

Article

The Complexity Paper: A Writing Assignment that Targets Cognitive Bias

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The persuasive essay has long been regarded by university instructors in arts and humanities disciplines as the quintessential writing genre. It is no secret as to why. To compose a strong persuasive essay, students must demonstrate many critical thinking skills, which include interpreting the work of others in a fair manner, proportioning one's beliefs to the available evidence, presenting strong reasons in support of a thesis, and anticipating and responding to counterarguments (Carey, 2000; Cooper & Patton, 1997). These numerous skills can be divided into two overarching categories:

- 1) truth-seeking, which involves conducting an open-minded inquiry into a problem, and
- 2) persuasion, which involves convincing the reader of a position (Ramage et al., 2006).

Without a targeted intervention to break up this two-staged process, however, it is likely that students who have prior beliefs on a topic will prioritize persuasion over a fair and full inquiry (Southworth, 2020). This is most apparent when students purposefully seek out sources to defend their prior beliefs, thereby treating the research process as a means to a pre-established end. But it also occurs when students who have a confirmed position on a topic seek to engage in a fair inquiry. Even in these cases, cognitive biases are likely to emerge, most notably confirmation bias and motivated reasoning.

Whereas confirmation bias is the tendency to seek out information that aligns with one's prior beliefs, often unconsciously (Ditto & Lopez, 1992; Taber & Lodge, 2006), motivated reasoning involves interpreting information in a way that reaffirms one's beliefs (Kunda, 1990; Taber & Lodge, 2006). More alarmingly, it has been shown that interpreting both confirming and disconfirming evidence on an issue actually strengthens one's prior beliefs (Edwards & Smith, 1996; Lord et al., 1979; Nisbett & Ross, 1980; Taber & Lodge, 2006). Simply knowing that these biases exist does little to mitigate their effects as we have deep motivations to preserve our prior beliefs (Taber & Lodge, 2006). This is especially the case for those beliefs that are central to our personal identity, upon which

our relations with family, friends, and broader social and political circles rest. Since changing a core belief can be a potentially distressing experience, confirmation bias and motivated reasoning help us to avoid this discomfort by directing us along a path of least resistance.

Although the persuasive essay requires students to demonstrate numerous critical thinking skills, it has no mechanism to disrupt confirmation bias and motivated reasoning at the inquiry stage (Southworth, 2020). It could be argued that the convention of considering counterarguments provides such a mechanism, but this is rarely the case. Considering and responding to counterarguments is most often a rhetorical strategy designed to persuade a reader, not a strategy to ensure a full and fair inquiry. Given this challenge of cognitive bias, a writing scaffold structure can be developed to help students develop the skills of engaging in a fair, full, and judicious inquiry before undertaking a persuasive essay.

John Bean (2011) advocates a writing scaffold structure that includes an exploratory essay prior to a persuasive essay to help students develop the skills associated with inquiry. Instead of attempting to convince the reader of a position, the writer of an exploratory essay investigates an issue and ultimately arrives at a position. The exploratory essay is therefore thesis seeking rather than thesis supporting (Bean, 2011). Since its structure motivates students to consult different perspectives on an issue, it can better address the challenge of confirmation bias. However, the exploratory essay does not sufficiently target the challenge of motivated reasoning (Southworth, 2020). After all, students often bring their prior beliefs to the writing of an exploratory essay, which they will be motivated to preserve when interpreting the work of others and developing their thesis. Likewise, consensus-seeking forms of argumentation fail to sufficiently target motivated reasoning. This includes Rogerian argumentation, which involves describing competing perspectives before working towards a thesis that seeks a compromise (Hairston, 1976). However, since the writer of a consensus-seeking essay frames the parameters of the debate, it is likely that motivated reasoning will skew the resulting compromise towards the writer's prior belief (Southworth, 2020). Ultimately, whether a persuasive essay, exploratory essay, or consensus-seeking essay, argumentative writing genres do not fully address the problem of cognitive bias. This is not a failure of argumentative writing genres. Rather, we need to help students develop the skills of confronting their cognitive biases before they engage in an argumentative writing task. In particular, we need a writing assignment that explicitly targets students' confirmation bias and motivated reasoning to ensure that a fair and full inquiry into a topic is undertaken.

The Complexity Paper: Purpose and Structure

To help students confront their confirmation bias and motivated reasoning, and thereby foster the skills of inquiry, I propose a writing assignment called a complexity paper. The purpose of a complexity paper is distinct from argumentative essays. The writer neither attempts to convince the reader of a particular position as with a persuasive essay, nor attempts to arrive at a position as with an exploratory essay or Rogerian argument. Rather, the writer of a complexity paper attempts to convince the reader that the issue under investigation is complicated and difficult to resolve. This difference in purpose radically changes the motivational structure of the assignment. To effectively demonstrate complexity, students are incentivized to consult research from a variety of perspectives, including those that do not align with their beliefs. Students are also incentivized to read and think about this research in a way that challenges motivated reasoning. After all, a student's ability to understand and appreciate the merits of other viewpoints is a prerequisite for an effective complexity paper. While all writing assignments motivate students toward particular ends, the complexity paper motivates students to confront their prior beliefs rather than simply perpetuate them. Since the goal is to illustrate that an issue is complicated, a reader should not be able to determine the writer's position on the issue. As a result of this structure, even students who have strong prior beliefs on the topic will be motivated to understand and be charitable to opposing perspectives.

One of the central skills that a complexity paper helps students to develop is perspective taking—that is, looking at a problem or debate from different points of view. By learning to be receptive to opposing views and by being able to empathize with those who hold those views, students can confront their motivated reasoning and, in turn, develop their open-mindedness (Southworth, 2021). To effectively illustrate the complexity of an issue, a writer must be able to take on the perspective of an individual who holds an opposing position. By imagining what it must be like to hold a particular belief, the writer can broaden their horizons to understand how others conceive of an issue. In this way, thinking is not bounded by a pre-established belief as it is with the argument-counterargument-response structure of persuasive essays. Through perspective taking, the writer may even arrive at a position of doubt, which is an ideal psychological state from which to engage with a complexity paper (Southworth, 2021).

Although there are different ways to structure a complexity paper, in what follows, I outline a template that includes three main sections:

- 1) Introduction to the problem by summarizing the different views

2) Analysis of how each view engages with the other(s)

3) Elaboration and distillation of the core area(s) of dispute

By elucidating this structure, my goal is to provide university instructors with guidance on how to assign complexity papers within their courses.

1) Introduction to the problem by summarizing the different views

A complexity paper begins by introducing the topic; it then highlights the problem or debate by providing a summary of the different viewpoints. A summary in the context of a complexity paper involves a concise description of how a particular perspective conceives of the issue, and how it justifies its position. Depending on the length of the complexity paper and the topic under investigation, numerous positions can be summarized. However, in order to establish a problem or debate, a minimum of two positions is necessary. The summary of the different views provides a foundation for both the writer and the reader of a complexity paper. For the writer, it requires articulating the main commitments, arguments, and justifications for a perspective. For the reader, it provides the overarching context for the more specific analysis that follows in sections two and three.

Let us consider a complexity paper on the topic of physician-assisted suicide (PAS), specifically for individuals who are in chronic pain and whose natural death is foreseeable. To keep matters simple, we can imagine a paper that focuses on two positions: advocates and critics of PAS. To begin, the writer introduces the topic of PAS, describing the practice and distinguishing it from active, passive, and indirect euthanasia (Keown, 2002; Rachels, 1975). Once the topic has been introduced, the general problem or debate is highlighted. The writer summarizes the pro-PAS view by emphasizing the principle of autonomy, which provides individuals with the dignity to make choices regarding their own lives and well-being (Brock, 1992; Sumner, 2011). According to this view, as long as individuals are competent to make informed decisions, then physicians ought to respect those decisions. Having summarized the pro-position, the writer would transition to summarize the anti-position. Critics of PAS prioritize the principle of nonmaleficence, which is rooted in the Hippocratic Oath of doing no harm. According to this position, deliberately bringing about the death of an individual, whether an individual requests it or not, is a harm as human life has inherent value (Gorsuch, 2006). It is antithetical to the role of a physician, which is to sustain life and health (Kass, 2002).

Once the topic has been introduced and the main perspectives have each been summarized to illustrate the problem, the writer proceeds to the next section of the complexity paper.

2) Analysis of how each view engages with the other view(s)

Although the complexity paper is descriptive in nature, insofar as it does not defend a position, it is more than a summary. It is important that the writer appreciate and articulate how each viewpoint engages with competing perspectives. This helps to ensure that the writer does not have the different viewpoints talk past each other. Similar to Rogerian argumentation, the purpose of this section is to put the different viewpoints into conversation. For example, what points of criticism does View B direct towards View A, how does View A respond, and how does View B respond to this response? A similar analysis would then be provided for how View A engages with View B. This back-and-forth conversational exercise encourages students to take on the perspective of each viewpoint. The structure is notably different than the persuasive essay's rhetorical strategy of argument-counterargument-response. Although in both cases the different views are put in conversation, there is no resolution reached in a complexity paper. Given this structure, students are encouraged to be receptive to an opposing perspective and call into question their own perspective, which serves to mitigate motivated reasoning. If done effectively, the writer will reveal the depths of the problem, illustrating that it has no simple resolution. In this way, the reader should not be able to detect any partisanship on behalf of the writer.

Returning to our example, the writer in this section would take on the perspectives of each view by first detailing how critics of PAS respond to the position that autonomy is of primary importance. Critics can agree that respecting the autonomy of patients is an important consideration when it comes to medical care, but this autonomy is not absolute. In certain cases, it needs to be constrained. Physicians regularly deny medical treatment requested by patients if that treatment is not in the best interest of the patient. PAS provides such an example. A physician assisting in the death of a patient is not in the best interest of the patient. Life, quite simply, is a better outcome than death. The writer would then shift perspectives to articulate the pro-PAS response to this criticism. The writer could note that advocates agree that autonomy has limits, but that the practice of PAS falls within those limits. If an individual is experiencing chronic pain and suffering, then PAS is in the best interest of the patient. It is not that life is better than death; rather, the cessation of pain and suffering is better than the continuation of pain and suffering.

The writer would then undertake a similar exercise by considering how advocates of PAS respond to the view that the principle of nonmaleficence is of primary importance. Advocates of PAS could note that a commitment of doing no harm in fact provides more support for their position. After all,

if a physician does not respect a patient's request to die, the patient will end up experiencing more pain and suffering, which ultimately causes more harm. Shifting to the perspective of the critic, the writer could respond by maintaining that death is a greater harm than pain. It is precisely by respecting one's inviolable right to life that harm is reduced. While reducing pain and suffering of patients is part of the principle of nonmaleficence, it is trumped by the principle's more foundational duty not to kill. Advocates of PAS could in turn respond by noting that physicians do bring about a patient's death when they decide to forego the use medical technology to sustain a patient's life. In such cases, the physician is letting the patient die, but there is no morally relevant difference between letting someone die and killing them. Critics could respond by rejecting this argument of a moral difference. In the case of withholding treatment such as the use of medical technology, it is not the physician that causes the death. Rather, it is the underlying disease that causes the death. In the case of PAS, however, the physician is the direct cause of the death.

By putting the different viewpoints into conversation, the writer is able to reveal the depths of the problem. In the next section of the complexity paper, the purpose is to build on this work by synthesizing the core areas of disagreement.

3) Elaboration and distillation of the core area(s) of dispute

Whereas the previous two sections require students to engage in perspective taking to appreciate the merits of opposing viewpoints, this section requires students to synthesize the discussion by articulating where exactly the dispute rests. What accounts for the difference in perspectives? Do they disagree on the meaning of a concept? Is there an assumption that one view makes that the other rejects? This section begins with an elaboration of the different areas of contention.

To return to our PAS example, the writer would elaborate on the core areas of dispute. Most fundamentally, advocates of PAS prioritize the principle of autonomy and critics prioritize the principle of nonmaleficence. These differences in priority of ethical principles reveal different conceptions of beneficence, namely, what is in the best interest of a patient. For advocates, a patient's best interest is regarded through the lens of reduced suffering. For critics, however, a patient's best interest is seen in terms of sustaining life. Second, there is a deep moral difference regarding the distinction of killing and letting die. Whereas critics of PAS maintain that there is a moral difference between killing and letting die, advocates reject this distinction.

Having elaborated on the core areas of dispute, the complexity paper articulates a thesis at the end of the paper, similar to an exploratory essay. But unlike an exploratory essay, a complexity

paper's thesis does not advocate for a specific position. Instead, the thesis highlights the core area(s) of tension as to why the issue is difficult to resolve. In this way, the thesis functions as a conclusion, summing up the purpose of the paper. In the case of our PAS example, the thesis could be presented as follows: The problem of PAS is difficult to resolve for three main reasons: 1) critics and advocates prioritize different and conflicting ethical principles, namely nonmaleficence and autonomy respectively; 2) critics and advocates have different conceptions of what is in a patient's best interest; and 3) critics and advocates have opposing perspectives on the ethical difference between killing and letting die. In this case, three areas of difference have been highlighted, but this number need not apply to all complexity papers. Students can develop an effective complexity paper by targeting one or more areas of dispute. Ultimately, it is the articulation of a thesis, which emphasizes the complexity of the issue, that provides the motivational structure for students to target their confirmation bias and motivated reasoning.

While the example sketched above engages with critics and advocates of PAS for individuals who are in chronic pain and have terminal conditions, we could imagine a more advanced complexity paper that investigates a specific debate within this broader topic. For example, a complexity paper could inquire into expanding the eligibility of PAS to include individuals whose sole condition is a mental disorder. This is a debate that is currently taking place within Canada, where PAS is framed in terms of medical assistance in dying (MAiD). In 2021, the Canadian government expanded the eligibility criteria for MAiD to include individuals who have a mental disorder but whose natural death is not reasonably foreseeable. This contentious law, which is scheduled to be enacted in 2024, brings additional questions to the debate (Freeland, et al., 2021) that a complexity paper could investigate, including:

1. Do individuals with mental disorders meet the threshold for decision-making capacity?
2. How should we think about the possibility of a future remedy or intervention relieving the individual's mental suffering?
3. Should inadequacies in the health care system, particularly in the treatment of mental health, be addressed before implementing this law?

As we have seen, a complexity paper can help students who have prior beliefs on a topic confront their confirmation bias and motivated reasoning, and in turn, better recognize the merits of other perspectives. This is especially the case for topics that are central to an individual's identity because such topics tend to resonate on an emotional level. In this regard, there is a relevant distinction in the cognitive bias literature between hot and cold confirmation bias (Yudkowsky, 2008). Hot

confirmation bias refers to those issues that an individual is emotionally invested in whereas cold confirmation bias refers to those that are emotionally neutral (Yudkowsky, 2008). Complexity papers are certainly most relevant when engaging with emotionally-charged topics because we tend to come to these topics with prior beliefs that amplify our cognitive biases. Nevertheless, there are still good reasons to engage in a complexity paper even when students do not have prior beliefs about an issue and are therefore emotionally neutral.

Let us consider an urban planning problem in which a municipality is looking to invest in a public transportation system. Students are tasked to provide a recommendation that will optimize social, economic, and environmental outcomes. Assuming that a student does not have prior beliefs about such a topic (e.g., whether to opt for subways, streetcars, and/or buses), a complexity paper would still be a useful exercise to engage in before providing a recommendation. There are two main reasons for this. First, even if a student starts out with no prior beliefs on a topic, it is possible to be swayed early on in the inquiry process by a convincing source. This could activate confirmation bias and motivated reasoning throughout the rest of the inquiry resulting in a biased and incomplete search. Second, even if a student has no confirmation bias or motivated reasoning throughout the entire inquiry stage, the task to illustrate the complexity of the topic before providing a recommendation will encourage a full inquiry.

Using the Complexity Paper in University-Level Courses

Although the complexity paper incentivizes students to confront their cognitive bias, it is not necessarily an end in itself. Nor is it a replacement for argumentative writing genres. In fact, I regard the complexity paper as a tool to help students who are engaging in divisive topics (e.g., social, political, and/or moral topics) acquire the full range of skills that are necessary to write an effective persuasive essay. In this way, I recommend using a complexity paper as part of a scaffolded writing structure that precedes a persuasive essay. After undertaking a complexity paper, students will be in a better position to write a more nuanced and defensible argument, which includes responding to the strongest and most compelling counterarguments. By including a complexity paper within a scaffolded structure, students will have the opportunity to develop the full scope of critical thinking skills, ranging from the skills of inquiry to the skills of persuasion.

Including a complexity paper within a scaffolded writing design is useful at the undergraduate level, especially first and second year courses. Since this assignment guides students through a research, thinking, and writing process that fosters perspective taking, students can learn how to

recognize the merits of other beliefs and challenge their own beliefs. These are core skills for more advanced academic work. It might be thought that such an assignment is unnecessary at the graduate level since students have more knowledge on the topic. However, research has shown that the more knowledgeable individuals are on a topic, the more resources they have to explain away disconfirming evidence (Taber & Lodge, 2006). This bias, which builds on confirmation bias and motivated reasoning, is called the sophistication effect (Taber & Lodge, 2006). Since knowledge and expertise do not mitigate confirmation bias or motivated reasoning, the complexity paper has an important role to play at the graduate level.

Preserving our prior beliefs may be psychologically expedient but it can impede critical thinking. To meet this challenge, educators need to develop assignments and activities that help students recognize and address cognitive bias. In this paper, I have argued that the complexity paper encourages students to confront their confirmation bias and motivated reasoning through perspective taking. Being able to adopt the perspective of others and appreciate complexity are foundational skills not only for students' future academic and professional work but for becoming thoughtful and respectful citizens.

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