A Primer Of Probability Logic

In contrast to the prevailing tradition in epistemology, the focus in this book is on low-level inferences, i.e., those inferences that we are usually not consciously aware of and that we share with the cat nearby which infers that the bird which she sees picking grains from the dirt, is able to fly. Presumably, such inferences are not generated by explicit logical reasoning, but logical methods can be used to describe and analyze such inferences. Part 1 gives a purely system-theoretic explication of belief and inference. Part 2 adds a reliabilist theory of justification for inference, with a qualitative notion of reliability being employed. Part 3 recalls and extends various systems of deductive and nonmonotonic logic and thereby explains the semantics of absolute and high reliability. In Part 4 it is proven that qualitative neural networks are able to draw justified deductive and nonmonotonic inferences on the basis of distributed representations. This is derived from a soundness/completeness theorem with regard to cognitive semantics of nonmonotonic reasoning. The appendix extends the theory both logically and ontologically, and relates it to A. Goldman's reliability account of justified belief.

The conditional, if...then, is probably the most important term in natural language and forms the core of systems of logic and mental representation. Cognition and Conditionals is the first volume for over 20 years (On Conditionals, 1986, CUP) that brings together recent developments in the cognitive science and psychology of conditional reasoning. Over the last 10 to 15 years, research on conditionals has come to dominate the psychology of reasoning providing arich seam of results that have created new theoretical possibilities. This book shows how these developments have led researchers to view people's conditional reasoning behaviour more as succesful probabilistic reasoning rather than as errorful logical reasoning. Cognition and Conditionalswill be a valuable resource for cognitive scientists, psychologists and philosophers interested how people actually reason with conditionals.

Addresses central questions concerning conditionals by combining the methods of formal epistemology with those of cognitive psychology.

Conditionals, Paradox, and Probability comprises fifteen original essays on themes from the work of Dorothy Edgington, the first woman to hold a chair in philosophy at Oxford. Eminent contributors from philosophy and linguistics discuss a range of topics including conditionals, vagueness, knowledge, reasoning, and probability.

Written by three of the world's most renowned petroleum and environmental engineers, Probability in Petroleum and Environmental Engineering is the first book to offer the practicing engineer and engineering student new cutting-edge techniques for prediction and forecasting in petroleum engineering and environmental management. The authors combine a rigorous, yet easy-to-understand, approach to probability and how it is applied to petroleum and environmental engineering to solve multiple problems that engineers or geologists face every day.

The first edition of the Handbook of Philosophical Logic (four volumes) was published in the period 1983-1989 and has proven to be an invaluable reference work to both students and researchers in formal philosophy, language and logic. The second edition of the Handbook is intended to comprise some 18 volumes and will provide a very up-to-date authoritative, in-depth coverage of all major topics in philosophical logic and its applications in many cutting-edge fields relating to computer science, language, argumentation, etc. The volumes will no longer be as topic-oriented as with the first edition because of the way the subject has evolved over the last 15 years or so. However the volumes will follow some natural groupings of chapters. Audience: Students and researchers whose work or interests involve philosophical logic and its applications

The QL&SC 2012 is a major symposium for scientists, and practitioners all around the world to present their latest researches, results, ideas, developments and applications in such areas as quantitative logic, many-valued logic, fuzzy logic, quantification of software, artificial intelligence, fuzzy sets and systems and soft computing. This invaluable book provides a broad introduction to the fuzzy reasoning and soft computing. It is certain one should not go too far in approximation and optimization, and a certain degree must be kept in mind. This is the essential idea of quantitative logic and soft computing. The explanations in the book are complete to provide the necessary background material needed to go further into the subject and explore the research literature. It is suitable reading for graduate students. It provides a platform for mutual exchanges from top experts and scholars around the world in this field.

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Admittedly, the notion "intelligence or intelligent computing" has been around us for several decades, implicitly indicating any non-conventional methods of solving complex system problems such as expert systems and intelligent control techniques that mimic human skill and replace human operators for automation. Various kinds of intelligent methods have been suggested, phenomenological or ontological, and we have been witnessing quite successful applications. On the other hand, "Soft Computing Techniques" is the concept coined by Lot? Zadeh, referring to "a set of approaches of computing which parallels the remarkable ability of the human mind to reason and learn in an environment of uncertainty, imprecision and partial truth. " Such a notion is well contrasted with the conventionalbinary logic based hard c- puting and has been effectively utilized with the guiding principle of "exploiting the tolerance for uncertainty,imprecision and partial truth to achieve tractability, - bustness and low solution cost. " The soft computing techniques are often employed as the technical entities in a tool box with tools being FL, ANN, Rough Set, GA etc. Based on one's intuition and experience, an engineer can build and realize hum- like systems by smartly mixing proper technical tools effectivelyand ef?ciently in a wide range of ?elds. For some time, the soft computing techniques are also referred to as intelligent computing tools.

In designing the Handbook of the History of Logic, the Editors have taken the view that the history of logic holds more than an antiquarian interest, and that a knowledge of logic's rich and sophisticated development is, in various respects, relevant to the research programmes of the present day. Ancient logic is no exception. The present volume attests to the distant origins of some of modern logic's most important features, such as can be found in the claim by the authors of the chapter on Aristotle's early logic that, from its infancy, the theory of the syllogism is an

example of an intuitionistic, non-monotonic, relevantly paraconsistent logic. Similarly, in addition to its comparative earliness, what is striking about the best of the Megarian and Stoic traditions is their sophistication and originality.

It is with great pleasure that we are presenting to the community the second edition of this extraordinary handbook. It has been over 15 years since the publication of the first edition and there have been great changes in the landscape of philosophical logic since then. The first edition has proved invaluable to generations of students and researchers in formal philosophy and language, as well as to consumers of logic in many applied areas. The main logic artiele in the Encyclopaedia Britannica 1999 has described the first edition as 'the best starting point for exploring any of the topics in logic'. We are confident that the second edition will prove to be just as good. ! The first edition was the second handbook published for the logic commu nity. It followed the North Holland one volume Handbook 0/ Mathematical Logic, published in 1977, edited by the late Jon Barwise. The four volume Handbook 0/ Philosophical Logic, published 1983-1989 came at a fortunate temporal junction at the evolution of logic. This was the time when logic was gaining ground in computer science and artificial intelligence cireles. These areas were under increasing commercial press ure to provide devices which help andjor replace the human in his daily activity. This pressure required the use of logic in the modelling of human activity and organisa tion on the one hand and to provide the theoretical basis for the computer program constructs on the other.

A Primer of Probability LogicStanford Univ Center for the Study

These are the proceedings of the 8th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty, ECSQARU 2005, held in Barcelona (Spain), July 6–8, 2005. The ECSQARU conferences are biennial and have become a major forum for advances in the theory and practice of r- soning under uncertainty. The ?rst ECSQARU conference was held in Marseille (1991), and after in Granada (1993), Fribourg (1995), Bonn (1997), London (1999), Toulouse (2001) and Aalborg (2003). The papers gathered in this volume were selected out of 130 submissions, after a strict review process by the members of the Program Committee, to be presented at ECSQARU 2005. In addition, the conference included invited lectures by three outstanding researchers in the area, Seraf ? ?n Moral (Imprecise Probabilities), Rudolf Kruse (Graphical Models in Planning) and J ? erˆ ome Lang (Social Choice). Moreover, the application of uncertainty models to real-world problems was addressed at ECSQARU 2005 by a special session devoted to s- cessful industrial applications, organized by Rudolf Kruse. Both invited lectures and papers of the special session contribute to this volume. On the whole, the programme of the conference provided a broad, rich and up-to-date perspective of the current high-level research in the area which is re?ected in the contents of this volume. IwouldliketowarmlythankthemembersoftheProgramCommitteeandthe additional referees for their valuable work, the invited speakers and the invited session organizer.

A unified treatment of conditionals based on epistemological principles rather than the semantical principles in vogue over recent decades. This book by distinguished philosopher Nicholas Rescher seeks to clarify the idea of what a conditional says by elucidating the information that is normally transmitted by its utterance. The result is a unified treatment of conditionals based on epistemological principles rather than the semantical principles in vogue over recent decades. This approach, argues Rescher, makes it easier to understand how conditionals actually function in our thought and discourse. In its concern with what language theorists call pragmatics—the study of the norms and principles governing our use of language in conveying information—Conditionals steps beyond the limits of logic as traditionally understood and moves into the realm claimed by theorists of artificial intelligence as they try to simulate our actual information-processing practices. The book's treatment of counterfactuals essentially revives an epistemological approach proposed by F. P. Ramsey in the 1920s and developed by Rescher himself in the 1960s but since overshadowed by the now-dominant possible-worlds approach. Rescher argues that the increasingly evident liabilities of the possible-worlds strategy make a reappraisal of the older style of analysis both timely and desirable. As the book makes clear, an epistemological approach demonstrates that counterfactual reasoning, unlike inductive inference, is not a matter of abstract reasoning alone but one of good judgment and common sense.

David E. Over is a leading cognitive scientist and, with his firm grounding in philosophical logic, he also exerts a powerful influence on the psychology of reasoning. He is responsible for not only a large body of empirical work and accompanying theory, but for advancing a major shift in thinking about reasoning, commonly known as the 'new paradigm' in the psychology of human reasoning. Over's signature mix of philosophical logic and experimental psychology has inspired generations of researchers, psychologists, and philosophers alike over more than a quarter of a century. The chapters in this volume, written by a leading group of contributors including a number who helped shape the psychology of reasoning as we know it today, each take their starting point from the key themes of Over's ground-breaking work. The essays in this collection explore a wide range of central topics—such as rationality, bias, dual processes, and dual systems—as well as contemporary psychological and philosophical theories of conditionals. It concludes with an engaging new chapter, authored by David E. Over himself, which details and analyses the new paradigm psychology of reasoning. This book is therefore important reading for scholars, researchers, and advanced students in psychology, philosophy, and the cognitive sciences, including those who are not familiar with Over's thought already.

The formal systems of logic have ordinarily been regarded as independent of biology, but recent developments in evolutionary theory suggest that biology and logic may be intimately interrelated. In this book, William Cooper outlines a theory of rationality in which logical law emerges as an intrinsic aspect of evolutionary biology. This biological perspective on logic, though at present unorthodox, could change traditional ideas about the reasoning process. Cooper examines the connections between logic and evolutionary biology and illustrates how logical rules are derived directly from evolutionary principles, and therefore have no independent status of their own. Laws of decision theory, utility theory, induction, and deduction are reinterpreted as natural consequences of evolutionary processes. Cooper's connection of logical law to evolutionary theory ultimately results in a unified foundation for an evolutionary science of reason. It will be of interest to professionals and students of philosophy of science, logic, evolutionary theory, and cognitive science.

The Routledge International Handbook of Thinking and Reasoning is an authoritative reference work providing a balanced overview of current scholarship spanning the full breadth of the rapidly developing and expanding field of thinking and reasoning. It contains 35 chapters written by leading international researchers, covering foundational issues as well as state-of-the-art developments in thinking and reasoning research. Topics covered range across all sub-areas of thinking and reasoning, including deduction, induction, abduction, judgment, decision making,

argumentation, problem solving, expertise, creativity and rationality. The contributors engage with cutting-edge debates such as the status of dual-process theories of thinking, the role of unconscious, intuitive, emotional and metacognitive processes in thinking, and the importance of probabilistic conceptualisations of thinking and reasoning. Authors also examine the importance of neuroscientific findings in informing theoretical developments, and explore the situated nature of thinking and reasoning across a range of real-world contexts such as mathematics, medicine and science. The Handbook provides a clear sense of the way in which contemporary ideas are challenging traditional viewpoints as "new paradigm of the psychology of reasoning" emerges. This paradigm-shifting research is paving the way toward a richer and more inclusive understanding of thinking and reasoning, where important new questions drive a forward-looking research agenda. It is essential reading for both established researchers in the field of thinking and reasoning as well as advanced students wishing to learn more about both the historical foundations and latest developments in this rapidly growing field.

Mainly focusing on processing uncertainty, this book presents state-of-the-art techniques and demonstrates their use in applications to econometrics and other areas. Processing uncertainty is essential, considering that computers – which help us understand real-life processes and make better decisions based on that understanding – get their information from measurements or from expert estimates, neither of which is ever 100% accurate. Measurement uncertainty is usually described using probabilistic techniques, while uncertainty in expert estimates is often described using fuzzy techniques. Therefore, it is important to master both techniques for processing data. This book is highly recommended for researchers and students interested in the latest results and challenges in uncertainty, as well as practitioners who want to learn how to use the corresponding state-of-the-art techniques.

This is an authoritative collection of papers addressing the key challenges that face the Bayesian interpretation of probability today. The volume includes important criticisms of Bayesian reasoning and gives an insight into some of the points of disagreement amongst advocates of the Bayesian approach. It will be of interest to graduate students, researchers, those involved with the applications of Bayesian reasoning, and philosophers.

Published in honor of Sergio Galvan, this collection concentrates on the application of logical and mathematical methods for the study of central issues in formal philosophy. The volume is subdivided into four sections, dedicated to logic and philosophy of logic, philosophy of mathematics, philosophy of science, metaphysics and philosophy of religion. The contributions adress, from a logical point of view, some of the main topics in these areas. The first two sections include formal treatments of: truth and paradoxes; definitions by abstraction; the status of abstract objects, such as mathematical objects and universal concepts; and the structure of explicit knowledge. The last two sections include papers on classical problems in philosophy of science, such as the status of subjective probability, the notion of verisimilitude, the notion of approximation, and the theory of mind and mental causation, and specific issues in metaphysics and philosophy of religion, such as the ontology of species, actions, and intelligible worlds, and the logic of religious belonging.

This book is meant to be a primer, that is an introduction, to probability logic, a subject that appears to be in its infancy. Probability logic is a subject envisioned by Hans Reichenbach and largely created by Adams. It treats conditionals as bearers of conditional probabilities and discusses an appropriate sense of validity for arguments such conditionals, as well as ordinary statements as premises. This is a clear well written text on the subject of probability logic, suitable for advanced undergraduates or graduates, but also of interest to professional philosophers. There are well thought out exercises, and a number of advanced topics treated in appendices, while some are brought up in exercises and some are alluded to only in footnotes. By this means it is hoped that the reader will at least be made aware of most of the important ramifications of the subject and its tie-ins with current research, and will have some indications concerning recent and relevant literature.

This volume is number ten in the 11-volume Handbook of the History of Logic. While there are many examples were a science split from philosophy and became autonomous (such as physics with Newton and biology with Darwin), and while there are, perhaps, topics that are of exclusively philosophical interest, inductive logic — as this handbook attests — is a research field where philosophers and scientists fruitfully and constructively interact. This handbook covers the rich history of scientific turning points in Inductive Logic, including probability theory and decision theory. Written by leading researchers in the field, both this volume and the Handbook as a whole are definitive reference tools for senior undergraduates, graduate students and researchers in the history of logic, the history of philosophy, and any discipline, such as mathematics, computer science, cognitive psychology, and artificial intelligence, for whom the historical background of his or her work is a salient consideration. • Chapter on the Port Royal contributions to probability theory and decision theory • Serves as a singular contribution to the intellectual history of the 20th century • Contains the latest scholarly discoveries and interpretative insights

This volume recreates the received notion of reflective equilibrium. It reconfigures reflective equilibrium as both a cognitive ideal and a method for approximating this ideal. The ideal of reflective equilibrium is restructured using the concept of discursive strata, which are formed by sentences and differentiated by function. Sentences that perform the same kind of linguistic function constitute a stratum. The book shows how moral discourse can be analyzed into phenomenal, instrumental, and teleological strata, and the ideal of reflective equilibrium reworked in these terms. In addition, the work strengthens the method of reflective equilibrium by harnessing the resources of decision theory and inductive logic. It launches a comparative version of decision theory and employs this framework as a guide to moral theory choice. It also recruits quantitative inductive logic to inform a standard of inductive cogency. When used in tandem with comparative decision theory, this standard can aid in the effort to turn the undesirable condition of reflective disequilibrium into reflective equilibrium.

This book is the proceedings of the Fourth International Conference on Quantitative Logic and Soft Computing (QLSC2016) held 14-17, October, 2016 in Zhejiang Sci-Tech University, Hangzhou, China. It includes 61 papers, of which 5 are plenary talks(3 abstracts and 2 full length talks). QLSC2016 was the fourth in a series of conferences on Quantitative Logic and Soft Computing. This conference was a major symposium for scientists, engineers and practitioners to present their updated results, ideas, developments and applications in all areas of quantitative logic and soft computing. The book aims to strengthen relations between industry research laboratories and universities in fields such as quantitative logic and soft computing worldwide as follows: (1) Quantitative Logic and Uncertainty Logic; (2) Automata and Quantification of Software; (3) Fuzzy Connectives and Fuzzy Reasoning; (4) Fuzzy Logical Algebras; (5) Artificial Intelligence and Soft Computing; (6) Fuzzy Sets Theory and Applications.

This proceedings volume is a collection of peer reviewed papers presented at the 8th International Conference on Soft Methods in Probability and Statistics (SMPS 2016) held in Rome (Italy). The book is dedicated to Data science which aims at developing automated methods to analyze massive amounts of data and to extract knowledge from them. It shows how Data science employs various programming techniques and methods of data wrangling, data visualization, machine learning, probability and statistics. The soft methods proposed in this volume represent a collection of tools in these fields that can also be useful for data science.

The Handbook of the Logic of Argument and Inference is an authoritative reference work in a single volume, designed for the attention of senior undergraduates, graduate students and researchers in all the leading research areas concerned with the logic of practical argument and inference. After an introductory chapter, the role of standard logics is surveyed in two chapters. These chapters can serve as a mini-course for interested readers, in deductive and inductive logic, or as a refresher. Then follow two chapters of criticism; one the internal critique and the other the empirical critique. The first deals with objections to standard logics (as theories of argument and inference) arising from the research programme in philosophical logic. The second canvasses criticisms arising from work in cognitive and experimental psychology. The next five chapters deal with developments in dialogue logic, interrogative logic, informal logic, probability logic and artificial intelligence. The last chapter surveys formal approaches to practical reasoning and anticipates possible future developments. Taken as a whole the Handbook is a single-volume indication of the present state of the logic of argument and inference at its conceptual and theoretical best. Future editions will periodically incorporate significant new developments.

This book offers a philosophically-based, yet clinically-oriented perspective on current medical reasoning aiming at 1) identifying important forms of uncertainty permeating current clinical reasoning and practice 2) promoting the application of an abductive methodology in the health context in order to deal with those clinical uncertainties 3) bridging the gap between biomedical knowledge, clinical practice, and research and values in both clinical and philosophical literature. With a clear philosophical emphasis, the book investigates themes lying at the border between several disciplines, such as medicine, nursing, logic, epistemology, and philosophy of science; but also ethics, epidemiology, and statistics. At the same time, it critically discusses and compares several professional approaches to clinical practice such as the one of medical doctors, nurses and other clinical practitioners, showing the need for developing a unified framework of reasoning, which merges methods and resources from many different clinical but also non-clinical disciplines. In particular, this book shows how to leverage nursing knowledge and practice, which has been considerably neglected so far, to further shape the interdisciplinary nature of clinical reasoning. Furthermore, a thorough philosophical investigation on the values involved in health care is provided, based on both the clinical and philosophical literature. The book concludes by proposing an integrative approach to health and disease going beyond the so-called "classical biomedical model of care".

This book constitutes the refereed proceedings of the International Symposium on Logical Foundations of Computer Science, LFCS 2016, held in Deerfield Beach, FL, USA in January 2016. The 27 revised full papers were carefully reviewed and selected from 46 submissions. The scope of the Symposium is broad and includes constructive mathematics and type theory; homotopy type theory; logic, automata, and automatic structures; computability and randomness; logical foundations of programming; logical aspects of computational complexity; parameterized complexity; logic programming and constraints; automated deduction and interactive theorem proving; logical methods in protocol and program verification; logical methods in program specification and extraction; domain theory logics; logical foundations of database theory; equational logic and term rewriting; lambda and combinatory calculi; categorical logic and topological semantics; linear logic; epistemic and temporal logics; intelligent and multiple-agent system logics; logics of proof and justification; non-monotonic reasoning; logic in game theory and social software; logic of hybrid systems; distributed system logics; mathematical fuzzy logic; system design logics; and other logics in computer science.

This book constitutes the thoroughly refereed postproceedings of the International Workshop on Conditionals, Information, and Inference, WCII 2002, held in Hagen, Germany in May 2002. The 9 revised full papers presented together with 3 invited papers by leading researchers in the area were carefully selected during iterated rounds of reviewing and improvement. The papers address all current issues of research on conditionals, ranging from foundational, theoretical, and methodological aspects to applications in various contexts of knowledge representation.

Logic is a field studied mainly by researchers and students of philosophy, mathematics and computing. Inductive logic seeks to determine the extent to which the premises of an argument entail its conclusion, aiming to provide a theory of how one should reason in the face of uncertainty. It has applications to decision making and artificial intelligence, as well as how scientists should reason when not in possession of the full facts. In this book, Jon Williamson embarks on a quest to find a general, reasonable, applicable inductive logic (GRAIL), all the while examining why pioneers such as Ludwig Wittgenstein and Rudolf Carnap did not entirely succeed in this task. Along the way he presents a general framework for the field, and reaches a new inductive logic, which builds upon recent developments in Bayesian epistemology (a theory about how strongly one should believe the various propositions that one can express). The book explores this logic in detail, discusses some key criticisms, and considers how it might be justified. Is this truly the GRAIL? Although the book presents new research, this material is well suited to being delivered as a series of lectures to students of philosophy, mathematics, or computing and doubles as an introduction to the field of inductive logic

This book explores the results of applying empirical methods to the philosophy of logic and mathematics. Much of the work that has earned experimental philosophy a prominent place in twenty-first century philosophy is concerned with ethics or epistemology. But, as this book shows, empirical methods are just as much at home in logic and the

philosophy of mathematics. Chapters demonstrate and discuss the applicability of a wide range of empirical methods including experiments, surveys, interviews, and data-mining. Distinct themes emerge that reflect recent developments in the field, such as issues concerning the logic of conditionals and the role played by visual elements in some mathematical proofs. Featuring leading figures from experimental philosophy and the fields of philosophy of logic and mathematics, this collection reveals that empirical work in these disciplines has been quietly thriving for some time and stresses the importance of collaboration between philosophers and researchers in mathematics education and mathematical cognition.

The text contains detailed and complete proofs and includes instructive historical introductions to key chapters. These serve to illustrate the hurdles faced by the scholars that developed the theory, and allow the novice to approach the subject from a wider angle, thus appreciating the human side of major figures in Mathematics. The style in which topics are addressed, albeit informal, always maintains a rigorous character. The attention placed in the careful layout of the logical steps of proofs, the abundant examples and the supplementary remarks disseminated throughout all contribute to render the reading pleasant and facilitate the learning process. The exposition is particularly suitable for students of Mathematics, Physics, Engineering and Statistics, besides providing the foundation essential for the study of Probability Theory and many branches of Applied Mathematics, including the Analysis of Financial Markets and other areas of Financial Engineering.

The LNCS Journal on Data Semantics is devoted to the presentation of notable work that, in one way or another, addresses research and development on issues related to data semantics. The scope of the journal ranges from theories supporting the formal definition of semantic content to innovative domain-specific applications of semantic knowledge. The journal addresses researchers and advanced practitioners working on the semantic web, interoperability, mobile information services, data warehousing, knowledge representation and reasoning, conceptual database modeling, ontologies, and artificial intelligence. Volume XV results from a rigorous selection among 25 full papers received in response to two calls for contributions issued in 2009 and 2010. In addition, this volume contains a special report on the Ontology Alignment Evaluation Initiative, an event that has been held once a year in the last five years and has attracted considerable attention from the ontology community. This is the last LNCS transactions volume of the Journal on Data Semantics; the next issue will appear as a regular Springer Journal, published quarterly starting from 2012.

The aim of this book is to provide an introduction to probability logic-based formalization of uncertain reasoning. The authors' primary interest is mathematical techniques for infinitary probability logics used to obtain results about proof-theoretical and model-theoretical issues such as axiomatizations, completeness, compactness, and decidability, including solutions of some problems from the literature. An extensive bibliography is provided to point to related work, and this book may serve as a basis for further research projects, as a reference for researchers using probability logic, and also as a textbook for graduate courses in logic.

Pure inductive logic is the study of rational probability treated as a branch of mathematical logic. This monograph, the first devoted to this approach, brings together the key results from the past seventy years plus the main contributions of the authors and their collaborators over the last decade to present a comprehensive account of the discipline within a single unified context. The exposition is structured around the traditional bases of rationality, such as avoiding Dutch Books, respecting symmetry and ignoring irrelevant information. The authors uncover further rationality concepts, both in the unary and in the newly emerging polyadic languages, such as conformity, spectrum exchangeability, similarity and language invariance. For logicians with a mathematical grounding, this book provides a complete self-contained course on the subject, taking the reader from the basics up to the most recent developments. It is also a useful reference for a wider audience from philosophy and computer science.

The Oxford Handbook of Causal Reasoning offers a state-of-the-art review of one of our most central cognitive competencies, which has for a long time been neglected in cognitive psychology. This Handbook provides introductions of competing theories of causal reasoning, and discusses its role in various cognitive functions and domains.

In recent years the psychology of reasoning has undergone radical change, which can only be seen as a Kuhn-style scientific revolution. This shift has been dubbed 'New Paradigm'. For years, psychologists of reasoning focused on binary truth values and regarded the influence of belief as a bias. In contrast to this, the new paradigm puts probabilities, and subjective degrees of belief, centre stage. It also emphasises subjective psychological value, or utility; the way we reason within our own social environment ('social pragmatics'); and the crucial role of dual process theories. Such theories distinguish between fast, intuitive processes, and effortful processes which enable hypothetical thinking. The new paradigm aims to integrate the psychology of reasoning with the study of judgement and decision making, leading to a much more unified field of higher mental processing. This collection showcases these recent developments, with chapters on topics such as the difference between deduction and induction, a Bayesian formulation of faint praise, the role of emotion in reasoning, and the relevance of psychology of reasoning to moral judgement. This book was originally published as a special issue of Thinking & Reasoning.

This book constitutes the refereed proceedings of the 12th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty, ECSQARU 2013, held in Utrecht, The Netherlands, in July 2013. The 44 revised full papers presented were carefully reviewed and selected from 89 submissions. Papers come from researchers interested in advancing the technology and from practitioners using uncertainty techniques in real-world applications. The scope of the ECSQARU conferences encompasses fundamental issues, representation, inference, learning, and decision making in qualitative and numeric uncertainty paradigms.

Examining the role of implicit, unconscious thinking on reasoning, decision making, problem solving, creativity, and its neurocognitive basis, for a genuinely psychological conception of rationality. This volume contributes to a current debate within the psychology of thought that has wide implications for our ideas about creativity, decision making, and economic behavior. The essays focus on the role of implicit, unconscious thinking in creativity and problem solving, the interaction of intuition and analytic thinking, and the relationship between communicative heuristics and thought. The analyses move beyond the conventional conception of mind informed by extra-psychological theoretical models toward a genuinely psychological conception of

rationality—a rationality no longer limited to conscious, explicit thought, but able to exploit the intentional implicit level. The contributors consider a new conception of human rationality that must cope with the uncertainty of the real world; the implications of abandoning the normative model of classic logic and adopting a probabilistic approach instead; the argumentative and linguistic aspects of reasoning; and the role of implicit thought in reasoning, creativity, and its neurological base. Contributors Maria Bagassi, Linden J. Ball, Jean Baratgin, Aron K. Barbey, Tilmann Betsch, Eric Billaut, Jean-François Bonnefon, Pierre Bonnier, Shira Elqayam, Keith Frankish, Gerd Gigerenzer, Ken Gilhooly, Denis Hilton, Anna Lang, Stefanie Lindow, Laura Macchi, Hugo Mercier, Giuseppe Mosconi, Ian R. Newman, Mike Oaksford, David Over, Guy Politzer, Johannes Ritter, Steven A. Sloman, Edward J. N. Stupple, Ron Sun, Nicole H. Therriault, Valerie A. Thompson, Emmanuel Trouche-Raymond, Riccardo Viale

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