LBA AND HUMAX:
A METHOD FOR MORAL DECISION-MAKING

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The purpose of this paper is to show that moral decision-making can be rationally optimized. The method the author will briefly present consists of three parts: First, moral decision-making. Second, the methodology of rational(!) justification in decision-making in general, and third, its applications to the field of morality. The second part is based on the idea of LBA ("Least Bad Alternative"), and the third on the idea of HUMAX, i.e., the "Human Maximum".

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1.   INTRODUCTION

This paper[1] is about the application of rationality to a special case, namely moral decision-making[2] (in the sense of moral dilemma solving). It is thus a revision and continuation of two papers: Kreuzbauer 2017 and Kreuzbauer 2022[3]. Moral dilemmas are usually seen as difficult, but, as the author wants to show, their solution is not impossible. Even further, she argues that there is a gold standard, i.e., a methodology of rational justification, as discussed here. So, the paper consists of three parts:

(1) Moral decision making
(2) Rational justification in decision making. As already mentioned above, this part is based on the idea of LBA, i.e., the "Least Bad Alternative", and as also mentioned the author has already written about rational justification in several publications[4], thus only a brief overview and a few newly added aspects are discussed.
(3) The applications of rational justification in the realm of morality. This is based on an idea, which the author calls 'HUMAX', i.e., the "Human Maximum". This is presented here for the first time.

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[1]   This paper is based on an earlier German version that was translated to English by the author herself with the help of DeepL®.

[2]   For an introduction to the topic cf. Parmigiani, Giovanni/Inoue, Lurdes, Decision Theory: Principles and Approaches, Wiley, Chichester 2009.

[3]   Kreuzbauer, Hanna Maria, Juristische Rationalität, in: Schweighofer, Erich/Kummer, Franz/Hötzendorfer, Walter/Sorger, Christoph (eds.): Trends und Communities der Rechtsinformatik: Tagungsband des 20. Internationalen Rechtsinformatik Symposions, IRIS 2017, Österreichische Computergesellschaft, Vienna 2017, pp. 329–336, DIESELBE, On the Preconditions of Rationality, in: Schweighofer, Erich/Saarenpää, Ahti/Eder, Stefan/Zanol, Jakob/Schmautzer, Felix/Kummer, Franz/Hanke, Philip (eds.): Recht DIGITAL – 25 Jahre IRIS: Tagungsband des 25. Internationalen Rechtsinformatik, IRIS 2022, Editions Weblaw, Bern 2022, pp. 49–54.

[4]   See footnote 1 as well as: Kreuzbauer, Hanna Maria, Inference to the Best Explanation in the Legal Universe: Two Challenges and One Opportunity, in Legal Theory 47, 2016, pp. 333–347.

2.   MORAL DECISION-MAKING

For the purpose of this paper the author understands moral decision-making simply as solving a moral dilemma and **a moral dilemma (in the philosophical sense)** is understood as

(1) a non-trivial moral problem,

(2) whose solution requires the achievement of two necessary factors,

(3) there are least two alternative solutions,

(4) but all alternatives are entangled which each other so that any alternative that delivers one necessary factor, or at least makes it more likely, simultaneously takes away one of the other necessary factors, or at least makes it less likely.[5]

Moral dilemmas are decision problems and decision-making is a kind of human mental activity, which includes all human non-motor mental activities, i.e., cognition in a broader sense, consisting of consciousness, attention, memory, language processing and cognition in the narrower sense (i.e., "thinking"), will (=volition) and emotion[6], and it is quite trivial that decision problems belong to the area of cognition in the narrower sense. A *solution* to a decision problem is a decision alternative that satisfies all the required factors under sufficient observance of the constraints (usually including the ceteris paribus condition), and if the solution to the dilemma is necessarily impossible, the dilemma is called 'absolute', otherwise 'ordinary'. There are two types of solutions: true solutions and workaround solutions[7]. Both types are accepted here, and both can equally further be divided into two sets: solutions in the strong sense and solutions in the weak sense. A solution in the strong sense is any decision alternative that solves the given problem in the most effective and/or efficient way – where the question of

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[5]   KREUZBAUER, HANNA MARIA, The Connected Car and Data Protection: A Dilemma of Legal Ethics, in: Data Protection/Legal Tech: Proceedings of the 21st International Legal Informatics Symposium, IRIS 2018, Schweighofer, Erich/Kummer, Franz/Saarenpää, Ahti/Schafer, Burkhard (eds.), Editions Weblaw, Bern 2018, pp. 427–436.

[6]   Since motivation can be explained by the other dimensions, we refrain from naming it separately.

[7]   KREUZBAUER, HANNA MARIA, The Connected Car and Data Protection, p. 431.

whether effectiveness or efficiency has priority depends on the constraints. All other solutions are called 'weak' here.

3.   RATIONAL JUSTIFICATION

By "**justification**" the author means '**justifying argumentation**'. Argumentation is the production and connection of arguments, where an argument is, in the standard case, an inferential instrumental relation between at least one input assertion ("premises") and one output assertion ("conclusion"), or, as one also says, a conclusion from premises to a conclusion. Justifying argumentation is argumentation with a given conclusion and not with given premises and if and only if a justifying argumentation satisfies the criterium of rationality, it is to be called 'rational'.

As just mentioned above, input and output of any argumentation consist of assertion, so input and output of justifications must be assertions as well. This means that **every** problem, i.e., also decision problems, must be represented as a set of assertions, which, however, does not cause any substantial problems. **Assertions** (in the narrower sense) are linguistically encoded ideas (mentally usually experienced as meaningful and constant), that map something outside themselves in a **property-specific way**, i.e., by expressing something specific about the properties or relations of an individual or the elements of a set.[8] Assertions are connected to states of affairs, meaning that the domain outside themselves, that they propose to map, has the character of a state of affairs[9]. This will be called the '*assertion's state of affairs*' here. So, in decisions we end up with a set of assertions of this sort: Decision alternative A is the optimal alternative solution under constraints $B_1 \dots B_n$.

Now, for any given assertion A there is the meta assertion M, saying that the assertion A's state of affairs is existing and A corresponds with it, where **correspondence** means that the mapping sufficiently corresponds with what is mapped.[10] This applies to all non-fictitious assertions, both about empirical and evaluative stuff, to descriptive and

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[8]   KREUZBAUER, HANNA MARIA, On the Preconditions of Rationality, p. 52.

[9]   This state of affairs could be an individual state of affairs or a set of states of affairs.

[10]   Cf. KREUZBAUER, HANNA MARIA, On the Preconditions of Rationality, p. 53.

theoretical assertions, and to singular and universal assertions. In addition to this it can also be applied analogously to fictitious assertions.[11] In general, settings may differ according to the greater or lesser tolerance for non-correspondence they provide. But for instrumentally and/or technologically oriented societies this is sometimes exceptionally low, i.e., correspondence is indeed an important dimension. **Reliability**, in turn, means that an assertion corresponds with the assertion's state of affairs with sufficiently high probability.[12] So, rational justification is all about the justification of assertions, and, strictly speaking, it is even about the justification of a meta-assertion, for what is actually to be justified is not the proposition "Socrates is mortal.", but the proposition "The assertion that Socrates is mortal corresponds (is reliable)."

To apply this to practical decision making, at least one alternative solution must first be found and then justified. So, there is the context of discovery and the *context of justification*[13] and any argument is a **proposal of** the (meta-)assertion that a conclusion corresponds. The quality of the premises and the conclusion are the rational justification for it, which means that it produces the output "reliable assertion" from the input "assertion", or not, in the sense of a "quality predicate" for "rationally justified", almost like "tested by experts". It does not produce the "quality predicate" of "true", "morally good", etc., but even so, this is quite a lot. For **purely discovering inference**, i.e., one whose task is only to bring us to a new idea based on existing ideas, the proposal is enough; for **justifying inference**, of course, justification must not only be proposed, but also be successful.

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[11] This means that the sentence "Unicorns are white." in principle can neither correspond nor non-correspond, but in relation to a particular narrative it can quasi-correspond. This is also true of the sentence "Unicorns are blue and pink.". However, it is reasonable to assume that it does not, because it is fairly sure, that there is no sufficient set of narratives that includes it in that way. Somewhat "poetically", however, one could also say that non-fictitious claims refer to the "least bad universal narrative", i.e., the one that talks about everything, and in which the bad performers have been eliminated to the greatest extent, and fictitious claims only to a concrete subset of it.

[12] For sufficient reliability, the probability must be greater than 0.5, or greater than the probability of negation of the assertion, which corresponds to the same. The assertion's state of affairs is that part of the universe outside the assertion to which the assertion refers.

[13] Cf. GETHMAN, CARL FRIEDRICH, Entdeckungszusammenhang/Begründungszusammenhang, in: Mittelstraß, Jürgen (ed.), Enzyklopädie Philosophie und Wissenschaftstheorie, vol. 1, J.B. Metzler, Stuttgart/Weimar 2004, pp. 549–550.

Unfortunately, **no assertion can ever justify another one** in the sense that the assertion's state of affairs must then be so and so, because no assertion can affect the world outside itself, for that would be magic. In fact, the reverse is true: the conclusion's state of affairs is existentially linked to the premises state of affairs in such a way that if the premises state of affairs exists, so does the conclusion's one: The argument in turn only demonstrates this. Precisely when this correlation between the argument and the existence-linked states of affairs is sufficient, the argument is **reliable**. In practice, however, one can usually skip this complicated train of thought by falsely but (at least) much more simply saying:

> *If the premises of an argument correspond and the conclusion is logically valid or curable[14], and if the assertion that the conclusion corresponds is the least bad alternative ("LBA"), then the assumption of correspondence of the conclusion is rationally justified.*

In this case one can call it a strong argument(-scheme). Instead of "correspondence" one can also take "reliability" and rational justification then means the (successful) demonstration of the reliability of a conclusion due to the argument.

3.1.   Rationality as a method

In its core rationality is a methodology for optimizing the production of reliable assertions through optimized human mental agency – given the case specific constraints (including the ceteris paribus condition). In the course of history, many methods of rational justification have been proposed. In particular, **logic** was and is always mentioned in this context, usually meaning the application of formal logic. This, however, is only partwise appropriate.

Logic is understood either in a sense of formal logic or informal logic. **Formal logic** is a sound and consistent and complete language (or any combination of it) consisting of (1) a core consisting of optimally regularized structural elements (constants, parameters,

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[14]   If a conclusion such as "Socrates is human and therefore mortal." is invalid, only because necessary parts have been omitted for discourse-pragmatic reasons (which is called an 'enthymeme'), but these parts can be added without discourse-pragmatic change, the conclusion is curable and to be treated in the same way as a logically valid conclusion.

and variables) and (2) enriching elements that supplement the core without reducing its consistency and completeness. As a theoretical academic discipline logic investigates such formal languages, but the most important feature is its application, because with it we can "compute language". This is done by first translating a more or less arbitrary sequence of language into formal ("logical") language, what we call 'representing'. Second, logical operations are performed. Often, even existing – so to speak – natural inferences are translated into formal ("logical") inferences and thereafter it is tested whether they comply with the rules of formal logic or not, such giving us an indicator of the quality of argumentation. Third, the result could be translated back into the source language (and often is even interpreted further).

Informal logic is everyday logic and not limited to formal languages. It focuses primarily on inferences (i.e., reasoning), but unfortunately, however, the relationship of humans to this is ambivalent, because certain things, such as modus ponens or disjunctive syllogism, we do very well even intuitively. Other logically valid forms of inference, such as modus tollens or addition ('p therefore p or q') we intuitively almost certainly get wrong, and moreover we constantly use logically *invalid* (and also incurable) forms of inference, such as the negated antecedent ('if p then q, not p therefore not q'), and do so completely convinced that this is right. One may suspect that this interesting phenomenon lies in the fact that in the course of evolution our ancestors did not face logical problems so often, but problems of information selection. In fact, the main problem was probably always to cope, select and sort the gigantic amount of irrelevant and relevant information provided by nature, our sensory organs and our minds. Logic is particularly good in the quasi-eternal inference of information-poor inputs, but humans, however, need short inferences on enormously information-rich inputs accompanied by the task of selecting the relevant information out of the irrelevant one. Thus, evolution did not develop us into logic experts.

Apart from logic, other rules of rationality were established. The classical canon contains the following rules: (1) avoidance of relevant influence on cognition by will or feeling, and (2) optimization of cognition by (a) separation of discovery and justification, i.e., the context of discovery and the context of justification, and (b) adherence to the rules of rationality, which include: (i) the principle of solidity, i.e., that everything in the discourse must be solid ("well-formed"), (ii) the four "laws of thought" and (iii) all the

rules of mathematics and logic. Unfortunately, the "laws of thought" are quite controversial, and rule (iii) is certainly too strict for being upheld here. Moreover, an especially important principle is completely missing, namely the elimination principle, which is related to of Karl Raimund Popper's (1902 to 1994) falsification principle[15]. In fact, the majority of philosophers, if not all, until well into the age of positivism have assumed the opposite as the gold standard, not falsification (we prefer to call it 'elimination' here) but verification. So, after some corrections, we end up with this brushed up and modernized canon of rationality:

1. Avoidance of relevant influence by volition/motivation (will) and emotion (feelings)
2. Optimization of cognition by adherence to:
   a) Principles of rationality
      i) Principle of contradiction
      ii) Principle of equivalence
      iii) Weak principle of logic and mathematics
   b) Methodological principles
      i) Cognition and discourse soundness including the strong ceteris paribus rule
      ii) Separation of discovery and justification of alternatives
      iii) Elimination of the worst performing alternatives

3.2.   The LBA method

The acronym 'LBA' is used here for 'Least Bad Alternative'[16], which will be briefly explained. Starting point is the principle of contradiction already mentioned by Aristotle (384 to 322 BC), which in a common formulation reads: *two contradictory assertions cannot be true at the same time,* thus at least one of them does not correspond (i.e., it can also be the case that none corresponds). This proposition, understood in the sense of an empirical rule, is – at least to the knowledge of the author – the only principle

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[15]   As an example cf. Janich, Peter, Falsifikation, in Mittelstraß, Jürgen (ed.), Enzyklopädie Philosophie und Wissenschaftstheorie, vol. 1, J.B. Metzler, Stuttgart/Weimar 2004, pp. 630-631.

[16]   The procedure is obviously oriented to the well-known inference to the best explanation. For the best overview cf. Lipton, Peter, Inference to the best explanation, 2nd ed., London/New York 2004 [1st edition London/New York 1991]; cf. also Amaya, Amalia, Inference to the best legal explanation, in: Kaptein, Hendrik/Prakken, Henry/Verheij, Bart (Eds.), Legal Evidence and Proof: Statistics, Stories, Logic, Aldershot 2009, p. 135–159.

that cannot be refuted without applying it, thus it "justifies itself", so to speak, at least in the sense that one cannot stop someone who holds it by rational means. In the practice of rationality, this seems to be the most solid thing we have. The LBA method has already been described in Kreuzbauer 2017 and Kreuzbauer 2022[17]. We will briefly summarize this here:

First of all, it needs no further explanation that rational justification is not about the context of discovery but the context of justification, and here LBA is used as a **rationality criterion**.[18] That means, an assertion is rationally justified if and only if it is the least bad alternative. Thus, the starting point is always an assertion, such as "Decision alternative A is under constraints $B_1 ... B_n$ the optimal alternative solution." However, to this initial assertion we do not add only arbitrary other assertions, but also the two standard assertions: (1) the *contradictory negation of the original assertion*, X_N, and (2) the *ignorance assertion*,[19] I_x, which states that the correspondence of the original assertion is not (currently) decidable. Now all assertions have to compete against each other, preferably in groups of three. Then, if all three contradict each other, all get one negative point, if only one contradicts the other two, while the other two do not contradict each other, the two assertions that get along with each other get one negative point[20], and the one in contradiction with them gets two. The negative points of all alternatives are recorded, and the worst performer, i.e., the alternative that has conflicted with others the most times, is eliminated. Then the competition is restarted. It is not claimed here that this always works, but if and only if a single alternative remains, it is the least bad alternative and the one to be recommended at present time. If it is an assertion of the type "Decision alternative A is the optimal alternative solution under constraints $B_1 ... B_n$." then this is the alternative solution to be recommended at present time.

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[17] Cf. fn. 1.

[18] Cf. KREUZBAUER, HANNA MARIA, On the Preconditions of Rationality, p. 53.

[19] Ibid.

[20] After all, they are only compatible with each other, but not with the third assertion.

4.   LBA RATIONALITY IN MORALITY

Now we will show how all of these ideas can be applied to the field of morality as well, and as the science of morality is called "ethics", this is an ethical question as well. Morality (in the non-metaphorical sense) actually exists in two variants: (1) morality in the narrow sense and (2) morality in the broader sense.

Morality in the narrow sense is understood here as a population (or metapopulation) of evaluations that:

1. evaluate human behavior independently of scope but with reference to the distribution of happiness and suffering, are experienced by an individual as
2. values in essence, and as a given, so not as self-made,
3. they are combined with an emotion of humanity, prosocial sentiment, rightness, or the respective opposites (for instance as pity, indignation, affection or suchlike) and
4. are HUMAX-capable.

Morality in the broader sense means morality in the narrower sense plus all other values that are experienced as related to it.

Norms are requests whose fulfillment is experienced as morally valuable, and morality is most probably a product of **human bio-cultural co-evolution**, and thus to be understood as populations[21] of responses to concrete requirements of earlier human environments. At the center of the evolution of morality stands cooperation, i.e., behavior that consciously or unconsciously postpones the achievement of one's own benefit in favor of the benefit of others, nevertheless, perhaps indirectly also increasing one's own benefit as well. One may speculate that several layers of morality have evolved:

1. Micro group morality, with its central values of loyalty towards group members, courage, and sacrifice for the group,

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[21] There is much to be said for viewing morality as a population, just like practically all other cultural phenomena (cf. RICHERSON, PETER J./BOYD, ROBERT, Not By Genes Alone: How Culture Transformed Human Evolution, Chicago 2004, p. 5 ff.).

2. Small group morality with the central values of cooperation with known but even unknown group members or strangers on terms of commitment and spirituality,

3. Pre-modern large group morality with the central values of justice, anonymous cooperation, restraint of aggression, and fidelity to law and contract, and

4. Modern large group morality with the central values of freedom, social justice and solidarity, but also individualism and inclusion, and above all the central value of non-intuitive trust in rationality.

Unfortunately, however, the latter has led directly to modern mysticism, namely modern religions and ideologies of nationalism, communism, fascism, Nazism, and Islamism, on the one hand, and to modern spirituality and irrationalism, such as esotericism, on the other. Many of these ideas have clearly overstepped the borders of morality.

4.1.   HUMAX

This paper is only about modern morality in the sense of rationally justified morality. Note that this excludes much more than one would expect, because all moral variants that have a relevant irrational (e.g. spiritual) link in their chain of justification are excluded, such as many religious moralities.[22] As it is well known, however, there is a fundamental problem in morality, namely the **is-ought-problem**[23], i.e. the postulate, that as far as the author knows, was first formulated by David Hume[24] (1711 to 1776) and states, **that no "Ought" follows or can be derived from an "Is"**. In an ontological form and in the terminology used for this paper, this is formulated the way, that evaluative properties or relations are not existentially linked to empirical properties or relations. The is-ought-problem is actually extremely huge, because it basically says that, if this is so – which probably is the case – there are no relevant moral values at all. This in essence means that **no morality exists** at all. Hume's postulate is accepted here, with

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[22]   Note that a reference to God does not necessarily make a moral statement irrational, but only if it is relevant for the strain of thought.

[23]   Arguably still the best work on this topic is SCHURZ, GERHARD, The Is-Ought Problem: An Investigation in Philosophical Logic, Kluwer, Dordrecht 1997.

[24]   As is well known, other important representatives of this position are Immanuel Kant (1724 to 1804) and Hans Kelsen (1881 to 1973).

the concession that – following Gerhard Schurz[25] – insignificant and/or irrelevant exceptions (e.g.: ultra posse nemo obligatur) are not excluded in principle.

The solution could be to accept this but look for the second best, i.e., the best values fulfilling the definition of morality that people can have, and to accept these and only these as quasi-moral values and quasi-moral value decisions. One would then say that the morally good is precisely the unsurpassably best. The unsurpassable best will be called '**Human Maximum**' here, or in short: '**HUMAX**'. It means, that if we as humans think about a thing as best as we can, we can still be wrong, as we all know. But if we in the sense of the whole mankind would besides providing for our subsistence never have done anything else as to reason about one single topic, i.e., we would have put all our energy, all our resources, etc. up to now as much as possible only into the reasoning about this single question, we can still be wrong, but we cannot improve it any more. This is the maximum that can be achieved, that is, the unsurpassable best in this question. The result is the human maximum, i.e., the **HUMAX**. What HUMAX evaluates as good is still not objectively good but good with unsurpassable moral justification and **what is set according to HUMAX is set with unsurpassable moral justification**.

4.2.   Practical application

Without doubt HUMAX is **utopian**, but it is **not ideal** in the Platonian sense, thus in principle it can be approximated. So, the question of what is the optimal approximation is open to reasoning and thus to rational justification. This means that the LBA method can be applied. Therefore, at the end of this paper, a method for its practical application will be briefly outlined:

(1) Starting point is a moral dilemma to be solved. In order to arrive at a moral decision, the first step is to determine the relevant **interests** and **constraints.** The term 'interest' is used in everyday meaning. Constraints refer to all relevant aspects or viewpoints arising from the case. Both can be empirically detected.

(2) Now alternative solutions have to be worked out, starting with the best alternative according to purely intuitive assessment. Then this alternative, as well as all subsequent

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[25]   Cf. SCHURZ, GERHARD, The Is-Ought Problem.

ones, must be related to the interests and constraints in such a way that it can be stated *which* alternative provides *which* satisfaction of *which* interests under *which* constraints.

(3) Now follows the most important step, consisting of finding the most general moral principle underlying the alternative solution, **as whose instance the alternative solution can be represented** under the given constraints. Thus, the alternative solutions are mapped as instances of principles.

(4) The instances are now to be **tested on the basis of thought experiments**. I.e., one tries to think up thought experiments and tests whether the alternative solution at stake leads to unacceptable results according to the HUMAX principle. If this is the case, the alternative solution must be changed or discarded, etc.

At each step where **rational justification** is needed, one has to proceed according to LBA, and finally, if we have done everything correctly, we may arrive at the conclusion that an alternative solution is the LBA according to HUMAX. This solution is recommended at present time, and we are done.

5. SUMMARY

Based on previous work, the author has tried to establish two central principles, namely LBA and HUMAX, and tried to establish them as fruitful for moral decision making. Some parts could not be discussed in depth, but only sketched. Thus, further work will have to go in exactly this direction, i.e., working out the details and using practical applications to see if the process lives up to its promise in practical application.