communication/news/archiv/2003/symposium.html) ideologies, whose proponents are often either unwilling or unable to see things from different viewpoints, or to seriously consider different possible epistemologies. But that may merely be an extreme example of a widespread phenomenon. In my experience, a certain entrenched resistance to appropriate interdisciplinarity can be observed in most academic disciplines. There may be good reasons for that: interdisciplinary scholars run the risk of appearing as amateurs to one or both sides, and the additional effort that is normally required for interdisciplinary research may be insufficiently rewarded within institutional infrastructures. Interdisciplinary research is characterized by difficulties of communication between researchers from different academic traditions, and the difficulty becomes acute when the research attempts to traverse the treacherous gap between the humanities and sciences (the "two cultures" of Snow, 1960). But this gap must surely be bridged if humanities and social sciences are to achieve a high academic standard. Humanities scholars and scientists who are interested in similar questions should not simply ignore each other. Given this background, the present guidelines aim to balance and combine the usual approaches of humanities and sciences - to develop and apply basic ideas and assumptions about "good" research that are common to both sides.

**1.12 Related approaches**

This approach is inspired by that of Toulmin (1969), who used similar concepts but different terms: *claim* (which I call thesis), *data* (evidence), *grounds* (arguments for the thesis), *warrants* (how the evidence supports the thesis), *qualifiers* (limitations), *rebuttals* or reservations (evidence and arguments against the thesis), *backing* (subtopics that support different aspects of the thesis).

Another related approach is that of Booth, Colomb, and Williams (2008). An important focus of their book is the art of effective communication with potential readers, which can be broken down into several different elements: identifying target readers, convincing them of the importance and relevance of the research question, presenting material in most logical and comprehensible order from their perspective (old before new, specific before general, simple before complex), and anticipating their reservations and responding to them appropriately. Booth et al. describe the structure of an argument in a similar way but with some differences in terminology: they talk about *reasons* rather than grounds, and *subordinate arguments* rather than evidence for and against subtheses.

**1.13 The philosophy of argumentation**

Readers with a background in philosophy will be disappointed to find that the present approach deviates considerably from standard philosophical treatments of argumentation, and even seems to ignore them. In fact, I have the greatest respect for philosophers and philosophy in this and other areas. The trouble is, their work is only partly relevant for the present task. That is because philosophical and scientific approaches to this issue often have different aims.

Philosophers like to classify different kinds of argument, or define the components of arguments. They have developed strict definitions of words such as “premise”, conclusion”, “logic”, “formal”, “valid”, “sound”, “cogent”, and even “truth”. These definitions may differ from everyday usage, which is more subjective. For this purpose, they analyze arguments that scientists may find trivial, for example: *All Greeks are human and all humans are mortal; therefore, all Greeks are mortal.* This is a *valid argument* because the conclusion must always be true, if the premises are true. If, however, the conclusion is not true, the premises cannot both be true. By contrast, the following is a “defeasible” argument, because it is (only) usually true: *Tweety is a bird. Birds generally fly. Therefore, Tweety (probably) flies.*

It is not the aim of these guidelines to classify arguments in this way. The aim is to help students present arguments that are convincing for relevant experts. In practice, convincing arguments may be carefully formulated and concise on the one hand, but also subjective and informal on the other. They may include technical jargon that is difficult for outsiders to understand, but they may also be expressed in a way that real people can talk and think about. This is not formal logic in the philosophical sense, and it is certainly not symbolic or mathematical logic. Therefore, the philosophy of logic is not necessarily relevant.

In any case, leading scientific experts may not know much about the philosophy of argumentation. Instead, they know a lot about their specialist field. Nor are they “objective” in the sense of formal logic in philosophy. The idea that science is more “objective” than humanities is not true when it comes to the people who make decisions about what should be published or not. In the end the anonymous reviewers of manuscripts that are submitted to academic journals make subjective decisions like everyone else. They evaluate arguments subjectively against the background of what they already know. They do not expect authors to follow strict rules of logic. They certainly do not expect to find absolute truth in the conclusion section; if, however, they find statements that are “obviously true”, they may reject the contribution for being too trivial or unoriginal. What they are looking for is interesting contributions to current specialist discourse that sheds new light on complex issues.

There are connections, of course, between this guideline and standard philosophical approaches to argumentation. In particular, the dependence of a main thesis on a set of subtheses is structurally the same as the dependence of a conclusion on premises. But in the present approach both the subtheses and the main thesis are inherently uncertain—otherwise they would be trivial and hence scientifically uninteresting. If the answer to a question is obvious, there is no need to investigate it. The thesis and subtheses only become convincing when arguments in favor of them seem to outweigh arguments against them. While this process normally involves logic in the philosophical sense, it is also subjective in that experts in relevant fields are typically weighing up the relative importance of arguments for or against given proposition.

The relative importance of arguments depends on many factors. How might a given stakeholder use a given conclusion? How might he or she turn the idea to his or her benefit? Issues of this kind may not be explicitly spelled out, but may nevertheless influence the outcome (the “constructed knowledge”). For example, an economic theory that indirectly benefits the rich more than the poor may be intuitively preferred by economists, and they may also be unaware that a conflict of interest exists, or if it does, that it is clouding their judgment (Moore et al., 2010).

One point from philosophical theory, however, is relevant and important: the distinction between inductive and deductive arguments. The main thesis of a theoretical scientific paper is generally inductive. The author invents an explanation for a set of data (or chooses from a set of existing explanations) and checks consistency between the explanation and different observations in a top-down fashion. In that sense, one could say that formulating an inductive argument is what this guideline is all about.

**2 Using these materials**

**2.1 Your thesis**

This guideline focuses strongly on the student's thesis (or main claim), which is intended to be original but in practice is similar to theses already expressed in the literature (sometimes embedded within other arguments). The student's task is to formulate a thesis that is interesting (which means it has practical implications and could well be true, but is not obvious). She or he then asks: to what extent might the thesis be true, or not true? And on that basis: Can this thesis expand our knowledge of the topic?

Your thesis should be a single, unitary claim. It should not be a collection of different claims, nor should it be two different possibilities separated by “and” or “or”. It should be neither obvious (trivial) nor improbable; in other words, it should seem reasonable at first glance. It should also be falsifiable, that is, it should be possible to make an observation that would contradict it. In other words, it should be an interesting idea or proposal that one would need to test, and it should be possible in advance that the result of such a test will be negative. Your thesis should also be supported in different ways by different sources (empirical or theoretical). It is ok if one or more sources contradict the thesis, suggesting that further work is necessary, provided most of the evidence supports it. The thesis should be carefully and concisely formatted: every word counts!

Having formulated your thesis, the idea is not to “prove” it, but to present arguments and evidence both for and against it, and then to show that the arguments for it are stronger than those against it. The ultimate aim is to convince a critical expert audience that your thesis is promising and probably true, at least within a given domain.

To find convergent evidence for your thesis, you will often have to look at research in different relevant disciplines. Thus, a secondary focus of the method is interdisciplinarity. How do people in contrasting disciplines approach the issues in question? What can we learn from trying to combine their approaches? To answer these questions, it is of course necessary to survey the relevant literature in different disciplines. But the presentation should never slip into a series of summaries. Instead, it should be structured around the student's original argument. All references to the literature should refer directly to that structure.

To enable this to happen in practice, the student fills in a table called a "tabular argument” that is intended to cover the central features of a good academic argument. Typically, the contents of the table are revised many times before the student starts to write the final text, which may for example be a Bachelor's thesis. The table is then included as an appendix.

Many colleagues find this approach overly formalistic, but they usually also agree that the points addressed in the table are important ingredients of any argument. The tabular argument is intended as an exercise to be done thoroughly, but only a few times. If students apply the ideas in the table to research questions that interest and motivate them, they will internalize the main ideas through a process of learning by doing. In my experience, that is pedagogically much more valuable than an abstract theoretical consideration of the same ideas. After that, students can return to a less formal approach to structuring an academic text, armed with a better understanding of general principles of critical thinking and academic communication.

Perhaps the central problem from the student’s viewpoint is this: How can I "unpack" my main question to look systematically at the details, and then "repack" it in order to reach some a general conclusion? Unpacking your question involves dividing it into subquestions and answering them with "subtheses" based on good research literature. "Repacking" involves formulating a main thesis and looking how each subthesis supports it. In most research, this process happens intuitively or implicitly. Here, we make the process explicit in the "tabular argument".

**2.2 The basic elements of an argument**

Let us assume that you want to convince your target audience that you have found the right answer to a given question. That sounds arrogant, but this is often the main motivation that drives academics. They want to become known for having answered interesting questions. Incidentally, hypothesis testing is widely regarded as the best approach to quantitative empirical research, and it is essentially the same thing: start with a falsifiable idea that you believe is true and convince others by showing that is it supported by data or observations.

Imagine for a moment that you are one of us arrogant, obsessed academics, and you want to say something like this: "I believe that explanation X is the best answer to question Y, for the following reasons: reason 1, reason 2 and reason 3." Imagine counting those three reasons off on your fingers while trying to convince somebody that you are right. Imagine that you then go on to explain why each of these reasons is separately true. Now imagine that your target audience comprises your fellow researchers in different countries. Have you ever tried to do something like that? Not with international academics as your audience, but a family member or a friend? If so, you already have some basic skills in the art of structuring an argument and writing a good theoretical abstract. In the jargon of this approach, X is the *main thesis*, Y is the *main question*, and 1, 2 and 3 are *subtheses*.

Now think about the structure of this statement: "I believe that explanation X is the best answer to question Y, for the following reasons: reason 1, reason 2 and reason 3." This is not the only possible structure for an argument, of course. But it is a very common form. It is an argument based on *convergent evidence*: the three subtheses provide convergent evidence for the main thesis.

The thesis is convincing if it is supported several times, and the different sources of support are plausible and independent. In general, we might say that the chance of convincing a critical expert depends on the number of subtheses or sources/kinds of evidence (the more the merrier), their quality (one good argument may be better than 100 poor arguments), and how independent (or non-overlapping) they are.

Sources of evidence may be considered “non-overlapping” if they arise from different sources. For example, relevant research projects in different areas (neurosciences, psychology and philosophy) may lead to different conclusions, but they may all be consistent with your specific thesis. Their independence increases the probability that your thesis is correct. Similarly, a judge is more likely to convict a murderer if evidence consistent with that conviction is presented independently by people who did not know each other before the death.

Have you ever been amazed by someone's failure to simple arguments that are supported by convergent evidence? There are several possible reasons for this kind of stubbornness. There may be problems in the detail of the arguments you are presenting; you have to be self-critical to notice them, listening to objections and adjusting your argument accordingly. Maybe that person is so emotionally attached to a given outcome (i.e. to a given possible answer to your main question) that no amount of logical explanation will convince them. Maybe that person has never learned the basics of the art of critical thinking, either directly or indirectly, or is not aware that good arguments often have this form.

**2.3 Writing an abstract**

Writing an abstract is one of the most important academic skills, because the abstract will be read much more often and more carefully than any other part of an academic article. People often find the abstract in the internet and either are unable to find the main text or have no time to read it. Clearly, it is important to attract the attention of your target readership with your abstract. To do that, you should get to the point quickly, focus on the main issues, say specific things about those issues, and do all of this clearly and concisely.

In modern academic research, a theoretical paper generally begins with an abstract whose structure reflects the structure of the paper. In the present approach, the abstract usually comprises the following elements:

* introductory sentence (address the important issues immediately and directly!)
* main question
* main thesis
* (first subtopic:) first subthesis
* (second subtopic:) second subthesis
* (third subtopic:) third subthesis
* main counterargument and rebuttal (i.e. why it could be weak or invalid)
* implications if the main thesis is correct

That's pretty straightforward, and here are some examples of how it works. Let's start with an important current issue at the interface between research and politics. Imagine you are writing an essay on "The causes of global warming". That is the title on your title page; in the jargon of this approach it is called the "main topic". Your main question is "What is the main cause of global warming?" Here is a possible abstract that includes all the above elements, one after the other:

Global warming may be the most serious problem ever faced by humans. What is its main cause? Convergent evidence suggests that the main cause is greenhouse gases produced by human activity. (Temperature data:) Apart from fluctuations with periods of one or a few years, global mean temperature has risen steadily since humans started burning fossil fuels. (Influences on global mean temperature:) In recent decades, natural influences on the long-term development of global mean temperature have been smaller than human influences. (Modeling results:) Models of the history global mean temperature data work best when they combine several factors, of which anthropogenic emissions is the biggest. (Magnitude of the temperature increase:) A model that includes the thermal capacities of oceans, crust and atmosphere can explain the relationship between total emissions since industrialisation and the magnitude of the increase in atmospheric temperature. (The role of expertise:) Almost all qualified climate scientists agree that global warming is caused by humans; there is no reason to expect bias, and non-experts are not in a position to disagree. Many people are skeptical about global warming because they cannot perceive its effects, but research shows that the effects are already serious. Urgent and radical political action is required to prevent global warming exceeding 2°C later this century.

Can you identify the above elements (starting with the introductory sentence) in this abstract draft? If so, you have understood the main features of this method. The words in brackets are the subtopics; they should be deleted to make the abstract flow.

Here is another interesting and controversial political issue. The essay might be called "The advantages and disadvantages of university fees":

Universities are funded from a mixture of sources. In many cases, they include student fees. Should university students have to pay fees? A range of available arguments and evidence suggests that they should not. (Social justice:) Fees can prevent young people from studying whose parents have less money. (Social well-being:)  Societies with lower wealth gaps are happier - more peaceful, healthier - than societies with higher wealth gaps. (Universities as long-term social investment:) The general public generally gets a good return on long-term investment in universities. (Taxation:) Universities can be entirely publicly funded if existing taxation schemes are applied fairly - e.g. by closing tax havens and enforcing progressive tax scales - and plans for wealth, environment and transaction taxes are implemented. Students may be more motivated to study if they have to pay for the privilege, but students can also be motivated by adjusting challenges to skills, to increase the sense of achievement.

Again, try to identify the main elements in the above argument. Note that I omitted the implications at the end, because implications were already been stated as arguments for the thesis.

Here is a musical example for my students in systematic musicology. The title might be "Role models and the motivation to play a musical instrument":

Children vary considerably in their motivation to play a musical instrument. That seems to determine whether they will become musicians and, if so, what standard they will achieve. What can account for this variability? The main source of motivation may not lie in the music itself or in the child's personality or physiology; instead, it may come from role models. Parents can be important role models if they regularly sing and play music themselves, and the child experiences their enjoyment of this activity. Much the same goes for siblings ((subtopic 2)) and peers ((subtopic 3)): friends and acquaintances both at school and outside of school. There is also evidence of motivation from the emotional reward of the musical sounds themselves; that certain personality types are more likely to want to play music; and that the brains of children who play music are different from the start. However, the evidence for these alternatives is weaker. It follows that, if parents or teachers want their children or pupils to engage in music, they must do so themselves, and genuinely enjoy doing so.

Here is another musical example. The topic might be "The psychological foundations of consonance and dissonance in Western music":

The structure of mainstream Western music depends crucially on consonance and dissonance. Dissonances resolve onto consonances with specific voice-leading patterns. What are the psychological foundations of consonance and dissonance? Musical consonance/dissonance is not a unitary construct, but a combination of several elements. (Roughness:) First, musical sonorities are more consonant if they sound less rough - if there is less peripheral interaction between partials falling in the same critical band. (Harmonicity:) Second, musical sonorities are more consonant if their spectra are more similar to a harmonic series. (Familiarity:) Third, musical sonorities are more consonant if they are more familiar to the listener. (Temporal relationships:) Fourth, the consonance of a musical passage also depends on relationships between successive sonorities. One of these factors may be dominant in given situations (for example, familiarity may be dominant for modern listeners), but when the historical dimension is included, there is no clear evidence for one main factor. On this basis, traditional Pythagorean ratio-based concepts of consonance should be abandoned, with interesting consequences for the foundations of music theory.

To write an abstract in this style, try first to concisely formulate your main question, main thesis, subtopics and subtheses. Then identify what is probably the main counterargument (the main objection that experts would have to your thesis) and try to refute it. If you can't refute it convincingly, think about changing your thesis! After that, add an introductory sentence and think about the implications if your thesis is correct. Bingo: you have a first draft of your abstract, and the most important points in your tabular argument.

Here are some further points about writing an abstract.

* 1. Focus on academic content: your main question (preceded by some informative background), possible answers to your question (theses), arguments and evidence for and against one or more theses, and possible implications of one or more promising theses.
	2. Write very concisely. Normally there is a word limit and you will want to use every word effectively to communicate concrete academic content. Often it is possible to reformulate a sentence using fewer words and still convey the same content. Experiment with that!
	3. Avoid talking about the contents (sections and topics) or structure of your paper. Instead, explain the main content. Don’t mention parts of the structure, such as the introduction or the first section of the middle part, or the order in which material is presented.

You also want your title and abstract to be found by internet search machines. Consider the following strategies:

* Abstract: Make sure it includes words that potential readers are likely to search for. To do this, list the main technical terms or keywords. Then list other words that mean almost the same thing (similes), using a thesaurus, and revise the abstract accordingly.
* Title: Avoid words that happen often in titles, e.g. “effect of”, “participation in”, “evidence for”. Be specific! Start with the most important words. Avoid punctuation such as hyphens, quotation marks, or question marks, which tend to confuse search machines. Avoid abbreviations.

**2.4 The deep structure of your argument**

A good presentation often moves from the specific to the general and back again. The introduction leads the reader or listener from a specific example to a more general issue or question. The main text considers specific aspects of that general question. The final section develops a general answer to your general question and considers specific implications. The process may be conceived to involve a kind of cycle, as illustrated in Figure 1.



*Figure 1. Specific versus general aspects of an academic presentation*

Your text should begin with a (specific) *example*, which attracts the reader's or listener's attention and vividly illustrates your main issue or question. If your topic is the role of personal relationships in a child's musical development, you may present a brief case study of a 7-year-old girl called Sarah who is learning the violin. The story includes specific events involving her sister Mary, her brother Jim, her schoolfriends Tatevik and Mohammed, her parents Jill and John, her teacher Susanna, and so on (if the names are invented, just explain in a footnote; but it may also be possible to find a real story that is already published, to which you can refer). The story suggests that each of these people played a specific role in Sarah's musical development. On this basis you can now formulate your main (general) *question* (e.g. "What role do personal relationships play in musical development?"), knowing that your reader or listener now has good feel for the question's nature, scope, and relevance. These are some of several elements of a good introduction (on which more later).

The central section of your presentation or article then looks at your question from different perspectives, entertaining a range of available arguments and evidence (for example from empirical research in music psychology). After this detailed analysis comes the final section, in which your (general) *thesis* is formulated to answer to the initial question, and the (specific) *implications* of that thesis are considered. What if the thesis were really true? What then? The implications are answers to these questions. Students often have trouble with implications, because to formulate them they have to think creatively, laterally, and "outside the box" - an essential skill that many high schools unfortunately do not seem to train. Your thesis has general character, whereas the implications are more specific. Finally, you can explain your thesis and its implications by reconsidering your original (specific) *example*, which closes the loop in Figure 1.

To convince an expert reader or audience that your thesis is valid, try presenting convergent evidence for it, and rebutting to the main counterevidence. Convergent evidence means that your subtheses should support your main thesis although they are approaching it from different directions. To make sure this is going to happen, subdivide your main question into subquestions (explain how and why you did this at the end of the introduction). The answers to your subquestions are your subtheses. All of your subtheses should support your main thesis (the start of the conclusion is the place for this). These relationships are illustrated in Figure 2.



*Figure 2. Subdividing your main question into subquestions, and your thesis into subtheses*

There are many different ways to divide your topic into subtopics. You may consider your question from the point of view of different disciplines. You may address some specific context-independent issues, and then consider the more global contexts for which you question has relevance. You may contrast qualitative and quantitative approaches. You may compare different theories. Every interesting question has a unique set of issues to address. The material in subtopics should not be introductory, so the main aim of a subtopic should not be to explain or define a concept or an empirical method, for an example. Instead, each subtopic should allow you to formulate, support and defend a unique subthesis. This subthesis should then support the main thesis (so of course it should not be the same as the main thesis); taken together, the subtheses provide convergent evidence for the main thesis.

Consider again the example introduced above. What contributes most to the success of a young musician? After studying the empirical literature, you may believe that the most important factor is personal relationships. That is an interesting idea, because it is not entirely clear whether it is true, or how much it is true; but good arguments can nevertheless be found to support it. You might then divide the main part of your presentation into four subtopics addressing the role of parents, siblings, teachers and peers respectively. In the first subtopic, you would then present arguments and evidence that parents make an important contribution to the later success of a young musician; in the second subtopic, siblings; in the third, teachers; and in the fourth, peers. In each case you would address different literature sources. After putting together all this convergent evidence, you would stand a good chance of convincing an expert reader that your thesis is correct, or at least a promising idea.

Another important aspect of the structure of your argument is the relationship between evidence, thesis (or conclusions) and implications. As illustrated in Figure 3, this relationship is simple and one-directional: the *thesis* depends on the *evidence*, and the *implications* depend on the *thesis*. The evidence does not depend on the thesis; nor does the thesis depend on the implications. In the previous example, the arguments and evidence that you present should be independent of your conclusions; to make this clear, you might systematically compare different possible answers to your main question and subquestions, or consider the results of empirical studies whose goal was quite different from yours, but nevertheless produced evidence in favor of your thesis. Your conclusion that the success of a young musician depends on personal contacts should depend only on the arguments and evidence; it should not depend on the implications. The implications may be that music educators should pay more attention to personal relationships of all kinds surrounding music lessons. They may not want to do that, and for that reason they may doubt your conclusion, or try to show that it is incorrect. But the conclusion depends only on the evidence! It does not depend on the implications. Similarly, politicians who are worried that this conclusion may increase the public cost of music education may also question your thesis. In reply you should remind them that thesis does not depend on the implications.



*Figure 3. The one-way relationship between evidence, conclusions and implications*

For a contrasting example, consider the question of climate change, and who or what is causing it. Many climate deniers refuse to believe that the planet is warming. Alternatively, they refuse to believe that humans are causing climate change, because that would make us (and especially them) responsible. They have a feeling that climate change cannot be caused by humans, because they don't want to share responsibility for such an enormous crime. In an attempt to escape from this responsibility, they talk as if the *conclusions* of climate science research depended on its *implications*. In fact, the *conclusions* depend only on the *evidence*. Climate deniers may also accuse climate scientists of rigging their *evidence* to support a given *conclusion*. But the scientists know that their evidence is (or should be) independent of their conclusions; they are trained to produce independent evidence, and they have access to diverse, tried-and-tested methods for this purpose, from experimental design to peer review. Climate deniers may have little knowledge or experience of these methods. Climate scientists realize similarly that their conclusions should be independent of the implications. They first develop their conclusions from the available evidence, and then consider the implications in a separate step.

**2.5 Writing the main text**

I am assuming that students reading this guideline already have considerable experience writing essays in an academic style, for example at the end of high school (*Vorwissenschaftliche Arbeit)* and the first year or two of a university bachelor degree course (*Proseminararbeit*).

The aim of this guideline is also to write a text in a regular academic style, but to ensure in advance that the structure of the argument is clear. The first step is to fill out the table “Structuring the argument of a theoretical paper” in the “how” document. This is certainly an interesting exercise, and you will find some tips on how to do it in the file “argument\_talk.pptx”.

Once the table is ready and has been discussed and revised in class, it is time to write your abstract and main text. A guideline for writing the abstract is above. The main text should be a regular academic text in the style of the literature that you cited, following the structure of the table.

Avoid using the terminology of the table. Don’t write about your “example”, the “main topic”, the “academic background” of the question, the “context and relevance”. Instead, include these things. This also applies to the headings: they should focus on your specific content and not repeat the terminology from the guidelines for the table. Only use that terminology if it seems natural in the context of an academic text. Your task, therefore, is not to write directly “My main thesis is XXX because of XXX”, but to explain the material in a way that makes it clear to the reader what your main thesis and arguments are. Do not assume that your reader has read the present guideline. Instead, write for a general educated reader who is interested in your topic.

Always write in sentences and group sentences into regular paragraphs of at least three sentences each. Similarly, a section should comprise at least three paragraphs. Normally, the entire text comprises regular headings and regular paragraphs, just like the papers you are citing. Avoid point form—this is not a Powerpoint file! The first sentence of each paragraph usually introduces the topic of the paragraph, so that readers who are in a hurry can read the first sentence to get a feel for the text or to find something specific.

**2.6 Responding to review**

Whether you are submitting an article to a journal or an essay for grading - in both cases you may get constructive expert feedback, and you may then have the opportunity to revise and resubmit your manuscript (possibly to get a better grade). A good teacher-researcher will give you feedback on your paper, just as s/he would when asked to review an article submitted to a journal.

This procedure typically takes at least a month, and sometimes several months. First, the reviewer or grader may need a few weeks to prepare the review, because everyone is busy with other things. Then you may need a few weeks to implement the recommendations. After that there will be a second review. So be patient and allow enough time.

Please regard expert feedback as generally valuable. In fact, it is exactly what you need to improve your work. If an expert takes the trouble to remind you that your argument is problematic or you forgot to read an important article, or if s/he is asking you to make corrections that are intended to improve your paper, your response should be one of gratitude. Don't be surprised or disappointed, and it definitely does not help to be angry or offended.

The best policy is to respond constructively to all comments. If you disagree with a suggestion, first try to implement it. Do this even if you disagree with it, or you cannot see the point of it. In the long run, you might find out that it wasn't such a bad idea after all, and even if it is not the best suggestion, you will probably learn interesting things from trying to implement it.

If you really are sure that a suggestion is poor or the reviewer made an error, don't ignore the suggestion and hope s/he won't notice. Instead, try to convince her/him that you are right. This can only work if your arguments are good, and you don't try to do it repeatedly.

Here's a procedure for responding to comments in a way that reviewers are known to appreciate:

* Turn on "track changes" in your word processor so the reviewer can see what you did. (If there are too many changes, you may decide later to accept them all, turn off “track changes” and ask the reviewer to read the entire text again.)
* Revise the paper taking into account each comment.
* Read through the whole text again, fixing up any other problems that have arisen because of the corrections, e.g. in the flow of the text. You may have to rewrite some passages and do some re-organizing.
* Go through the reviewer's suggestions again and insert a comment after each one, explaining briefly how you responded to it or - better - copying and pasting the corresponding new piece of text under the comment.

If the changes to your text are minor, it may be enough just to resubmit the text with the changes marked. If the changes are major, it may be easier to accept all the changes in the main text so they are no longer marked (because there are so many of them, or you changed the structure) and instead respond carefully to each comment.

These ideas apply more or less equally to advanced student essays (term papers, seminar papers, Bachelor's theses) and articles submitted to peer-reviewed journals. If you are thinking of a research career, it is a good idea to start practicing these procedures when you are a student, at any level.

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