

Reasoning to be rational – John Broome

In Reasoning, Rationality and Probability

edited by Maria Carla Galavotti, Roberto Scazzieri and Patrick Suppes

CSLI Publications, 2008, pp. 119-38

1. The problem of motivation

Suppose you believe you ought to do something. Very often, a belief of this sort will cause you to do what you believe you ought to do. But many philosophers find this puzzling. They wonder how a belief can ‘motivate’ an action, as they put it. This puzzle has driven a great deal of recent moral philosophy.

Noncognitivists deny that your state is a genuine belief. This offers one solution to the puzzle. When you apparently believe you ought to do something, noncognitivists think you are actually in some other sort of a state, which already incorporates a motivation in some way. Perhaps, say, it is really a sort of intention.¹ Other philosophers accept that a normative belief is a genuine belief, and then are then faced with the need to explain how a genuine belief can cause a person to act.

Whether or not this seems puzzling, it is not really very hard to explain. We can simply say that people are naturally disposed to do what they believe they ought to do. This is not a universal or infallible disposition, but most of us most of the time are inclined that way. Furthermore, this easy explanation is surely correct; we do indeed mostly have this disposition. We can add that we have been caused to have it by processes of natural selection. But this explanation still leaves a lot to be explained. Through what process does the disposition work, exactly? *How* does our belief cause us to act, when it does?

An answer might be that people who have the disposition just do what they believe they ought to do; it just happens through some unconscious causal process within them. But this answer is unsatisfying. Some people have the disposition, and others do not. We can classify them accordingly; let us call the first sort ‘sheep’ and the second sort ‘goats’. But unless we are inclined to Calvinism, we shall not be content with merely classifying. We should expect goats to be able to make themselves sheep: we should expect that people by their own efforts can actually bring themselves to intend to do what they believe they ought to do. And we should expect to be able to produce an account of how they can do so.

We can call in rationality to help. We can say that rationality requires you to do what you believe you ought to do, from which it follows that the goats are irrational. No doubt this is correct too, and it gives us a criticism to throw at the goats. But it does not help explain how the goats can turn themselves into sheep. We need an account of how people can bring themselves to satisfy requirements of rationality. Till we have that, we still lack an explanation of how they can bring themselves to do what they believe they ought to do. Our story remains unsatisfactory.

However, calling in rationality is a genuine step forward, because people have a means of bringing themselves to meet some of the requirements of rationality. Our means is reasoning. Reasoning is something we do. It is a mental activity of ours that can bring us to satisfy some of the requirements of rationality.

Suppose you believe it is raining and that if it is raining the snow will melt. Plausibly, rationality requires you to believe what is entailed by things that you believe – in this case that the snow will melt. But suppose you do not yet believe the snow will melt. (Suppose you have just woken up. You have noticed the rain, and you know that rain causes snow to melt, but you have not yet thought about the snow.) You can bring yourself to believe it by undertaking a process of reasoning. This process will start from your initial beliefs and it will

conclude with your believing the snow will melt. In doing this reasoning you are mentally active, and you bring yourself to satisfy a requirement of rationality.

Now suppose you believe you ought to stand for parliament. Plausibly, rationality requires you to intend to do what you believe you ought to do. You can bring yourself to satisfy this requirement, too, by a process of reasoning. So I claim, at least. I call this *kratic reasoning*. The process will start from your initial belief that you ought to stand for parliament, and conclude with your intending to stand for parliament. Intending to do something normally causes you to do it, so normally you will end up standing for parliament.

In your reasoning you are active; you bring yourself to satisfy the requirement of rationality. It is because you reason that you are disposed to do what you believe you ought to do. This is the answer to the question I asked. How does your disposition work? It works through this activity of yours. You are not merely passive.

I am talking about explicit, conscious reasoning. That is something we do. Very often, we come to satisfy various requirements of rationality through unconscious, automatic processes. We might well call those processes unconscious reasoning. But I am not counting them as reasoning in this paper. In this paper, I am concerned only with reasoning as activity, and that is conscious reasoning.

Reasoning offers the best answer to the question of how we can be motivated by our normative beliefs, because it is an answer that recognizes we are active. That explains my interest in kratic reasoning, and the motivation for this paper. I need to demonstrate that there is indeed such a thing as kratic reasoning. I cannot achieve that much in this paper. This paper is merely the beginning of a movement in that direction. It examines the nature of reasoning in general, and particularly of practical reasoning. It ends by saying a little about kratic reasoning in particular.

2. *Types of reasoning*

Reasoning is a process that starts from some mental states of yours, and brings you to a new mental state. These states are of the sort that are called *attitudes*, which means they have a *content*. The attitude is an attitude towards its content. A belief is an attitude; the content of a belief is the proposition that is believed. An intention is another type of attitude; its content is what is intended. Philosophers generally assume that the content of any attitude – not just a belief – is a proposition, and they give the name ‘propositional attitude’ to all attitudes. But I think we have to recognize that some attitudes have contents that are not propositions,² my term is simply ‘attitude’.

Reasoning sets out from some premise-attitudes and brings you to a conclusion-attitude. In the first example above, your two premise-attitudes are a belief that it is raining and a belief that if it is raining the snow will melt. Your conclusion attitude is a belief that the snow will melt. In the second example, your premise-attitude is a belief that you ought to stand for parliament, and your conclusion-attitude is an intention to enter parliament.

Traditionally, reasoning has been divided into two types: theoretical and practical. We can classify reasoning into types by the nature of its conclusion-attitude. Theoretical reasoning is reasoning that concludes in a belief; practical reasoning is reasoning that concludes in an intention. There may also be other types, such as reasoning that concludes in a desire, but this paper is concerned with theoretical and practical reasoning only.

3. *Requirements of rationality*

Reasoning is an activity by means of which we can bring ourselves to satisfy some of the requirements of rationality. In a sense, this is its purpose. I therefore need to start by

describing some requirements of rationality. Here are three examples:

Modus ponens. Rationality requires of N that, if N believes that p and N believes that if p then q , and if it matters to N whether q , then N believes that q .

End-means. Rationality requires of N that, if N intends that e , and if N believes that e will be so only if m is so, and if N believes that m will be so only if she intends that m , then N intends that m .

Krasia. Rationality requires of N that, if N believes that she ought that p , and if N believes that p will be so if and only if she intends that p , then N intends that p .

These are rather formally set out, using schematic letters. They are technically requirement-schemata. To generate a specific requirement, for ' N ' substitute a term that designates a person, and for the other letters substitute terms that designate propositions. The ungrammatical 'ought that' is employed as a technical device in the statement of *Krasia*; its meaning is clear.

The formulae say, roughly, that rationality requires you to believe what follows by modus ponens from things that you believe, that rationality requires you to intend what you believe is a necessary means to an end that you intend, and that rationality requires you to intend to do what you believe you ought to do. The more precise formulations include a number of qualifying clauses, without which the requirements would not be accurately stated. The qualifying clauses in *Modus ponens* and *Krasia* do not matter for my purposes in this paper, and I shall leave you to work out for yourself why they are needed. However, I do need to give some attention to the formal specification of *End-means*, because my rough description of this requirement could be misleading.

First, *End-means* contains the clause 'if N believes that m will be so only if she intends that m '. Suppose you intend to win a race, and suppose that you believe you will not win it unless you breathe. But suppose you believe you will breathe anyway, whether or not you intend to breathe. You believe that breathing is something you do automatically. Then, even though you intend to win the race and believe that breathing is a necessary means of doing so, you may be perfectly rational even if you do not intend to breathe. Hence the need for this qualifying clause.

Next look at the other conditional clause in *End-means*: 'if N believes that e will be so only if m is so'. My rough description of *End-means* suggests the clause is 'if N believes that m is a necessary means to e ', but actually it is not. That is why the rough description can be misleading. The actual, formal condition is different in two respects. First, N is not required to believe m is a means to e . It might be a consequence of e , for example. The presence of that second condition 'if N believes that m will be so only if she intends that m ' allows me to formulate *End-means* with this extra little bit of generality. However, as it happens, this bit of generality plays no part in this paper. The other difference is much more important.

The other difference is that the condition requires N to believe only that: If e then m . It does not require her to believe, more strongly, that: Necessarily, if e then m . In a sense, N has to believe that m is a necessary condition for e , but only in a weak sense of 'necessary condition'. It will emerge in section 9 that this extra generality very much increases the importance of *End-means*.

I cannot enter into the grounds of requirements of rationality in this paper, and I cannot try to justify the formulations I have given. I think they are all intuitively satisfactory. For example, *End-means* is a rendering of Kant's famous remark:

Who wills the end, wills (so far as reason has a decisive influence on his actions) also the means which are indispensably necessary and in his power.³

I shall accept these requirements simply on intuitive grounds. Nevertheless, in fairness I

ought to mention that each is controversial to some degree; I shall have to ignore the controversy.

4. *Theoretical reasoning: the second order model*

I shall start my investigation of reasoning with theoretical reasoning because it is easier to understand than other types. I shall use it to draw out some of the central characteristics of reasoning. Practical reasoning will come later.

Modus ponens is a requirement on your beliefs. You can be brought to satisfy it by theoretical reasoning. So I shall start with that requirement. How can you come to satisfy *Modus ponens* by reasoning? Two very different models of reasoning are available; I call them respectively the second-order model and the first-order model. I shall start with the second-order model, but only in order to reject it.

I call it the ‘second-order model’ because it assumes that second-order beliefs participate in your reasoning. I can explain it most easily using the example I have already introduced. You wake up hearing rain. Because of what you hear, you believe it is raining. You have a long-established belief that, if it is raining, the snow will melt. Moreover, it matters to you whether the snow will melt. However, because you are sleepy and have not yet thought about the snow, you do not yet believe the snow will melt. So you do not satisfy the requirement *Modus ponens* in this instance. You believe it is raining; you believe that, if it is raining, the snow will melt; but you do not believe the snow will melt. By reasoning, you can surely bring yourself to satisfy the requirement. How will your reasoning proceed?

According to the second-order model, it will set out from a belief in the requirement itself. The model assumes you believe the relevant instance of *Modus ponens*. That is, you believe rationality requires of you that: you believe the snow will melt if you believe it is raining and you believe that, if it is raining the snow will melt. According to the second-order model, starting from this belief in the requirement, you reason your way to satisfying the requirement.

This is an example of theoretical reasoning, but the second-order model can be applied to reasoning of any sort. In general, it supposes that your reasoning starts from your believing some requirement of rationality in some instance, and concludes with your satisfying that requirement in that instance. The requirements I am concerned with are requirements on your attitudes of the sort I described in section 3. So when you believe a requirement, your belief is about your attitudes – specifically about what rationality requires of them. I therefore call it a ‘second-order belief’. The model supposes that your reasoning sets out from a second-order belief of this sort.

I think the second-order model fails, and I shall next explain why. My explanation will be brief.⁴

The model requires you to progress from believing in a requirement of rationality to satisfying that requirement. How might that happen? I see two possible routes. One is that it might happen through some unconscious process. You might be so constituted that, when you believe rationality requires you to be in such-and-such a mental state, you tend to enter that state without thinking about it. I find it implausible that this sort of thing would happen reliably. But I am anyway not interested in this route because a process of this sort would not be reasoning, even if it did happen. At least, it would not be conscious reasoning, which is what concerns me in this paper.

The second possible route goes through an intention. When you believe you ought to be in such-and-such a state, this belief might first bring you to form the intention of being in that state. Then, second, the intention might cause you to be in it.

The first stage of this process is forming the intention. This is the sort of thing that can happen through conscious reasoning. At least I think so. I think that reasoning can bring you to satisfy the requirement *Krasia*. That is to say, when you believe you ought to do something, reasoning can bring you to intend to do it. I have already called this type of reasoning ‘kratic reasoning’. It is described in section 10. We might suppose that, when you believe rationality requires you to be in a particular mental state, kratic reasoning could bring you to intend to be in that state. At least for the sake of argument, I shall grant that this is possible.

But the second stage of the process can rarely succeed. Intending to be in a mental state is rarely successful; it rarely causes you to be in that state. I am speaking only of the sorts of mental states that rationality requires of you. These are complexes of attitudes, as my examples show. You can rarely alter your attitudes by intending to.

Sometimes you can. Sometimes you have a means available of coming to have a particular attitude. For example, going regularly to church may be a means of coming to believe there is a God. If so, an intention to believe there is a God might be effective. It might cause you to believe there is a God, through causing you to go regularly to church. But for most attitudes, no such means is available.

Without a means, you cannot alter your attitudes by intending to. You can do some things by intending to, without using a means. For example, you can raise your arm by intending to, without using a means. But we do not have that sort of control over our attitudes. I cannot support this claim here; I simply assert it.⁵ It means the second-order model of theoretical reasoning cannot work through this second route, because we do not have the sort of control over our attitudes that it would require.

We do not have that sort of control over any of our attitudes, not just our beliefs. The second-order model therefore fails, not just as a model of theoretical reasoning, but as a model of reasoning in general. It will not appear again in this paper.

5. *Theoretical reasoning: the first-order model*

The first-order model is very different. To describe it I shall continue to use the same example. Suppose you believe it is raining, and that if it is raining the snow will melt. But suppose you do not believe the snow will melt. Then you do not satisfy requirement (2). But you might bring yourself to satisfy it by reasoning. To do so, you would say to yourself that:

It is raining

If it is raining the snow will melt.

So, the snow will melt.

I have written down a sequence of sentences, which designate propositions. You do not necessarily say these sentences to yourself; you might reason in Italian, say. But you do say to yourself the propositions that these sentences designate. You say to yourself *that* it is raining, and *that* if it is raining the snow will melt, and then you say *that* the snow will melt. I shall mention the word ‘so’ later.

You initially believe the first two of these propositions; in saying them to yourself you are expressing your beliefs. You do not initially believe the third. But when you say it to yourself, you express a belief in it. By the time you come to say it, your reasoning has brought you to believe it. By this time, you satisfy *Modus ponens*. That is how your reasoning works.

The propositions you say to yourself constitute the contents of your beliefs. You can reason with beliefs only because they are attitudes, which are states that have contents. Their contents give you something to reason with.

Saying to yourself is an act. Sometimes no doubt, you say things to yourself out loud, but more often you do it silently. In that case, I could alternatively have said you call the proposition to mind; ‘saying to yourself’ is a more graphic way of describing what you do. One thing it does it bring the beliefs together, if you have not previously done that in your mind. In any case, whether you speak silently or out loud, you are acting. So you are literally active when you reason. This partially explains how reasoning is a way to be active in satisfying the requirements of rationality. It is an activity. It is an activity in a further way I shall describe later.

Your acts of saying to yourself are part of your reasoning, but not the whole of it. Your reasoning is the causal process whereby some of your beliefs cause you to acquire a new belief. It includes a sequence of acts, and it is itself a complex act. To be reasoning, the process must involve acts of saying to yourself. Some of your beliefs cause you to acquire a new belief, through some acts of this sort. The process ends when you acquire your new belief.

The acquisition of this belief is an act. Described one way, the acquisition is something you intend. When you embark on your reasoning, you intend to come to believe whatever is the conclusion that emerges from the reasoning: you intend that, if p is the proposition that emerges from the reasoning, you believe p . However, you do not intend to believe the specific proposition that emerges. In the example, you do not intend to believe the snow will melt. Coming to believe the snow will melt is an act like finding your glasses under the bed, after looking for them. You intend to find your glasses, and this makes it the case that your finding them under the bed is an act. But you do not intend to find them under the bed.

Since reasoning is a process whereby some of your beliefs give rise to a new belief, acts of saying to yourself can only form a part of it when they express beliefs. In the example, in saying to yourself that it is raining, you must express a belief of yours that it is raining. When you say to yourself that the snow will melt, you must express a belief of yours that the snow will melt, and so on. In the context of belief, saying to yourself is asserting to yourself. True, you could say to yourself the sequence of sentences

‘It is raining.

If it is raining the snow will melt.

So the snow will melt.’

even if you did not have the corresponding beliefs. But in doing that you would not be reasoning because you would not be going through a process whereby some of your beliefs give rise to a new belief.

In the course of your reasoning, you do not say to yourself any second-order propositions about your mental states; you say to yourself the propositions that constitute the contents of your mental states. In the example, you do not say to yourself that you believe it is raining, nor that you ought to believe the snow will melt, nor anything else about your beliefs. You reasoning is not *about* your beliefs. We may say you reason *with* your beliefs. It is *about* the contents of your beliefs.

(The word ‘belief’ is ambiguous. It sometimes refers to a mental attitude, and sometimes to a proposition that is a content of a mental attitude. I use it in the former sense only.)

The second-order model of reasoning fails because we do not have the sort of control over our beliefs that it demands. On the other hand, the process I am now describing directly modifies your beliefs, because it works on the contents of beliefs. When you conclude that the snow will melt, in doing that you are directly acquiring a new belief.

I have not yet said enough to characterize reasoning even for the paradigmatic example of theoretical reasoning. My description so far has only been this: you say to yourself some

propositions that you believe, and this causes you to acquire a new belief. But some processes that fit this description would not be reasoning. For example, suppose you believe it is raining and that if it is raining the snow will melt. Suppose you say to yourself that it is raining and that if it is raining the snow will melt, and suppose this causes you to believe you hear trumpets. That bizarre process is probably not reasoning.

What distinguishes true reasoning from bizarre processes like this? You might think it is the presence of a second-order belief. In my example of genuine reasoning, you moved from believing it is raining and believing that, if it is raining the snow will melt to believing the snow will melt. You might think this process is reasoning only if you have the second-order belief that: rationality requires you to believe the snow will melt if you believe it is raining and you believe that if it is raining the snow will melt. The presence of that belief is needed to make it reasoning.

Even if this was so, it would not restore the second-order model of reasoning. The reasoning is still conducted at the first order, even if you need a second-order belief in the background to make it reasoning. But actually I think it is not so. A sophisticated reasoner may have this second-order belief, but I do not see why you need so much sophistication in order to reason. I do not see why you need to have the concept of a rational requirement, or even the concept of a belief.

It is more plausible that a different sort of background belief is needed to separate your reasoning process from others such as the bizarre one. You might need to believe that, from the proposition that it is raining and the proposition that if it is raining the snow will melt, it follows that the snow will melt. That is to say, you might need in the background, not a second-order belief about what rationality requires of your beliefs, but a belief about the inferential relations that hold among the propositions that constitute the contents of your beliefs. I do not deny that a belief such as this may be a necessary conditions for you to reason. But even if it is necessary in the background, it is not itself a part of the reasoning; its content does not constitute an extra premise. That is the lesson taught us by Lewis Carroll in 'What the tortoise said to Achilles'. So the first-order model of reasoning is not affected, even if this belief is necessary in the background.

My own view is that reasoning processes are computational. This is what characterizes them as reasoning and distinguishes them from bizarre processes such as the one I described. If I am right, it adds to the ways in which reasoning is an activity, since computation is something you do. You operate on the contents of your attitudes computationally. The content of your first premise-belief – that it is raining – is the antecedent of the content of your second premise-belief – the conditional proposition that if it is raining the snow will melt. You apply the modus ponens rule, which tells you in these circumstances to form a proposition that is the consequent of the conditional: that the snow will melt. You end up believing this consequent. According to this model, that word 'so' indicates your working through the rule-governed process. Computation is too big and difficult a topic for me to broach in this paper. I shall simply allow myself the assumption that reasoning is an operation on the contents of your attitudes.

To summarize the description of reasoning that has emerged from this paradigmatic example: reasoning is a process whereby some of your attitudes give rise to another attitude; in reasoning you say to yourself the contents of these attitudes, and you reason about these contents, operating on them computationally. Reasoning is an operation on contents.

6. Theoretical reasoning in reverse

Theoretical reasoning often does not proceed in a neat linear fashion as it did in my example.

In the example, your reasoning sets out from some initial beliefs and concludes with a new belief. But actual theoretical reasoning will often lead you to drop one or more of your initial beliefs, rather than acquire a new one. Dropping a premise-belief will equally successfully bring you to satisfy the requirement of rationality *Modus ponens*. But how does reasoning of this sort work?

Suppose you embark on the process of reasoning I described, but do not conclude it. I shall change the example. You believe that whales are fish and that if whales are fish then whales have gills. You say to yourself that whales are fish and that if whales are fish then whales have gills, but you find you do not end up believing whales have gills. You have failed in what you intended, which was to come to believe a new proposition.

You remain in violation of the requirement *Modus ponens*. But you may yet be able to achieve rationality through reasoning. You may not be able to do so if it is some irrational obstruction that prevents you from believing the conclusion. But normally, when you cannot believe the conclusion of reasoning you embark on, it is because you believe the negation of the conclusion. In the example, you believe whales do not have gills. For example, you may have seen pictures of whales, and seen that they do not have gills.

This means you can continue with your reasoning in another direction. You can say to yourself that whales do not have gills. You might conclude your reasoning by saying to yourself that whales are not fish. You now have a new belief that whales are not fish. In the course of your reasoning, you say to yourself in sequence that

Whales are fish.

If whales are fish, then whales have gills.

Whales do not have gills.

So, whales are not fish.

Each time, you express a belief. This is peculiar at first sight. It is a single sequence of reasoning, but it contains two contradictory beliefs. How is this possible? Because the process of reasoning takes time. At the outset, you believe whales are fish, but by the end of your reasoning you no longer believe this and instead you believe its negation.

Rationality requires you not to believe both a proposition and its negation. This is a requirement I have not mentioned yet, because it is not one that we can come to satisfy by reasoning. We are caused to satisfy some requirements of rationality by unconscious processes, and this is one of them. Unconscious processes will normally not allow you to believe both a proposition and its negation. Given that, you will not be able to come to believe whales are not fish whilst still believing whales are fish. So for you to complete your reverse reasoning, two things must happen: you must come to believe whales are not fish, and you must stop believing whales are fish. Provided both do happen, you will end up satisfying *Modus ponens* and also its cousin – yet another requirement of rationality – *Modus tollens*.

Since reasoning is not necessarily linear, it might go in either of two directions. In the example, it could have gone forward and brought you to believe whales have gills, but actually it went backward and brought you to believe whales are not fish. This raises a new question. What controls the direction of your reasoning?

In the example, you start with competing beliefs: that whales are fish, that if whales are fish then whales have gills, and that whales do not have gills.. In a sense, the direction of your reasoning must be determined by the relative robustness of these beliefs. How convinced are you that whales are fish, or that they have no gills? Robustness in this context is a complex notion. Consequently, to give a proper account of the direction of reasoning would be a substantial undertaking, which I cannot embark on here.

7. Intentions and beliefs

So much for theoretical reasoning. I am about to turn to practical reasoning, but I need to mention a crucial preliminary first. Practical reasoning is reasoning that concludes in an intention. Before we can understand it, we need to notice something about the way we express intentions. In expressing an intention we also express a belief. When you say ‘I shall wake up at 5.00’, expressing an intention, you are saying that you will wake up at 5.00. If a prospective burglar overhears what you say, she may well conclude she had better finish burgling your house before 5.00. To her it does not matter whether you are expressing an intention or merely a belief that you will wake up at 5.00. Either way, what you say constitutes an assertion.

This is puzzling. How can the expression of an intention also express a belief? It means that, when you express an intention sincerely, you must have the corresponding belief. But does anything guarantee that is so?

Something does. There is a connection between the belief and the intention that makes this possible. It is sometimes thought that, if you intend to do something, you must believe you will do it. This is not exactly true, because you may have an intention without believing you have it. For example, suppose you have arranged to go to a meeting in Pisa on 21 May, but have temporarily forgotten your appointment. You still intend to be there, but you have forgotten you intend it. In that case, though you do intend it, you may not believe you will be in Pisa on 21 May. However, if you *believe* you intend to do something, in that case you must believe you will do it. This is the intimate connection between an intention and the corresponding belief, which allows both to be expressed by the same sentence. Although you can have an intention without believing you have it, you cannot *express* an intention without believing you have it. Consequently, when you express an intention, you must believe you will do what you intend.

I recognize this is a strong claim, and very controversial in the philosophy of action. The evidence I offer for it is that the expression of an intention is also an expression of a belief. Both take the form of saying an indicative sentence. So you cannot express an intention without expressing a belief that you will do what you intend, which you cannot do sincerely without having the belief. This should not be surprising. One purpose of forming an intention is to settle something about what is going to happen. You decide to be in Pisa on 21 May, and that settles it that you will be in Pisa on 21 May. In your subsequent thinking you can use the information that you will be in Pisa on 21 May. For example, it may become a premise in your theoretical reasoning. You may conclude that you will not be in Bologna that day. Since this is one of the purposes of an intention, it is unsurprising that expressing an intention is also expressing a belief.

8. Instrumental reasoning

Now at last I arrive at practical reasoning. I shall start with instrumental reasoning, and specifically with reasoning that can bring you to satisfy the requirement of rationality *End-means* stated in section 3. This is the requirement (roughly) that you intend what you believe is a necessary means to an end that you intend. I repeat the precise formula here:

End-means. Rationality requires of N that, if N intends that e , and if N believes that e will be so only if m is so, and if N believes that m will be so only if she intends that m , then N intends that m .

Suppose you intend to visit Stockholm, and believe you cannot do so except by buying a ticket. Suppose at present you do not intend to buy a ticket. Suppose, moreover, that you believe you will not buy a ticket unless you intend to do so. Then at present you do not

satisfy *End-means*; you do not intend what you believe is a necessary means to an end that you intend. But you can bring yourself to satisfy this requirement by a piece of practical reasoning. You can say to yourself:

‘I shall visit Stockholm.

I shall not visit Stockholm if I do not buy a ticket.

So I shall buy a ticket.’

When you say the first of these sentences, you express your initial intention to visit Stockholm. When you say the second, you express your initial belief that buying a ticket is necessary for doing so. When you say the third, you express an intention to buy a ticket. You did not have this intention initially, but you acquire it by means of your reasoning.

This is an intuitively satisfying example of practical reasoning. Let us see if we can give a satisfactory account of how it works. When you say to yourself ‘I shall visit Stockholm’, whatever else you do, you say to yourself that you will visit Stockholm. In your reasoning as a whole, you are asserting three propositions to yourself in sequence. You are saying that:

You will visit Stockholm.

You will not visit Stockholm if you do not buy a ticket.

And finally that

You will buy a ticket.

When you say you will visit Stockholm, whatever else you are doing, you are expressing a belief that you will visit Stockholm. You have this belief only because you intend to visit Stockholm. Consequently, what you say expresses your intention as well as your belief. You next say to yourself that you cannot visit Stockholm except by buying a ticket. This expresses a straightforward belief. You have now expressed two beliefs, and from their content it *follows* that you will buy a ticket. If you do not believe you will buy a ticket, you are in violation, not just of the practical requirement *End-means*, but also of the theoretical requirement *Modus ponens* or rather of its cousin *Modus tollens*.

Compare my paradigm example of theoretical reasoning. You start by saying to yourself that

It is raining

If it is raining, the snow will melt

You now operate on these propositions and end up believing that

The snow will melt

You could do exactly the same with the Stockholm case. After saying to yourself that you will visit Stockholm and that you will not visit Stockholm if you do not buy a ticket, you could operate on these propositions and end up believing that you will buy a ticket.

However, the process of coming to believe you will buy a ticket is not as simple as it is in the theoretical case. Remember you believe you will not buy a ticket unless you intend to do so. Consequently, you will not be able to acquire the belief that you will buy a ticket unless you also acquire the belief that you intend to buy a ticket. In normal circumstances, you can only come to believe you intend to buy a ticket by actually coming to intend to buy one. So, in order to acquire the belief that you will buy a ticket, which your theoretical reasoning leads you to, you need also to acquire the intention of buying a ticket.

To complete your reasoning two things must click into place: the intention and the belief. Provided the reasoning proceeds smoothly, they will do so. You may then say to yourself ‘I shall buy a ticket’, thereby expressing both a newly-acquired intention to buy a ticket and a newly-acquired belief that you will buy a ticket. Your reasoning is practical because it concludes in an intention, and it is theoretical because it concludes in a belief. It brings you to satisfy both the practical requirement *End-means* and the theoretical requirement *Modus*

tollens. It is a single piece of reasoning that has theoretical and practical aspects.

The practical and theoretical aspects cannot be separated. You might think that the theoretical reasoning leads the practical reasoning: that you first come to believe you will buy a ticket through some theoretical reasoning, and this belief then causes you to intend to buy a ticket. But that is not so. Merely believing you will do something will not cause you to intend to do it. The causal connection is the other way round: intending to buy a ticket causes you to believe you intend to buy a ticket, which causes you to believe you will buy a ticket. Given that you believe you will not buy a ticket unless you intend to, no purely theoretical reasoning can take you from your premise-beliefs – that you will visit Venice and you will not visit Venice if you do not buy a ticket – to a conclusion-belief that you will buy a ticket. You acquire that belief only by acquiring the intention of buying a ticket.

Like theoretical reasoning, this piece of practical reasoning may not proceed in a linear fashion. Your acquisition of a new belief might be blocked. You might find you cannot believe you will buy a ticket. Perhaps you believe you do not have enough money, so you cannot form the intention of buying one. If you do not form it, you remain in violation of requirements *Modus tollens* and *End-means*. But you have an alternative way to satisfy these requirements by reasoning: you can throw your reasoning into reverse. You may say to yourself that you will not buy a ticket. Then you might conclude your reasoning by believing you will not visit Stockholm. In this case, your reasoning goes:

You will visit Stockholm

You will not visit Stockholm if you do not buy a ticket

You will not buy a ticket

So you will not visit Stockholm

This reverse practical reasoning is not as straightforward as reverse theoretical reasoning. If you are to reach the end point of believing you will not visit Stockholm, you will have to drop your belief that you will visit Stockholm. This in turn requires you to drop your intention of visiting Stockholm. To be successful, your reverse reasoning must cause you to drop that intention. Once you have done that, you satisfy *Modus tollens* and *End-means*.

9. *Two objections and a generalization*

This account of instrumental reasoning to a means you believe is necessary is a development of an earlier account of mine.⁶ That earlier account attracted some accurate criticism from Jay Wallace, in his paper ‘Normativity, commitment, and instrumental reason’. My new amended account owes a lot to Wallace’s paper. I am not yet confident it is correct, but I think it survives a couple of objections, which I shall now describe.

The first is that it makes practical reasoning too close to theoretical reasoning. In my account, theoretical and practical reasoning are inextricably entangled. The practical reasoning that brings you to intend to buy a ticket is also theoretical reasoning that brings you to believe you will buy a ticket. In one way, this is a valuable feature of the account. It makes it a good antidote to scepticism about practical reasoning. Scepticism has been rife since David Hume announced that ‘reason is the discovery of truth and falsehood’.⁷ Practical reasoning is plainly not the discovery of truth and falsehood, so if Hume was right, there is no practical reasoning. But I think no one should doubt that you can reason from an intention to achieve an end to an intention to take a means. The Stockholm example is an intuitively attractive example of this sort of reasoning, even if my account of how it works is mistaken. Furthermore, if my account is not mistaken, it shows that this sort of reasoning is made correct by the same valid syllogism as makes the corresponding theoretical reasoning correct. This strengthens the example as an antidote to scepticism.

However, the close entanglement of theoretical and practical reasoning is a disadvantage in another way. Intuitively, there should be more independence between theoretical and practical reasoning. As Michael Bratman put it to me, this account of practical reasoning is ‘just too cognitive’. Bratman’s objection is included in his paper ‘Intention, belief, practical, theoretical’.

My present view is that practical and theoretical reasoning are indeed genuinely entangled to the extent described in my account. That is my response to this objection. The argument is set out in detail in my paper ‘The unity of reasoning?’ I shall not rehearse it here.

The second objection is that the account is too special to be interesting. It is an account of reasoning that can bring you to satisfy the requirement *End-means*. As I described it informally, *End-means* is the requirement to intend what you believe is a necessary means to an end that you intend. It is a requirement of instrumental rationality, and the reasoning that brings you to satisfy it is instrumental reasoning. It is reasoning from an end to a means. This already makes it a special, limited sort of reasoning. But, more than that, it is reasoning from an end to a means that you believe is necessary to that end. This makes it very special indeed. A worthwhile account of practical reasoning has to be wider than this. That is the objection.

It is founded on a misunderstanding. Informally, I described the requirement *End-means* as the requirement to intend what you believe is a necessary means to an end that you intend. But I explained in section 3 that this is not a very accurate statement of the formal requirement. The example shows why not. In the example, you believe buying a ticket is a necessary condition for your visiting Stockholm, but only in a weak sense of ‘necessary condition’. You believe you will not visit Stockholm if you do not buy a ticket. You do not believe that you *cannot* visit Stockholm if you do not buy a ticket. That strong belief is not required to make your reasoning work.

You will rarely believe a means to an end is necessary in the strong sense. For example, you probably do not believe that buying a ticket is a necessary means, in the strong sense, of visiting Stockholm. You probably believe you can get to Stockholm in other ways – perhaps by walking and swimming, or perhaps by stowing away on a ship. So if the reasoning I described required that sort of a belief, it would be so special as to be uninteresting. The objection would be a real one.

On the other hand, you will very commonly believe a means to an end is necessary in the weak sense. Unless you live in Sweden, you probably do believe that, actually, you will not visit Stockholm unless you buy a ticket. Because this type of belief is so common, my account of instrumental reasoning has a very wide field of application.

Indeed, I hope it may even be developed into the core of an account of instrumental reasoning in general. At present I can offer only a rough outline of how I hope the development may be achieved. Here it is.

Instrumental reasoning in general is reasoning that takes you from intending an end to intending some means of achieving it. Suppose you intend an end, and you believe there is a range of alternative means available. Suppose you intend to visit Stockholm, and you see various alternative ways of getting here. Here is how I suggest your reasoning proceeds. It goes through several stages.

At the first stage, you evaluate the alternative means. Your evaluation will be a piece of theoretical reasoning whose details do not concern me here. It may be long drawn-out and complex. I am only concerned with the conclusion-attitude that will eventually emerge from it. I suggest it will be a normative belief that has a conditional content. I suggest you conclude this theoretical stage of your reasoning by coming to believe that you ought, if you achieve the end, to take a particular means. For example, you come to believe you ought, if

you visit Stockholm, to buy a ticket. This stage of reasoning is theoretical because the conclusion-attitude is a belief; that is how theoretical reasoning is identified.

Suppose you have acquired a normative belief of this sort. According to the requirement of reasoning *Krasia*, rationality requires you, if you believe you ought to do something, to intend to do it. In this case, rationality requires to have a conditional intention corresponding to your conditional normative belief. I have already assumed there is a process of reasoning, which I called kratic reasoning, that can bring you to satisfy this requirement. I shall say more about it in section 10. If this is right, then the next step of your reasoning is to form a conditional intention, through kratic reasoning. In the example, through kratic reasoning, you come to intend, if you visit Stockholm, to buy a ticket. That intention is the conclusion-attitude of this second stage of your reasoning.

You acquire this intention by reasoning, which means you must believe you have it. As I explained in section 7, this means you must acquire at the same time the belief that you will carry it the intention out. You come to believe that, if you visit Stockholm, you will buy a ticket – in other words, that you will not visit Stockholm if you do not buy a ticket. You believe that your buying a ticket is a condition of your visiting Stockholm that is necessary in the weak sense. This is exactly the premise-belief of the instrumental reasoning that I described in section 8. Since you intend to visit Stockholm, you are now able to go through the reasoning I described there. You will emerge with the intention to buy a ticket.

My suggestion is that this multi-stage process is the activity of reasoning that can bring you to intend a means to and end that you intend, when there is a choice of means. You might take a short cut through it. You might cut out the theoretical reasoning that leads you to a conditional normative belief, and the kratic reasoning that takes you from there to a conditional intention. You might choose a means is some other, less reasoned, way. That is to say, you might arrive by some other route at the conditional intention to take a particular means if you achieve the end. Once you have that conditional intention, so long as you believe you have it, you can then do the last stage of the reasoning I described. Through the process instrumental reasoning set out in section 8, you can arrive at an unconditional intention to take the means.

If all this is correct, it means that the account I gave of instrumental reasoning represents the core of all instrumental reasoning. At first it may have seemed to have a very limited application. Instead it may be entirely general.

If all this is correct, it also means that kratic reasoning is at the heart of instrumental reasoning. In the course of instrumental reasoning, you may take a short cut that cuts out the stage of kratic reasoning. But full-blooded, complete instrumental reasoning requires it. This makes kratic reasoning even more important than it may have seemed at first. We very badly need an account of it.

10. *Kratic reasoning*

But I have to confess that I am not yet in a position to provide much of an account. I think the outline of it is plain. Kratic reasoning is reasoning by means of which you can bring yourself to satisfy the requirement *Krasia* set out in section 3. I repeat it here.

Krasia. Rationality requires of *N* that, if *N* believes that she ought that *p*, and if *N* believes that *p* will be so if and only if she intends that *p*, then *N* intends that *p*.

Roughly, *Krasia* requires you, if you believe you ought to do something, to intend to do it. Suppose you believe you ought to stand for parliament. You can say to yourself:

‘I ought to stand for parliament
So, I shall stand for parliament.’

Your first statement expresses your normative belief that you ought to stand for parliament. Your second statement expresses an intention to stand for parliament. You do not have this intention when you start your reasoning, but by the time you conclude your reasoning, you have it.

This process satisfies the description of reasoning that emerged in section 5. It is a process that takes place among your attitudes, which have contents. It is an activity of yours. It is computational: the content of your concluding attitude can be computed from the content of your initial belief. It is an operation on contents, then. So it satisfies the description. Moreover, it is intuitively plausible as a piece of reasoning.

So there is an outline of kratic reasoning. However, I would hope to be able to say more than this to justify the claim that it is genuine reasoning.⁸ Compare the account I gave of instrumental reasoning in section 8. I there explained in detail the process by which your conclusion-intention arose during the process of the reasoning. But in the case of kratic reasoning, I have so far left that mysterious. Explaining it is a task for the future.

Notes

1. For example, see Allan Gibbard, *Thinking How to Live*.
2. See my ‘The unity of reasoning?’ for an explanation of why.
3. Kant, *Groundwork*, pp. 80–1.
4. There is a fuller explanation in my ‘Reasoning with preferences?’.
5. It is supported by Pamela Hieronymi in ‘Controlling attitudes’. My own arguments are different from hers.
6. In ‘Practical reasoning’.
7. *Treatise of Human Nature*, book 3, part 1, section 1.
8. My ‘Normative practical reasoning’ is a step in that direction, but it mainly answers possible objections, rather than giving a proper positive account of kratic reasoning.

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