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Refusing the COVID-19 vaccine: what's wrong with that?

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Abstract: COVID-19 vaccine refusal seems like a paradigm case of irrationality. Vaccines are supposed to be the best way to get us out of the COVID-19 pandemic. And yet many people believe that they should not be vaccinated even though they are dissatisfied with the current situation. In this paper, we analyse COVID-19 vaccine refusal with the tools of contemporary philosophical theories of responsibility and rationality. The main outcome of this analysis is that many vaccine-refusers are responsible for the belief that they should not be vaccinated and epistemically rational in holding it. This is an important result because it provides insights into the legitimacy of certain public health policies. In particular, this result shows that a public health policy that would abandon the project of convincing certain vaccine-refusers with reasons – e.g., by simply making vaccination compulsory – is *prima facie* illegitimate.

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1. Introduction

Vaccines are a blessing. Researchers have worked day and night to provide us with a vaccine against COVID-19 in record time. We should all receive it with gratitude. But, as we know, this is not what is happening. Many people have refused to receive the COVID-19 vaccine and a large proportion of them are still unvaccinated now. This is not a minor phenomenon: in Germany, over 23 percent of the population are not fully vaccinated to this date, over 30 percent in Switzerland, and over 30 percent in the US (Corona-in-Zahlen.de, n.d.; OFSP, n.d.; CDC, n.d.). Note also that the proportion of individuals who refuse to be vaccinated against COVID-19 – henceforth simply "vaccine-refusers" – is significantly higher than the percentage of people who do not want their children to receive the MMR vaccine.[1]

[1] In Switzerland, 94 percent of children have received two doses of the MMR vaccine before the age of 16 (statistics for the period 2017–2019); see OFSP (2021). In Germany, the vaccination rate of 4- to 7-year-olds is significantly more than 90 percent at least since 2009; see RKI (2022). In the US, the proportion of adults vaccinated against MMR was 90.8 percent in 2015; see NCHS (n.d.).

This paper takes stock of the widespread reticence that characterizes the public response to the COVID-19 vaccination campaign. Our purpose is to answer two questions. First, we ask whether we can hold COVID-19 vaccine-refusers – or, more precisely, a representative class of them – responsible for the beliefs that lead to their refusal. This is the *question of cognitive responsibility*. Second, we ask whether the belief of this group of COVID-19 vaccine-refusers – *viz.* the belief that they should not be vaccinated – is rational. This is the *question of cognitive rationality*. Clearly some people reject the vaccine because of irrational beliefs, based, for example, on dodgy conspiracy theories. We do not deny this. Rather, the question we ask is whether there is a significant group of vaccine-refusers for whom it is not irrational to believe that they shouldn't be vaccinated.[2]

As these two questions show, this paper aims to evaluate the *cognitive attitudes* of a specific class of COVID-19 vaccine-refusers (whether these cognitive attitudes are things for which they are responsible and whether these attitudes are rational). Indeed, in many cases, the reason why certain vaccine-refusers refuse the vaccine is that they *believe* that they should not be vaccinated against COVID-19 (they believe this for reasons that we present in more detail below). There are also perhaps individuals who refuse the shot even though they believe that they *should* be vaccinated (say, because they are afraid of needles). However, the vaccine-refusers that interest us are not weak-willed in this sense.

We also assume, for the sake of simplicity, that the following bridge principle applies: if the main reason why a typical vaccine-refuser refuses the shot is that she believes that she should not be vaccinated and if this belief is rational, then her action of refusing the vaccine is rational too. This is a simplifying principle since it does not mention the influence that the desires of the vaccine-refuser might also have on the rationality of her action. But since the potential irrationality of vaccine-refusers is generally taken to be a matter of some misleading opinions about the vaccine they have upstream (rather than a matter of some incorrect desires), this simplification is not problematic for our purpose here.

Why are the questions of cognitive responsibility and of cognitive rationality important? We discuss the relevance of our results at greater length in the conclusion of the

[2] We do not claim here that belief in all conspiracy theories is irrational – rather, an argument could be made that confirmation bias, which is the tendency to believe, attend to and remember things that fit with one's current belief-system (see Oswald & Grosjean, 2004), and which is central to understanding how conspiracy beliefs come about, is often a rational process (see Schmidt, 2021).

article but, put briefly, our results are important because they provide insights into the legitimacy of certain public health policies.

Imagine some sort of contemporary Don Quixote who believes that he still lives in the time of the knights and cannot do anything about this.[3] When an individual is affected by such a serious form of irrationality, it sometimes seems legitimate to abandon the project of convincing her with reasons and rather to impose on her certain decisions. However, if a substantial number of vaccine-refusers are *not* contemporary Don Quixotes – that is, if they are responsible for the belief that they should not be vaccinated and if this belief is just as rational as many other beliefs we all hold – then a public health policy that uses non-argumentative means with them (for instance, by simply making vaccination compulsory) does not seem *prima facie* legitimate. In this sense, answering the questions of cognitive responsibility and cognitive rationality helps to define the very first step of an adequate public health policy.[4]

We shall proceed as follows. Answering the questions of responsibility and rationality requires that we understand the reasons for which a substantial number of vaccine-refusers believe that they should refuse the vaccine. Accordingly, in section 2, we spell out the reasons that, according to some recent studies on the topic, are most commonly given by vaccine-refusers to justify their beliefs that they should not be vaccinated. On this basis, we also construct our own example of what we shall call "the standard vaccine-refuser". We speak of the *standard* vaccine-refuser precisely because she belongs to a category of vaccine-refusers that is the most common one according to some recent empirical studies.[5]

Then, in sections 3 and 4 respectively, we analyse this example with the tools of the contemporary theories of responsibility and rationality. In section 5, we briefly consider the possibility that the "mistake" of the vaccine-refusers could be a purely moral (rather than epistemic) matter. In the concluding section 6, we summarize the results and draw implications for public health policy.

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[3] Lisa Bortolotti (2015, ch. 4) uses Don Quixote to illustrate irrationality. Our use is inspired by her work.
[4] A similar point has been made by Cassam (2021). It is, according to him, crucial to reach a "Verstehen" of the reasons why people refuse the vaccine in order to build an efficient health policy.
[5] There has been disagreement among the reviewers of this paper about our claim that the empirical studies establish that our standard refuser represents the most common cases. However, our claim could be weakened as follows: a large and significant subgroup of vaccine-refusers is characterized by rational distrust in epistemic authorities which leads to rational refusal beliefs. This would still give us a *pro tanto* reason against certain public health policies that employ non-argumentative means to make people comply (such as mandatory vaccination), albeit maybe a weaker reason.

2. Meet Khay: The Standard Vaccine-Refuser and Her Reasons

In most African countries, the inaccessibility of the COVID-19 vaccine is still the main cause of low vaccination rates. This is different in Europe and the USA. There, vaccines are accessible to the population. Yet some people still refuse the shot because they believe that they should not be vaccinated. What are their reasons for believing this? The reasons given for refusing the vaccine are quite diverse, of course. But beyond this diversity, some empirical studies have shown that some reasons are given much more often than others. Chevallier et al. (2021, p. 331) note that "[i]n every country for which there is data, people provide similar reasons to refuse potential COVID-19 vaccination".[6] It is possible to classify these common reasons into the following categories (see Chevallier et al., 2021):

1. *Reasons that have to do with the personal situation of the individual*, e.g., "I don't feel concerned because of my age, my health, etc.";
2. *Reasons that have to do with the effectiveness of the vaccine*, e.g., "given the high probability that the virus mutates, it is in fact quite pointless to be vaccinated", "it is better to develop my own immunity";
3. *Reasons that have to do with a lack of trust in the laboratories, and/or the political and/or medical establishment* (see Kärki, 2021), e.g., "the side effects are unknown", "the laboratories are primarily concerned with profitability".[7]

Given this list, the following is a plausible example of a standard COVID-19 vaccine-refuser (standard in the sense that the reasons she gives for refusing to be vaccinated are the most common according to empirical studies).

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[6] Some people also refuse the COVID-19 vaccine as a result of a general *antivax-attitude* such as the supposed impacts of vaccines (in general) on their health. We shall ignore this additional reason since it is not COVID-19-specific.

[7] This list is silent regarding the deeper motivational structure of individuals. For instance, it does not tell us why distrust of the pharmaceutical industry and the medical profession developed in the first place. It is likely that answers to such further "why"-questions must appeal to the socio-cultural background and history of individuals. For instance, Bunch (2021) argues that many Black Americans' distrust of the US health system has to do with institutional racism within this health system. A recent article of the *Neue Zürcher Zeitung* critically discusses the idea of whether German vaccine hesitancy can partly be traced back to the Romanticism of the nineteenth century, which continues to shape an attitude of technological skepticism and "back to nature" individualism even today (Müller, 2021). Answers to these further "why"-questions will thus be very diverse. They will often appeal to the roots of distrust in corporations, medical systems, or overall political systems or social structures of a country. We return to the issue of distrust in section 4.

Khay, the standard COVID-19 vaccine-refuser

Khay studied law and works in a law office. She lives in a middle-sized European city. Each morning, Khay reads the free newspapers she finds at the bus stop. She also follows the evolution of the pandemic by watching the national news every night and she regularly discusses the topic with her husband and her many friends. When the vaccine was first made available to the population, she heard, like many of us, of the suspicion that injecting the vaccine might be correlated with a higher risk of thrombosis. Later she was also informed, via the media, that this was not the case after all. During the entire vaccination campaign, but mainly at the beginning of it, Khay and her husband had many discussions as to whether they should be vaccinated or not, especially given their frequent visits from Khay's elderly mother. Over coffee with her friends one morning in January 2021, Khay said to them:

"After having weighed the pros and cons, I now believe that I should not be vaccinated against COVID-19 and won't therefore receive the vaccine. I am healthy and in my early 40s. I prefer to be cautious and try not to catch this virus to receiving a vaccine which I cannot be sure is really innocuous and the efficacy of which I find doubtful. I am aware that many serious scientists say it is safe. But should I really believe what they say? After all, there have been many scientific errors in history. And I remind you that at the beginning of the pandemic other serious scientists told us that masks were not useful. So I don't think we should always believe them."

Khay is a standard vaccine-refuser in that the reasons she gives for believing that she should not be vaccinated are the ones that most vaccine-refusers seem to have (according to the studies mentioned above). Briefly, (i) Khay does not see the point of the vaccine for herself, (ii) she does not fully trust the scientific and political establishment, and, on this basis, (iii) she believes that she has more reasons to refuse the vaccine than reasons to receive it. Two additional remarks are in order here.

First, in our example, Khay is an educated person, with a privileged social background. These characteristics are relevant because they serve a methodological goal. Indeed, if Khay is rational, then so are many other vaccine-refusers who do not enjoy the same social advantages (the reason why this is true is presented at the end of section 4). It is thus methodologically

beneficial to make our standard vaccine-refuser a well-educated person. It allows us to make inferences that are not necessarily permitted if we had built the case differently.[8]

Second, note that Khay's mistrust is not the result of her attributing malicious intentions to either the scientists or the politicians. She does not believe either that the latter are involved in a conspiracy. And she does not hold a general anti-vax attitude (for instance, we can assume that Khay's children have received the MMR vaccine).

3. The Responsibility of a Standard COVID-19 Vaccine-Refuser

Is Khay responsible for her belief that she should not be vaccinated against COVID-19? One view that philosophers share is that a subject is not responsible for her F-ing if she does not exercise any control over her F-ing.[9] The problem that cognitive attitudes – such as Khay's belief – raise is that they do not seem to be under our directly voluntary control.[10] Even though I would like to believe that I have immunity to all viruses (because, say, it would be so reassuring to believe this), I cannot believe this just because I want it. By contrast, in ordinary circumstances, I can raise my hand just because I want to raise it.

The philosophical literature contains several competing solutions to this problem that correspond to different accounts of the cognitive control that individuals need to exercise over their cognitive attitudes in order to be responsible for them. The presentation of these accounts would require a paper-length treatment. To keep the length of this article within reasonable limits, we shall just present one of the most influential of these accounts of cognitive responsibility. It is the one according to which our cognitive responsibility – *viz.* the responsibility we exercise over our cognitive attitudes – is a matter of the *reasons-responsiveness* of these cognitive attitudes. More specifically, in order to evaluate whether Khay is responsible for her belief, we are going to rely on McHugh's (2013, 2014, 2015) influential account of cognitive responsibility in terms of reasons-responsiveness (but note that the most common alternative – the solution of indirect influence – leads to the same result[11]).

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[8] We wish to emphasize that Khay is not representative of the whole class of people who do not get vaccinated. She is different both from people who hold a strong anti-vax attitude, and from people who are just hesitant, but who might well decide tomorrow to get the vaccine. Like many others, she reflectively refuses to take the vaccine based on her perceived reasons. If Khay is rational in her belief (as we will argue), then surely many people who are merely hesitant will be rational as well (since their attitude is weaker and thus more easily justifiable). We are grateful to an anonymous referee for pressing us to clarify that Khay does not represent all vaccine-refusers.

[9] See, e.g., Hieronymi (2006, 2008), McHugh (2015), McCormick (2011, 2015), Steup (2012).

[10] The *locus classicus* for the view that we cannot believe "at will" is Williams (1973). Another classic is Alston (1988). See Peels (2015) for the view that we might be able to believe at will since the truth of a proposition is sometimes dependent on whether we believe it or not.

[11] The main alternative is the solution of *indirect doxastic influence* (see Peels, 2017; Meylan 2017). In this view, a subject is responsible for her cognitive attitude only if she has exercised indirect voluntary

McHugh's account of cognitive responsibility is modelled after the compatibilist account of agentive responsibility defended by Fischer and Ravizza (1998), and the chief idea of his view is that a subject's responsibility for believing that p depends on whether her belief that p is:

> "receptive and reactive to epistemic reasons" (McHugh, 2015, p. 7).

In more detail:

A subject S's cognitive attitude is reasons-responsive, and S is thus responsible for it, if and only if, in some alternative scenarios in which S has sufficient reasons not to hold this cognitive attitude:

1. S would recognize these sufficient reasons as sufficient reasons for not holding it; (=*the condition of receptivity to epistemic reasons*)

and

2. S would not hold this cognitive attitude for these reasons. (=*the condition of reactivity to epistemic reasons*)[12]

Here is an example that should make the functioning of this account of cognitive responsibility more concrete.

The Light Was Left On

When I enter my office this morning, I see that the light is still on. Because of this visual perception, I believe that I forgot to turn off the light the evening before.

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influence over this attitude. The solution of indirect influence is usually taken to be a stronger account of cognitive responsibility than the reasons-responsiveness account in that the latter view assigns more responsibility than the former. All beliefs acquired for reasons are beliefs for which we are responsible according to the reasons-responsiveness account, even if we have not in any way influenced this acquisition. Interestingly, however, the indirect influence account seems to deliver the same outcome in the specific case of the beliefs of ordinary vaccine-refusers. Very briefly: just as I am responsible for the beliefs that I hold about the Ukraine War as a result of my reading the newspaper, Khay is, according to the solution of indirect influence, responsible for the belief that she holds about the vaccine because there are things Khay could have done such that if she had done them she would not believe that she should not be vaccinated.

[12] For the sake of simplicity, we ignore several subtleties of McHugh's view that do not matter for the purpose of this paper. For instance, it is not the attitude itself that is supposed to be reasons-responsive but the mechanisms that trigger it.

However, if my fellow office-mate had just told me that she had to work really late yesterday evening:

1. I would recognize this as a sufficient reason not to believe that I am the one who forgot to turn off the light;
2. I would not believe that I am the one who forgot to turn off the light.

My actual belief, *viz.* my belief that I forgot to turn off the light, is a mundane belief that satisfies the conditions of receptivity and reactivity to epistemic reasons. It is, like many ordinary beliefs, reasons-responsive.

What about Khay's belief that she should not be vaccinated? Is her cognitive attitude reasons-responsive in this sense? Let us consider this in more detail by asking first whether Khay's belief satisfies the *condition of reactivity to epistemic reasons* (condition 2 above).

2. Would Khay hold a different cognitive attitude if she were to recognize a sufficient reason not to believe that she should not be vaccinated?

Beliefs that violate the condition of reactivity to reasons are beliefs that one cannot revise no matter what one thinks is true, even though one recognizes sufficient reasons to change them. Paradigmatic examples of such beliefs are prejudicial beliefs (McHugh, 2015) or beliefs that are so deeply entrenched in the individual's psychology (because of their education, maybe) that they cannot be revised. Clearly, Khay's belief that she should not be vaccinated is not of this kind. Khay's belief is not the immovable result of her education or some indoctrination. Khay does not suffer from any incapacity to change her mind even when she was aware of sufficient reasons to change it. If she were to recognize sufficient reasons to revise her belief, she would revise it. Now the question is whether she is also able to recognize sufficient reasons to change her mind, that is, whether Khay's belief satisfies the *condition of receptivity to epistemic reasons*.

1. In some of the alternative scenarios in which she has a sufficient reason to hold a different cognitive attitude, would Khay recognize this sufficient reason not to believe that she should not be vaccinated?

Clearly, some facts cast serious doubt on the belief that one should not be vaccinated. For instance, the mere fact that the vaccine has been administered to billions of people with no bad side effects in the huge majority of cases seems to be a sufficient reason to believe that the vaccine is innocuous. Now, there is a (very close) alternative scenario in which Khay, our standard vaccine-refuser, is made aware of this fact (suppose – and this is quite probable – that one of the free newspapers she reads mentions this). However, even if aware of this fact, it is not certain that a standard vaccine-refuser such as Khay would recognize it to be a sufficient reason to change their mind (as shown by the fact that much of the pro-vaccine communication relies on this argument with no great effect).

Importantly, this is not sufficient to show that the belief of the standard vaccine-refusers is not receptive to epistemic reasons. Indeed, as Fischer and Ravizza (1998, pp. 44–45) make clear, the condition of receptivity to epistemic reasons does not require that the individuals recognize sufficient reasons to revise their attitude in *all* alternative scenarios in which they have sufficient reasons to revise them. The condition of receptivity to epistemic reasons only requires that they recognize sufficient reasons to revise their attitude in *some* scenarios in which they have sufficient reasons to revise them. And there seem to be such scenarios in the case of vaccine refusal. For instance, it is very likely that a standard vaccine-refuser such as Khay would consider changing her mind if we were 15 years ahead, that is, when we had more hindsight about the vaccine. This suspicion is supported by the already mentioned fact that many COVID-19 vaccine-refusers accept receiving – or let their children receive – other vaccines that are less new and regarding which we have more hindsight.

What these last considerations show is that the standard COVID-19 vaccine-refuser *cannot* be compared to someone suffering from, say, a delusional form of paranoia. In the case of a severe delusion of this kind, there are no possible scenarios in which the individual would recognize sufficient reasons to abandon her paranoid belief. As just stated, this does not seem to be true of the standard vaccine-refuser. In some (even if not all) alternative scenarios in which there are sufficient reasons to change her mind, the standard vaccine-refuser would recognize this sufficient reason to revise her view. Unlike the belief of the deeply paranoid individual, the belief of the standard COVID-19 vaccine-refuser satisfies the condition of

receptivity to epistemic reasons. Consequently, she is responsible for her belief (since, as previously shown, her belief also satisfies the condition of *reactivity* to epistemic reasons).

4. The Rationality of a Standard COVID-19 Vaccine-Refuser

If vaccine-refusers are normally responsible for their beliefs, we can ask in a next step whether their beliefs are to be evaluated as rational or irrational. We assume a concept of rationality that presupposes that the subject who is evaluated as rational or as irrational is responsible for holding their belief. This assumption is in line with the current discussion on rationality. Take, for instance, Benjamin Kiesewetter's use of "irrational":

> The notion of irrationality we are interested in when asking for the normativity of rationality – the one that is associated with legitimate criticism – does, I think, require the capacity to modify one's attitudes in the light of reflection, and thus the absence of compulsion. (Kiesewetter, 2017, p. 100)

In line with this use of "irrational", we will assume in our discussion that the charge of intellectual irrationality is a serious one: it amounts to criticizing a person for a belief, thus presupposing the person's responsibility for that belief (see Schmidt, 2020). According to this use of "irrational", a pathological delusion for which a subject is not responsible counts as a-rational rather than as irrational. If we consider someone to be irrational in this sense, then we are assuming that the subject *can* be rational: there is some possible path for them to reason themselves out of their irrational belief.[13]

For the purpose of this paper, it is also important to distinguish between different *kinds* of irrationality:

[13] Parfit uses "irrational" to mean "deserves strong criticism of the kind that we also express with words like 'foolish', 'stupid', and 'crazy'" (Parfit, 2011, p. 123). Other proponents, like Kiesewetter (2017, ch. 2), Lord (2018, p. 4) and Way (2009, p. 1), argue that we use "irrational" as personal criticism, and they contrast it with merely evaluating a response as bad or merely criticizing the person's rational response system for malfunctioning. Recently, Worsnip (2021) has raised doubts about the view that irrationality is always criticizable. According to him, rational criticism is often "merely evaluative". However, his doubts stem partly from excusing conditions (which we can allow for), and partly from his interest in a purely structural kind of rationality, which he regards as providing us with mere *pro tanto* reasons to avoid incoherence by appropriately structuring one's deliberations. By contrast, we are interested in cases of irrationality in which we can *rightly expect* others (absent excuse) to revise their attitudes if they are irrational in this sense.

· *Instances of propositional irrationality*: having one particular irrational belief (or one particular irrational combination of attitudes); e.g., believing irrationally that the attractive stranger was definitely flirting with *you*.

· *Local dispositional irrationality*: being disposed to be irrational with respect to a certain topic; e.g., always dogmatically ignoring scientific evidence for vaccine safety.

· *Global dispositional irrationality*: being a generally irrational person; e.g., being irrational with respect to a range of topics, only believing what one desires to be true, etc.

Instances of propositional irrationality can sometimes be resolved by making the person aware of their irrationality – e.g., by pointing out that the attractive stranger was probably smiling at someone else behind you. Dispositional irrationality is not so easily resolved, because it is an entrenched character trait. That is, if vaccine-refusers were dispositionally irrational, the project of convincing them by exchanging reasons might not be the most effective one. Rather, one might have to address the deeper causes of their irrationality (say, their frustration with politics), or introduce sanctions to enforce objectively reasonable behavior (say, mandatory vaccination). An alternative would be to change their character so that they again appreciate reasons and evidence. However, any measure that aims at improving people's character in this way would be a long educational process. Yet often time is pressing.

Dispositional irrationality *implies* propositional irrationality: someone who is (locally or globally) dispositionally irrational necessarily holds irrational cognitive attitudes.[14] So, one way of showing that a person is dispositionally rational is by showing that her attitudes are rational. In what follows, we argue that Khay's belief that she should not get vaccinated is propositionally rational. Given the aforementioned implication, this also shows that Khay does not suffer from local dispositional irrationality.[15] That is, *Khay* is far from being a contemporary Don Quixote (cf. section 1) with regard to the COVID-19 vaccine. This is an important result mainly because it has some repercussions for what is the appropriate public health policy for this specific group of vaccine-refusers. We turn to these repercussions in the conclusion.

[14] In principle, it is possible that dispositions don't manifest due to environmental conditions. For instance, someone who is merely *disposed* to form irrational beliefs about whether p might not ever form irrational beliefs because they are never confronted with the question whether p. However, since our use of "irrational" implies criticizability, and since it is questionable whether a person who never commits any mistake is criticizable, this person isn't irrational according to our use of the term.

[15] Of course, she might be irrational when it comes to other topics – maybe she is irrationally biased about Italians. However, we are not concerned with any other potential irrationalities.

One dominant view within the recent debate on rationality is *coherentism*. According to this view, to be rational is to satisfy the coherence requirements of rationality. Here are initial formulations of the most discussed requirements of epistemic rationality:

· *Consistency*. "If you believe that p, then do not believe that not-p."
· *Evidence A*. "If you believe that you have sufficient evidence for p, then believe that p."
· *Evidence B*. "If you believe that you lack sufficient evidence for p, then do not believe that p."

The idea is that, if you don't fulfil these requirements, then you are criticizable as irrational (see Kiesewetter, 2017, ch. 2). For instance, if you fail to believe that p even though you acknowledge that your evidence sufficiently supports that p (*Evidence A*), others might accuse you of wishful thinking.[16]

It does seem that Khay is epistemically rational, given these requirements. First, she doesn't obviously violate *Consistency*. She does not believe, for instance, both that the vaccines are safe and that they are unsafe: Khay does not have a divided mind. Khay furthermore doesn't violate the *Evidence* requirements. In fact, she denies that there is sufficient evidence for the vaccines' safety. Rather, she believes that there is sufficient evidence *against* their safety and justifies her refusal on this basis.

It seems that coherentism gives us the result that the standard vaccine-refusers are rational: they don't violate the coherence requirements of rationality. Their rationality seems to result from the platitude that one can have false beliefs that are nevertheless coherent. In the remainder of this section, we consider several objections with the purpose of thereby

[16] The requirements must be further specified. For instance, we are not rationally required to believe everything we take ourselves to have evidence for (*Evidence A*): we are not irrational for failing to believe all the mathematical or logical implications of our beliefs (cf. Harman, 1986, p. 12). Furthermore, we assume a *synchronic* reading of these requirements, according to which only the beliefs that the person currently holds are taken into account for rational evaluation, rather than reading them as requiring people to revise their beliefs over time. We here depart from Kiesewetter (2017, pp. 62–70), who argues that rational requirements are *diachronic* insofar as revising one's attitudes can take time. According to Kiesewetter, a synchronic conception would be over-demanding, because it implies that we are required to *immediately* revise incoherent attitudes. However, we agree with Worsnip (2021, pp. 183–187) that we are irrational as long as we have not revised our incoherent beliefs. Addressing the many controversies and subtleties that characterize the debate on rationality would take us too far afield. In the process of our argument, we will rely only on claims about rationality that are rather uncontroversial, given the current debate.

sharpening our argument. In the process, we will also argue that Khay is rational even if we assume that rationality is a matter of reasons-responsiveness (rather than coherence).

One might object that the incoherence of Khay's beliefs is just less obvious because it is located elsewhere. For instance, one might point out that Khay does not trust the testimony of scientists about the safety of the vaccine on the grounds that scientists have erred in the past. However, as an educated person, she surely knows that her own judgement is not superior to the majority judgement of experts. If so, then she believes both that she should trust her own judgement more than the scientists' and also knows that the scientists' judgement should be trusted more. This seems like a violation of *Consistency*. More generally, one might argue that Khay has (given her education) implicit knowledge of the validity of scientific expertise and claim that this implicit knowledge is incoherent with her explicitly endorsed opinion about the vaccine. Relatedly, one might point out that she does trust scientists in many other matters, as for instance when she takes other medicine.

In reply to this objection, we grant that implicit incoherences might characterize some vaccine refusals. However, it isn't obvious that implicit incoherences always contribute to a belief's propositional irrationality. For it is not obvious that implicit incoherences make a person criticizable in the way necessary for irrationality. We surely all have beliefs that contradict other things we implicitly know. Philosophy partly aims at uncovering our contradictory beliefs about, say, free will, knowledge, or morality, and it helps us to form a more consistent belief-system about philosophical topics. But that doesn't mean that all people who don't spend their time solving philosophical puzzles are criticizable as irrational merely because they do not uncover these implicit contradictions.

Furthermore, implicit incoherences are not always irrational because we often *forget* about something without ceasing to believe it, and we then adopt contradictory beliefs because of our forgetfulness without being irrational. For instance, you might know that your friend Tom doesn't like cumin, but then still prepare a meal with cumin and think: "how much everyone will enjoy this delicious meal!", thereby contradicting your implicit knowledge about Tom. However, your forgetfulness here doesn't make you irrational. You might be criticizable for your forgetfulness – say, because you didn't make enough mental notes about Tom's tastes, or because you didn't care about Tom as we would expect from a good friend. But this kind of criticism is intuitively not well-captured by saying that you are irrationally incoherent. As

Timothy Williamson puts it, "forgetting is not irrational; it is just unfortunate" (Williamson, 2000, p. 216). Coherentists thus need to distinguish cases of incoherence that make you irrational from those that do not. Cases in which your current beliefs contradict your implicit knowledge seem to belong to the latter category, and thus do not provide a basis for arguing that vaccine-refusers like Khay are irrational.[17]

Against this reply, one might further object that even though an implicit incoherence is not as bad as an explicit one, it still makes Khay *less than fully rational*. However, as pointed out above, we all hold implicit incoherences. Khay is simply falling short of ideal rationality. But such a failure is not a good basis for ascribing irrationality: we do not flog ourselves daily for not achieving a state of ideal rationality in which we are fully coherent. The same is true about Khay's beliefs: she is not irrational merely because she holds an implicit incoherence of which she is currently unaware.[18]

The objector could insist that Khay, as the active inquirer she is, will at some point become aware of some of the implicit incoherences that she holds. How should she then resolve these incoherences? In the case of contradictory beliefs, it is open for her to drop either the belief that p or the belief that not-p.[19] In our example, she might just drop the belief that scientists are sufficiently trustworthy and keep her belief that she herself and other sources are more trustworthy than the scientists. This is one of the two rationally permissible ways of resolving her contradiction when she becomes aware of it.[20]

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[17] Kiesewetter (2017, pp. 184–185) argues that you are irrational in failing to believe what your evidence sufficiently supports only if you *attend* to whether p. This attendance condition nicely rules out many cases of forgetfulness as cases of irrationality (that is, it rules out those cases where you would remember that p if you were to attend to whether p).

[18] Our point here is that although Khay's beliefs might not be ideally rational (none of our belief-systems are ideally rational), she is *rational enough* in her belief-system. See Wedgwood (in press) for an extensive account of degrees of rational belief which can capture the distinction between ideal rationality and ordinary (ir)rationality ascriptions.

[19] Note that here we presuppose a wide-scope reading of *Consistency*: rationality requires that [if one believes p, one does not believe not-p]. Following Broome (1999, 2013), most philosophers who are coherentists or who allow for a structural kind of rationality endorse this reading nowadays (see, e.g., Worsnip, 2021).

[20] Khay can become aware of implicit contradictions by actively engaging with her own beliefs. One might thus think that she should make these implicit contradictions explicit to herself by actively deliberating, and then coming to the conclusion that she should drop her refusal belief in light of what she knows. (We thank an anonymous reviewer for raising this point.) However, such active deliberation takes time and energy, and is thus only (practically) rational for Khay when it is also (practically) rational for her to invest this time and energy. Furthermore, even if Khay does invest this time and energy, sticking with her refusal belief can still be rationally permissible as long as it coheres with her other beliefs. We explain below why such coherence is likely due to Khay's distrust in the medical establishment.

In sum, as long as Khay's incoherences are implicit, they do not make her irrational. But as soon as these incoherences become explicit, she is likely to revise them in such a way that her refusal-belief coheres with her other beliefs. Importantly, whether this kind of revision (in favor of the refusal-belief and against the belief that conflicts with it) is itself rational will depend on whether her distrust of epistemic authorities is rational – an issue to which we will return towards the end of this section.

At this point, one might object that we rely too heavily on a coherentist picture of rationality and claim instead that Khay's belief is irrational because she *fails to respond correctly to her possessed reasons*. Many philosophers have recently abandoned the idea that rationality is a purely structural matter of how your attitudes relate to one another (Kiesewetter, 2017, 2020; Lord, 2018). On this alternative view, a person's beliefs might well cohere with one another but if they are unresponsive to certain facts that constitute evidence against them, then these beliefs will count as irrational, nevertheless. Importantly, facts must be *possessed* by the person in order to be relevant to the rationality of the person's beliefs: if you do not know p, perceive p, or remember p, etc., then p cannot make a difference to your rationality. For instance, if the house is burning but you do not know about the fire at all, then leaving the house is not rational although it would be best to do so (Parfit, 2001, p. 17).[21]

Therefore, the question to be considered is the following: do Khay's possessed reasons – the facts she remembers from her studies, what she reads in newspapers, etc. – make the belief that she should not be vaccinated rational? Maybe after Khay left university, she had many experiences that made her lose confidence in scientific practice. If her individual experiences fostered such distrust, then the testimony of scientific experts might be unavailable to her as a reason in the way it is available for people who trust the epistemic establishment. That is, the testimony of scientific experts might not provide Khay with a reason for her beliefs or she might be rational in not ascribing the same weight to expert testimony as those who do trust the experts. As a result, due to her distrust, she will not *possess* the same set of reasons as people who have trust. Thus, on a reasons-responsivist view of rationality, it seems that the rationality of Khay's beliefs depends on whether her distrust of the relevant epistemic authorities is *itself* supported by her possessed reasons.

[21] "Responding correctly to reasons" implies that you take up the attitude supported by your reasons *for* the reasons that support it: you are not always rational when you possess epistemic reasons for believing that vaccines are safe, *and* you believe that vaccines are safe. If you believe this only because you threw a dice and it showed 6, then you are not rational. Rather, your attitudes must be *properly based* on your reasons (cf. Lord, 2018, chs. 5 and 6).

One might be inclined to think that Khay's distrust is irrational. Forming complex beliefs about viruses and vaccines is outside the competence of individuals who lack professional training. Thus, the only rational option seems to be reliance on epistemic authorities – scientists and medical practitioners. However, trust in epistemic authorities can be rationally undermined by different factors.

First, evidence suggests that many lose trust in the medical establishment because of widespread systemic injustices, like sexism and generally disrespectful treatment of patients (Navin, 2013), dismissal of patient concerns (Helps et al., 2019, p. 5), as well as racism (see Bunch, 2021), which are all found to be central to how vaccine refusal comes about (especially in the specific context of COVID-19 vaccination; see Kärki, 2021, pp. 2–3). While Khay might not be a constant target of these injustices, it is plausible that she has experienced some of them and that she knows that others experience them regularly. This can lead to her losing a significant degree of trust in medical practitioners, who are intimately linked to the science community.

Second, Levy (2022) argues that our environments are *epistemically polluted*, and that this pollution can make it rational to reduce one's trust in certain institutions. The two driving factors of epistemic pollution, according to Levy, are mimicry of expertise (ibid., pp. 112–115) and problems within scientific practice itself (ibid., pp. 115–117). Mimicry of experts is the contemporary analogue of ancient sophistry. Levy mentions fake scientific journals as well as parallel institutions that aim at spreading doubt about science, like the "American College of Pediatrics", a right-wing institution misleading people into thinking that their statements are representative of the medical consensus. As for problems within science itself, Levy discusses scientific crises: results cannot be replicated, journals are biased towards publishing on specific topics, and research is often dependent on companies that have an interest in funding it. According to Levy, this overall epistemic pollution created by other agents makes it difficult for us to assign trust scores to experts in proportion to their reliability (ibid., pp. 117–124). Therefore, Levy's view is that we should take measures that reduce epistemic pollution and increase trust in science, rather than trying to improve individuals' reasoning skills or epistemic virtues, which are not as deficient as we think (ibid., pp. 124–131).[22]

These two main factors – systemic injustices and epistemic pollution – provide Khay with reasons for discrediting objectively reliable sources. Additionally, the media outlets Khay

[22] Cf. also Jamieson et al. (2021) for a recent study that reveals the importance of increasing trust in health authorities to promote vaccine acceptance.

consults sometimes report contradictory results and Khay is also aware that scientists themselves disagree on many details concerning, say, the efficacy of vaccination against new virus mutations, and that they change their own views with incoming evidence. As a result, Khay perceives an overall atmosphere of uncertainty that rationally leads her to caution with regard to COVID-19 vaccines.

Let's take stock. Rationality as reasons-responsiveness is about *possessed* reasons, and Khay's possessed reasons are largely shaped by which sources she regards as trustworthy. The question of whether vaccine refusal is epistemically rational therefore breaks down to the question of whether Khay's distrust of mainstream epistemic authorities is rational. Relying on recent empirical literature on injustice in medical practice, we have suggested that many vaccine-refusers rationally develop distrust towards the medical establishment. Combined with the fact that vaccine-refusers must navigate through epistemically polluted environments, it seems that Khay, even though she is an educated person, can easily end up *rationally* believing falsehoods about whether she should be vaccinated.

A fortiori, less educated and socially more disadvantaged groups – who usually suffer from more injustices and have more difficulty navigating epistemically polluted environments – are thus even more likely to be rational in distrusting mainstream epistemic authorities. As a result, standard vaccine-refusers are epistemically rational: they don't commit an epistemic mistake. But do they perhaps commit another mistake?[23]

5. Is There a Moral Mistake?

A legitimate reaction to this conclusion is to concede that Khay's mistake is not epistemic, in that her belief is not irrational, but to insist that vaccine-refusers certainly make a *moral* mistake in refusing the vaccine. To recall, one main purpose in this paper is to evaluate the rationality

[23] In evaluating the rationality of vaccine-refusers, *time* is a significant factor. For instance, if more and more expert predictions turn out to be true, distrust of experts will become less rational. So, while a vaccine-refuser might not have been irrational, say, a few months ago, they might become irrational if with time they come to possess more and more evidence against their refusal-belief. Note, however, that due to their distrust, much evidence that turns up might not be easily accessible to them *as evidence for vaccine safety*, or it might not be strong enough, given their other possessed reasons, to render their distrust irrational. In order to access new evidence, refusers would have to further inquire or actively deliberate about the new evidence – activities that take up time and energy. If a refuser has sufficient time and energy for such epistemic activities, then failing to (intend to) engage with the new evidence can be *practically* irrational. Yet the refusers' current beliefs might remain *epistemically* rational as long as the refuser does not engage with the new evidence. Confirmation bias might explain why a refuser does not engage with new evidence, thereby contributing to their practical irrationality. What we must acknowledge is that a refuser's rationality, both epistemic and practical, can be affected by changing epistemic circumstances, and that therefore changing epistemic circumstances can affect how we should engage with refusers.

of the beliefs of the standard vaccine-refuser. We do not intend to assess their *moral* qualities. Still, we regard it as important – not least because it might inspire some further exciting works on the matter – to say a few words about what seems to be the least and the most plausible way of capturing the potential moral mistake that Khay makes.

One first conceivable way of capturing the potential moral mistake made by the standard COVID-19 vaccine-refusers would be to state that they are free-riders: they do not contribute to the goal of herd immunity while reaping its benefits by relying on other people who receive the shot. This, however, does not seem to be true of the standard COVID-19 vaccine-refusers (see Yaqub et al., 2014). Indeed, many of them spread anti-vaccination material and take it as their moral duty to warn others of the supposed health risks of the vaccine. This seems incompatible with the intention to free ride (see Kärki, 2021).

Besides the contribution to herd immunity, two main moral reasons speak in favor of receiving the vaccine. They are: (i) the fact that vaccination prevents the most serious complications of the disease and, thereby, avoids potentially harmful overcrowding of hospital beds, and (ii) the fact that a vaccinated person, even if he or she is a carrier of the virus, might be less contagious, thereby reducing the risks he or she poses to others.

It seems that vaccine-refusers display a form of unresponsiveness to these objective moral reasons (in that these moral reasons do not cause them to change their minds). Is this sufficient to say that the vaccine-refusers make a moral mistake? Things are not as simple.

Even though most of the standard vaccine-refusers have certainly heard of facts (i) and (ii), it is not obvious that they are able to recognize them as sufficient reasons to change their mind. One explanation for this inability is their distrust of the medical establishment (already discussed in section 4). Furthermore, the currently prevalent rather individualistic conception of healthcare might contribute to making certain moral reasons inaccessible to patients. The patient is sometimes perceived – and she sometimes sees herself – as a "consumer" who has a right to take advantage of the healthcare system (cf. Kata, 2012, p. 3784). This individualistic framing of healthcare certainly makes it harder to recognize altruistic considerations (such as i and ii) as sufficient reasons to change one's mind about the vaccine.

But if this is so, if vaccine-refusers cannot in fact recognize facts (i) and (ii) to be sufficient reasons to change their mind, is it legitimate to criticize them for not changing their mind about the vaccine? Readers who are moved by internalist intuitions will be inclined to answer this question negatively. Suppose someone you trust lies to you by saying that she is a good snowboarder (when in fact she is quite bad). You cannot recognize her statement to be a reason to stay on the easy slopes. As a result, if you take her to a very steep slope and she

breaks her wrist, it does not seem you are to be criticized for this accident. The same internalist reasoning can be run regarding the vaccine-refusers. If their lack of trust and the individualistic conception of healthcare prevents them from recognizing (i) and (ii) to be sufficient reasons to change their minds, they are not to be criticized for not changing their minds.

Here once again a lot depends on whether their distrust of the medical establishment is appropriate or not. By way of a final remark, we wish to emphasize that *time* is a crucial factor to consider here. As more evidence gets uncovered and becomes undeniable – for instance, if more and more people get vaccinated without suffering severe side effects – vaccine-refusers will be under more and more rational pressure to trust the medical establishment and, consequently, to change their mind about the vaccine. Thus, while many vaccine-refusers might not *yet* commit any rational or moral mistake because their beliefs seem to respond to the current reasons they possess (given their lack of trust), they might end up committing such a mistake if they remain entrenched in their position and do not agree to trust the medical authorities again.[24]

If our analysis in this paper is correct, then distrust often causes people to *rationally* reject reliable sources of knowledge when it comes to vaccine recommendations. Public health policy should take this into account and focus on rebuilding trust in the medical establishment, also by ensuring that all social groups can *rationally* regard the institutions as trustworthy. It should also encourage vaccine-refusers to continue engaging in inquiry, especially with those they distrust, i.e., the "mainstream" epistemic authorities. Importantly, all this should be done without presenting vaccine-refusers as irrational or immoral. For, as we have argued, they aren't irrational or immoral in any way that obviously warrants criticism.

6. Conclusion

In conclusion, we would like to briefly recall the main results of this paper and present their most relevant implications.

First, standard vaccine-refusers are not like contemporary Don Quixotes, due to being responsible for their beliefs (section 3) and due to being dispositionally rational with regard to their refusal-belief (section 4). We need to acknowledge that we are dealing with people who

[24] See footnote 23 on the relevance of time and further incoming evidence for the rationality of vaccine-refusers. However, note that in the many cases when people suffered from racist, sexist or other kinds of traumatizing experiences with the relevant authorities, the new evidence for the trustworthiness of medical and scientific institutions would have to be strong for the victims to rationally trust these institutions. Probably such strong evidence could be attained by vulnerable groups *only if the institutions actually become more trustworthy for them* than they currently are. We thank an anonymous reviewer for pressing us to emphasize this point.

are rational and with whom we should enable rational dialogue. If we deny this, we risk committing epistemic injustice by overconfidence in our own judgements concerning their rationality and intellectual arrogance in taking ourselves to be epistemically superior (Cassam, 2021, pp. 2–3). Now, such injustices could have the undesirable effect of isolating vaccine-refusers from the rest of the epistemic community. Rational engagement with these agents might then become difficult or even impossible, because what we take to be a sufficient reason for or against a belief won't coincide with what they take to be a sufficient reason and vice versa.

Second, section 4 also defended the claim that the vaccine-refusers' belief that they should not get vaccinated is *propositionally rational* (to recall, it follows from this claim that they are not dispositionally irrational in virtue of their refusal-belief). If vaccine-refusers are rational persons holding rational beliefs, any policy that aims at changing their beliefs and actions without argument requires special justification. For this reason, making vaccines against COVID-19 mandatory by sanctioning non-compliance is *prima facie* problematic because it forces people to act against their rational judgement about what to do.

Now, one might object that it is not always *pro tanto* bad to force people to comply with a (public health) policy against their own judgement, and this even when this judgement is rational (take a case of rational sexism, for instance).[25]

There are certainly situations in which it is legitimate to force an individual to comply with a policy or principle even if it goes against their rational judgement. But we wish to submit that there is a strong *pro tanto* reason not to do so when their belief is rational. To see this, consider how enforcing compliance by non-rational means is likely to undermine the subject's autonomy when their beliefs are rationally held, but not when their beliefs are irrational.

Consider first a clear case of an irrational vaccine-refuser who believes that he ought not to get vaccinated *and* believes that the evidence points towards the conclusion that he ought to get vaccinated. Here it seems that we might actually *help* him to become more intellectually autonomous by nudging him towards doxastic enkrasia: that is, by helping him to make his belief that he ought to get vaccinated coherent with his belief about evidence. If there is any reason not to interfere with his beliefs here, then this reason is easily outweighed. This is because his intellectual autonomy is not obviously threatened by non-rational means.[26]

[25] We thank an anonymous reviewer for raising this legitimate objection.

[26] We thank an anonymous referee for pointing out that there might always be some *pro tanto* reason not to interfere with belief forming processes, even if they are irrational. However, we claim that the reason not to interfere is stronger when the beliefs are rational, because then autonomy is at stake.

By contrast, if we are successful in nudging a rational vaccine-refuser, or even just someone who rationally suspends judgement about the vaccine, towards *believing* that she ought to get vaccinated, then we might wonder if we are any better than politicians who make use of targeted political advertising based on purchased social network data about undecided voters.[27] Interfering in this way in rational processes of belief formation undermines people's intellectual autonomy by doxastic manipulation (cf. Chrisman, n.d.).[28] However, as just said, in cases where someone clearly suffers from irrationality, some kinds of interference can be good means of *helping someone out* in their process of belief forming or decision making. It is a complex question, of course, which ways of interfering count as "helping out".[29]

In sum, it seems that the rationality of vaccine-refusers provides a strong *pro tanto* reason against mandatory vaccination or other non-rational means of enforcing vaccination. But, let us insist, this reason is only *pro tanto*. If, for instance, severe harms can be prevented by introducing it, mandatory vaccination can be permissible or even obligatory. Still, this policy should not be adopted lightly, since the *pro tanto* reason we identified in this article seems weighty. In particular, this reason seems more weighty than the reason against interfering when a person holds an irrational belief, because in that case the subject's autonomy isn't obviously threatened.

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[27] We here of course think of the Facebook and Cambridge Analytica Data Scandal; see, for instance, Confessore (2018).

[28] Note that we are not claiming here that there is any essential connection between rationality and autonomy. The idea is merely that the fact that someone is rational is an indicator that the person is autonomous in their beliefs or decisions, and that certain forms of interfering in rational processes of belief formation or decision making are often likely to threaten a person's autonomy. On a recent extensive treatment of the relationship between rationality and autonomy in the context of bioethics, see Pugh (2020).

[29] For a helpful discussion on how nudging can improve intellectual autonomy, see Levy (2022, pp. 132–148), who argues that nudges can often provide epistemic reasons for belief, and Grundmann (2021), who argues that we can nudge people not only towards actions, but also to holding justified beliefs (without nudges being epistemic reasons for those beliefs). On the dangers of nudging for a person's autonomy, see Bovens (2008) and Wilkinson (2013).

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