

THE CAMBRIDGE  
HISTORY OF  
MORAL PHILOSOPHY

\*

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**CAMBRIDGE**  
UNIVERSITY PRESS

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University Printing House, Cambridge CB2 8BS, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314-321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre,  
New Delhi – 110025, India

79 Anson Road, #06-04/06, Singapore 079906

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[www.cambridge.org](http://www.cambridge.org)

Information on this title: [www.cambridge.org/9781107033054](http://www.cambridge.org/9781107033054)

DOI: 10.1017/9781139519267

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First published 2017

Printed in the United States of America by Sheridan Books, Inc.

*A catalogue record for this publication is available from the British Library.*

*Library of Congress Cataloging-in-Publication Data*

NAMES: Golob, Sacha, 1981– editor.

TITLE: The Cambridge history of moral philosophy / edited by Sacha Golob,  
King's College London, Jens Timmermann, University of St Andrews, Scotland.

DESCRIPTION: New York : Cambridge University Press, 2017. | Includes  
bibliographical references and index.

IDENTIFIERS: LCCN 2017012392 | ISBN 9781107033054 (alk. paper)

SUBJECTS: LCSH: Ethics – History.

CLASSIFICATION: LCC BJ71 .C36 2017 | DDC 170.9–dc23

LC record available at <https://lcn.loc.gov/2017012392>

ISBN 978-1-107-03305-4 Hardback

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## Decision Theory

BEN EGGLESTON

Decision theory is important in the history of moral philosophy, and it is important in an unusual way. Many theories in the history of moral philosophy, such as utilitarianism and Kant's moral theory, are not only parts of that history but are also stand-alone moral theories in their own right. In fact, it is their prominence and influence as distinct moral theories that make them important parts of the history of moral philosophy. In contrast, decision theory is not a distinct moral theory. Instead, it is important in the history of moral philosophy in a different way: as a source of concepts and principles that play crucial roles in certain important moral theories. In short, although decision theory itself is not among the discrete parts of the history of moral philosophy, some of its elements are integral to several theories that are.

Before focusing on those elements specifically, it will be useful to briefly survey decision theory more generally. Decision theory is a field of thought that consists not of a single theory, but of many theories; it is a broad and variegated field, with its constituent theories having little in common other than being concerned with decision-making. But certain organizing distinctions are commonly made. One is the familiar descriptive/prescriptive distinction: some theories attempt to explain certain systematically or anecdotally observed patterns of decision-making, while other theories propose normative criteria for decision-making, such as principles for making certain kinds of decisions rationally. Another organizing distinction, independent of the descriptive/prescriptive one, hinges on the maker of the decision: there are theories that focus on the decisions of a single person, theories that focus on the decisions of several interacting people (as in game theory), and theories that focus on the decisions of groups constituted by multiple people (as in social choice theory). As discussed below, the elements of decision theory that are

I would like to thank Donald Bruckner, Dale Miller, Martin Peterson, and Ned McClennen for their comments on an earlier version of this chapter.

integral to major moral theories come mostly from prescriptive approaches to individual decision-making.

Given the breadth of the field of decision theory and the variety of the kinds of decision-making that fall within its ambit, one might wonder whether it claims moral theories as constituent theories as well. After all, most moral theories often focus on decision-making and the prescriptive half of decision theory would seem to accommodate them easily. The reality, however, is that moral philosophy is typically seen as separate from, rather than a department of, decision theory. Canonically moral concepts and principles such as fairness, justice, individual rights, and the golden rule are largely absent from decision theory (though some parts of social choice theory do attempt to address them). Instead, decision theory usually takes the pursuit of individual self-interest or well-being as its starting point; and even when it does not, it is principally concerned with non-moral aspects of decision-making, such as when and how a person's preferences can be represented in a mathematically convenient structure, how complex choices can sometimes be reduced to simpler ones, and what risks it is rational to take. The mostly non-moral character of decision theory is manifested in the elements of decision theory discussed in this chapter.

The organization of this chapter reflects the fact that elements of decision theory have been used in two main ways in the history of moral philosophy (or the history of ethics – different terms are, of course, used by different authors). First, moral theorists have drawn on elements of decision theory in order to more fully specify the contents of their moral principles. That is, they have drawn on elements of decision theory in order to articulate their principles of moral rightness and moral wrongness more explicitly, or to provide something like an algorithm that an agent can follow in order to act morally (by the lights of their theories) in a particular decision situation. Second, moral theorists have drawn on elements of decision theory in order to argue in support of their moral principles. In most cases, decision-theoretic reasoning has been used in combination with moral reasoning, but in some cases, decision-theoretic reasoning has been claimed to entail, by itself, substantive moral principles.<sup>1</sup>

<sup>1</sup> The plan of this chapter is but one of many possible ways of discussing decision theory and moral philosophy. For other approaches, see Dreier 2004 and the articles in *Ethical Theory and Moral Practice* vol. 13, no. 5 (November 2010), a special issue titled "Rational Choice and Ethics": Lumer 2010a, Narveson 2010, McClennen 2010, Verbeek 2010, Lumer 2010b, and Hansson 2010.

## SPECIFYING THE CONTENTS OF MORAL PRINCIPLES

Moral theorists, as a group, have diverse aims and priorities in articulating their theories. Most of them, however, take the specification of a principle of rightness and wrongness to be a central task in their endeavors, and in this task most of them strive to make that principle highly determinate – i.e., providing specific guidance concerning how an agent should act in a large range of cases. Some moral theorists, especially consequentialist ones, find elements of decision theory to be helpful for this purpose.

Probably the most influential such element is the idea of expected utility. This is used primarily in the specification of consequentialist principles – in particular, in response to the fact that it is usually impossible for an agent to predict all of the consequences of all of her possible actions. For an illustration of how expected-utility theory can be used in such cases, suppose that there is an outbreak of a disease that a public-health doctor can treat with either a conventional antibiotic or an experimental antibiotic. It is known that the conventional antibiotic will result in partial eradication, and that the experimental antibiotic will result in either complete eradication or no change at all. Which option is better?

Expected-utility theory provides a way of answering this question, if two kinds of quantitative information can be established. First, probabilities need to be assigned to the possible outcomes. Given the description of the situation just provided, the conventional antibiotic obviously has a 100-percent probability of resulting in partial eradication. And let us also suppose that the experimental antibiotic has a 30-percent probability of resulting in complete eradication and a 70-percent probability of resulting in no change.

Second, the possible outcomes need to be assigned utilities that reflect their relative goodness. Obviously complete eradication is better than partial eradication, and partial eradication is better than no change. So, there is a goodness difference between the first outcome and the second, and a goodness difference between the second and the third. Expected-utility theory requires a comparison of the *magnitudes* of those goodness differences. So, let us suppose that complete eradication would be better than partial eradication *three times as much as* partial eradication would be better than no change. Then we can say that complete eradication, partial eradication, and no change have utilities of 5, 2, and 1. (Many other values, such as 27, 21, and 19, would work equally well. The absolute magnitudes do not matter; only the *relative* magnitudes of the *gaps* between the numbers matter.)

Given these pieces of quantitative information, expected-utility theory provides a way of ascertaining which option is better. The two options' expected utilities are to be computed, and the option with the higher expected utility is better. An option's expected utility is defined as the weighted average of the utilities of its possible outcomes, where the weights are the probabilities of the occurrences of the possible outcomes. Since the conventional antibiotic has a 100-percent probability of resulting in an outcome having a utility of 2, its expected utility is easy to compute:

$$100 \text{ percent} \times 2 = 2$$

And since the experimental antibiotic has a 30-percent probability of resulting in an outcome having a utility of 5 and a 70-percent probability of resulting in an outcome having a utility of 1, its expected utility can be computed as follows:

$$(30 \text{ percent} \times 5) + (70 \text{ percent} \times 1) = 1.5 + 0.7 = 2.2$$

Because the experimental antibiotic has the higher expected utility, it is the better option.

This sort of reasoning is invoked in several ways in the specification of consequentialist principles. J.J.C. Smart, articulating an act-utilitarian theory, writes that although expected-utility considerations do not affect whether an act is *right* (for that still depends on the act's actual consequences), having maximal expected utility is enough to make an act *rational*.<sup>2</sup> Some theorists, however, go farther, and make rightness itself depend on expected utility (or expected value, where value is understood to be broader than utility, as consequentialism is broader than utilitarianism). The best-known advocate of this maneuver is Frank Jackson, who formulates a "decision-theoretic consequentialism."<sup>3</sup>

Acts are not the only things whose effects interest consequentialists. Some consequentialists focus on the effects of various rules, motives, character traits, or institutions, and here, too, expected-utility reasoning provides a way of coping with unpredictability. For example, Brad Hooker begins his rule-consequentialist book by asking, "Shouldn't we try to live by the moral code whose communal acceptance would, as far as we can tell, have the best

<sup>2</sup> Smart 1961: 33–4. This material reappears in Smart 1973: 46–7. A similar position is suggested in Lyons 1965: 26–7.

<sup>3</sup> Jackson 1991: 463–4 (though the phrase "decision-theoretic consequentialism" is from the title of the article).

consequences?”<sup>4</sup> Because of the difficulty of identifying that code, Hooker writes that moral codes should be compared not in terms of the actual consequences of their communal acceptance, but in terms of the expected values of their communal acceptance.

We have seen how one element of decision theory – the idea of expected utility – is employed in the specification of the contents of moral principles. Although this is the element that is most illuminating to consider at length, other elements are also employed. For example, Smart suggests turning to decision theory for techniques for the assignment of probabilities to possible outcomes<sup>5</sup> and for deciding whether to comply with an onerous but generally beneficial rule.<sup>6</sup> Michael Slote suggests formulating act consequentialism as requiring only that the agent perform an act that is *good enough* rather than the *best* one – using the economist Herbert Simon’s idea of “satisficing.”<sup>7</sup> And there is an extensive literature debating the coherence of interpersonal comparisons of well-being.<sup>8</sup> In many ways, then, elements of decision theory are used in the specification of the contents of moral principles.

#### ARGUING IN SUPPORT OF MORAL PRINCIPLES

The other frequent use of elements of decision theory in moral philosophy is in the formulation of arguments in support of moral principles. Important examples of this kind of work are found not only in consequentialist theories, but in Kantian and Hobbesian ones as well.

##### *Smart’s Maximization Argument*

One argument in support of act utilitarianism is the simple idea that if it is rational for one person to maximize his or her personal well-being, then it is equally justifiable, in the moral realm, for overall well-being to be maximized. This is true, according to this argument, even if maximizing overall well-being requires actions that decrease, rather than increase, certain persons’ well-being. Smart makes this argument in the following passage:

<sup>4</sup> Hooker 2000: 1. All of the material from Hooker discussed in this paragraph is in Hooker 2000: 1–2, but also see Hooker 2000: 72–5.

<sup>5</sup> Smart 1961: 28–9; and Smart 1973: 40–1.

<sup>6</sup> Smart 1956: 351–2; Smart 1961: 43–4; and Smart 1973: 57–60. See also Gauthier 1965.

<sup>7</sup> The seminal works on this topic are Slote 1984 and Pettit 1984. See also Byron 2004.

<sup>8</sup> See, for example, Elster and Roemer 1991.

if it is rational for me to choose the pain of a visit to the dentist in order to prevent the pain of toothache, why is it not rational of me to choose a pain for Jones, similar to that of my visit to the dentist, if that is the only way in which I can prevent a pain, equal to that of my toothache, for Robinson?<sup>9</sup>

Smart offers this argument in response to a claim that John Rawls presents in his 1958 article "Justice as Fairness,"<sup>10</sup> and Rawls criticizes it in his *A Theory of Justice* (1971):

This view of social cooperation [i.e., act utilitarianism] is the consequence of extending to society the principle of choice for one man, and then, to make this extension work, conflating all persons into one through the imaginative acts of the impartial sympathetic spectator. Utilitarianism does not take seriously the distinction between persons.<sup>11</sup>

This remains one of the most well-known objections to act utilitarianism, and its merits continue to be debated.<sup>12</sup>

#### *Harsanyi's Hypothetical-Choice Argument*

Another argument in support of act utilitarianism, one developed in the work of John C. Harsanyi, proceeds as follows.<sup>13</sup> If it would be rational for the people of some society to unanimously prefer that social decisions be made in accordance with a certain moral principle, then that fact would make that moral principle justified. (This is, of course, the intuition at the root of the social-contract tradition in moral and political philosophy.) Unfortunately, given the fact that persons' different positions in society cause it to be rational

<sup>9</sup> Smart 1961: 26; and Smart 1973: 37. <sup>10</sup> Rawls 1958. <sup>11</sup> Rawls 1971: 27.

<sup>12</sup> Probing discussions include Brink 1993 and Zwolinski 2008.

<sup>13</sup> This paragraph and the succeeding one are based on Harsanyi 1953; Harsanyi 1977: 48–51; and Harsanyi 1982: 44–8.

Harsanyi also formulated highly technical axiomatic arguments in support of act utilitarianism. See Harsanyi 1955; and Harsanyi 1977: 64–81. Although this approach attracted considerable attention from other decision theorists in the ensuing decades, it had a much smaller influence on the work of moral theorists. Harsanyi himself writes that it "yields a lesser amount of philosophically interesting information about the nature of morality" than the approach discussed in the text (Harsanyi 1982: 48). John Broome evaluates it more favorably; see Broome 1991: 58. For an overview and critical assessment of it, see Roemer 1996: 138–47. But for a largely favorable moral-theoretic reception, see Risse 2002.

Despite formulating these pioneering arguments in support of act utilitarianism, Harsanyi actually turned out to be a longtime advocate of rule utilitarianism, which he supported using decision-theoretic and other arguments. For what might be Harsanyi's last published work on this topic, see Harsanyi 1998.



for them to have divergent preferences, it seems hopeless to argue in favor of any moral principle in this way. But there are variations on this approach that might be fruitful. For example, if it would be rational for the people in some hypothetical choice situation to unanimously prefer that social decisions be made in accordance with a certain moral principle, and that hypothetical choice situation had moral force (despite being hypothetical), then that fact would also make that moral principle justified.<sup>14</sup>

Now (the argument continues), imagine a choice situation populated by people who are ignorant of their positions in society, so that each person must think impartially about how he or she would prefer for social decisions to be made. Surely this choice situation has moral force, despite being hypothetical; in fact, it gains its moral force from the very alteration that makes it hypothetical. Now, what would it be rational for the people in this choice situation to prefer? To answer this question, the argument invokes decision-theoretic reasoning. It claims that it would be rational for each person (1) to assume that he or she stood an equal probability of occupying each of the positions occupied by the people of that society, (2) to deduce that his or her expected utility would be maximized if social decisions were made in accordance with act utilitarianism, and (3) to prefer that social decisions be made in that way. Because of the moral force of the given choice situation (so the argument concludes), this preference entails that act utilitarianism is justified.

Although this argument has been criticized,<sup>15</sup> its basic strategy is ingenious. It starts with the obviously moral question of which moral principle is justified, and then argues that we would have an answer to this question if we could answer the non-moral question of what it would be rational for people in a certain choice situation to prefer. Finally, it invokes decision-theoretic reasoning to answer that non-moral question. In effect, it engages in just enough moral reasoning – the design of the choice situation – to enable the rest of the work to be done by non-moral reasoning. And the role of decision theory, of course, is to provide that non-moral reasoning.

### *Rawls's Hypothetical-Choice Argument*

A similar argument is used by Rawls, in support of his Kantian theory of justice. Rawls follows Harsanyi in imagining a choice situation populated by

<sup>14</sup> A classic discussion of the general approach of invoking hypothetical situations in moral reasoning is Broad 1916.

<sup>15</sup> For a recent and accessible critique, see Roemer 2008.

people who are ignorant of their positions in society, so that each person must think impartially about how he or she would prefer for social decisions to be made. (Rawls calls his choice situation “the original position” and famously characterizes the persons’ lack of information with the evocative metaphor of the “veil of ignorance.”)<sup>16</sup> Then, in order to answer the question of what it would be rational for the people in this choice situation to prefer, Rawls again follows Harsanyi in drawing on a choice rule of decision theory. However, he departs from Harsanyi’s path by denying that it would be rational for the people to employ the rule of maximizing expected utility. Instead, Rawls argues, it would be rational for the people to employ the maximin rule – the rule of choosing an option whose worst possible outcome is at least as good as the worst possible outcome of every other option. (As suggested by the name, the idea is to *maximize* the *minimum*. All of the options are compared solely in terms of their worst, or minimum, possible outcomes – their other possible outcomes do not matter.)<sup>17</sup> Rawls points out that if the people employ this rule, then they will reject the prospect of social decisions being made in accordance with act utilitarianism, since such a regime might cause the worst-off people in society to be worse off than it is necessary for the worst-off people to be. (After all, maximizing overall well-being does not necessarily maximize the well-being of the worst-off.)<sup>18</sup> Instead, the kind of regime recommended by the maximin rule is one governed by Rawls’s conception of justice,<sup>19</sup> in which concern for the well-being of the worst-off people in society is explicitly built into the governing principle:

All social primary goods – liberty and opportunity, income and wealth, and the bases of self-respect – are to be distributed equally unless an unequal distribution of any or all of these goods is *to the advantage of the least favored*.<sup>20</sup>

This is the “General Conception” of Rawls’s theory of justice. In essence, it is the maximin decision rule restated as a principle of moral and political philosophy. Rawls further argues that the people would reason that “the long-run tendency” of this principle would require two kinds of strict equality – equality of political liberties and fair equality of opportunity – and would allow inequality only in the distribution of social and economic goods.<sup>21</sup> Consequently, the principles Rawls says the people would endorse are explicitly egalitarian in a way that the maximin rule is not. But the persons’

<sup>16</sup> Rawls 1971: 136–42. <sup>17</sup> Rawls 1971: 154–5. <sup>18</sup> Rawls 1971: 156, 158, 160, and 170–1.

<sup>19</sup> Rawls 1971: 152–7. <sup>20</sup> Rawls 1971: 303, emphasis added. <sup>21</sup> Rawls 1971: 152.

reasoning about what they would prefer is entirely guided by the maximin rule, not any moral or other independent commitment to equality.

Rawls's reliance on the maximin rule is generally seen as one of the more questionable parts of his theory. Rawls acknowledges that "Clearly the maximin rule is not, in general, a suitable guide for choices under uncertainty"<sup>22</sup> but defends the maximin rule as suitable when three conditions are satisfied: the basis for probability estimates is weak, the option selected by the maximin rule will lead to an acceptable outcome, and the options selected by other rules might lead to unacceptable outcomes.<sup>23</sup> (And he claims that these conditions are satisfied in the present case.)<sup>24</sup> Most moral theorists maintain that the general implausibility of the maximin rule (which Rawls acknowledges, as just mentioned) persists even when these conditions are satisfied, though some recent discussions of the maximin rule are more sympathetic.<sup>25</sup>

#### *Gauthier and McClennen: Deriving Morality from Rationality*

The last use of decision theory in moral philosophy to be considered here is found in the Hobbesian moral theory of David Gauthier and the closely aligned view of Edward F. McClennen.<sup>26</sup> One of the perennial questions of ethics concerns the seemingly irresolvable conflict between self-interest and morality – often encapsulated in the question "Why be moral?" It is a commonplace of discussions of this question that a person's interests are usually better served by complying with certain moral rules (such as rules requiring cooperation and the keeping of promises) than by breaking them. That is, it is usually rational to comply with certain moral rules. Gauthier and McClennen draw attention to the further, subtler truth that a person's interests are usually well served if she has a *disposition* to comply with certain moral rules, even if that disposition is so strong that it causes her to comply with moral rules in cases in which, all things considered, she would be better off breaking those rules. That is, it is usually rational to be disposed to comply with certain moral rules. Now, the next step in the argument is the novel one,

<sup>22</sup> Rawls 1971: 153. <sup>23</sup> Rawls 1971: 154–5. <sup>24</sup> Rawls 1971: 155–6.

<sup>25</sup> See Angner 2004 (which also provides a helpful overview of the previous debate over the maximin rule) and van Roojen 2008.

<sup>26</sup> For Gauthier, see Gauthier 1986: 182–7; Gauthier 1994: 701; and Gauthier 1998: 58, n. 5. For McClennen, see McClennen 1990: 157 and 209–13; and McClennen 1997: 231–3 and 241. Gauthier later revised his decision-theoretic views substantially; see Gauthier 2013: 606–9. The approach proposed there might, in time, turn out to be another important use of decision theory in moral philosophy.

from a decision-theoretic point of view. It is, in essence, the assertion of the principle that if some action is required by rules that it is rational for a person to be disposed to comply with, then that action is rational (for that person) – even if it makes the person worse off, all things considered. Given the earlier claim that it is rational to be disposed to comply with certain moral rules, it follows that the actions required by those moral rules are also rational, from a decision-theoretic point of view.

Two things are important to notice about this argument. First, the asserted decision-theoretic principle is highly unorthodox. Orthodox decision theory holds that an act is rational if and only if it maximally advances the person's interests: an act "inherits" its rationality (for a person) from its outcome's optimality (for a person). This is denied by the principle on which Gauthier and McClennen rely. That principle holds that an act inherits its rationality from the rationality of the rules that require it, and those rules inherit their rationality from the optimality of their outcomes. By analogy with the relationship between traditional (act) utilitarianism and rule utilitarianism, we can say that Gauthier's and McClennen's arguments aspire to nothing less than discrediting the traditional egoistic foundations of decision theory and re-founding the theory on the principle of rule egoism instead.<sup>27</sup>

The second thing it is important to notice about this argument is its extreme ambition: it is a genuine instance of attempting to derive morality from rationality. In the arguments for moral theories reviewed previously (those of Smart, Harsanyi, and Rawls), the premises include substantive moral claims as well as non-moral claims (such as decision-theoretic claims). But the argument suggested by the work of Gauthier and McClennen has no substantive moral claims among its premises. Instead, the argument purports to show that rather than needing to appeal to moral considerations in order to vindicate moral rules, we can just appeal to decision-theoretic rationality. Thus, the argument not only defends moral rules but also – and perhaps primarily – purports to give a deep and rigorous answer to the question "Why be moral?" It is thus one of the most ambitious uses of decision theory in the history of moral philosophy.

<sup>27</sup> This unorthodox conception of rationality is, of course, controversial. See, for example, MacIntosh 1988; Uzan-Milofsky 2009; and the articles in the symposium on Gauthier's *Morals by Agreement* in *Ethics* vol. 123, no. 4 (July 2013): Morris 2013, Gauthier 2013, MacIntosh 2013, Bratman 2013, Finkelstein 2013, and van Donselaar 2013.

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