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Title: Decision Theory as a primary part of Critical Thinking Courses

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Introduction

In this paper I argue that, contrary to present practice, introductory logic courses ought to include decision theory as a major component.¹ (I am inclined to think—though I will not defend the claim here—that the time devoted to decision theory ought to be greater than that devoted to such matters as argument evaluation or fallacy recognition.) I do this by showing that, given a fairly neutral interpretation (amongst those who differ on the ends *and* those who—agreeing on ends—disagree about the best means of reaching those ends) of what an introductory logic course ought to provide to its students, people on all sides of these debates have good reasons for devoting substantial amounts of time to covering such topics as:

- the difference between intrinsic and instrumental values
- the concepts involved in maximizing expected utility
- the distinction between individual choice theory and game theory
- various game-theoretic problems, especially the prisoner’s dilemma, the iterated prisoner’s dilemma, chicken, and the assurance game. I hold that, in terms of students’ interests (whether conceived of as their actual interests or as their “real” or well-informed interests), learning elementary decision theory is much more important to them than learning the fundamentals of argument evaluation.

The Class of Logic Instructors

Most logic instructors are either philosophers or philosophically inclined academics. It is a characteristic of academics to value truth (or warranted beliefs) more than most people do. But it is not just truth we value; we value those truths which one has a good *reason* to think are truths. Arguments, evidence, inference patterns, and the like all matter a lot to us because we value finding truths which we can demonstrate to others are what we think they are, truths. The idea of Divine Revelation holds no special appeal to the academic. Indeed, revealed truths alone would be a terrible burden. As epistemologists we are likely to hold that one cannot know that **p** unless (among other things, such as **p** being true and believing that **p** is the case) one has adequate grounds to support **p**. (It does not matter for my purposes whether these “grounds” are foundational, coherentist, emergent, or involve some form of tracking to the truth. All that matters is that one be able to say something to others which gives them good reasons for thinking that **p** is true.) So, we literally cannot imagine knowing that **p** without being able to (at least in principle) offer some evidence for **p**’s being the case. But we can imagine *thinking* we know that **p** without having any evidence for **p**. And imagining that—imagining that one thinks one is in

¹ I checked the texts on my bookshelf and found none that discuss decision theory in anything more than a cursory way. The broadest in range among them (Diestler, 2001) contains material on induction, deduction, fallacy recognition, rhetoric, claim evaluation, and media scrutiny, but nothing on decision theory.

possession of revealed truths for which there is no support whatsoever—is to imagine something very unpleasant, for it is to imagine that one has lost one's rigor, one's proper standing as an academic, and even one's marbles.

But alas, the same cannot be said for the vast majority of our students. They do not value truth for its own sake. Still less do they value the grounds for truth. For them, truth is only valued instrumentally. (Perhaps it will be useful in answering some of the questions “on the test”! Or to get a job. Or a date.) Now, I certainly do not wish to claim that getting students to come to value truth, or, more importantly, the pursuit of truth, for its own sake is not something we should be doing. Of course we should be doing that. That—or something like that—is what we all believe that higher education is all about. Producing in people a love of learning and the capacity to promote, protect, and sustain that love in rigorous and fruitful ways is what we do. And for most of us we would not be devoting our lives to the academy unless we thought that thinking critically about what one is warranted in believing really matters. But, as we all know, going into a classroom and simply extolling the virtues of being able to detect truths for their own sake is a disaster. It turns many students off. We have to first show that what we have to offer is of some value to them, in terms of their own values. And, then we have to hope that, in the course of doing something that matters to them from their perspective, they come to adopt some of our values.

Students—lots of observable evidence to the contrary, notwithstanding—value being able to make rational choices. Of course, rational choices based on false beliefs are more likely to lead to undesired outcomes than are rational choices based on true beliefs. So, critical thinking and argument evaluation remain important to those who (attaching no intrinsic value to having true beliefs) value choosing efficiently or wisely. Nonetheless, most students would prefer not to have their lives go badly because they made unwise choices, and they (aptly, in my view) rank this preference above that of avoiding having their lives go badly because they clung to false beliefs. Given this, it is easier to show those students who understand the basic features of decision theory—those who realize the importance of thinking clearly about what to *do*—that they ought to devote more of their energy to thinking clearly about what they are warranted in believing.

Thus, given the choice between teaching argument evaluation (or fallacy detection, or the basic skills in determining how warranted a claim is) and teaching decision theory, doing the latter is the more appealing choice to the typical student.

Recently, the main debate among those offering introductory logic courses has been between those who think such courses should concentrate on the rudiments of formal logic and those who think the informal approach is superior. I do not have a very good grasp of this debate. I have not even been able to figure out whether it is a debate over ends or one over the most appropriate means of attaining shared ends—though, since virtually everyone participating in the debate would accept Thomas Jefferson's claim that the good citizen must be able to think clearly, we can characterize the debate as one over which means best yield a mutually desired end. (Copi quotes Jefferson as claiming that, "In a republican nation, whose citizens are to be led by reason and persuasion and not by force, the art or reasoning becomes of the first importance.") But on whether such a characterization begs the question or unfairly puts the issue in some respect, I remain agnostic.

Towards a neutral interpretation

It seems to me that what we want to accomplish in introductory logic courses is (in no particular order) the following:

- to provide students with the skills that will enable them to reason clearly about matters they are likely to actually face in real life (that is, outside university);
- to provide students with the sorts of skills that will allow them to gain more than they otherwise would gain from the other courses they are taking;
- to provide those students who will go on to take other philosophy courses with background information which will enhance their performance in those courses;
- to get students thinking philosophically and critically about whatever is important to them;
- to keep students happy;
- to have fun ourselves—not just for the selfish reason that having fun is, well, fun, but because having fun doing intellectual work tends to be contagious and we want students—at least a few of them—to catch this attitude.

Logic, standardly construed

I suggest that we characterize logic as answering the following three questions:

- Given the evidence what ought I to believe?
- Given the argument what ought I to believe?
- Given what I already believe, what else ought I to believe?

Of course, some readers will want to substitute "warranted in asserting" or some such phrase for "ought to believe". But that is not really of interest to me here. Given your favorite idiom, I suggest that the three items above pretty much cover what most people include in their introductory logic courses. Certainly, the numerous texts sent to me seem to indicate that this is pretty much what publishers think ought to be included. And the only book I have read which was written for those writing informal logic texts (Grennan, 1997) makes no mention of decision theory.²

Characterizing decision theory

I suggest that we characterize decision theory as the theory which answers the question, given what I believe and desire, what ought I to do? Of course, some people will want to use different terminology, such as "Given my beliefs and desires, what is the most rational thing to do?" or "What would I be warranted in doing?" But however this is phrased, the topic can, and should, be divided into two parts, individual choice theory, and game theory.

² Despite this, I highly recommend Grennan's book to anyone teaching informal logic. His text (Grennan, 1994) includes no decision theory, but it is a very fine informal logic text.

Decision theory as part of logic

Whether one thinks logic should be taught in the formal or the informal mode, it seems to me that decision theory can and should be part of introductory level logic courses. For those who prefer to teach such courses more formally, I point out that principles of individual choice (for example, the maximize expected utility principle, the maxim rule, and the disaster avoidance principle) and the principles of game theory (for example, the dominance principle, tit-for-tat, constrained maximization) have now been developed with all the formal rigor that we find in propositional or predicate calculus. (If decision theory is formally less advanced than logic, this is definitely not something which shows up in an introductory logic course.) So, formal logic fans have no reason to object to decision theory as a part of a first logic course.

Informal logic fans are in the same situation. There simply is no real difference in the level of development in either area. At least, there is no substantial difference.

Decision theory really just reduces to logic

Some will say that the important parts of decision theory just consist in argument evaluation. The choice between doing A and doing B really just amounts to critically evaluating the arguments for doing A over B and those for doing B over A. They hold that, at the introductory level at least, the important parts of decision theory are just parts of argument evaluation. But this is obviously mistaken. I think of the claim as being similar to the claim that all argument evaluation is really just decision theory; it all comes down to the decision of whether to call the argument a good one or not!

Are we prejudiced?

The principal justification for introducing decision theory to my students is that, for the vast majority of them, it is more relevant than argument evaluation is.³ Using the standard classification system one might (only somewhat misleadingly) characterize inductive logic as the study of what one is entitled to believe given the evidence available to one, and deductive logic as the study of what additional beliefs one is justified in holding given one's existing belief set. Decision theory, by contrast, can (again, only slightly misleadingly) be characterized as the study of what one ought to do given one's beliefs and desires. It is no surprise that academics—people who devote their lives to critical reflection on what one is warranted in believing—would, when designing logic courses, devote such courses to those areas concerned with what one should believe. But most of our students are less interested in what one should *believe* than they are in what one should *do*. They are neither academics, nor do many of them aspire to become academics. Much of their thinking is, and will be, concerned with practical rather than theoretical reasoning. They spend a great deal of time trying to decide what they should do. Very little of their thinking concerns what they should believe. Decision theory, then, is more clearly relevant to their personal lives as they see them.

³ The *causes* of my teaching decision theory at the expense of other areas of logic have to do with the fact that my research involves the use of decision theory more than other branches of logic. That I started teaching decision theory on a day when I arrived at class unprepared to lecture on logic cannot be cited as a *justification* for including it in my courses.

Of course, as educators, we are not supposed to simply pander to the present interests of our students. We are to help shape and mold those interests so that the students will become better people, ones more prepared to reflect upon and deal wisely with the issues they are likely to face and ones who are more capable of enhancing the quality of their own pursuits through mature, critical reflection. I now begin the task of arguing that acquiring the skills of the critical decision-maker serves these goals just as well as does acquiring the skills of the critical believer. Along the way, I will suggest that learning to be a rational decision-maker is likely to enhance one's other critical thinking capacities more than learning to be a critical thinker (in respects other than how to make rational decisions) is likely to enhance a student's ability to make rational decisions. It also serves as a better lead-in to the moral and political questions which students will be confronting.

The appeal of decision theory

Since most people reading this article will already have knowledge by acquaintance of the extent to which teaching introductory logic allows the instructor both to improve students' capacity to become critical thinkers and to introduce them to a range of issues which all undergraduates should be exposed, I will devote the remainder of this paper to indicating some of the ways in which teaching introductory decision theory accomplishes these same things.

Decision theory begins with the idea of a rational agent, one who is capable of making rational decisions. I take a rational agent to be one who:

- (a) can perceive contingent facts;
- (b) can make valid inferences and warranted extrapolations from those facts;
- (c) has aims—cares that things are one way rather than another;
- (d) has a positive attitude toward the satisfaction of her aims and a negative attitude toward their frustration;
- (e) can formulate strategies for attaining that at which she aims;
- (f) acts on those strategies to get what she seeks; and
- (g) may have any preferences whatever, but must have a consistent preference set.

Condition (a) is required because ignorance of the character or consequences of an act excuses one from rational evaluation for that act. Condition (b) is required since one must be able to understand whether what one is about to do is consistent with what one rationally ought to do. Instructors of all introductory logic courses use discussion of (a) and (b) as ways to lead into general topics which they hope will both be of interest to students and serve to broaden their education. Condition (c) is necessary since it is not simply behavior, but informed motivated intentions which prompt behavior, that are the object of rational evaluation. This can serve as an entry into a host of interesting topics about everything from the nature of human motivation to the differences between explanation in the natural sciences and in the social sciences. Condition (d) is needed since all agency presupposes goals of some sort. One can use this as a launching point to discuss the nature of autonomy and Harry Frankfurt's notion of a wonton. Condition (e) is needed since we refrain from evaluating the agent when her actions are unrepresentative of her character, and this leads naturally to opportunities to discuss everything from the conceptual features of responsibility to the nature of virtue and vice. Condition (f) is needed because if one

is unable to act in the ways one has intended to act, one escapes rational evaluation; this condition opens up all the issues in action theory. Condition (g) is required because of the well-known problems which arise if one has an inconsistent preference set. It is characteristics (c) and (d) which motivate the agent. Characteristics (a), (b), (e), (f), and (g) make her an intentional entity. Such an agent has a second-order desire (or goal) to maximize the satisfaction of her first-order desires (or goals). She embodies the minimal conception of rationality. (There may be more to rationality than this—and getting students to try to figure out what more there might be and to formulate that in a rigorous way is an interesting challenge—but anyone who does not have at least these features simply is not rational.)

So, just introducing the notion of a rational *agent*, of someone interested in practical rather than theoretical reason, opens up a host of fascinating topics. Within the realm of individual choice theory one would likely discuss the maximize expected utility principle. This allows one to discuss the difference between the ways that, say, most moral philosophers use the term “utility” and how it is used by social scientists. (Bringing out the fallacies that result from equivocating on the term is a matter of traditional logic. But identifying such fallacies seems more important when one is actually using the concept involved.) One can branch into moral theory by showing how John Harsanyi’s proof of the principle of average utilitarianism works.⁴ And the introduction of the maximin rule allows one to compare Harsanyi’s theory with that offered by John Rawls.⁵ I usually end my discussion of individual choice theory with a short account of Pascal’s Wager and the various paradoxical choice situations such as Kavka’s poison problem and the Newcomb’s problem.⁶ This leads naturally to a host of puzzles, and links individual choice theory with game theory.

Moving on to game theory takes one to topics such as simple coordination problems, prisoner’s dilemmas, assurance games, and chicken. Since an understanding of these problems makes it so much easier for students to understand free-rider problems and the need for the provision of public goods, the benefits they get in understanding contemporary issues in economic theory and the insights into current social problems are most important. In addition, discussion of such matters as changing one’s conception of rationality from the standard instrumental conception to a richer conception because the instrumental conception itself dictates doing so, leads into some of the most exciting philosophic work being done these days⁷. Finally, the literature on strategies for iterated prisoner’s dilemma games and the literature on apparent errors people make in making rational choices naturally directs one’s attention to exciting epistemological issues.

⁴ I modify the statement of Harsanyi’s proof by assuming that the agents have interpersonally comparable cardinal utility scales. This makes the proof easy enough for even those students who are not technically inclined.

⁵ For reasons I do not fully understand, students seem to get very stimulated by discussing Rawls’s two principles of justice.

⁶ Suppose that you will be given a large sum of money if you intend today to drink a vial of poison tomorrow which will temporarily make you sick but which will have no long term side-effects. Should you form the intention? Should you act on it? For an excellent collection of essays on the Newcomb’s problem, see Campbell and Sowden, 1985.

⁷ Here I am thinking about David Gauthier’s arguments in *Morals by Agreement* that what he calls straightforward maximizers rationally ought to become (and remain) constrained maximizers, and the vast literature that idea has spawned.

Concluding remarks

Put briefly, the topics discussed in covering elementary rational decision theory seem to me to be more relevant to the lives of students than those we discuss in other areas of logic. They lead into other extraordinarily interesting topics, and they do a lot to enable students to understand problems which (individually and collectively) they are going to confront repeatedly throughout their lives. It seems to me a great service to expose them to such thinking. And I can report that it is—at least sometimes—great fun.

Finally, if I may be permitted to close with a bit of rhetoric, we should all remember that the founder of our discipline held that a proper grasp of the distinction between instrumental and intrinsic values was essential if one wished to avoid living a life that was empty and vain (*Nichomachean Ethics* 1094a17-20). I suspect that one of the best ways of helping our students avoid such lives is to expose them to the distinction Aristotle thought so very important.⁸

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⁸ I thank Thea E. Smith for helpful discussion.