UDK 162.6
DOI https://doi.org/10.2298/FID2404933F
Original Scientific Article
Received 17.06.2024 Accepted 10.8.2024.

PHILOSOPHY AND SOCIETY
VOL. 35, NO. 4, 731–992

To cite text:
Filipović, Nenad. 2024. "Normative Decision Theory and Reindividuation of the Outcomes." *Philosophy and Society* 35 (4): 933–956.

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NORMATIVE DECISION THEORY AND REINDIVIDUATION OF THE OUTCOMES

ABSTRACT
This article examines and critiques efforts to preserve the requirements of normative decision theory from counterexamples by reindividuating outcomes. Reindividuation is often employed in response to counterexamples that challenge even the most fundamental requirements of rationality, such as transitivity. These counterexamples demonstrate that even basic rationality requirements can appear to be violated in seemingly rational ways, thus casting doubt on their plausibility. Reindividuation seeks to preserve these requirements by refining the objects of preference in more detailed terms. However, John Broome has pointed out that this strategy can lead to the issue of making the requirements vacuous. We will explore counterexamples to transitivity and demonstrate how reindividuation can lead to this problem of emptiness. Following that, we will review significant attempts to address this problem, showing that they fall short and that any direction we take either makes the requirements too permissive or leaves them unjustified. In the final section, we suggest a less conventional solution: rejecting finer individuation and accepting that the requirements of rationality are not universal. Finally, we point out several established approaches to decision theory that allow for domain-specific requirements.

KEYWORDS
normative decision theory, requirements of rationality, transitivity, problem of reindividuation, John Broome.

Introduction

Majority of the axioms of mainstream normative decision theories, such as expected utility theory (EUT), have some counterexamples, i.e., examples of preferences violating the axioms that do not seem irrational. The typical strategy to deal with counterexamples is to describe the decision problem differently. In this article, we focus on the simplest of the axioms, the transitivity of preferences. Namely, to deal with counterexamples to transitivity (e.g., Sen 1993), we reindividuate the outcomes more finely, in such a way that preferences are transitive. John Broome (1991; 1993) noticed that this strategy, if unconstrained, makes the requirements of rationality vacuous.

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There are numerous attempts to give plausible constraints for finer reindividuation, so that we avoid counterexamples to the requirements, but also avoid the possible problem of the emptiness of the requirements. I will argue that the search for plausible constraints is futile. Attempts to constrain finer reindividuation either lead to overly permissive or unjustified requirements. It should be noted that many of the issues with reindividuation, as well as counterexamples to all the requirements of rationality, are well-known. In that sense, I am not pointing out many new problems. Instead, I combine the issues and show that they are deeper in the sense that previous attempts to solve them do not work, and we have several good reasons to think that the majority of conventional approaches are bound to encounter major problems. Finally, I offer a possible but unconventional solution. Namely, we can reject finer reindividuation and adopt a view that claims the requirements of rationality are not universal but domain-dependent. While this is not an implication of the arguments presented in the article, we will see in Section 4 that this proposal offers the benefit of preserving both the strength and plausibility of the axioms, something the standard proposals for reindividuation cannot claim to do. We will also mention a few views on rationality that elaborate on domain-dependent norms of rationality. Since our focus is not on the overall costs and benefits of specific theories but only on the problem of reindividuation, we will not elaborate on these views in detail but will analyze them only insofar as they are viable options for a domain-dependent view on norms of rationality.

The article will be organized as follows. In section 1, I will briefly analyze what typical normative decision theory claims about the requirements of rationality, and the common counterexamples to transitivity and the problem of reindividuation. In section 2, I will analyze three attempts to solve the problem and show why all three of them fail. In section 3, I strengthen the critique by arguing against other possible solutions. In section 4, I argue that a possible way to deal with all of this is to avoid finer reindividuation altogether and accept that the requirements of rationality, such as transitivity, are not universal.

Normative Decision Theory and the Problem of Reindividuation

Normative axiomatic decision theory is an explication of the moderate Humean view of practical rationality that no preferences are irrational by themselves.[1] Rather, practical rationality only prohibits inconsistent sets of preferences. Axiomatic decision theories, like EUT (e.g., Savage's ([1954] 1972) theory), formally explicate this view. The theories present several axioms of consistency (e.g., ordering, independence, and continuity axioms), which function as requirements of rationality.[2] When interpreted as normative, the aim of the theories is

1 Based on Hume's dictum that "reason is, and ought only to be the slave of the passions" (Hume [1739] 1975: 415).

2 Jointly with structural axioms, these axioms serve as a basis of representation theorem, i. e., to deduce the expected utility rule.

to offer an analysis of ideal rationality (e.g., Buchak 2013: 34).[3] This means that they not only state the conditions of consistency but also claim that practical rationality *consists of* the consistency conditions. Moreover, the term "ideal" is important in the theories' methodology and scope. Since we are concerned with how an *ideally* rational agent should make decisions, we typically abstract away from the cognitive limitations and imperfections of actual agents. The focus on an ideally rational agent also influences the domain of theory. Namely, since ideal rationality consists only of a few formal requirements of consistency, being rational is a matter of following these requirements, regardless of the context of the decision.[4] Thus, we usually take axiomatic decision theory as offering *universal* norms of ideal rationality.[5]

An additional question is how to justify that the axioms are the requirements of rationality. The justification is typically done in several ways: by appealing to the intuitive plausibility of the requirements (e.g., Gilboa et al. 2019); by saying that they have the same status as laws of logic (Broome 1991); or by pragmatic arguments like money-pump arguments that show that violating the requirements leads to subpar consequences like guaranteed exploitability (Gustafsson 2022).

The Requirement of Transitivity

Transitivity of preference says that if agents' preferences are A≻B and B≻C, then agents' preferences ought to be A≻C, where "≻" is a sign for strict preference.[6] We talk solely about transitivity, and not all of the requirements, as it is the simplest, most plausible, and basic requirement that the theory presents.

3 The theories discussed in this paper have both descriptive and explanatory interpretations. Explanatory interpretations claim that standard decision theory is a good way to interpret and explain the actions of persons in the sense that we assume, charitably, that people maximize their expected utility, and then explain and interpret their actions according to that assumption. The problem of reindividuation is not considered as significant for descriptive interpretations. We mention some of the authors who discuss the problem in the context of explanatory interpretations in footnote 9, but otherwise we will not deal with the influence that the problem has on that interpretation.

4 For example, one of the founders of axiomatic decision theory Ramsey (1926) thought of the axioms as "laws of thought", similar to the laws of deductive logic.

5 Rich (2016) dedicates a section of the article to the topic of a domain, claiming that axiomatic theories are usually taken as universal in scope, but thinks that such approach is merely rhetoric, rather than a substantive assumption. In a way, I would agree with this view, since it is not necessary to take any axiom as a universal norm. But I argue for a stronger conclusion: that there are reasons to take the requirements as strictly domain-specific.

6 Transitivity is usually taken as the requirement of the relation of *weak* preference (cf. Fishburn 1981: 145): if A≽B and B≽C, then A≽C. We use strict preference in the article, mainly for simplicity. Since the agents' strict preferences in the examples we use are of a form A≻B≻C≻A, it is clear that they also violate transitivity of weak preference: A≻B and B≻C imply A≽B and B≽C, and C≻A implies not A≽C; where "≽" is a sign of weak preference relation.

In other words, if anything is the norm of rationality, it is that a rational agent's preferences ought to be transitive. Transitivity is also the cornerstone of most normative axiomatic decision theories, such as all variants of EUT (cf. Fishburn 1981; 1991). The fact that transitivity is common to all these theories means that most candidates for normative decision theories are affected by the problems of reindividuation.

The Problem of Reindividuation

Consider an example, E1, due to Broome (1991: 100-102; 1993: 53-55). An agent, Maurice, prefers staying at home (H) over visiting Rome (R), and visiting Rome over going mountaineering (M). Maurice also prefers going mountaineering over staying home. So, his preferences are intransitive: H>R>M>H. However, Maurice offers a reasonable explanation for such preferences. He likes staying at home over Rome because visiting cities bores him, and Rome over mountaineering because mountaineering frightens him. However, he also does not like to be a coward, and he thinks that choosing home over mountaineering would be cowardly. (He thinks of going to Rome over mountaineering as cultured rather than cowardly, so cowardliness does not come into play.) Maurice's explanation kind of makes sense, so it is not easy to consider him irrational. But then we have a counterexample to transitivity – a seemingly rational, yet intransitive set of preferences. This trouble for transitivity is even bigger since this is not an isolated counterexample.[7] The pattern of preferences is easily repeatable. We only need to have two or more characteristics of interest in outcomes (i.e., cowardliness and boredom), and they need to clash only in some and not all of the pairs of preferences. In other words, we need some sort of *matchup*-based reasons for preferences. E1 thus shows a structural issue for transitivity, the type of counterexamples that can arise from certain types of preferences.

A common strategy to deal with this issue is to *reindividuate* the objects of preferences, i.e., outcomes (Broome, 1991, 1993). In E1, that means that instead of taking H, R, and M as the outcomes, we consider that Maurice's options are more finely individuated outcomes. Specifically, the outcome H should be considered as two outcomes: "staying home and not being a coward" ($H_{\&nc}$) and "staying home and being a coward" ($H_{\&c}$). Maurice really likes $H_{\&nc}$ and really dislikes $H_{\&c}$. So, Maurice's preferences are $H_{\&nc}$>R>M>$H_{\&c}$. These preferences are not intransitive, so transitivity is saved from this sort of counterexamples by reindividuation. We should note that what the term 'reindividuation' means is an alternate description of the decision problem in such a way that

7 If someone does not like the counterexample that Broome offers, it should be noted that there are numerous other examples. Sen (1993: 501) gives another widely used counterexample. Sugden (1985), Schumm (1987), and Anand (1993) offer other interesting examples. Fishburn (1991) gives good elaboration of why these kinds of preferences make sense.

the outcomes are individuated more finely than in the original description. Because of this, one can find terms like "description" (Mamou 2020), "fine individuation" (Dreier 1996), or simply "individuation" (Fumagalli 2020) used for the maneuver that Broome calls reindividuation. We will use these terms as synonyms.

Reindividuation Leading to the Vacuous Requirements

As Broome (1991: 102; 1993: 54-55) notices, there is a big problem with the strategy of using reindividuation to save transitivity. Namely, if there are no constraints on how outcomes can be reindividuated, we can rationalize any set of preferences as transitive. If everything can be transitive, then the requirement is vacuous. So, by saving transitivity, we fall into *the problem of reindividuation,* i.e., we make the requirement of transitivity empty.

To see why this problem is serious, consider example E2. An agent, Herb, is offered a choice between investing in Fiat (F), Renault (R), and Volkswagen (V) stocks. Herb's only objective is a higher return on his stock investment. However, he has a peculiar pattern of feelings and thoughts regarding these investments. He really hates the idea of investing in Fiat when offered alongside Volkswagen, and investing in Volkswagen when offered alongside Renault. But then, he really thinks it is good to invest in Fiat when offered alongside Renault. So, Herb's preferences are F>R>V>F. Herb's preferences can hardly be considered rational. In fact, it seems that he just circularly considers his alternatives depending on what they are compared to. But whether they appear rational or not is not the only issue. A more important issue is that if these preferences are rational, the requirements of rationality will be vacuous. The reason why this is a more important issue is because the normative EUT, along with the entire Humean view of rationality, relies *solely* upon these requirements of consistency. There are no other requirements of rationality but those of consistency. If these requirements are vacuous, the whole view of rationality as consistency becomes vacuous. In other words, it is essential for that particular view of rationality that these requirements are not vacuous.

However, with unconstrained reindividuation, we can easily accommodate Herb's preferences as transitive. Let us consider the outcome "Fiat" as two different outcomes: "Fiat when the alternative is Volkswagen" (F_V) and "Fiat when the alternative is Renault" (F_R). Then, Herb's preferences are F_R>R>V>F_V. This pattern of preferences is no longer intransitive, and is thus rational.

Now, the problem for the requirements of rationality is not solely whether we should consider these specific preferences rational. The problem is that we can rationalize any pattern of preferences in the same way. Consider an agent who prefers A>B>C>A, without specifying the alternatives. This is a paradigmatic example of intransitive preferences. However, the agent can claim, like Herb, that A is not a single outcome but two: "A when the alternative is B" and "A when the alternative is C," making the preferences A_B>B>C>A_C. Thus, we have a scheme that makes any preference pattern transitive if reindividuation

is unconstrained by some rules. And if we can make any preference pattern transitive, the requirement of transitivity becomes vacuous. Since this requirement is the cornerstone of the Humean view of rationality and decision theory, that makes the entire view of rationality vacuous.

Solutions to the Problem of Reindividuation

There were a few attempts to solve the problem of reindividuation in the context of normative decision theory. We will review three of the most prominent solutions proposed specifically in the context of normative decision theory: Broome's criteria by justifiers (Broome 1991; 1993); Dreier's criteria by non-practical preferences (Dreier 1996); and Mamou's explanation by the assumption of maximal relevance (Mamou 2020).[8] We will analyze and criticize these views one by one.

Broome's Reindividuation by Justifiers

Broome (1991) uses the problem of reindividuation to criticize a moderate Humean view of rationality. He claims that in order to avoid the problem of emptiness, one must adopt a non-Humean, i.e., external criteria for reindividuation.[9] Broome's reasoning is that what allows us to uphold transitivity and to count E1 as an example of rational preferences are two facts: a) Maurice considers $H_{\&nc}$ and $H_{\&c}$ as different outcomes; b) Maurice is not indifferent between these outcomes but prefers $H_{\&nc}$ to $H_{\&c}$. According to Broome's

8 There are numerous important discussions on the topic of reindividuation that I do not analyze, since it is hard to see the offered solutions as plausible for normative theories. I will mention them briefly here. Bermúdez (2009: chap. 3) discusses the topic of framing of decision problems. He mentions several views that tackle the issue of correct framing. But, only Broome's view seems relevant for normative decision theory, while the others seem useful for explanatory or descriptive purposes. Buchak (2013) analyzes the topic of reindividuation in the context of global and local properties of gambles, as pertinent to her theory of risk-weighted expected utility, but that has no obvious connection to our topic. (Since our topic is not a concern of Buchak's book at all, this is not a criticism of her view.) Mamou (2020) analyzes Pettit's (1991) view of individuation by properties. However, since Pettit (1991: 159) considers that the consequences of his view are that decision theory is non-autonomous and non-practical, it is hard to see his solution as plausible for the normative theory of practical rationality. Finally, Fumagalli (2020) analyzes and answers common problems of individuation of outcomes, for both the normative and descriptive interpretation of decision theory. Section "Trivialization Challenge" (Fumagalli, 2020: 345-348) touches upon our topics. But, speaking of normative decision theory, I fail to see many differences between Fumagalli's answers and those of Broome's or Mamou's, so I do not include it here as a separate view.

9 It should be noted that Broome's points are a part of a larger project of introducing a form of rational utilitarianism, similar to Harsanyi's (1955) views. Since my knowledge of the field is quite limited, I will not go into more details on his ethical theory. I will assume that we can talk about the theory of practical rationality independently from the concerns of ethical theory.

opinion, if we want to constrain reindividuation, we need to say that Maurice is either not justified in considering the outcomes as different (i.e., deny a), or that he must be indifferent between the outcomes (i.e., deny b) (Broome 1991: 102-106; 1993: 56-57). Broome offers two ways to do this: *the principle of reindividuation* and *the requirement of indifference*. The principle states that "Outcomes should be distinguished as different if and only if they differ in a way that makes it rational to have a preference between them." (Broome 1991: 103) The requirement of indifference forbids the agent from preferring one outcome to the other by stating that agents should be indifferent between the two outcomes if and only if they do not differ in a way that makes it rational to have a preference between them (Broome 1991: 103-104). It should be emphasized that Broome says that the principle and requirement come about as essentially the same condition: "... a justifier is simply the opposite of a rational requirement of indifference. If rationality requires one to be indifferent between two alternatives, then the alternatives do not differ in a justifier: they do not differ in any way that justifies a preference between them." (Broome 1991: 104). The upshot is that we need to have a justifier, i.e., a fact that makes it rational for the agents to consider the outcomes as different and to have preferences among them. This is a non-Humean element that Broome introduces into the theory, since we must rely on substantive normative claims (i.e., saying that an agent cannot rationally have some preferences), rather than solely on formal rules of consistency.

Since Broome's theory is ultimately based on *goodness* rather than on utility, what counts as a justifier is tied to what can change the goodness of an outcome. Namely, if some fact about the outcome changes its goodness, it can be a justifier. According to Broome (1991: 106; 1993: 57), in E1, if it is true that staying home while rejecting mountaineering is cowardly, Maurice has a justifier. That fact affects the goodness of the outcome, since staying home is not equally good as staying home while rejecting going to Rome. Thus, it counts as a justifier for reindividuation and preferences between outcomes. We will focus on the main issue with Broome's proposal: how to specify the facts that can be justifiers. Let us see what the facts about the goodness of outcomes can be. In E1, it is the fact about cowardice, which somewhat clearly changes the value of the outcome. But, as Bermúdez (2009: 107-109) notes, things can get unclear really quickly. Let us change E1 a bit. Now, consider E1'. Maurice has the same preferences but a different explanation for preferring M to H. He considers how he would spend time if he stayed at home and thinks that he would watch a documentary about mountains. Considering that, he finds it silly to reject mountaineering and then to watch mountains on TV. Since he would not watch a documentary about Rome if he stayed home, nor would he watch anything if he went to Rome, this reason only comes into play when comparing H to M. We have possible reindividuation: the outcome H can be counted as two outcomes "Home & feeling silly" and "Home & not feeling silly"; preferences can be transitive once again. Maurice is certainly correct when stating that staying home would make *him feel* silly if it came by rejecting

mountaineering. But this is not an external factor like cowardice. Should it count as a justifier?[10] It is not easy to argue for either yes or no unless we already determine whether Maurice is correct in thinking that his feelings based on the rejected alternatives are sufficient to look at the outcomes as different. In other words, the only way to argue for the rationality of preference here is by determining whether the value of the outcome changes, but to see whether the value changes, we need to know whether Maurice can rationally differentiate between the outcomes.

There are additional worries. We will either say that silliness is sufficient as a justifier or not. If we say that it is sufficient, why would the feeling of silliness be any different from hate in E2? Both are negative feelings caused by particular alternatives. Broome's theory would need to have a list of 'rationally allowed feelings' to sort out these differences. If we would say that it is not sufficient, why would Maurice care about these constraints? In other words, since it is obviously relevant for him, what would be the practical benefit for him to be rational and reject an alternative that he values more?[11]

Dreier's 'Non-practical Preferences' View

Dreier (1996) offers a criterion to determine whether preferences such as those in E1/E2 are genuinely transitive and rational. By determining whether the preferences are transitive, one can differentiate between cases of genuine transitivity and intransitivity. Since there can be cases of violation of transitivity *even with* reindividuation, transitivity is not an empty requirement, and we avoid the problem of reindividuation.

Let us take a deeper look at Dreier's view. He introduces another type of preferences: non-practical preferences. To explain what non-practical preferences are, first note that the objects of regular preferences are the outcomes that agents can, in principle, choose. In E1, Maurice has a preference for staying home over visiting Rome – which he can choose. Dreier considers non-practical preferences as preferences among outcomes that cannot be matters of actual choice. The actual choice between A and B is a situation in which A is chosen when the alternative is B. Dreier's idea is that if A is offered when the

10 In another example, Broome (1991: 15; 105-107) rejects reindividuation on the basis that comparing the outcome in question to other alternatives might bring to mind different *considerations*, but it does not alter the outcome's actual goodness. Extrapolating from that example, I suspect that Broome would reject reindividuation in E1'. But I have little to no certainty about that claim, which is kind of my point here: it is hard to clearly see why and when something alters actual goodness unless we see whether the preferences between the outcomes make sense.

11 Broome adopts the view that the transitivity of goodness is a matter of logic (Broome 1991: 11-12), which would kind of explain why the agent ought to care about it. However, it is not clear why it would have normative force for practical as opposed to theoretical rationality, where laws of logic typically fall. Another matter is that the view is not that plausible: the transitivity of goodness, whatever it is, is certainly different from the law of non-contradiction.

alternative is B, then agents cannot have a practical choice between A and C by definition, since the alternative to A in that situation is B. In E1, consider the preference between "home when offered a trip to Rome" ($H_{\&R}$) and "mountaineering" (M). The agent considers the outcome "home when offered next to a trip to Rome" ($H_{\&R}$), which consists of only two alternatives H and R. By Dreier's definition of actual choice, if home is offered next to a trip to Rome, then the second alternative cannot be "mountaineering," since the second alternative to "home" is already "Rome." Dreier's view is that this can only be a matter of hypothetical choice, since the agent ought to consider the situation in which he is offered H next to R, consider *such* outcome H, coupled with the alternative R, and compare it with M. In other words, the agent should consider the situation *as if* H is offered next to R, but evaluate it against M. This, according to Dreier's view, cannot be a matter of actual choice, because if the agent chooses H or M, the second outcome is M rather than R. Thus, this can only be a matter of hypothetical choice, and because of that, a matter of non-practical preferences. However, Dreier claims that even though this cannot be a matter of practical choice, it can be a matter of non-practical preferences, which he considers to be similar to an exercise in abstraction, in which agents can put themselves in a hypothetical situation and decide what they would prefer (Dreier 1996: 264-265).

Although non-practical preferences cannot offer direct practical guidance for decisions, they can offer a criterion to see whether preferences are genuinely transitive in cases like E1. Maurice's reindividuated preferences are $H_{\&nc}$>R>M>$H_{\&c}$. Dreier claims that if these preferences are transitive, Maurice must also have certain non-practical preferences. For example, since his preferences are $H_{\&nc}$>R and R>M, he must hold that $H_{\&nc}$>M. Since Maurice thinks that staying home is cowardly only when offered next to mountaineering, $H_{\&nc}$>M cannot be a practical preference. But, *per* Dreier, Maurice can imagine what he would like more if he could remove the aspect of cowardice when considering between home and mountaineering. If he prefers staying home, it would/will mean that his preferences are transitive; if he does not, then they are intransitive. Thus, transitivity puts constraints on agents' preferences even with reindividuation, and it is not an empty requirement; the only thing is that constraints are on practical and non-practical preferences.

Dreier's view has two main claims: (a) agents can reliably access their non-practical preferences; (b) constraints over both practical and non-practical preferences are plausible normative requirements. Dreier offers detailed reasoning in support of (a), dedicating much of his paper to explaining why these preferences make sense and how, in a sense, agents can somewhat reliably know their preferences in non-practical matters. We can certainly grant that these preferences are legit.[12] However, granting (a) does not mean that (b) is plausible. The idea of constraints over hypothetical preferences can function

12 Savage's theory ([1954] 1972: 25) has *constant* acts, defined in such a way that they lead to the same outcome regardless of the state of the world. Save for some artificial

as a foundation for a theory of personal consistency, but it is not clear how it would function for decision theory. Consider E2: Herb's preferences are generated by his feelings and reasoning about the returns of his stock investment, considered in specific match-ups of alternatives. One can quite reasonably add the appropriate non-practical preferences. Herb has the following preferences: F_R>R>V>F_V. Is it plausible to think that he also prefers F_R to V? He does not think that Fiat is a good option when offered next to Volkswagen, but F_R is Fiat offered next to Renault, so it seems plausible to say that he prefers it more than Volkswagen. The same is true for other non-practical preferences that Herb needs to have according to Dreier, e.g., preferring F_R to F_V.[13]Considering Dreier's rules, we need to accept E2 as an example of transitive preferences. The problem with this solution is not the conclusion itself. Rather, the issue is that Dreier's rules do not explain why these preferences should be considered rational. The rules certainly do not change how we perceive these preferences: adding some non-practical preferences does not make the practical preferences any less circular. Equally important, Dreier's rules can be applied to any pattern of circular practical preferences. As a result, the rules would make the theory too weak.[14]

Mamou's Solution by the Assumption of Maximal Relevance

Mamou (2020) recently argued that the problem of reindividuation is not a genuine problem for normative decision theory. Mamou's main point is that decision theory only works on *the assumption of maximal relevance* of the description of the outcomes, and that only on that assumption we can judge agents' preferences. According to Mamou, the assumption of maximal relevance means that the description of the outcomes comprises every single detail that is relevant to the agent (Mamou 2020: 287). Because every relevant detail is already included in the description of the outcomes, there is nothing to reindividuate, since the outcomes are already maximally finely individuated according to the agents' interests. Only when the outcomes are individuated

examples, constant acts are rarely something that can be a matter of practical choice. So, there is a precedent for non-practical preferences in Savage's theory.

13 We can also stipulate that Herb has the necessary non-practical preferences. The example is supposed to be somewhat plausible in regard to the feelings Herb can have, but for normative decision theory, it would be bad even if *implausible* irrational preferences must be judged as rational.

14 Dreier claims that the theory still has "practical significance, in the only relevant sense I can think of, when it provides a criterion for the rationality of preferences and actions. Whether an action is rational depends on the rationality of the preferences that motivate it. Whether those preferences are rational depends, most surely, on which other preferences the agent has." (Dreier 1996: 261) It is not entirely clear how the theory can have practical significance if it can accept E2 as an example of rational preferences, and claim that rationality consists of the requirements of consistency. As we mentioned earlier in the article, the main problem is not E2 as such, but that the theory cannot convincingly rule anything out as irrational then, i.e., that the theory will be vacuous.

in such a way, we can apply the theory. If agents' preferences are transitive according to the individuation under the assumption of maximal relevance, then they are rational; otherwise, they are irrational.[15] The additional detail of Mamou's view is that he considers the question of what is an acceptable description not as a question for decision theory, but for a separate theory, thus viewing decision theory as an incomplete theory. His reasoning is that if decision theory simultaneously provides the rules for the validity of individuation and the requirements of rationality, then we would not be able to say whether any violation of rationality is a violation of the requirements or a violation of proper individuation (Mamou 2020: 288-290).

In a narrow sense, this approach saves the theory from the problem of reindividuation. Agents cannot just rationalize irrational preferences by cleverly changing the description of the outcomes. Instead, they start from the maximally detailed individuation, and the preferences are then either transitive or intransitive. Moreover, it is possible that this view is what most decision theorists had in mind when introducing axiomatic theories, since the rules for proper individuation are rarely discussed, unless precisely in the sense that individuation must contain everything of interest to agents (Savage [1954] 1972: 8-10).

However, in a different sense, this approach does little to alleviate the problem of reindividuation, since if we decide what is good individuation solely on the assumption of maximal relevance, arguably every pattern of preferences can be described as transitive. In E2, Herb is aware of his pattern of feelings and reasons, and for him, it is very relevant if the stocks of Fiat are offered next to stocks of Volkswagen or Renault. In other words, he would describe the outcomes as four outcomes when assuming maximal relevance of description. So, the assumption of maximal relevance on its own is not sufficient to remove E2.

What could alleviate this issue are some rules that state what makes a description good. One can grant that these rules cannot be a part of decision theory, but of some separate theory. However, the issue here is that there are no *prima facie* reasons to think that any separate theory can give plausible rules *and* hold to the spirit of the assumption of maximal relevance *and* deal with E1 and E2 acceptably. While this does not imply that we should believe the opposite—that there is no such theory—there are some reasons to suggest that such a theory would be difficult to find. First, the assumption of maximal relevance grants significant importance to agents' interests when reindividuating outcomes. A theory that adheres to this assumption has no principled reason to deem examples like E2 irrational. In fact, since for any seemingly intransitive pattern of preferences, one can find some characteristics relevant to the agents, such a theory would struggle to rule anything as irrational. In short, upholding the assumption of maximal relevance would make decision theory quite weak. On the other hand, if we constrain this assumption in some way, Mamou's view would become entirely dependent on an additional theory, as

15 For simplicity, we assume that the agent does not violate some of the other requirements of rationality when judging her as rational.

the assumption of maximal relevance alone cannot address the problem of emptiness. In that sense, any additional theory would displace the assumption, rather than incorporating it into the solution.

Problems for Other Possible Solutions

In this section, we strengthen the argument against the strategies of reindividuation by showing that any solution will face problems similar to those of the views mentioned. We will first analyze and emphasize why we need reindividuation. In E1, the non-reindividuated outcomes have a characteristic or consideration of interest (i.e., cowardliness), which comes into play only in a specific matchup (i.e., comparing home to mountaineering). Maurice uses this characteristic to explain his preferences. As long as there are characteristics and considerations of interest only in specific matchups of preferences, there is a possibility of well-explained, seemingly rational, yet intransitive preferences. Reindividuation is an alternate description of outcomes. The problematic characteristics, previously serving as reasons for agents' rankings of outcomes, in the alternate description serve to individuate the outcomes, in such a way that there are no more characteristics that come into play only in specific matchups. For example, in reindividuated E1, cowardliness figures in every comparison of home with the other outcomes since it is explicitly written in the outcomes "$H_{\&c}$" and "$H_{\&nc}$". This structurally prohibits agents from valuing one outcome in its relation to another, i.e., it prohibits reasons to apply only in specific matchups.

Saying which characteristics of the outcomes can be used for this can be done either in an internal or an external way. Namely, agents' interests can ultimately decide which characteristics are relevant for individuation, i.e., we can have *internal constraints* of reindividuation (e.g., Mamou's view). Or, we can say that some characteristics of interest are not worthy as a basis of reduction, regardless of agents finding them relevant. In other words, we can have *external constraints* of reindividuation (e.g., Broome's view).

Internal Constraints Are Overly Permissive

Even if internal constraints avoid the problem of emptiness, they will be overly permissive. If any characteristic that agents find relevant can be a reason for reindividuation, then we can make a lot of preferences transitive by reindividuation. In E2, from Herb's point of view, the characteristic of the stocks of Fiat such as "being offered next to the stocks of Volkswagen" is clearly relevant, according to his evaluation. Internal constraints must allow such characteristics for reindividuation. More generally, in any instance of intransitive preferences, agents will value differently one outcome depending on what they compare it with since the preferences would not have been intransitive otherwise. From the agent's perspective, there will usually be some reasons for that valuation. If any characteristic that is cited in these reasons can be used for reindividuation, transitivity would constrain quite a few preference sets. E2 is

introduced as an artificially silly example, where every characteristic and consideration that the agent has is purely relational, i.e., of the form "X is offered next to Y". Can we alleviate the issue simply by prohibiting purely relational characteristics of outcomes? Not exactly, since one can only slightly change E2. Let us say that Herb finds some non-relational characteristics relevant, such that these characteristics figure in ranking only when compared with specific alternatives. For example, let us say that when the stocks are of Italian cars, Herb thinks that they will do worse than the stocks of German cars, because of Italian history of subordination to Germany in World War II. Thus, he prefers V to F_V, and the rest of his preferences stay the same. This means that F should be individuated as two different outcomes according to internal constraints. The example now does not rely on purely relational characteristics of outcomes, but it seems obviously too permissive as a reason for individuation.

The underlying problem that causes the excessive permissiveness is double evaluation. On the one hand, the agents must evaluate the outcomes, whatever they might be, simply because that is what typical decision theory demands. This evaluative step is necessarily internal, performed solely according to agents' interests. If the criteria for reindividuation are internal, then agents make a similar evaluation for *what counts* as an outcome, performed also according to their interests. Since these interests are the same in both evaluations – they look at what characteristics of the outcomes are relevant to them – there is little reason to think that this process will lead to irrational preferences. If an outcome A is at two places in the agent's ranking, the agent has some reason to evaluate the outcomes in such a way. That means the agent sees the outcome A as two outcomes $A_{\_ranked\_higher}$ and $A_{\_ranked\_lower}$ according to these reasons, which completes the evaluation of the outcomes as different.

External Constraints Require Additional Normative Theory

If we want to avoid this excessive permissiveness, we must say that at least some characteristics that agents find relevant cannot constitute grounds for reindividuation.[16] For example, Broome's criteria by justifiers fall into this type of solution, since he says that some characteristics (those that do not affect goodness) cannot be justifiers for reindividuation. I argue that Broome's solution is indicative of problems that any external constraints solution will have.

Let us assume that there are some external constraints that say that a characteristic of an outcome is not relevant for reindividuation, regardless of the agent seeing it as relevant. (The agent's interests and external constraints must diverge in at least some cases, like E2.) External constraints can easily remove a lot of reindividuations as unjustified. However, unlike the double evaluation of internal constraints, we now have two evaluations based on diverging interests. Since some of the characteristics that agents find relevant will be considered as

16 Of course, this does not mean that everything relevant for reindividuation will be external, i.e., that agents' interests will be entirely irrelevant.

irrelevant for reindividuation, we must say that agents cannot rationally evaluate outcomes as different based on these characteristics. This is a normative claim, since it amounts to saying that agents have a preference that they cannot rationally have. How do we explain the source of this normative claim? It is not a consequence of the requirements of consistency. We need a different theory that says that some of the outcomes that agents see and evaluate as different should be evaluated as the same. There are no principal reasons why such a theory should not be possible. But, adding a different theory has consequences for how we think of normative decision theory, since rationality then cannot be analyzed solely as a matter of the requirements of consistency.

The addition of separate norms for reindividuation can have, as a possible consequence, the domain-dependence of at least some normative claims. The main reason is that norms for proper reindividuation cannot simply be rules of consistency. They must specify when certain outcomes should be considered distinct and when they should be considered as one outcome. In other words, they must make substantive claims about agents' reasons for evaluating the outcomes—namely, that they are or are not sufficient for reindividuation. These reasons, in turn, are at least sometimes highly domain-dependent. Take cowardice in E1. If we consider it a good basis for reindividuation, it is because of various contextual facts, e.g., what is considered cowardly, cowardice as a culturally negative characteristic, etc. The norms of reindividuation must make substantive claims, such as that the choice is indeed cowardly and that cowardice is a sufficient reason for evaluation. These substantive claims are rarely universal, but instead rely on various contextual factors. In other words, what constitutes a good basis for reindividuation will depend on numerous contextual claims.

One could argue that requirements of rationality, such as transitivity, would still be universal. That is, in every context, it would be true that violating transitivity is irrational. But this universality of the requirement comes at the cost of the domain-dependence of the norms of individuation. In two different contexts, an agent can have the same set of preferences on the same prospects with the same reasoning, yet be rational in one context and irrational in the other. This means that rationality cannot be solely a matter of internal consistency but must also account for how preferences and reasons fit within the context in which the decision takes place.

Reindividuation Leads to the Lack of Plausibility of Transitivity

Cases like E1 show that transitivity of preferences is not an unconditional requirement of rationality. Rather, the requirement is transitivity of preferences according to a correct description of the decision problem. Why would we want to uphold transitivity according to a correct description as the requirement of rationality?

One might argue that agents who uphold the transitivity of preferences according to a proper description benefit in some way because of such an axiom.

However, it is not entirely plausible to claim this. If a proper description does not consist of the exact agents' interests, it implies that agents ought to evaluate as neutral some characteristics that they consider non-neutral. Therefore, the agents do not benefit from such an axiom by their internal measures. Can they be better off by some external measures? Unless we assume that the proper level of description is the macro-level of exchangeable commodities, money-pump arguments cannot help us here, for the reasons discussed in section 3.4. On the other hand, it is difficult to construct an empirical argument for this. The reason is that agents are more likely to satisfy their interests if they follow descriptions aligned with their interests. Furthermore, employing empirical evidence in this type of normative consideration is quite rare. In fact, empirical evidence (Arkes, Gigerenzer, & Hertwig 2016) often shows that there is no evidence of the costs of violating the axioms of rationality.

The other way is to say that transitivity is intuitively plausible or, following Broome, a truth of logic, and that one or both of these reasons constitute justification for it. I find it hard to accept that intuitive plausibility on its own constitutes sufficient justification for accepting something as the universal requirement of rationality. But even if somehow it is, with reindividuation, we lose at least some of the intuitive plausibility, since now the norm is not "preferences should be transitive" but the less intuitive "preferences should be transitive when we have the correct description of the outcomes". It is similar for the idea that transitivity is a truth of logic. It certainly does not seem that 'preferences should be transitive' is on the same level as the law of non-contradiction. The difference between the two claims is more significant when the norm is "preferences should be transitive when we have the correct description of the outcomes".

We can perhaps say that transitivity is too technically elegant, and simply too neat of a requirement, so we should hold on to it because of these theoretical virtues. We can grant that most of the positive theoretical virtues that someone can think of transitivity are correctly ascribed to it. However, that is not a sufficient argument that it should be a universal requirement of rationality. These characteristics can lead to a more elegant theory (e.g., EUT), but why would that mean anything for normative requirements? If a requirement does not make sense in some cases, the fact that it functions as the foundation of an elegant theory should not give it a special normative status.[17]

Justification via Money-Pump Arguments?

We have mentioned that the justification for the axioms often consists of claims about their intuitive plausibility. However, this is not the only way to justify the axioms. In the literature, there are a couple of other ways, for example, claims

17 Note that we do not claim that theoretical virtues and elegance of the theory cannot be important for any purpose. They can be quite important, for example, when using the theory for explanatory or even descriptive purposes.

about the analytic status of the axioms, akin to logical truths (e.g., Broome 1991). Especially in philosophical literature, a highly popular way to justify the axioms is the so-called money-pump argument (Davidson, McKinsey, & Suppes 1955; Gustafsson 2022). The idea, due to Davidson, McKinsey, and Suppes (1955), is quite simple. If we take exploitability to be a mark of irrationality, the argument shows that agents who violate the axioms of rationality, such as transitivity, are prone to be exploited, thus proving that they are irrational. Therefore, the axioms are necessary conditions for rationality. The argument shows exploitability by proving that preferences violating the axioms are susceptible to a scheme of exploitation. Let us say that an agent, like Herb, has intransitive preferences $X \succ Y \succ Z \succ X$ and is in possession of X. A clever schemer, Don, sees this pattern of preferences as an opportunity to earn some easy cash.[18] He offers to exchange Z for X plus a small amount of money. Since Herb prefers Z to X, he accepts. Now Don offers to exchange Y for Z plus a small amount of money.[19] Once again, Herb accepts, since he prefers Y to Z. Don strikes again, offering X for Y and a small amount of money. Herb accepts again, for the same reasons, completing the circular exchange. Herb is now back where he started, in possession of X, only poorer by three small amounts of money, and Don can continue his offers until Herb is out of money. Since Don does not apply any special knowledge that Herb lacks but only exploits Herb's specific pattern of preferences, we are left with the conclusion that this pattern of preferences is at fault. In other words, intransitive preferences are responsible for exploitability and are therefore irrational.

The question now is, why do we not employ money-pump arguments to justify the axioms rather than relying on intuitive plausibility? The reason is that money-pump arguments only work on a specific level of individuation, thus presuming that the problem of individuation is solved in such a way that the axioms now certainly lack plausibility, i.e., they are prone to many counterexamples (cf. Broome 1991, 1993; Filipović 2023). To see this, consider Maurice with reindividuated preferences. He would pay a small amount of money to exchange going mountaineering for going to Rome, since $M \succ R$, and then a small amount of money to give up the trip to Rome and stay home, since $H_{\&nc} \succ R$. When he has the option of staying home and is then offered mountaineering, his thinking about cowardice kicks in – his preference is $H_{\&c} \succ M$, and he would pay money to go mountaineering, thus completing the circular

18 Money does not play an essential role in the argument. The exploiter can be after anything that the agent finds valuable, but money is probably the most effective for illustration of the point of the argument.

19 An assumption here is that there exists a sufficiently small amount of money such that agents would prefer to pay it to move up in their preference ranking. This assumption is not innocuous, as it implies continuity of preferences (cf. Gustafsson 2022), which is not easily accepted unless we already desire preferences to form at least a partial weak order, i.e., for them to be transitive and complete. Since this is a minor point regarding the technical apparatus necessary for money-pump arguments, we will omit further inquiry into it.

exchange, which can then continue until he is money pumped (cf. Broome 1993: 57-59; cf. Filipović 2023).[20] The point is that the exploiters constructing money-pumps are not really interested in finer reindividuation since they operate on a coarse-grained level of description of exchangeable commodities. Transitivity on a finer levels does not protect us from this sort of exploitation, regardless of whether the description is deemed correct. This, of course, makes sense, since money-pump arguments are schemes that work by exchanging commodities, and if the outcomes are not exchangeable commodities — as they are not when finely-grained — then the arguments cannot work. So, we cannot justify the axioms by the money-pump arguments without presuming a solution to the individuation problem. However, we can ask why not just take the coarsely-grained outcomes? The fact is that the axioms, in that case, are prone to many, many counterexamples, as documented not only in Maurice's case, but throughout the literature (cf. Fishburn 1991; Veit 2024). Essentially, whenever we have match-up-based preferences, we can have perfectly reasonable preferences that are intransitive.

Why not take the side of money-pump arguments and ignore counterexamples? We have several reasons that indicate problems with using money-pump arguments in this context. Since our topic here is not primarily money-pump arguments but only their influence on the issue of individuation of outcomes, we will avoid an in-depth discussion of the general merits of such arguments (cf. Gustafsson 2022) and instead analyze a few reasons why the usage of money-pump arguments is problematic for our particular topic.[21]

First, the coarse-grained level is never meant to be sufficient for the outcomes, yet it is necessary for money-pump arguments. Savage (1954/1972), for example, mentions that descriptions of the outcomes (or "consequences" in his terms) are to contain everything of interest to the agent, suggesting a finely-grained level of description. The reason for this is that the axiom of independence cannot be convincing at all if we allow that outcomes are coarse-grained,

20 Broome dismisses the possibility of money-pump arguments for reindividuated preferences as unfair since it changes the options that Maurice is offered from H&nc to H&c. According to Broome: "It is as though you stole his shirt and then sold it back to him. Rationality cannot protect Maurice from that sort of sharp practice. So, the fact that he is susceptible to it is no evidence of irrationality. The money-pump argument fails, therefore." (Broome 1993: 58) As Filipović (2023: sect. 4) argues, Broome's answer fails if we want to have money-pump arguments as *justification* for the requirements, since the exploiter does not possess any unfair advantage, like additional knowledge, that he uses to trick Maurice. If the money-pump is to show any practical significance, it must be in preventing precisely this sort of exploitable trading for the agents who respect the axioms. Filipović (2023) makes a point similar to the point we introduce in the present section, but on a smaller scale. He seems to claim that money-pump arguments become useless as justification coupled with reindividuation in the style that Mamou proposes. On the other hand, we claim a stronger conclusion, namely that money-pump arguments cannot serve as justification coupled with *any finer* reindividuation.

21 This list of reasons is not meant to be a complete list of criticism of the argument, but only a list of criticism that is somewhat connected to our topic.

since agents' evaluation of the outcomes can now depend on the alternatives offered (cf. Broome, 1991, 1993). Second, since the coarse-grained level of description allows agents to evaluate outcomes depending on the alternatives offered, there is no convincing reason to think that transitivity ought to hold, as evaluation can now explicitly be match-up dependent. Third, the arguments are sometimes referred to as "logical bogeymen" (Lopes 1996: 187) and as highly implausible (Schick 1986; Levi 2002), often for good reasons. For example, Arkes, Gigerenzer, and Hertwig (2016) conducted a cross-study, analyzing over 100 studies of violations of the axioms of rationality, finding no evidence of these agents being money-pumped. While these findings do not disprove the arguments, they indicate that their practical significance is limited at best. And since these arguments should concern practical rationality, the question of their practical significance is not irrelevant. In our examples, the possibility of agents being money-pumped does not seem high, making it unclear why they would care about potential exploitation. Fourth, the money-pump arguments work by presupposing specific choice methods. Namely, only if we assume that agents ought to always optimize their preferences can they be money-pumped when violating the axioms. If the agents, for example, satisfice (Simon 1947; 1955; 1956) by determining levels of acceptability of alternatives, they can have intransitive preferences and avoid money-pumps. Take E2, for example. If Herb finds all the alternatives acceptable and follows a satisficing model that tells him to choose the first acceptable alternative, he will not be susceptible to a money-pump. Of course, if he wishes to optimize his preferences rather than satisfice, then he will be open to a money-pump argument. However, this only means that the arguments work by assuming a specific choice procedure. If one wishes to prove the rationality of that choice procedure, one needs to find another argument—bringing us back to the intuitive plausibility of the requirements of rationality.

To recap, we can try to avoid the issue of the plausibility of the axioms by applying the money-pump arguments. However, this maneuver assumes one specific level of description of the outcomes as appropriate: the coarse-grained level of exchangeable commodities. This level, in turn, leaves any normative theory that applies the axioms prone to numerous counterexamples, as evidenced by the long list of counterexamples in the literature. For that reason, and due to several of their own problems, the money-pump arguments cannot convincingly be applied to avoid the issue of reindividuation.

Coarse-Grained Individuation and Non-transitive Rational Preferences

A somewhat simple solution to the problem of reindividuation is to reject finer reindividuation. Namely, we should individuate the outcomes on a coarse-grained level. This leads us to identify the outcomes by the commodities that can be chosen, exchanged, and realized regardless of other alternatives. For example, in E1, Maurice can have preferences between staying home, going to Rome, or mountaineering, i.e., the options that can be presented independently

of each other. If Maurice chooses to stay home, he is staying home regardless of how that came to be, i.e., what he rejected in order to stay home. In this sense, they would be the same options, even if it was the only option he could choose. Maurice can feel differently about the outcomes and find different characteristics of them as relevant depending on the rejected alternatives. These characteristics that outcomes display, considerations, and feelings that agents have when comparing the outcomes are something that falls into agents' reasoning for evaluation.

The coarse-grained level of individuation has clear benefits for decision theory. It preserves the practical impact that constraints on agents' preferences can have, since it ties objects of preferences to objects of possible choices that are not specific to agents' evaluation of outcomes. This can be best seen in the fact that only on a coarse-grained level of individuation can respecting the requirements have practically optimal consequences, like not being susceptible to money-pumps. If we want the theory to be not solely a theory of consistency but practical decision-making, this is the best way of individuation.[22] A drawback of this proposal is that we have numerous examples of well-reasoned and non-transitive preferences. One can say that all of these examples show irrational preferences. If this were an isolated example, that would be an easy claim to accept. But, as mentioned, the example shows a structural problem for the requirement. The only road to avoiding these issues is to reject transitivity as the universal requirement of rationality. The majority of normative decision theories – e.g., EUT (Savage [1954] 1972; Fishburn 1981; Jeffrey 1965) and derivatives, generalizations, and modifications of EUT (Buchak 2013; 2022; cf. Fishburn 1991) – have transitivity as the requirement. So, we can reject them as complete and universally applicable analyses of rationality.

Decision Theory Without the Universal Requirements

Losing transitivity as a universal requirement might be too high a price to pay. However, while this is not by any means a standard route in decision theory, there are numerous established views that consider the requirements of rationality to be domain-dependent. Gigerenzer and his collaborators (Gigerenzer 2021) offer a normative theory of ecological rationality, in which norms for rational decision-making are explicitly tied to the environment in which the decision takes place. Simon (1947; 1955; 1956) famously claims that standard theories of decision-making, such as EUT, are limited to situations where conditions for optimization are met and that, in other situations, agents should satisfice, i.e., use a method in which they can have intransitive preferences. Veit

22 Notice that the proposed coarse-grained level of individuation does not prohibit historical details from being used in the individuation of outcomes. To use Dreier's (1996: 247) example: $100 stolen is different from $100 gifted. However, the historical difference of the outcome is relevant for individuation precisely at the coarse-grained level I propose – these are different commodities that an agent can choose, exchange with other agents, and end up with regardless of the alternatives offered.

(2024) offers a general pluralistic approach to normative rationality, in which there are multiple valid theories of rational decision-making, some without the requirement of transitivity. A reason-based view of normative rationality (e.g., Heinzelmann 2024) can allow for situations in which transitivity is not supported. Gilboa, Postlewaite, and Schmeidler's (2012) idea that rationality is tied to the ability to defend a decision-making process from criticism also leaves room to deny any specific requirement of rationality. This is not an attempt at an exhaustive list of options, but it does suggest that limiting the domain of some rationality requirements has precedent in the literature on normative rationality, even if it is not a standard approach.

Since our focus is not on claiming that any of these theories or views is correct but on showing that the problem of reindividuation can be solved by rejecting finer individuation and adopting one of these options, we will not analyze the pros and cons of these views in depth. (In other words, arguing for any specific view is a separate argument, quite deserving of its own dedicated article.) However, we will offer a brief overview of the first listed option, Gigerenzer's theory of ecological rationality. His theory claims that, depending on the environment in which the decision takes place, various rules can be considered rational. What makes a rule rational, briefly, is its superior performance over alternative rules in a given environment. The performance of a rule is graded based on criteria such as accuracy, frugality, and efficiency.[23] As an example of a rule favored in some environments, Gigerenzer offers the *take-the-best* heuristic.[24] The heuristic consists of three steps: a search step, a stopping step, and a decision step. The search step involves scanning through alternatives, the stop step indicates that agents should stop when they find an acceptable alternative, and the decision step suggests that agents ought to choose that acceptable alternative. Since this is a lexicographic choice model, it cannot be represented by a utility function and allows for intransitive preferences. As Gigerenzer shows, the model outperforms optimizing models in various environments (Gigerenzer, 2021).

We can apply this model to our situation. Maurice has intransitive preferences over various alternatives. Let us say they are all acceptable to him. He then stops at the first offered alternative and chooses it. There are no cycles in his decision-making, even though he has intransitive preferences; the choice procedure provides Maurice with a fast and efficient method for arriving at a decision. Our proposal here is thus modest. Namely, we propose that when agents have match-up-based preferences, ranking alternatives according to two or more distinct characteristics of interest, they can rationally have intransitive preferences and choose according to the take-the-best model, or another

23 One can, of course, ask why these criteria specifically and how do we agree on a correct meaning of these terms that can be quite ambivalent (cf. Rich 2016). These are important methodological issues that ecological rationality clearly faces, which is something that should be a matter of future work.

24 In turn, this heuristic has obvious similarities to Simon's satisficing models (Simon 1955; 1956).

choice model that scores best on performance-related criteria in such situations. The proposal is modest because it is only a brief draft, and it does not claim which choice model is the best or even that a single best model exists. Rather, it outlines a way to decide, based on performance-related criteria, how to handle situations where intransitive preferences can be rational. We emphasize that further work is needed to identify the specific characteristics of environments in which specific choice models are adequate. The views mentioned in this section, especially Gigerenzer's and Veit's, have already begun some of this work, but it is far from complete.

Concluding Remarks

In the previous section, we mentioned several alternatives to the standard normative decision theories. I intentionally omitted the simplest way to deal with the issues presented, namely: to generalize a well-accepted theory such as EUT in such a way that it does not have the requirement of transitivity among the axioms but some weaker axiom instead. Standard EUT would thus be a special case of a more general theory. I did not mention this alternative since, as mentioned in section 1, the problem of reindividuation is not specific to transitivity. For example, Broome (1991) mentions it in the context of the axiom of independence, and Dreier (1996) in the context of the axiom of continuity. In other words, the plausibility of the rest of the axioms is dependent on the solution to the problem of reindividuation. So, if we want to weaken the problematic axioms, we would/will need to weaken all of them – which would lead us to the general theory that does not say much substantively. The general point here is that transitivity is not the main culprit but the idea that rationality can be analyzed as a matter of a few axioms of consistency that are valid regardless of the domain. To borrow Fishburn's (1991) expression, that makes normative theory a creed, a matter of faith, dependent on various traditions and schools. The problem of reindividuation points to the need for rethinking the foundations and methodology of normative decision theories, rather than merely fixing the existing core.

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Nenad Filipović

Normativna teorija odlučivanja i reindividuacija ishoda

Apstrakt

Ovaj članak ispituje i kritikuje pokušaje očuvanja zahteva normativne teorije odlučivanja od kontraprimerâ putem reindividuacije ishoda. Reindividuacija se često koristi kao odgovor na kontraprimere koji izazivaju čak i najosnovnije zahteve racionalnosti, poput tranzitivnosti. Ovi kontraprimeri pokazuju da čak i osnovni zahtevi racionalnosti mogu izgledati prekršeni na naizgled racionalan način, što dovodi u pitanje njihovu verodostojnost. Reindividuacija nastoji da očuva ove zahteve preciznijim definisanjem objekata preferencije. Međutim, Džon Brum je ukazao da ova strategija može dovesti do problema u kojem zahtevi postaju besmisleni. Istražićemo kontraprimere tranzitivnosti i pokazati kako reindividuacija može voditi ovom problemu besmisla. Nakon toga, osvrnućemo se na značajne pokušaje rešavanja ovog problema, pokazujući da oni nisu uspešni i da svaki pravac koji preduzmemo ili čini zahteve previše permisivnim ili ih ostavlja neosnovanim. U završnom delu predlažemo manje konvencionalno rešenje: odbacivanje preciznije individuacije i prihvatanje da zahtevi racionalnosti nisu univerzalni. Konačno, ističemo nekoliko utvrđenih pristupa teoriji odlučivanja koji dopuštaju zahteve specifične za određene domene.

Ključne reči: normativna teorija odlučivanja, zahtevi racionalnosti, tranzitivnost, problem reindividuacije, Džon Brum.