ORIGINAL ARTICLE

Ratiocination

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Abstract

In this paper, I analyse the nature of a particular form of theoretical reasoning—ratiocination. Ratiocination is purposeful, self-conscious, deliberatively controlled reasoning. I will argue that ratiocination concludes when the ratiocinator believes that she ought to believe p. In Section 1, I suggest that the way a reasoner's mind moves in ratiocination is different from the way her mind moves in non-ratiocinative reasoning. Such a difference should motivate an analysis that focuses just on ratiocination. In Section 2, I provide a general characterisation of ratiocination and distinguish it from non-ratiocinative reasoning. I draw a distinction between non-deliberative rational control and deliberative rational control. I then argue that the ratiocinator always exercises the latter. Since theoretical reasoning is a norm-governed activity and since ratiocination involves deliberatively controlled reasoning, the ratiocinator necessarily tries to control her mental movements in a way that is in line with the normative requirements of this activity. In Section 3, I argue that ratiocination ends when the ratiocinator believes that she ought to believe p. I further explain the nature of the 'ought' in the ratiocinator's belief that she ought to believe p. In Section 4, I address possible objections to the account on offer and explain why my account does not undermine our general understanding of the nature of theoretical reasoning. I explain that my claim is compatible with the claim that reasons to be rational are transparent to reasons to believe p. I also discuss why the ratiocinator's belief that she ought to believe p is not an intermediate stage in ratiocination. Finally, I argue that ratiocination, as described, is compatible with the claim that belief is truth-governed.

Keywords Reasoning · Rationality · Rational control · Theoretical reasoning

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1 Introduction

Ratiocination is an everyday phenomenon. It is not the privilege of a philosopher, a judge, or a scientist. Human agents who are capable of reasoning have likely engaged, at some point, in purposefully, self-consciously, deliberatively controlled reasoning to work out whether something is the case; for example, when one wants to work out whether a politician is lying, which laptop has better features, whether a certain vaccine is effective. We thus have at least a loose pre-theoretical grip on the notion. Some earmarks of ratiocination are, for example, when one says or thinks to herself, 'Who should I believe?' 'Let's reason this out…' Descartes's inner dialogue in the *First Meditation* is a good example of ratiocination. But it is not always the big questions that invite ratiocination. Sometimes people ratiocinate about mundane matters, say, when one is trying to work out where she left her wallet.

In this paper, I aim to clarify our understanding of ratiocination as the notion appears in everyday life. I am not simply stipulating the nature of ratiocination, and then claiming that, by definition, it has certain features. Rather my central claim is that, once we better understand ratiocination, we see that, given the nature of this mental activity, ratiocination has a particularly interesting feature with important implications: namely, ratiocination concludes when the reasoner believes that she ought to believe *p*. This goes against the standard assumption in the literature that the conclusion of theoretical reasoning is a proposition about the first-order subject matter of reasoning. If I can show that ratiocination is a type of reasoning that carries certain special characteristics, then even if not all instances of reasoning carry those special characteristics, we can at least say that sometimes theoretical reasoning has those special characteristics. This will shed light on the nature of theoretical reasoning. I will analyse the nature of ratiocination in Section 2 and explain why ratiocination as a type of theoretical reasoning necessarily involves purposeful, self-conscious and deliberative control. Before that, let me first motivate the question why we need a separate analysis of ratiocinative theoretical reasoning instead of settling with a general account of theoretical reasoning.

In existing discussions of reasoning, philosophers are generally sensitive to the differences between practical and theoretical reasoning.[1] However, within the domain of theoretical reasoning, philosophers have not generally been sensitive to the possible differences between ratiocination and non-ratiocinative reasoning. Even though the difference between ratiocination and non-ratiocinative reasoning is sometimes noted, the focus is on developing a general account of reasoning that can cover both.[2] Broome, for example, says that reasoning is not necessarily explicitly conducted in language. His account of reasoning can apply to both explicit and non-explicit cases of reasoning. Kolodny also makes it clear that his discussion of reasoning covers both cases where 'reasoning is explicit, or deliberate' and reasoning that is 'implicit and not voluntarily directed.'[3]

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[1] See the collection of papers in McHugh et al., 2018, for examples of recent attempts to explain certain similarities between theoretical reasoning and practical reasoning.

[2] See, for example, Broome, 2013, Kolodny, 2005, Scanlon, 2007, p. 91, Streumer, 2007, p. 2.

[3] Kolodny, 2005, p. 520.

Those who offer a single account of theoretical reasoning, covering both ratiocinative and non-ratiocinative, might think that whether or not one is ratiocinating, it still is the case that one is engaged in theoretical reasoning. To be satisfied with a uniform account, we would have to think that the presence of purposeful, self-conscious, deliberative control does not change the nature of theoretical reasoning. Whether it is ratiocinative reasoning or non-ratiocinative reasoning, we can just focus on the reasoning part. And from this, they might infer that ratiocinative reasoning and non-ratiocinative reasoning are both concerned with what to believe. But we should not think this.

For certain activities, the presence of purposeful, self-conscious, deliberative control does not change the nature of the activity itself. It might not be problematic to give the same treatment to both the activity when it is self-consciously, purposefully and deliberatively controlled and when the activity is non-self-consciously, non-purposefully and non-deliberatively controlled. Take, for example, swimming. If we try to explain the nature of swimming, whether or not one is self-consciously, purposefully and deliberatively controlling her movements, it does not change the nature of the activity that she is performing. In both cases, she is still swimming. There is of course a difference in the mental states of the swimmers, but that difference does not prevent us from giving a general, uniform account of swimming. Even if the additional presence of purposeful, self-conscious, deliberative control might affect how well the swimmer performs this activity, it does not change the fact that she is swimming. This line of thinking is analogous to why one might think we can have a uniform account that covers all types of theoretical reasoning.

However, there is something disanalogous between the swimming example and ratiocination. Theoretical reasoning is the kind of activity whose nature changes depending on whether or not it is purposefully, self-consciously and deliberatively controlled. Theoretical reasoning is a mental activity. Whether or not the reasoner is exercising self-conscious, purposeful and deliberative control makes a difference to the mental activity the reasoner is performing. For example, suppose one is trying to articulate her 'gut feelings' about p. Given the nature of gut feelings, the moment when one starts to self-consciously deliberate about p, she is no longer articulating her gut feelings about p. Similarly, there is a difference between the mental movements of the ratiocinative reasoner and the mental movements of the non-ratiocinative reasoner. The former is in a self-conscious mental state and is exercising deliberative control over the mental movements. This difference, which I will elaborate on below, motivates us to entertain the possibility that ratiocination and non-ratiocination conclude in different mental states.

It is important to clarify what I mean by 'conclusion' in order to avoid confusion in our thinking about the nature of reasoning. We need to draw a distinction between what a reasoner concludes and when the activity of reasoning concludes. The word 'conclusion' has at least two meanings. When philosophers say that the conclusion of theoretical reasoning is p, the intended meaning of the word 'conclusion' in such a context is the judgement that one makes after deliberation. Let's call this 'meaning 1'. When the word 'conclusion' expresses meaning 1, the word is tied to a proposition. For example, when we say, 'The conclusion of this study is that p'. When we

say that the conclusion of theoretical reasoning is *p,* the word 'conclusion' in such a context expresses meaning 1.

Another meaning of 'conclusion' is the end or termination of an activity, an event, a process, etc. Let's call this 'meaning 2'. When the word 'conclusion' expresses meaning 2, the word is tied to a process. For example, when we say, 'That was the conclusion of the ceremony', we are using meaning 2. When we say that the conclusion of theoretical reasoning is the belief that *p*, the word 'conclusion' in such a context expresses meaning 2. We are not saying that 'the belief that *p*' is a proposition that is being concluded. Rather, we are saying that the activity of the reasoning ends when one forms the belief that *p*.

In what follows, I will only use the word 'the conclusion' to express meaning 2. When I say 'the conclusion of ratiocination', I mean the end point of the activity of theoretical reasoning. I will argue that the conclusion of ratiocination is when the reasoner forms the belief that she ought to believe *p*. I will bracket the question concerning what the conclusion of non-ratiocinative reasoning is.

Since I use 'conclusion' to mean the end point of the activity of reasoning, when I say that the conclusion of ratiocination is one's belief that one ought to believe that *p*, we should be careful not to read this claim as saying that the conclusion (expressing meaning 1) of ratiocination is the proposition *I ought to believe p*. I am not claiming that the ratiocinator consciously concludes that 'I ought to believe *p*'. In everyday life, the thought that 'I ought to believe *p*' does not consciously enter into the mind of the ratiocinator at the end of ratiocination. But this does not mean that she cannot be in the state of believing that she ought to believe *p*. Let us consider the following inner dialogue of a ratiocinator:

> 'Where is my wallet? The last time I used it was at the restaurant when I paid the dinner bill. My wallet is at the restaurant.'

When writing the above example, I am forced to present an inner dialogue. Yet, even if there were such a dialogue, it may be a mistake to focus on it. We have to remind ourselves that the theorist's task is to describe the reasoner's mental activity. It is possible that a certain mental process and the subject's thoughts or sentences produced while she is undergoing that process come apart. We have to be open to the idea that theoretical considerations need not always defer to the subject's own thoughts or inner dialogue.[4] Suppose my friend asks me if the bank is closed and I answer, 'the bank is closed'. Even though I did not say 'I believe that the bank is closed', I am in the state of believing that the bank is closed. Normally, one's conscious thoughts or sentences are not meant to be descriptions of the mental state that one is in. I do not need to describe the mental state I am in and say 'I believe that the bank is closed' to be in the state of believing that the bank is closed. The theorist cannot just rely on the inner dialogue to pin down the conclusion of a piece of reasoning.

To better understand the end point of ratiocination, the theorist must also take into account the nature of her mental process. The prima facie difference between ratiocinative and non-ratiocinative reasoning motivates us to offer a separate

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[4] I am grateful to Mike Martin and Rory Madden for helping me formulate this point.

analysis of ratiocinative reasoning as a mental process. And at this point, we do not yet have a firm grip on the nature of ratiocination. This leaves open the possibility that the ratiocinator is in the state of believing that she ought to believe *p* when she thinks consciously or says '*p*'.

If we focus on the inner dialogue of a reasoner, it is tempting to take the last sentence of the inner dialogue as the end point of her reasoning and take her to be in the state of believing that her wallet is at the restaurant. Yet, we should resist the temptation of simply taking the thought in the reasoner's head to be the mental state the reasoner is in. If we are talking about the proposition with which the ratiocinator concludes at the end of ratiocination, it is the proposition 'My wallet is at the restaurant'. However, that she consciously thinks the proposition that 'My wallet is at the restaurant' does not mean that she is in the state of believing that proposition.

Consider an analogy: suppose there is only one way to cook a dish. Alex knows exactly how to make the dish. When he gets to the final step, he adds a teaspoon of sugar. He does not need to consult the recipe and he is doing exactly what he should be doing. When he gets to the last step, he thinks, 'Add a teaspoon of sugar'. Amy has not made the dish before and has to follow the recipe to the letter. When she gets to the final step, she looks at the recipe and also thinks, 'Add a teaspoon of sugar'. We may assume that both Alex and Amy are interested in cooking the same dish, both have the same inner dialogue such as 'Add a teaspoon of sugar', and both carry out exactly the same steps of cooking. But, crucially, their minds are directed differently. Amy is directing herself to follow the recipe while Alex is not, even though Alex is in fact doing exactly the same as what the recipe prescribes. Even though Amy's inner dialogue might be exactly the same as Alex, the mental activities they engaged in are different. Amy is following a recipe whereas Alex is not.

Since what a ratiocinator says is not particularly helpful in terms of identifying what mental state she is in, we have to consider more carefully both how a reasoner's mind moves when she ratiocinates by paying attention to the reasoner's own perspective and the nature of the activity. In the following section, I will analyse the nature of ratiocination.

2 Ratiocination

Ratiocination is self-conscious, purposeful and deliberatively controlled theoretical reasoning. In Section 2.1, I will elaborate on the nature of theoretical reasoning. In Section 2.2, I will explain why purposeful and self-conscious theoretical reasoning necessarily involves deliberative control.

2.1 Theoretical reasoning

Theoretical reasoning is concerned with what to believe. Philosophers sometimes use 'reasoning in a formal sense' to refer to the process of drawing out the

consequences of premises and 'reasoning in an informal sense' to refer to the process of revising one's beliefs.[5] Here, I use 'theoretical reasoning' to mean what Harman calls 'the reasoned change in view'. In Harman's words:[6]

> Reasoning in the sense of reasoned change in view should never be identified with proof or argument; inference is not implication. Logic is the theory of implication, not directly the theory of reasoning.[7]

Deduction and theoretical reasoning are different.[8] Deduction is the process in which one draws out the implication of premises.[9] An implication is a logically necessary consequence. Let us assume A entails B. Then, if A is true, there is no way for B to be false. Deduction is in the realm of logic. Logic itself does not have anything to do with belief. It is possible that one might believe A without believing B, but it does not change the logical relation between A and B. Imagine a student in her logic exam. She deduces B from A but she does not believe A nor B. Even if she believes A, she does not necessarily believe B. The student is only using A as a hypothesis to draw out the implication or use it to investigate the implicative relationship between propositions.

Theoretical reasoning is the process in which one draws out an inference on the basis of evidence. One reasons when one thinks that the evidence for p does not immediately settle the question whether p. The reasoner attends to what she takes to be evidence and draws an inference. An inference is not guaranteed to be true by the premises. Even if one is maximally responsive to reasons and thinks that all evidence favours p, it could still be the case that p is false. Even if we assume that the evidence for p is in fact conclusive, the evidence is not wearing p on its face for the reasoner. The reasoner has to take the evidence to be evidence for her in her reasoning and draw a conclusion about p on the basis of the evidence that she thinks she possesses. Hence, two reasoners' minds could move differently and change their minds differently even though they both are reasoning with the same set of evidence. The courtroom, for example, is a place where different reasoners take the same set of evidence in different directions. It is possible for one to have completed reasoning but drawn the wrong inference.

We should be careful not to confuse deduction with the application of rules of deductive logic in theoretical reasoning. In everyday life, we often apply rules of deductive logic in our theoretical reasoning. For example, we may imagine a subject ratiocinating: 'Is the grass wet? It is raining. If it is raining, the grass is wet. The grass is wet'. Philosophers sometimes call this deductive reasoning. This is a merely terminological difference. This still counts as theoretical reasoning in the way I use the term because the subject is trying to form a belief. The way the subject's mind moves when she applies the *modus ponens* rule mirrors an inferential relation, not an entailment relation. Suppose she checks the grass and realises that it is not wet,

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[5] MacFarlane, 2004, p. 4.

[6] Harman, 1986, p.1.

[7] See also Harman's distinction between induction and deduction (Harman, 1986, p. 10).

[8] Harman, 1986, pp. 3–6.

[9] Rumfitt, 2015, for example, uses 'deduction' to refer to the activity in which 'a thinker engages in the task of tracing out the implications of some premises' (p. 35).

she will change her belief to 'The grass is not wet'. This is unlike the student in her logic exam who might succeed in drawing all the implications but does not have any of her beliefs about the world changed. The validity of a deductive argument cannot be undercut by adding premises.

> If it is raining, the grass is wet.
> It is raining.
> The grass is wet.

If we add a premise 'The grass is not wet', the argument is still deductively valid. The conclusion 'the grass is wet' is still true. But a rational reasoner will recognise that it is absurd to believe both that the grass is not wet and that the grass is wet.[10] Hence, the validity of an argument does not necessarily map onto the way a reasoner's beliefs stand in relation to one another in theoretical reasoning.[11]

Although both deduction and reasoning can fail, the failure in each case is different. A logic machine can break down and fail to draw the implication *B* from *A*. When the logic machine breaks down, the process of deduction failed. Accordingly, when the logic machine gives the incorrect output, we do say that it is incorrect, but we do not make the additional, normative claim that it is incorrect in the sense that it made a wrong turn. When the logic machine gives the correct output, we say that the output is correct without making the additional, normative claim that it made the right turn. It is not possible for a logic machine to complete the deduction but draw a wrong implication. It is not possible for two functioning logic machines to both complete deducing from the same set of premises but draw different implications.

However, it is possible for a reasoner to complete the reasoning process but draws a false inference. One counts as having completed the reasoning process if one draws an inference in a way that is responsive to reasons. A reasoner will make a mistake that results from being confused by other possibilities. To the reasoner, there are different possible ways in which she could have moved her mind. When a reasoner makes a mistake, we make the additional normative claim that her mind made a wrong turn. When the reasoner reasons well, we make the additional, normative claim that her mind made the right turn.

One who engages in deduction is like being in a one-way tunnel, there is just one path. It is a matter of whether or not she can make it to the end. If she fails to make it to the end, it is not because she made a wrong turn, for there are no turns to be made. The process of moving to the end of the tunnel simply failed. One who engages in theoretical reasoning is like moving forward in an open field and she has to decide which path, among the many possible paths, to take. Even if we assume there is in fact one way to the destination, there are many paths the reasoner could have taken. Even for ideal reasoners, it is only if the ideal reasoner could have changed her mind differently that she counts as having engaged in theoretical reasoning. If there is a

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[10] This point is developed on the basis of Harman's discussion in Harman, 1986, p. 4.

[11] I am grateful to Mike Martin for alerting me to this distinction and the surrounding questions that bear on the nature of reasoning.

chip built into someone's brain such that she will always produce the most rational answer, but she cannot control how her mind moves, then she cannot be considered as having engaged in reasoning. We may say that the person's mental movements are governed by reasons, but she is not reasoning. What it means to reason is that the reasoner has to decide the direction the evidence points in the face of many different possible ways of taking the evidence. Hence, reasoning is an activity because an agent who engages in reasoning is necessarily in control of her mental movements such that she takes the evidence to a certain direction and makes her own mental transitions.

Suppose a reasoner's mind is equipped with a logic machine. The reasoner can use the logic machine and apply rules of logic to help her with reasoning. But the movement of her mind in theoretical reasoning is still one that is like moving forward in an open field. There are many possible paths that she could have taken. Even if logic is supposed to constrain the way a reasoner's mind moves, it still is the case that, in theoretical reasoning, a reasoner forms beliefs by navigating her mind through many possibilities.

Since there are different possible ways in which one could change one's mind in theoretical reasoning, there are some requirements the satisfaction of which counts one as having changed her mind in a way that is appropriately responsive to apparent reasons. Here, I refer to these requirements as 'requirements of reasoning'.[12] The requirements are, in Grice's words, 'directives (the precise kind of which remains to be determined), the observance, or non-violation, of which is a desideratum.'[13] A reasoner, qua reasoner, is subject to the requirements of reasoning. The requirements of reasoning have to be met in order for the activity to qualify as reasoning. If a reasoner, S, takes a random fact q (e.g. there are rocks on the moon) to infer p (e.g. the accused is guilty), one is not in fact engaged in theoretical reasoning. We can tell her that she is *not supposed* to take q as evidence for p. The 'not supposed' part captures the assumption that there are some requirements of theoretical reasoning that S has not met. Even if an observer may say that S has failed to meet the requirements of reasoning, it is possible that S takes herself to have met the requirements of reasoning. Here, let us bracket whether a reasoner is in fact reasoning well or correctly. It suffices to say at this point that reasoning is a norm-governed activity. Only certain ways of making transitions qualify as reasoning.

Because of the norm-governed nature of reasoning, for one to take herself to be reasoning, she has to take herself to be making transitions in a way that complies with what she takes to be the requirements of reasoning. For example, someone who is learning to play the piano might understand that piano-playing is a norm-governed activity, but she still cannot read the notes well. She plays the wrong note. The teacher will tell the learner that she is supposed to play D, not C. But from the

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[12] I use 'requirements of reasoning' instead of 'rational requirements' to avoid the impression that the ratiocinator must have rationality as her goal. See discussion in Section 3.

[13] Grice, 2005, p. 22.

learner's perspective, she thought that she is supposed to play C. In this case, the learner makes a mistake by getting the note wrong; nevertheless, from her perspective, she still understands that she is performing a norm-governed activity and she is trying to comply with the norms. This is different from someone who is not trying to play the piano but is only randomly hitting the keys on the keyboard.

Let us recap the key features of theoretical reasoning that are important to our understanding of ratiocination. First, the reasoner engages in theoretical reasoning to arrive at a view about the world. There are different ways in which a reasoner could change her mind. Second, since there are different ways in which a reasoner could change her mind, a reasoner has to be in control of her mental movements. Reasoning is not something that just happens to the reasoner. Third, reasoning is a norm-governed activity. There is a set of normative requirements that need to be met for an activity to qualify as reasoning. Bearing these features in mind, I now turn to consider what happens when one self-consciously and purposefully engages in theoretical reasoning to work out whether *p* is true.

2.2 Purposeful, self-conscious and deliberatively controlled theoretical reasoning

When the truth of *p* is unsettled for a subject and she wants to make up her mind about *p*, she could use various methods to find out whether *p* is true. Reasoning is a key method by which we form beliefs. Although reasoning is a useful method, we are not creatures who only rely on reasoning to find out whether *p*. We also have available to us other methods, such as perception, testimony, and memory, to find out whether *p*. These methods could sometimes short-circuit reasoning. But for many truths, reasoning can probably get us to these truths more reliably and more efficiently than some other methods. For example, for things that do not exist or events that did not happen, there is not much (if any) perceptual experience or testimonies to rely on. Yet, it is still possible for us to reasonably infer that certain things do not exist or certain events did not happen. Since reasoning is a useful method, but since we are not hardwired to reason all the time, we often have to self-consciously and purposefully rely on reasoning to find out whether *p* is true.[14] This paper is only concerned with cases where an average reasoner uses reasoning to find out whether *p* is true. By 'average reasoner', I mean a reasoner who is less than ideally rational but is not irrational and she knows that she is an average reasoner. Some average reasoners might be motivated to work out what they ought to believe concerning *p* simply because they want to preserve their rationality, but I will exclude these cases from my consideration of ratiocination. We will only focus on cases where the reasoner wants to find out whether *p* is true.

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[14] In this regard, there is a parallel between ratiocination and practical reasoning. Both ratiocination and practical reasoning are goal-oriented activities.

Reasoning self-consciously is more than just reasoning consciously. One might reason consciously that the ground is wet because it just rained without being conscious of the fact that she is reasoning.[15] One who is engaged in self-conscious reasoning, by contrast, is necessarily conscious of the fact that she is engaged in reasoning. Recall that reasoning is norm-governed activity. When an average reasoner is self-consciously reasoning, she necessarily monitors her reasoning process lest she makes a wrong transition. By 'monitoring', I mean the normative kind of monitoring, as in a judicial monitor. It is different from the descriptive kind of monitoring, as in a weather monitor. The normative kind of monitoring involves checking whether an activity is carried out in a way that satisfies certain requirements.

Recall that there are different possible ways a reasoner could make the transitions in the reasoning process, the self-conscious average reasoner also has to exercise control to make sure that she is making the transitions in a way that satisfies the norms of reasoning. What I mean by 'control' here is similar to what Burge says about 'rational control'.

> As a critical reasoner, one not only reasons. One recognizes reasons as reasons. One evaluates, checks, weighs, criticizes, supplements one's reasons and reasoning....A non-critical reasoner reasons blind, without appreciating rea-

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[15] What philosophers sometimes refer to as 'critical reasoning' or 'explicit reasoning' is similar to what I mean by ratiocination. The details of what each philosopher means matter and we need to look at each account closely to tell if they have ratiocination. In some discussions of theoretical reasoning, 'reasoning' seems to be used interchangeably with 'ratiocination'. For example, when Boghossian discusses reasoning, he says that what he means by reasoning is 'System 1.5 reasoning'. It is somewhere between what Kahneman calls 'System 1' reasoning, which is 'sub-personal, sub-conscious, involuntary and automatic,' and 'System 2' reasoning, which is 'personal-level, conscious, attention hogging and effortful' (2014, p. 2). This suggests that in Boghossian's view, even though reasoning is not necessarily effortful and slow, it has to be at the 'personal-level' which is what I mean by 'the conscious level'. Boghossian also explicitly says that '[reasoning] is something we do, not just something that is done by sub-personal bits of us' (2014, p. 2). And when Boghossian discusses the 'Taking Condition', which states that 'Inferring necessarily involves the thinker *taking* his premises to support his conclusion and drawing his conclusion *because* of that fact,' Boghossian seems to imply that the reasoner is not only conscious of what he is doing, he also has to guide himself in the activity of reasoning (Boghossian, 2014, p. 5). This suggests that what Boghossian means by 'reasoning' is similar to what I mean by 'ratiocination', although he might understand ratiocination as something more cognitively sophisticated than I do. If I am right in saying that there is a substantive difference between ratiocination and non-ratiocinative reasoning, then Boghossian's debate with many of his critics talk past each other because some are about ratiocination whereas some are about non-ratiocinative theoretical reasoning. In other discussions, 'reasoning' is used for both ratiocination and non-ratiocinative reasoning. For example, Grice says that a reasoner has to entertain 'in thought or in speech of a set of initial ideas (propositions)' (Grice, 2005, p. 5). This suggests that Grice thinks that reasoning is conducted self-consciously and is close to what I mean by ratiocination. But it is not entirely clear if Grice has ratiocination in mind because he later goes on to say that the steps made by a reasoner in reasoning are '*either* validly made or are thought to be validly made' (2005, p. 6). The claim that a reasoner could make a valid step without thinking that she makes a valid step suggests that perhaps Grice includes some forms of reasoning that would not qualify as what I mean by ratiocination. The details of what each philosopher means matters and we need to look at each account closely to tell if they mean ratiocination.

sons as reasons. Animals and small children reason in this way. But reasoning under rational control of the reasoner is critical reasoning.[16]

Building on Burge's thought, we can draw a distinction between non-deliberative rational control and deliberative rational control involved in reasoning. One's reasoning is under non-deliberative control if one's mind is responsive to reasons and that there is no monitoring and self-guiding involved. One's reasoning is under deliberative control if one is monitoring and controlling her mind to be responsive to reasons. Consider how a seasoned swimmer's bodily movements are in a sense controlled. Her arms and legs can move with precision even though she does not deliberatively control her movements. But for a beginner, she has to deliberate about how to control her body. Even though the beginner can control the movement of her arms and legs, she still has to think about how to control her arms and legs in the water.

What differentiates ratiocination from non-ratiocinative reasoning is that the ratiocinator not only controls her reasoning, she also has to deliberate about how to control her reasoning. When one is reasoning non-ratiocinatively, there is still non-deliberative rational control involved, but there is no deliberative rational control. The non-ratiocinative reasoner could recognise that reasoning is a norm-governed activity and control her reasoning. However, since deliberative control requires one to be in a self-conscious state to monitor one's reasoning, if one is not reasoning self-consciously, one is not in a position to exercise deliberative control over one's own reasoning.[17]

We do not have to suppose that a non-ratiocinative reasoner is zombie-like or machine-like. Suppose an ideal reasoner only sees the right way of making transitions. Recall that it is only if the ideal reasoner could have changed her mind differently that she counts as having engaged in theoretical reasoning. And because the ideal reasoner could have changed her mind differently, she has to move her mind in a way that is controlled, although she does not need to deliberatively control how her mind moves. For less than ideal reasoners, like many of us, we need to deliberatively control our reasoning to make sure that we make the transitions that satisfy the requirements of reasoning. Average reasoners, who recognise that reasoning is a norm-governed activity and are aware that they could fail to meet the requirements of reasoning, when they reason self-consciously, they have to monitor their reasoning process and deliberate about what transitions are to be made such that these transitions satisfy the requirements of reasoning.[18]

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[16] Burge, 1996, pp. 98–9.

[17] I thank an anonymous reviewer for pressing me to clarify this point.

[18] Note that it is not only because one is not ideally rational that one has to deliberatively control one's reasoning. It is also because the ratiocinator recognises that reasoning is a norm-governed activity that the ratiocinator necessarily exercises deliberative control. Suppose I am not a piano prodigy. This fact alone does not explain why I need to deliberate about how to control my fingers when I play the piano, if there are no rules that govern the activity of piano-playing. I can just hit the keys in any way I want. But if piano-playing is a norm-governed activity and I recognise that and I want to perform the activity, I need to deliberate about how to control my fingers to play the right notes.

3 I ought to believe *P*

In this section, I will first explain what it means for the ratiocinator to believe she has satisfied the requirements of reasoning and then explain why ratiocination concludes when the ratiocinator believes that she ought to believe *p*.

Since reasoning is a norm-governed activity, the reasoner who self-consciously and purposefully engages in reasoning to work out 'Is it the case that *p*?' also asks the question 'How should I change my mind?'. To say that the ratiocinator is deliberatively controlling herself in accordance with what she takes to be the requirements of reasoning is not to say that she is consciously rehearsing the requirements of reasoning to herself. It might not even be clear to the ratiocinator what the standards are. Let *R* be the requirements of reasoning in the generic sense and r_1, r_2, $r_3...r_n$ be the specific requirements of reasoning. There is a difference to one's mind between taking oneself to be following *R* and taking oneself to be following r_1, r_2, $r_3...r_n$. A case will help illustrate the point.

A professor asks her graduate student to be in charge of the in-class test in her course. The professor is quite lax, so she has not specified what the student is supposed to do. All the professor has said is that 'You need to help me with the in-class test'. The professor has not given much thought to what she wants the student helper to do. But the student helper is very diligent. On the day of the test, as soon as the professor signals that the test has begun, the student starts walking up and down the aisle checking IDs, counting the number of students present, announcing the time and the like. The lax professor had not thought of these measures previously. But when she sees what the graduate student is doing, she is also not opposed to any of the things he does. From the perspective of the helper, when he was announcing the time, for example, he was not rehearsing to himself any requirement that he has to announce the time, for there was no such pre-existing requirement. Still, he took what he did to be what is required of him. He does not reason from 'there is a requirement that requires of me that I announce the time' to announcing the time. Rather, he simply reasons from 'I am required to announce the time' to announcing the time. It is from his announcing the time that we, the observers, can say he takes announcing the time as part of what he is required to do.

Similarly, a ratiocinator does not have to consciously think about which requirements of reasoning she should apply when she reasons. For some ratiocinator, she might think that every move she makes in ratiocination complies with *R* without thinking that she is applying certain specific requirements. She does not have to reason from 'according to r_3, I should believe *p*', to thinking '*p*'. She simply reasons from 'I am required by R to believe *p*,' to thinking '*p*'. Some ratiocinators might rehearse requirements of reasoning to themselves and guide themselves with those requirements, some might not. Not everyone is trained to do reasoning, but this does not prevent them from ratiocinating. For even ratiocinators who are not consciously generating and guiding themselves with requirements still have to deliberatively control their minds to turn in a way that they see as complying with *R*. In short, a ratiocinator necessarily brings herself to follow what she takes to be *R*. It does not concern us whether a ratiocinator actually gets the requirements of reasoning right. One who

ratiocinates might in fact get certain requirements wrong or fail to comply with others, but from her first-person perspective, she takes *R* to be the standard and takes herself to be conforming to *R*. A ratiocinator might not be able to answer the question 'Which specific requirement governed your reasoning?' but will answer positively to the question 'Are you complying with the requirements of reasoning in believing *p*?'.

In this regard, there is a parallel between ratiocination and practical reasoning. When one is not sure which action she is morally required to take, one usually resorts to practical reasoning. To the practical reasoner's mind, there are courses of action available. Because the possibility of pursuing the wrong course of action is available, one has to work out which course of action she ought to take. This is similar to someone who might think that she is morally required to *φ* without thinking about what specific moral requirement requires her to *φ*. Suppose one deliberates about what to do and decides to donate to charity. She might not be able to spell out the moral requirement that moves her to donate, but this does not prevent her from thinking that what she is doing is what she is required by morality to do. Similarly, in ratiocination, the ratiocinator is in fact trying to work out which way her reasoning should proceed. Such deliberative rational control is only successful when she takes herself to have complied with *R*. Hence, even if the ratiocinator might just think to herself at the end of her ratiocination 'therefore, *p*', as describers of her mind, we say that the activity that she engages in ended with her believing that it is in compliance with the requirements of reasoning to believe *p*.

It is worth highlighting the distinction between a reasoner holding herself to follow *R* and a reasoner being subject to *R*. To help illustrate the difference, we may consider how this is different from the 'error constraint' proposed by Lavin. The error constraint states: 'a reasoner is subject to a principle only if the reasoner can go wrong in respect of it'.[19] I remain neutral about this constraint if Lavin is here talking about a reasoner being subject to a principle. A reasoner, such as an ideally rational reasoner who is reasoning non-ratiocinatively, can be under non-deliberative control and complying with *R* without having to hold herself to follow *R*. A ratiocinator necessarily holds herself to follow *R* in turning her mind, even in cases where she cannot in fact go wrong in respect of *R*. Consider the parallel in a practical case. By the error constraint, there cannot be a requirement that says one ought not to run faster than 80 km/h because no human being can go wrong in respect of it. Suppose an agent mistakenly takes there to be a requirement that demands she not run faster than 80 km/h. It is possible that when such an agent is running faster and faster, she would caution herself that she ought not to exceed 80 km/h. Similarly, in ratiocination, it is possible that what a ratiocinator takes to be *R* is something that she in fact cannot fail to meet; nonetheless, the ratiocinator can still be directing herself to make transitions that conform to what she takes to be *R*. And she will only conclude this activity when she thinks she has conformed to *R*.

Here, we need not go into the details concerning what a ratiocinator takes the requirements of reasoning to be and why a ratiocinator thinks that the mental movements she decides to make are required. She might be consciously following what she takes to be the requirements of reasoning or simply an intuition that responding

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[19] Lavin, 2004, p. 425.

to evidence in a certain way meets the requirements of reasoning.[20] Minimally, we can say that there are some requirements that the ratiocinator takes to be requirements, and it is only when the requirements are satisfied that she qualifies as having changed her mind in a way that is appropriately responsive to reasons. My point here is simply that the ratiocinator deliberatively controls her mind to make transitions that she *takes* to be in compliance with the requirements of reasoning. It does not necessarily mean that she is in fact in compliance with the requirements of reasoning. This mental activity concludes when the ratiocinator believes that it is in compliance with the requirements of reasoning to believe that *p*. Let us now turn to consider why the ratiocinator's believing that it is in compliance with the requirements of reasoning to believe that *p* amounts to her believing that she *ought* to believe *p*.

Suppose the ratiocinator thinks that given *q* and *r*, it is not irrational for her to believe *p* or that she has the option to believe *p*, the activity of ratiocination will not end because she still has not worked out whether it is the case that *p*. Recall that the ratiocinator under consideration does not initiate the process of ratiocination to work out what belief will be consistent with her existing beliefs or what belief she should acquire in order to maintain her rationality. A ratiocinator ratiocinates because she wants to find out whether *p* is true. Ratiocination also does not terminate when the ratiocinator believes that she is rationally permitted to believe *p* because she has not achieved her goal of finding out whether *p* is the case through reasoning.

The ratiocinator also does not conclude ratiocination with the belief that she has a reason to believe that *p*. If she only works out that she has a reason to believe that *p*, it still leaves open the possibility that the ratiocinator has some other reason not to believe *p* or believe not-*p*. She is still in the process of weighing evidence. Consider the following example, *S* has evidence E_1 that gives her a reason to believe *p*. *S* also has evidence E_2 that gives her a reason to believe not-*p*. Suppose E_1 and E_2 are the only pieces of evidence she has, and she assigns equal weight to each. In a situation like this, *S* is not able to conclude whether *p* is true. This is not to say that *S* cannot form a belief about *p* in some other way. My point is that she is not able to form a belief about *p* by way of ratiocination in this situation.

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[20] It is important to separate the question of whether logic is normative for reasoning from how a ratiocinator's mind moves when she ratiocinates. We are not trying to figure out how her theoretical reasoning to a belief ought to be constrained. The standard of reasoning *R*, whatever it is, governs a ratiocinator's reasoning. The ratiocinator holds herself to comply with *R*. *R* does not additionally hold the reasoner to hold herself to follow *R*. The point I am making here is different from Steinberger's point about whether logic provides first-personal directives. Steinberger, 2019, argues that there are three distinct ways in which logic is normative for reasoning: in its role as first-personal directives to the reasoner, as third-personal evaluative standards or as third-personal appraisals on which praise and blame are attributed. Steinberger might agree that MacFarlene's bridge principles cannot provide first-personal directives to a reasoner (MacFarlene 2004). However, our target of analysis is different. My focus is not on what normative requirements look like, whether they are first-person directives or not. My focus is on what a ratiocinator's response looks like, one that is made under the condition that she is directing herself to comply with normative requirements. Even if logic is normative for reasoning and provides first-person directives to the reasoner, such that if she believes *q* and *r*, it directs her to believe *p*, it does not by itself direct the ratiocinator during ratiocination. When one ratiocinates, one's mind does not mechanically follow the directives. It does not work like a function such that if it processes *q* and *r*, it generates the output *p*. In order for the norms to guide the ratiocinator during ratiocination, the ratiocinator has to hold herself to comply with what normativity requires.

When a ratiocinator gets to a point where she believes that it is no option of changing her mind left, the ratiocination process concludes. This happens when the ratiocinator believes that she ought to believe that *p*. To the ratiocinator's mind, there is a definite proposition she ought to believe. The belief that she ought to believe *p* does not leave a range of possibilities among which she will still have to figure out whether *p* is true. Hence, for the ratiocinator to take herself to have satisfied *R* is for her to take herself to believe that she ought to believe *p*.

We may also say that ratiocination ends when one believes that 'I ought to believe not-*p*' because, to one's mind, one has reached one's goal of finding out whether *p*. However, ratiocination does not end with one's belief that she ought not disbelieve *p*. It is like if one wants to find out what number is on the ball in a box, which can be any number, if she finds out that it is not 5, it does not mean that she has worked out what the number on the ball is. Assuming that it is possible to suspend belief, she might decide to suspend belief about what number is on the ball. Since she has not yet worked out what number is on the ball, which is the goal of her initiating this piece of reasoning, her reasoning is not concluded. Her ratiocination process is suspended. If she wants to continue ratiocination, she still has to work out what it is that she ought to believe.

The claim that ratiocination ends with the ratiocinator believing that she ought to believe that *p* is controversial. It goes against a long-standing assumption that since a reasoner tries to determine what to believe in theoretical reasoning, theoretical reasoning concludes when one forms a belief. I anticipate that much of the resistance to my account comes from the following line of thought suggested by Adler:

> Theoretical reasoning is directed to the content or proposition believed, and only directed secondarily or derivatively, to the agent or to his attitude. This structure is obscured if the conclusions of theoretical reasoning are taken to be of the form "I ought to believe p". But this is an error. Theoretical reasoning aims to answer whether p is the case, not whether I ought (ethically?, prudentially?) to believe it [...] Since a conclusion of theoretical reasoning is someone's conclusion, then, by this natural assumption, it becomes that person's belief. But no directive to belief derives from theoretical reasoning itself [...] One cannot openly judge the conclusion of one's theoretical reasoning to be p, and fail to accept – fully believe – that p. For belief is nothing but an attitude that the content of the belief is true.[21]

It should be clarified that my account is compatible with the view that a reasoner tries to determine what to believe in theoretical reasoning. We may begin with a clarification of the 'ought to believe that *p*' part. There are two important aspects to ratiocination: the ratiocinator wants to find out whether *p* is the case, and the ratiocinator wants to find out whether *p* by consciously adopting the method of reasoning. We have to take into account both aspects when we consider ratiocination. If we only focus on the aspect of ratiocination that parallels non-ratiocinative theoretical reasoning, namely, that it focuses on the question

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[21] Adler, 2002, p. 4.

whether *p*, we will miss the practical aspect of this activity, that the ratiocinator is deliberatively trying to reach her goal by bringing herself to follow the requirements of reasoning. That said, if we only focus on the aspect of ratiocination that parallels practical reasoning, we will miss the theoretical aspect of this activity. It is after all the truth of *p* that the ratiocinator is interested in, not the consistency of her own beliefs.

In order to properly understand ratiocination, we should avoid falling into the false dilemma of thinking the activity is either concerned with 'Is it the case that *p*?' and 'What ought I to do?' These are not the only two questions that can be asked. If we have to identify the form of the question that the ratiocinator is asking, it is something like: 'What ought the object on which an act is to be performed be?' The 'ought' here does not concern one's own rationality, as in 'How ought I, someone who possesses this given set of beliefs and evidence, control my mental movements so that I form a belief that is consistent with my existing beliefs and preserve my rationality?' The 'ought' here concerns the way the world is, as in 'How ought my mind move so that it can get to the truth about *p*?' The truth of *p* is what the ratiocinator is interested in finding out. The truth about *p* dictates how a reasoner's mind should move if it is the truth of *p* that she wants to get to. Because of this difference in the goal, the emphasis of the 'ought' in ratiocinator's conclusion that she ought to believe *p* is on *p*, not on believing. The conclusion gives content to what the ratiocinator ought to believe. It is not saying that she ought to act in a certain way, namely, to believe *p*. The focus is not on 'I' in the sense that, to maintain my subjective rationality, *I* ought to believe that *p*. To help illustrate the difference, consider:

(1) 'What ought I to do?' 'I ought to eat something'.
(2) 'What ought I to eat?' 'I ought to eat a sandwich'.

The focus of the 'ought' in (1) is about doing something, namely, eating. The focus of the 'ought' in (2) is about the object, namely, the sandwich, (1) prescribes an action but (2) does not, (2) tells me what to eat on the condition that I eat something. In (1) if I do not eat, I violate the 'ought' but, on one reading of (2), if I do not eat at all, I do not violate the 'ought'. We can take the emphasis of the answer to (1) 'What ought I to do' to be the act; whereas the emphasis of the answer to (2) to be the object. I only violate the 'ought' in (2) if I eat something but that thing is not a sandwich. Once we come to see the difference, then we can see the difference between:

(1*) 'What ought I to do?' I ought to eat a sandwich.
(2) 'What ought I to eat?' I ought to eat a sandwich.

It is easy to confuse (1*) and (2) because they can yield the same answers. Judging by the answers alone, we might think that the answer to (1*) indicates that the question is (2). But we should be reminded that (1) and (2) ask different questions. (1) and (1*) ask the same question; (1*) and (2) ask different questions. But the answers to (1*) and (2) could be written in the same way or appear as the

same sentences in a subject's thought. Therefore, the sentences are not informative. We have to also pay attention to what kind of inquiry of which 'I ought to…' is an output. 'I ought to each a sandwich' in (1*) is the output of an inquiry about what action to be taken, whereas 'I ought to eat a sandwich' in (2) is an output of an inquiry that concerns what object on which an act is to be performed, if an act is to be performed at all. If one has sorted out (1*), one has also sorted out (2) but not vice versa. Similarly, there is a difference between the following:

(3)   'What ought I to do?' I ought to believe p.
(4)   'What ought I to believe?' I ought to believe p.

The emphasis of the 'ought' in (3) is on believing whereas the emphasis of (4) is on p. I violate the 'ought' in (3) if I do not go on to believe p. But my conclusion in ratiocination takes the form of (4), for in ratiocination my focus is the object of belief. I try to work out in ratiocination what it is that I should believe. I do not violate the 'ought' in (4) if I do not go on to believe p. I only violate the 'ought' in (4) if I form the belief not-p or a belief that is inconsistent with p. It tells me what to believe but it does not tell me to believe. It is possible that rationality requires me to form true beliefs if I were to form beliefs yet permit me not to form a belief in some cases. If I am going to form a belief about p at all, then p should be the content of my belief. But it might not violate rationality if I am not motivated to form a belief about p.

Those who find my claim counter-intuitive are likely caught between thinking whether the 'ought' in believing I ought to believe p at the end of ratiocination is an epistemic ought or a non-epistemic ought. But this distinction is not very helpful in this context because we need to remind ourselves that while one's believing p is governed by truth, an agent has to carry out the activity that gets her to the truth. Theoretical reasoning has both practical and theoretical aspects. And ratiocination, being a species of theoretical reasoning, also has a self-governing aspect—the agent governs herself to meet the requirements of reasoning. It is thus difficult to cleanly classify the relevant ought as either epistemic or non-epistemic. What I hope this study can do is to alert us to the possibility that there is a sense of 'ought' that does not fall squarely into either, and for this reason, we should not restrict ourselves to think that either the 'What ought I to believe?' question is to be answered the same way as 'What ought I to do?' question or it is not.[22]

In summary, the ratiocinator believes that she ought to believe p. The ratiocinator does not necessarily have an inner dialogue running that says, 'I ought to believe p.' She could simply be thinking 'p.' But given the nature of ratiocination, we have to recognise that when she thinks 'p', she in fact is in a state of believing that she ought to believe p. If we accept that ratiocination is a species of theoretical reasoning and if we accept that ratiocination concludes when one believes that one ought to believe p, then we should at least reject the standard assumption that the conclusion of all cases of theoretical reasoning is one's believing that p.

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[22] See Rinard, 2019, for a recent example that assumes that the ought in 'What ought I to believe?' question is to be understood either as theoretical or practical.

Note that I am only arguing that the activity of ratiocination concludes when one believes that she ought to believe *p*. I remain open to the idea that for most ratiocinators, her ratiocination will go on to fix her belief that *p*. This process can proceed very quickly such that it may not be detectable from the first-person perspective. It is like when one watches a stop-motion film, it seems to the viewers that it is a seamless flow of movements when in fact there are different frames. Even though it is not detectable or is difficult to detect from the first-person perspective, theoretically, we should be clear that believing that one ought to believe *p* and believing *p* are two different states. Ratiocination ends in the former.

4 Possible objections

In the following, I will address some possible objections to my account and try to clarify some potential confusions.

4.1 Ratiocination and rationality

One of my main claims is that a ratiocinator directs her reasoning in a way that she sees as satisfying the requirements of reasoning. We should not take this to mean that one who ratiocinates always must have the goal to be rational or the goal to comply with the specific standards of reasoning. It is true that some ratiocinators might deliberate by thinking explicitly, 'What would a rational person believe?' 'What am I rationally required to believe?'. However, ratiocinators need not consciously have the goal of being rational. Some ratiocinators can simply deliberate with respect to the question 'Is it the case that *p*?'.

Not every ratiocinator wants to be what Kolodny calls 'subjectively rational' or what Scanlon calls 'structurally rational'.[23] Subjective rationality holds when certain relations between one's own attitudes hold. Suppose one believes that *p* and believes that if *p*, then *q*, then it will be subjectively rational for one to believe that *q*. But if we consider the everyday psychological phenomenon of ratiocination, one does not normally ratiocinate in order to form a belief that is consistent with pre-existing beliefs. Often, it is precisely because one worries that she might not arrive at a true belief that she wants to be extra cautious in her reasoning. Imagine someone has the pre-existing beliefs that her friend has never committed a crime. Then, allegations emerge suggesting that her friend committed a crime in the past. She wants to figure out whether the allegations are true, and she is worried that she could be biased towards her friend. Hence, she ratiocinates with additional caution, making sure she attends and responds appropriately to the evidence. If she merely wants to be subjectively rational, she can simply believe that the allegation is false, which is consistent with her pre-existing belief that her friend has never committed a crime. Maybe some people ratiocinate simply in order to maintain consistency with their pre-existing beliefs. For most everyday cases of ratiocination though, one probably just wants to find out whether

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[23] Kolodny, 2005; Scanlon, 2007.

something is true, such as whether the bank is closed, not whether it preserves her rationality to believe so. Hence, we do not need to think of all ratiocinators as those who are 'fetishising' rationality.[24] At least for some of them, rationality is not the goal. If they were presented with the options of either taking a pill and forming the true belief p or ratiocinating about whether p is the case, some would choose to take the pill and form the true belief.

We should not confuse what motivates the ratiocinator to ratiocinate with what motivates the ratiocinator in ratiocination. Ratiocination might occur more often in instances where the reasoner worries that she might reason poorly because of certain practical concerns. One may also ratiocinate out of pure theoretical interest. Different situations might trigger different people to ratiocinate. Some might also ratiocinate more frequently than others because of differences in circumstances or dispositions. Our focus is not on why one is motivated to ratiocinate, but what it is for one to ratiocinate. My account remains open to different possible ways in accounting for why a subject can be motivated to ratiocinate. We do not need to suppose that ratiocinators are people who are more interested in being rational than others. What I hope to stress is that as long as a reasoner is ratiocinating, necessarily, she has to deliberatively control her reasoning. And when she controls it, she will control it in a way that she takes to be complying with what is normatively required of her. And once she works out that she ought to believe p, her ratiocination process concludes.

One might object: In order to monitor and control one's reasoning, one has to recognise the evidence she has and use it in her reasoning. Hence, one's reasons must be explicit, in the sense that she can consciously reflect on her reasoning. For example, if one were to ratiocinate about whether the ground is wet, she not only looks out and sees that it is raining, she also has to be conscious that she is using her belief that it is raining as a reason for her to think that the ground is wet. Doesn't this qualify as having set herself the task of being rational?

Unlike a non-ratiocinative reasoner who is not self-conscious that she is using q and r as evidence, the ratiocinator has to critically use q and r in her reasoning and see if they should be revised. The ratiocinator has to be self-aware of the propositions that she uses. So, it is true that a ratiocinator has to be aware of the propositions that she believes. However, this does not mean that she has to be self-aware that she is using her beliefs in her reasoning. Again, we are describing the mind of the ratiocinator. In the head of the ratiocinator, she does not have to make explicit to herself that 'I believe that q and I believe that r'. She can simply be thinking to herself 'q, r, therefore p'. From the ratiocinator's perspective, she may not be trying to maintain the consistency of her beliefs. But, from the theorist's perspective, we may say that she is working at the level of higher-order beliefs. If we were to describe what goes on in her mind, we may write out the process as: the ratiocinator consciously believes that q, the ratiocinator consciously believes that r, the ratiocinator concludes that she ought to believe that p.

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[24] Kolodny, 2005 discusses the worry that having the goal of being rational can seem 'fetishistic' (pp. 546–7).

Those who hold the transparency account of rationality might raise this question: If we assume that a ratiocinator does not have the goal of being rational but is interested in working out whether p is the case and the 'ought' of rationality is transparent, why does the ratiocinator need to be directing herself to comply with the requirements of reasoning? Can't she simply be attending to the reasons for and against p?

My account is compatible with the transparency account of rationality. Because by attending, in a deliberatively controlled fashion, to the reasons for and against p, a ratiocinator is directing herself to comply with what she *takes* the requirements of reasoning to be. There is thus no conflict between this account of rationality and what I have said about ratiocination.

Moreover, the requirements of reasoning do not have to be the same as rational requirements, that is, requirements for maintaining one's rationality. For example, some might think that if I believe q and if I believe that q entails p, then to be rational I have to believe p. I might have no interest in whether p is true. Rational requirements require you to have the beliefs that maintain your rationality. Requirements of reasoning, in the generic sense I have been using, only require one to respond to reasons. Some think that there can be additional requirements to be subjectively rational that go beyond responding to reasons. Even if there are, it does not affect my claim.

Consider, for example, Kolodny's view that the 'ought' of rationality from the first-person perspective is transparent to the 'ought' of reasons. He writes:

> From the first-person standpoint, the 'ought' of rationality is transparent. It looks just like the 'ought' of reasons. It is only from the second- or third-person standpoint that the 'ought' of rationality and the 'ought' of reasons come apart. For it is only from a standpoint other than the subject's that it is possible to distinguish what attitudes he has reason to have from what attitudes, as it seems to him, he has reason to have.[25]

Granting this transparency, we can still focus on what the ratiocinator, from her perspective, is focusing on. For a ratiocinator who is not fetishising rationality, she is focusing on responding to the 'ought' of reasons. She thinks that she is required by q and r to believe p. Even if she is in fact not required by q and r to believe p, she will hold herself to comply with what seems to her to be the ought of reasons. The ratiocinator does not necessarily have the further thought that 'because of such and such requirements of reasoning, I have to believe that p.' As explained above, she could simply attend to the evidence and think that the 'ought' of reasons mandates her to believe that p. However, since she is engaged in an activity that she is deliberatively holding herself to comply with the 'ought' of reasons, her activity ends when she has worked out that believing p complies with the 'ought' of reasons.

But an objector may continue to press the point: If the ratiocinator is not thinking something like 'because of such and such requirements of reasoning, I have to believe p,' then can't we just say that one responds to reasons? It seems redundant to say that the ratiocinator is directing herself to comply with the requirements of

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[25] Kolodny, 2005, p. 558.

reasoning. A ratiocinator is just a reasoner who is self-conscious of the reasoning process. We do not have to think that she is doing the extra work of directing herself to comply with requirements of rationality.

Again, ratiocination concludes with the ratiocinator's believing that she ought to believe *p* because of two key aspects of ratiocination: reasoning is an activity governed by requirements and the ratiocinator is holding herself to comply with the requirements. Because reasoning is an activity, when one is self-consciously engaged in it, one has to think about how to direct it. Because it is norm-governed, one has to think about how to direct it in a way that she takes to satisfy the norms of the activity (i.e., the requirements of reasoning). Even though she might not be able to articulate the specific requirements she is complying with when she directs her mind, she takes herself to be making the transitions that comply with what is required by the requirements of reasoning.

4.2 Believing that I ought to believe p is not an intermediate stage of ratiocination

Many hold that if a ratiocinator thinks that rationality requires her to believe that *p*, but she herself does not see any reason to believe *p*, then she will not form the belief that *p*. This motivates them to think that a higher-order normative belief must be involved at some point of reasoning such that one moves from recognising that she ought to believe *p* to believing that *p*.[26] They might raise the following objection to my account: Instead of saying that the higher-order normative belief is the conclusion, can't we say that the higher-order normative belief is involved at some intermediate stage of the reasoning process? Won't this allow us to make the less controversial claim that the conclusion of ratiocination is the belief that *p*?

There are at least two possible ways in which a higher-order normative belief is involved in some intermediate stage of ratiocination. One possibility is that the higher-order normative belief is recognised as a reason in ratiocination. A second possibility is that the higher-order belief operates in the background. In the following, I will argue that neither of these options is compatible with my account. My account is not a higher-order account of reasoning and it does not succumb to the problems associated with such accounts.

The first option is held by what Broome calls the 'higher-order account of reasoning'. According to Broome, a higher-order account is 'any account of reasoning in which the content of a normative higher-order belief serves as a premise at some stage [of the process of reasoning]'.[27] What Broome means by 'premise' is what I mean by reason. To avoid confusion between deductive reasoning and theoretical reasoning, I will continue to use the term 'reason'. The problems with the first possibility—that the normative belief consciously recognised as a reason in reasoning—is discussed in detail by Broome. I will not rehearse this discussion nor assess Broome's criticisms of the higher-order accounts.[28] Here, I would like to focus on

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[26] Broome, 2013, p. 209.

[27] *Ibid*. Broome thinks the higher-order account is implicitly adopted, for example, by Korsgaard, 2009.

[28] Broome, 2013, Chapter 12.

explaining how my account is different from these higher-order accounts. What is crucial is explaining why the difficulties faced by such accounts are not faced by my account.

When Broome talks about 'higher-order normative belief', he means that the reasoner consciously believes that she ought to believe that *p*. This question is difficult to answer due to the ambiguity of 'higher-order'. Usually, when 'higher-order belief' is being discussed in this context, it is taken to mean a subject's belief about her own belief.[29] This gives rise to the main question: How is the conscious belief that she ought to believe *p* supposed to figure in one's reasoning? My account does say that a ratiocinator has to eventually come to be in the higher-order state in which she believes that she ought to believe that *p*. But my account is not a higher-order account of reasoning in two important respects: First, it does not hold that the ratiocinator treats her belief that she ought to believe *p* as a reason in her ratiocination. The higher-order normative belief is not involved in her ratiocination process as a reason that the ratiocinator reasons with; instead, it is the conclusion of the ratiocination process. As soon as the ratiocinator works out what she ought to believe, the activity of ratiocination ends. The mental movement to believe *p* starts with ratiocination but the final movement is not part of the ratiocination process.

Second, my account does not say that the ratiocinator has to consciously believe that she ought to believe that *p*. As explained before, to the ratiocinator's mind, she need not consciously think that 'I ought to believe that *p*'. To her mind, she might simply attend to evidence about *p* and consciously conclude: '*p*'. Therefore, the worry that she will, from her own conscious perspective, go on to reason with her conscious belief that she ought to believe that *p* does not arise. The nature of theorising invites a confusion that we need to avoid. When theorising, we need to bear in mind that the ratiocinator is engaged in a conscious normative activity. If we are to give an accurate description of the state she is in, the state that she is in should be described as a higher-order state in which she believes that she ought to believe that *p*. To say that the ratiocinator is in a higher-order state in which she believes that she ought to believe *p* is not the same as saying that the ratiocinator has a conscious belief that she ought to believe *p*. On the higher-order account, a conscious belief that she ought to believe *p* is derived from what she takes to be reasons to be rational. On my account, the ratiocinator's higher-order normative belief is not derived from premises. Rather, the ratiocinator's higher-order normative belief is the result of the conscious normative activity that she sees herself as engaged in. The occurrence of the higher-order normative belief is explained by the nature of ratiocination. When ratiocination ends, one ends in a higher-order state in which she believes that she ought to believe *p*. Because of these differences between my account and the higher-order account, it cannot be the case that the ratiocinator is using her higher-order belief that she ought to believe *p* as a reason in her reasoning. So, on this front, my account does not face the problems faced by the higher-order account.

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[29] The 'higher-order' component in my explanation of ratiocination is a higher-order state but that does not always amount to a belief about one's belief.

Another problem associated with the higher-order account concerns how one's consciously believing that p can bring about one's aiming to believe p. To answer this question, the higher-order account might have to say that in enkratic reasoning the reasoner believes that if she believes that she ought to believe that p, then she aims to believe that p.[30] The problem with this, as Broome points out, is that it will require her to also believe that she believes that she ought to believe p. One will then have to believe that if I believe that I believe that I ought to believe that p, then I have to aim to believe that p. This regress is vicious. My account has the advantage of avoiding this regress problem because it does not hold that one has to consciously reason with her belief that she ought to believe that p.

Another potential problem associated with the higher-order account is that it has to explain how one's higher-order belief that p directly brings about one's believing that p in the process of reasoning. According to Broome, although it is conceivable how one's belief that she ought to believe that p will cause her to believe that p, such as 'enlisting the help of a hypnotist or by undertaking a programme of self-persuasion,' that movement from believing that she ought to believe that p or from aiming to believe p to believing that p cannot be a process of reasoning.[31] One has to rely on means other than reasoning to come to believe p. My account holds that ratiocination ends with one's being in the state of believing that she ought to believe that p. The movement from believing that she ought to believe p to believing that p is not part of ratiocination. So, it does not face the difficulty of explaining how one can move from believing that she ought to believe p to believing p within the process of ratiocination.

One more difficulty that my account avoids but the higher-order account faces is how one arrives at the higher-order normative belief in the first place. To explain how one gets from believing q and believing r to consciously believing that she ought to believe p, it is difficult for the higher-order account to avoid saying that the subject has to attend to her reasons to be rational. Borrowing Broome's example, a reasoner who reasons with her higher-order normative beliefs will reason like this: 'It is raining. If it is raining, the snow will melt. Rationality requires of me that, if I believe it is raining and I believe that if it is raining the snow will melt, I believe the snow will melt. I ought to believe that the snow will melt.'[32] This invites the worry that the reasoner's higher-order normative belief is not brought about by reasons that have to do with whether snow will melt but by reasons that have to do with whether I am rational. The reasoner is attending to what belief she should have to be rational, rather than whether the snow is melting. I have already explained in Section 4.1' why the ratiocinator is not necessarily attending to what belief she should have to be rational. The ratiocinator could be just attending to evidence about p and sees herself as governed by the 'ought' of reasons. It is true that as long as she is conscious of the reasoning process, she has to also direct her reasoning in a way that she thinks complies with the requirements of reasoning. However, she does not even have to have specific requirements in her mind. My claim is only that, for every transition

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[30] Broome, 2013.

[31] *Ibid.*, p. 213.

[32] *Ibid.*, pp. 218-9.

she makes, the transition seems to her to be required. Once she thinks she has made all the transitions she is required to make, her ratiocination ends. Hence, the ratiocinator's belief that she ought to believe that *p* is not 'derived' from a conscious belief about what rationality requires of her. Rather, it is in virtue of the conscious normative activity that she undertakes that the endpoint of her activity is a higher-order state in which she believes that she ought to believe that *p*.

For those who do not want to say that the ratiocinator has to consciously believe that she ought to believe that *p* and treat that as a reason, they might suggest the second option: one's belief that she ought to believe *p* operates in the background of ratiocination.[33] Those who favour this option might say: since we assume that the ratiocinator is just attending to *q*, *r*, we can agree with you that a ratiocinator is at some stage of ratiocination in the state of believing that she ought to believe that *p* in virtue of the activity of ratiocination; however, the state that she believes that she ought to believe that *p* operates in the background through a rule or linking belief that looks like 'If I ought to believe that *p*, then infer *p*'. Understood in this way, the conclusion of ratiocination is still the belief that *p*.

I leave it open that there could be some linking belief operating in the background when one ratiocinates; however, the linking belief cannot be the belief that *I ought to believe p*. The reason for rejecting this possibility for my account is not that it requires a ratiocinator to have concepts such as belief or ought, although this could be another reason for rejecting this possibility. It is also not because the ratiocinator might arrive at the belief that *I ought to believe p* through some 'weird theory of rationality' such that her linking belief is 'weirdly-grounded' as Broome has suggested.[34] Whatever linking belief or background rule operates in ratiocination, there cannot be a background rule that says something like, 'If you ought to believe *p*, infer *p*'. To follow such a rule, one has to first work out what she ought to believe. But as soon as the ratiocinator works out what she ought to believe, the process of ratiocination ends. She has concluded the activity of ratiocination. This explains why the background rule cannot be one that says, 'If I ought to believe that *p*, then infer *p*' in ratiocination. Note that I am not disputing that there can be a linking belief or background rule that says, 'If you ought to believe *p*, infer *p*' in non-ratiocinative theoretical reasoning. I am only making a more limited point that such a background rule cannot be applied in ratiocination.

4.3 Ratiocination and truth

Another possible objection concerns whether ratiocination aims at truth. Some might worry that even if we restrict the cases to those of theoretical reasoning that are deliberatively controlled, it still sounds odd to say that the conclusion of theoretical reasoning is when one believes that one ought to believe *p*. Theoretical reasoning

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[33] This option is motivated by Carroll, 1895, and Broome's discussion of linking belief in Broome, 2013, Chapter 13.

[34] See Broome, 2013, pp. 228–9 for discussion of these two worries. Recall that a ratiocinator is directing herself in what she regards as the requirements of reasoning. So, from her perspective, the linking belief or background inferential rule is not 'weirdly-grounded'.

is supposed to aim at what is true. It is often assumed that since theoretical reasoning is supposed to answer whether *p* is the case, the conclusion of theoretical reasoning is the belief that *p*. Recall Adler's quote above in Section 3.[35] The worry is about what question is being answered in ratiocination. It is often assumed that since theoretical reasoning is supposed to answer whether *p* is the case, the conclusion of theoretical reasoning is the belief that *p*. My account does not require us to reject the thought that theoretical reasoning is supposed to answer whether *p* is the case; it only requires us to unlink these two claims and reject the thought that one is in the state of believing *p* when one answers the question whether *p*.

Those who agree with what I have said so far will accept that it is not necessary for a ratiocinator to respond to the 'ought' of rationality. Still, some might worry that on my account, the ratiocinator answers the wrong question. Answering what she ought to believe is not answering the question about whether *p* is the case. And if the ratiocinator answers the wrong question, then she is responding to the wrong kind of reasons. This worry is motivated by Hieronymi's suggestion that the right kind of reasons bear on the question of whether *p*, not the question of what I ought to believe.[36]

I am not sure if the question 'What ought I to believe?' counts as the kind of question on which wrong kind of reasons bear in Hieronymi's view, but I can see how some might argue that one who tries to answer this question is perhaps thought to be responding to the wrong kind of reasons. Let me try to articulate the worry. It might be put like this: Even if we assume that the ratiocinator is not trying to be subjectively rational and is only responding to the 'ought' of reasons, the ratiocinator is still trying to monitor and check her reasoning. For example, the ratiocinator is thinking that 'The sky is looking grey. It is very cloudy outside. But wait, these are not clouds. The weather forecast mentioned that there will be haze today. It is the haze that is making the sky look grey'. The 'but wait' indicates the moment when the ratiocinator reminds herself that she could have made a mistake in reasoning and prompts herself to check her reasoning. When she checks, she still has to respond to the 'ought' of reasons. We do not have to suppose that she consults different evidence. Nevertheless, she is answering the question 'Is it correct for me to believe *p*?' instead of 'Is *p* true?'.

This worry arises from what I take to be a mistaken conception of what it means for a ratiocinator to check her reasoning. The objector mistakenly thinks that the ratiocinator is checking her own reasoning as in the checker is verifying the accuracy of something. Imagine you put down your passport number on a form. Suppose further that a checker checks if you have put down your passport number correctly by looking at your original passport. She looks at your passport and then at what you wrote on the form. When you are copying down the numbers, you are answering the question, 'What are the numbers?' In assessing whether you are 'correct', the checker attends to the same set of evidence as you do, namely, your passport. This is consistent with the thought that a ratiocinator only responds to what seems to her to be the 'ought' of reasons. But when the checker is checking what you put down,

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[35] Adler, 2002, p. 4. See Owens, 2002, Hieronymi, 2005, Boyle, 2009 for similar lines of thought.
[36] Hieronymi, 2005.

she is answering a different question, namely, 'Have you put down the numbers correctly?' On this model, the difference between your and the checker's mental movements does not lie in whether they are attending to the same set of evidence, but in whether they are answering the same questions.

When one is ratiocinating, one is one's own checker of reasoning and is trying to answer the question 'Is it correct for me to believe p?' One might think the 'ought' in 'I ought to believe p' is a positive response to this question and then worry that my account fails to capture what is characteristic about theoretical reasoning, which answers the question 'Is it the case that p?' This way of understanding checking as verifying is misleading. When one monitors one's own reasoning, we do not have to suppose that there is a checking part of the mind looking into another part of the mind, seeing if the answer produced matches the evidence. Recall that reasoning occurs when p is unsettled for the reasoner. Even if the mind prompts itself to check, there is no answer printed somewhere for it to check against. So, eventually, the ratiocinator has to answer the question 'Is it the case that p?'.

A better analogy is this: a student is asked in an exam to multiply without a calculator 1623 and 1932. The first time she calculated she got 3,135,636. But before she reports her answer, she thinks she should double check. She has no answer sheet or calculator to check. All she can do is to apply the rules she thought she knows and calculate again. In order to answer the question 'Is 3,135,636 the correct answer, she still has to answer the question 'What is the product of 1623 and 1932?'. Since p is unsettled and the ratiocinator in ratiocination is trying to work out whether p is the case, the ratiocinator still has to answer the question whether it is p even if she is prompting herself to check her reasoning. The ratiocinator does not have to make reference to what she believes and then check it against p.

In the checking passport example, the checker's answer has to make reference to what you put down against the passport. The 'ought' involved in her answer concerns checking whether what you produced matches with what is in the passport. But in the checking math example, the checker's answer does not make reference to what she already put down and then check it against something else. She is working out the answer by ensuring that the rules are followed correctly. The 'ought' involved in her answer concerns whether she has followed the rules correctly. Ratiocination parallels the math example in that the 'ought' part of 'I ought to believe p' is about whether the ratiocinator has successfully brought herself to comply with what she takes to be the requirements of reasoning. It is not the case that the ratiocinator is making reference to what she believes and then checks it against p.

5 Conclusion

To summarise, in ratiocination, a ratiocinator self-consciously, purposefully and deliberatively controls her reasoning process in order to find out whether p is true. She follows what she takes to be the requirements of reasoning to arrive at a view about p. Ratiocination ends when the ratiocinator thinks that she has worked out the

truth about *p* in a way that complies with what she takes to be the requirements of reasoning. Ratiocination thus concludes when one believes that she ought to believe *p*. An immediate worry one might have is that for one to believe that she ought to believe *p* is not the same as believing that *p*. At the end of ratiocination, a ratiocinator only has the attitude that *p* is what she should believe. One has not yet changed her mind about *p* when ratiocination concludes. This opens up the worry that at least in some instances of theoretical reasoning, the transition from conclusion at the end of ratiocination to believing *p* might be accomplished by some non-rational process. If what I have said about ratiocination is correct, we are invited to question the assumption that different cases of theoretical reasoning fix belief in a uniform way. It also invites the worry that ratiocination makes us vulnerable to epistemic akrasia. Relatedly, the account offered points to new avenues for explaining puzzling phenomena such as self-deception and confabulation.

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I do not analyse or generate any datasets, because our work proceeds within a theoretical and mathematical approach.