

# Cambridge Elements

Elements in Decision Theory and Philosophy

edited by  
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## RATIONAL CHOICE USING IMPRECISE PROBABILITIES AND UTILITIES

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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

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning, and research at the highest international levels of excellence.

[www.cambridge.org](http://www.cambridge.org)  
Information on this title: [www.cambridge.org/9781108713504](http://www.cambridge.org/9781108713504)  
DOI: 10.1017/9781108582209

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First published 2021

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

ISBN 978-1-108-71350-4 Paperback  
ISSN 2517-4827 (online)  
ISSN 2517-4819 (print)

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## Rational Choice Using Imprecise Probabilities and Utilities

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DOI: 10.1017/9781108582209  
First published online: February 2021

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**Abstract:** An agent often does not have precise probabilities or utilities to guide resolution of a decision problem. I advance a principle of rationality for making decisions in such cases. To begin, I represent the doxastic and conative state of an agent with a set of pairs of a probability assignment and a utility assignment. Then I support a decision principle that allows any act that maximizes expected utility according to some pair of assignments in the set. Assuming that computation of an option's expected utility uses comprehensive possible outcomes that include the option's risk, no consideration supports a stricter requirement.

**Keywords:** decision theory, game theory, imprecise probabilities, sequences of choices, imprecise utilities

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ISBNs: 9781108713504 (PB), 9781108582209 (OC)  
ISSNs: 2517-4827 (online), 2517-4819 (print)

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