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ARTICLE

Curiosity and Mental Search

Julia Smith

Hope College, Holland, MI, USA
Email: juliasmith@hope.edu

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Abstract

Some philosophers have recently argued that one should not be curious about a question whose answer one knows. This norm is said to follow from the fact that curiosity aims at knowledge. This article contends that the view that curiosity is inappropriate when directed at what is known, though attractive, is false. In fact, we are frequently curious about questions whose answers we know, and this curiosity is entirely appropriate because, along with metacognitive judgments about the contents of memory, it plays an important role in the process by which we successfully retrieve knowledge from memory. If this argument is successful, it reveals that some curiosity-driven inquiries target knowledge that lies within one's own mind and raises important questions about the status and interpretation of the claim that curiosity aims at knowledge.

Keywords: curiosity; metacognition; inquiry; aims; feeling of knowing; Knowledge Norm

1. Introduction

Ordinarily, curiosity is directed towards what we do not know. I can be curious about who will be at the party when I haven't seen the guest list, but my being curious about who will be at the party seems odd when I know who will be there. One explanation of why it seems odd for a person to be curious about a question whose answer they know appeals to the aim of curiosity. From this perspective, which finds support in both the psychological and philosophical literature, curiosity aims at knowledge. If the goal of curiosity is securing some item of knowledge, then curiosity ought to cease when the relevant knowledge is acquired. According to this viewpoint, the best explanation of why it seems odd to be curious about a question whose answer one knows is that there really is something inappropriate about being in such a state. Accordingly, some authors have defended the existence of an Ignorance Norm that prohibits being curious about questions whose answers one already knows.

The idea that it is always inappropriate to be curious about something one knows has been challenged. As Avery Archer (2018) has argued, sometimes being curious about something known but temporarily irretrievable is the most effective strategy for recalling that knowledge to mind. Even so, one might think that what this shows is not that the Ignorance Norm is false, but that there are instances in which it is violated blamelessly (van Elswyk and Sapir 2021).

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The central contention of this paper is that it is frequently appropriate to experience curiosity about what is already known, and that far from being blameless norm violations, these instances represent human curiosity functioning just as it should. By examining the cognitive science of metacognitive feelings and the role they play in memory search, we come to understand the adaptive role curiosity plays in the process by which we retrieve temporarily inaccessible knowledge stored in memory.

A secondary aim of this paper is to evaluate the implications of the fact that curiosity can be a tool for retrieving stored knowledge for the view that curiosity aims at knowledge, a view that is widely accepted among contemporary curiosity researchers as being intuitively compelling and parsimoniously explaining a large range of human and animal behaviors as curiosity-driven searches for knowledge. However, once we recognize that it can sometimes be perfectly appropriate to be curious about something *known*, the view that curiosity aims at knowledge can seem less plausible. If an important function of curiosity is to help agents access knowledge that lies within us, then perhaps curiosity is not best described as being directed at knowledge gain. The recognition that some inquiries target knowledge that lies within one's own mind raises important questions about the status and interpretation of the claim that curiosity aims at knowledge.

2. The nature of curiosity

I will assume that curiosity is a question-directed attitude with motivational force. To say that curiosity is a *question-directed attitude* means that it is an attitude that has a question, rather than a proposition, as its content (Carruthers 2018; Friedman 2013; Whitcomb 2010). Conceiving of curiosity as a question-directed attitude has several advantages over alternative higher-order propositionalist views, which conceive of curiosity as a desire for knowledge (Litman 2005; Sharot and Sunstein 2020) or a desire to reduce a perceived gap between what one knows and what one wishes to know (Loewenstein 1994). These views posit that epistemic statuses such as knowledge and ignorance figure into the propositional content of curiosity, thereby requiring curious agents to have metacognitive capabilities. Yet, the dominant view among those who study curiosity is that many creatures incapable of possessing concepts such as knowledge, ignorance, and belief (e.g., octopi, rats, and infants) are nevertheless capable of curiosity. The view that the mental contents of curiosity are questions rather than propositions allows for agents who are less cognitively sophisticated than us to be curious, since plausibly, mentally representing a question is attainable for creatures incapable of more sophisticated metacognition.[1] For this reason, I will assume that curiosity is a question-directed attitude.[2]

[1]Compare Friedman on this point: "For us [humans], having [interrogative attitudes such as curiosity] plausibly often involves higher-order thought. But that sort of thought is neither necessary nor sufficient for having an [interrogative attitude]" (2013, p. 156). See also (Carruthers, 2018, 2023).

[2]The view that curiosity is a question-directed attitude has additional advantages over the alternative view that curiosity has propositional content. For one thing, ascriptions of curiosity embed questions, not propositions. The fact that the semantic contents of curiosity ascriptions are questions provides initial support for the view that the mental contents of curiosity underlying these ascriptions are, too. For another, it is implausible that the mental content of curiosity is a proposition or propositions that would satisfy my curiosity, since I can be curious without having any attitude at all towards those propositions, or even representing them in thought. See Whitcomb (2010, pp. 671–672), Friedman (2013, especially pp. 146-9 and p. 163), and Carruthers (2018, pp. 3–5) for elaboration on these considerations in favor of the view that the content of curiosity is a question. See Haziza (2022) for an opposing perspective. See Friedman (2013, pp. 149–153) for further elaboration on the content of a question.

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Irrespective of how we characterize the content of curiosity, any adequate account will capture the fact that curiosity is a motivational state. Curious agents are characteristically motivated to engage in information-seeking behavior.[3] For example, a philosopher's curiosity about Kantian transcendental arguments for God's existence will motivate her to seek out and read primary and secondary sources on those arguments, and a rat's curiosity about the properties of new objects added to its cage will motivate it to approach and explore those objects. Of course, curious agents may sometimes fail to engage in information-seeking – for example, if the motive to satisfy curiosity is suppressed because an agent has more urgent priorities. It will be helpful to distinguish between curiosity as an attitude that has motivational force from the information-seeking behavior that is often (but not always) the result of curiosity. The attitude with motivational force is curiosity; the information-seeking behavior by which an agent seeks the answer to the question that is her curiosity's content we can call *question-driven inquiry*.

For our purposes, it is also important to note that among contemporary curiosity researchers, it is widely agreed that curiosity is intrinsically motivated. Curious agents regard certain information as intrinsically valuable, pursuing it even when it has no discernible benefit and even sacrificing other goods to obtain it (Harlow 1950; Harlow et al. 1950; Wang and Hayden 2019). Within the history of psychological research on curiosity, situations in which animals or people treat the acquisition of information itself as rewarding have been understood as paradigmatic instances of curiosity. D.E. Berlyne, one of the pioneers of contemporary curiosity research, defined specific curiosity as a state of *intrinsic motivation* that is directed toward gaining particular information, and distinguished this from *diversive* curiosity, a state that *intrinsically motivates* a more general seeking of stimulation (Berlyne 1954). With these preliminaries aside, we can turn to the question of the relationship between curiosity and knowledge.

3. The Ignorance Norm and the aim of curiosity

Recently, some philosophers have argued that it is not epistemically permissible to be curious about questions whose answers one already knows. Initial support for the view that there is a norm prohibiting this comes from reflection on the following kinds of cases:

Idle Curiosity 1

Asher is idly passing the time by thinking about movies he'd like to see. He enjoyed Daniel Craig as Bond in *Casino Royale* and becomes curious about Craig's starring roles before he was selected to play Bond. He pulls out his phone and learns from Craig's Wikipedia page that he starred in *Munich* the year before *Casino Royale* and in *Layer Cake* the year before that.

Idle Curiosity 2

Ben is idly passing the time by thinking about movies he's like to see. He's a James Bond fan and knows that Daniel Craig starred in *Layer Cake* and *Munich* in roles somewhat similar to the role of Bond before he was cast as Bond in *Casino Royale*. However, he becomes curious about what Craig's starring roles were before he was selected to play Bond. He pulls out his phone, navigates to Craig's Wikipedia page and

[3]In contemporary philosophers' definitions of curiosity, the motivational component of curiosity is captured in various ways: for example, by characterizing it is a *goal-directed* state of mind (Friedman, 2017), a *desire* to know (Whitcomb, 2010), or a state that *causes knowledge acquisition* (Carruthers, 2023). While conceptually distinct, these characterizations all imply the motivational force of curiosity.

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reads that Craig starred in *Munich* the year before *Casino Royale* and in *Layer Cake* the year before that, just as he knew.

Both Asher and Ben are curious about Daniel Craig's starring roles prior to playing Bond. But while Asher's curiosity and subsequent question-driven inquiry seem ordinary and unproblematic, Ben's curiosity and subsequent inquiry seem odd. Why? One possible explanation is that Ben's curiosity is inappropriate because, unlike Asher's, it is directed at a question whose answer he already knows. Why bother to seek out knowledge one already has? Some have argued that these considerations suggest the existence of a norm prohibiting an agent from knowing P while holding a question-directed attitude toward some question Q to which P is an answer. Where P^Q signifies that P is a true and complete answer to Q:[4]

Ignorance Norm: One ought not: be curious about Q and know P^Q.[5]

Ben's curiosity violates the Ignorance Norm, whereas Asher's curiosity is acceptable by the lights of this norm. Thus, the Ignorance Norm can explain our intuitions about what is going wrong in Ben's case, and also what seems odd about similar cases in which agents are described as being curious about something they know. So far, so good.

So far, though, the Ignorance Norm provides only a superficial level of explanation. *Why* should it be inappropriate for a person to be curious about a question whose answer they already know? A deeper explanation – one that underlies and substantiates the Ignorance Norm – is provided by an attractive and widely endorsed picture of curiosity as "aiming at" knowledge gain. There are two parts to this claim: that curiosity *aims at* something, and that what curiosity aims at it is *knowledge*. First part first. It is commonly said that inquiries motivated by curiosity have an aim or goal:

> "Suppose that you are inquiring into whether something is so. Your *aim is to find out whether it is so*. Since finding out is nothing less than coming to know, what you aim for is knowledge." (Millar 2011, p. 63, emphasis mine)

> "[The question-directed state of mind that motivates inquiry] is *a goal-directed state of mind*. It's a state of mind that has specific sorts of epistemic or doxastic satisfaction conditions: in inquiring into some question *we aim to resolve or answer the question—we aim to (e.g.) know the answer* to the question." (Friedman 2017, p. 308, emphasis mine)[6]

> "Suppose you ask yourself whether your father's record collection includes a certain recording of *The Trout* and venture to find out. At that time, you embark on an

[4]A complete answer to some question is a proposition that provides an exhaustive answer to that question. For example, a complete answer to the question 'Who will be at the party?' is the proposition that supplies the identities of everyone who will be at the party and says that no one else will be there.

[5]The Ignorance Norm is endorsed by Friedman (2017, p. 311), Whitcomb (2017, p. 152) and van Elswyk and Sapir (2021, p. 5838). Friedman formulates the Ignorance Norm as a prohibition on holding an interrogative attitude (a category that includes curiosity, but also includes other potentially distinct question-directed attitudes such as wondering) towards a question whose answer one knows. Whitcomb and van Elswyk and Sapir formulate the norm as a prohibition on *inquiring* into a question whose answer one already knows. However, they would also endorse the norm as formulated here, since they view having a question-directed attitude as central to inquiry (*cf.* Whitcomb (2017, p. 149), van Elswyk and Sapir (2021, p. 5838)).

[6]In more recent work, Friedman expresses skepticism about whether there can be any coherent meaning given to the claim that inquiry "aims at" anything (2023).

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> inquiry into whether your father owns the relevant recording. *Your inquiry is a project with a specific goal*: finding out whether your father owns the recording. This fact about your inquiry generalises: *inquiry is a goal-directed enterprise*." (Kelp 2014, p. 1, emphasis mine)

What is the aim or goal of curiosity and the inquiries it motivates? According to these authors, the aim is to *find out the answer to a question.* But when has one found out the answer to a question? Plausibly, when one *knows the answer* to that question. Hence, knowledge is frequently taken to be the aim or goal of curiosity and question-driven inquiry.[7]

Figurative talk about aims and goals is notoriously slippery to interpret, but it is typically agreed that the aims or goals of an activity ground, or perhaps even constitute, norms pertaining to that activity. For example, a standard interpretation of the claim that belief aims at truth is as a normative claim about when one ought to believe something: namely, that one ought to believe P only if P is true (Gibbard 2005; Wedgwood 2002, 2013; Whiting 2013). Similarly, we can view talk about the aims or goals of curiosity as establishing or perhaps constituting the norms of curiosity and the inquiries it motivates. The Ignorance Norm looks like an excellent candidate for such a norm: plausibly, if curiosity aims at getting knowledge of the answer to some question, one ought not to be curious when one has that knowledge.[8]

A similar justification for the Ignorance Norm eschews talk of aims or goals, putting the point instead in terms of the *satisfaction conditions* for curiosity:

> "Curiosity is a desire for knowledge . . . in that it *comes to be satisfied* iff you come to know the answer to the question that is its content." (Whitcomb 2010, p. 673, emphasis mine)

> "[C]uriosity both causes, *and is satisfied by*, knowledge acquisition—as well as being caused by one's own ignorance and sustained by learning." (Carruthers 2023, p. 6, emphasis mine)

Whitcomb elaborates on what it means for curiosity to be satisfied by way of an analogy with hunger: curiosity stands to knowledge as hunger stands to nourishment. In each case, there is a desire (curiosity, hunger), and its "unique satisfier" (knowledge, nourishment). Knowledge is the unique satisfier of curiosity in that curiosity will be satisfied when and only when the curious agent possesses knowledge of the answer to her question (2010, p. 673). While avoiding talk of aims or goals, this picture of the relationship between curiosity and knowledge allegedly produces the same normative result: conceiving of knowledge as the unique satisfier of curiosity can explain why it is "illegitimate" to be curious about a question whose answer one knows:

> [I]t is illegitimate to be curious about a question when you know its answer. And why is that illegitimate? For the same reason, whatever it is, that it is illegitimate to be hungry when you are nourished. In each case there is a proprietary desire and its

[7]Authors who defend the view that curiosity aims at knowledge include Christophe Kelp (2014, 2019, 2021), Alan Millar (2011), Jennifer Nagel (2024), Peter van Elswyk and Yasha Sapir (2021), and Timothy Williamson (2000).

[8]Compare van Elswyk and Sapir on the connection between the Ignorance Norm and the view that inquiry aims at knowledge. They write that the Ignorance Norm is no longer "controversial," but rather, "pretty boring and mundane if knowledge is the aim of inquiry" (2021, p. 5853). See also (Haziza, 2023).

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> unique satisfier, and it is illegitimate to have both of them at once. The proprietary gustatory desire is hunger and its unique satisfier is nourishment; similarly, the proprietary epistemic desire is curiosity and its unique satisfier is knowledge. (Whitcomb 2010, p. 674)

According to this way of thinking, identifying the aims or satisfaction conditions of curiosity has implications for the conditions under which curiosity properly terminates. Specifically, once we recognize that the aim or unique satisfaction condition of curiosity is knowledge, we can see that one ought not to be curious about what one knows. Going forward, I will lump these closely related justifications for the Ignorance Norm together, speaking primarily of whether the view that curiosity *aims at knowledge* supports the Ignorance Norm.

4. Being curious about what you know

One interpretation of a case like Idle Curiosity 2 is that Ben's mental state as described is not psychologically possible. There is some intuitive pull to the idea that the presence of curiosity about Craig's roles prior to Bond shows that Ben's confidence about what those roles were is wavering in a way that is incompatible with knowledge. According to this interpretation, what strikes us as odd about Ben's situation is not that he violates an epistemic norm, but that he is portrayed as being in a psychologically impossible state. If this interpretation is correct, the motivation for the Ignorance Norm disappears: there is no need to posit a prohibition on doing something that it is psychologically impossible for us to do!

The following cases, however, show not only that it is possible, but that it is common, for a subject to be curious about a question whose answer they know:

Colleague

Claire knows that her colleague Damian is on leave in Paris this term; he told Claire last month that he would be. Still, yesterday Claire seemed to have no memory of that conversation with Damian and she was curious about why he hadn't been to the talk last week; today she remembered. Yesterday, Claire knew why Damian hadn't been to the talk, and yet she was curious about why he'd not been there at the same time. (Friedman 2017, pp. 309–310)

Keys

Emma knows that she's put her keys in her tennis bag, but she spends 20 minutes wondering where they are. Eventually, Emma recalls what she's done and locates her keys. (Friedman 2017, p. 310)[9]

Cases can be multiplied. These kinds of examples show that it is possible to be curious about something one already knows. Claire knows that Damian is in Paris, concurrently with being curious about why he isn't at the talk. Emma is curious about where her keys are while knowing that they are in her tennis bag. In general, we are willing to attribute to subjects knowledge of propositional content they have stored in memory, even when that knowledge is not occurrent. The same principle applies here: the subjects have some propositional content stored in memory, but their ability to retrieve that content is

[9]These passages are adapted slightly to take them out of the first person and to name the protagonists. It is also important to note that many would not see Keys as an uncontroversial case of curiosity, since Emma's question-driven inquiry is *instrumentally* motivated, not *intrinsically* motivated: she is not seeking knowledge for its own sake. I've included the case because of its prominent place in the literature on the Ignorance Norm, but subsequent discussion applies just as well to cases involving an intrinsically motivated agent (cases like Movie Story 1, Movie Story 2, and Colleague).

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temporarily blocked. Later, and without acquiring new information, the subjects can recall the temporarily inaccessible information, suggesting that it was known all along.[10]

So, it is possible to inquire into a question whose answer one knows. But, according to defenders of the Ignorance Norm, it is not permissible. This stance might seem unduly harsh towards agents like Claire and Emma, who seem to be forced by factors beyond their control (*viz.*, challenges that attend recall for ordinary subjects) into violating an epistemic norm.[11]

One response is to argue that Claire and Emma (and agents in similar situations) are blameless because they falsely yet justifiably believe that they *do not know* the answer to the question they're curious about (van Elswyk and Sapir 2021).[12] Though they violate a norm, they falsely but justifiably believe that they are in a situation in which curiosity is appropriate, and so their norm violations are blameless.

This interpretation, however, gets things wrong in more than one way. First, it is a mistake to think of agents like Emma as characteristically wrong about whether they possess the knowledge that is the target of their curiosity. To the contrary, agents with knowledge that is temporarily inaccessible are frequently aware that they possess this knowledge. Second, it is a mistake to think of agents who experience curiosity while trying to retrieve temporarily inaccessible information as violating a norm, even excusably. As I will go on to show, there is credible empirical evidence that being curious about temporarily inaccessible information stored in memory is an important part of the process of successfully retrieving the stored information. We can articulate these claims as follows:

Knowledge of Temporarily Inaccessible Knowledge (KIK): Cases in which agents possess knowledge that is temporarily inaccessible to them, yet have occurrent knowledge that they possess this knowledge, are common.

Permissible Curiosity (PC): In the presence of a feeling that one knows the answer to Q^P, curiosity about the answer and the attempts at retrieval from memory it motivates are permissible.

Jointly, these claims express the view that we often know when information is stored in memory, that curiosity often motivates behaviors that help us recover that knowledge, and that this state of affairs is often perfectly epistemically appropriate. In the remainder of this section, I defend these two claims.

[10]The standard interpretation of these cases is that they show that knowing P and having a question-directed attitude toward Q^P are compossible. See, e.g., Friedman (2017), Archer (2018), and van Elswyk and Sapir (2021). I'll return to the plausibility of this interpretation in Section 5.

[11]A related criticism is that it is often not within a person's power to comply with the Ignorance Norm, since people are often unable to control whether they experience curiosity or whether they possess knowledge, and so are unable to comply with a wide-scope norm that prohibits being curious about a question whose answer one knows. One way to address this concern is by weakening the norm so that it prohibits *inquiring* into a question whose answer one knows, but not having the attitude that motivates the inquiry. Whether one experiences curiosity may not be under one's control, but whether one *acts* on one's curiosity by engaging in inquiry is. Bearing this in mind, the arguments I offer against the Ignorance Norm in the remainder of the paper are applicable to both the original and the weakened versions of the norm. There are circumstances in which it can be appropriate both to be curious about what one knows *and* to act on that curiosity.

[12]Like van Elswyk and Sapir, Friedman sees such agents' curiosity as attributable in part by lack of awareness that they possess the knowledge that is the target of their curiosity, writing of Keys that "some knowledge that [Emma has] temporarily escapes [her] view *along with the knowledge that [she has] it*, and as a result [she reconsiders] a question that that knowledge fully answers" (2017, p. 310). Whitcomb also argues that norms about when to end or reopen inquiry are violated excusably when one justifiably believes one is not violating the norm (2010, pp. 677, 681).

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4.1. Knowledge of Temporarily Inaccessible Knowledge

KIK says that it is quite ordinary for people to have trouble recalling something yet know that the (temporarily irretrievable) information is stored in memory. Why think that such cases are common? Begin by reflecting on a familiar experience: that of having a definite feeling that one knows the answer to a question but being unable to call that answer to mind. One feels as if the retrieval of a known fact is "blocked." William James evocatively describes this feeling as an "intensely active" gap in our consciousness which "beckons" us towards the target information (1890, p. 251). These experiences occur frequently and with many kinds of target information. Contemporary psychologists have studied this metacognitive feeling extensively, dubbing it the "feeling of knowing" (FOK) (Hart 1965). A closely related feeling is the "tip-of-the-tongue" state (TOT) (R. Brown and McNeill 1966). FOK is usually defined as a judgment that one knows the answer to a question (and sometimes, that one could pick it out of a list of alternatives). TOT is the feeling that information stored in memory will soon be recalled or that it is on the tip of one's tongue.[13] Both feelings have been documented in relation to retrieval of semantic information (e.g., *What is the capital city of South Africa?*) as well as retrieval of information from episodic memory (e.g., *Where did I see my phone last?*). Going forward, I won't make fine distinctions between FOK and TOT. What is important for our purposes is that both are metacognitive judgments about one's own epistemic states – in particular, they are judgments about whether certain information is known.

An especially fascinating feature of feelings of knowing is that they are generally reliable indicators of what is stored in memory. In his inaugural studies of FOK, Hart (1965, 1966) found that subjects who felt that they did not know the answer to a question and would not be able to identify it out of a list of alternatives did no better than chance on a subsequent multiple choice test, whereas subjects who felt strongly that they knew the answer to a question and would be able to identify it out of a list of alternatives were three times more likely to answer the subsequent multiple choice question correctly. Since Hart's initial research, FOK judgments have been confirmed to be a reliable predictor of the likelihood of recalling the target in the future, producing it in response to clues, and identifying it among distractors (R. Brown and McNeill 1966; Freedman and Landauer 1966; Schwartz and Metcalfe 1992).

FOK is not generated by direct access to the sought-after target. Rather, it is hypothesized that the subject's familiarity with the cue (Metcalfe et al. 1993; Reder 1987; Schwartz and Metcalfe 1992) and the accessibility of information related to the target (Koriat 1993, 1995; Koriat and Levy-Sadot 2001) mediate FOK. For example, in response to the question "Who wrote *The Catcher in the Rye*?," both (i) one's prior familiarity with the cue – in this case, the title of the novel, and (ii) the relevant information that comes to mind on being asked the question – for example, the nationality of the author, the time period of publication, memories of having read the book, etc. – would determine the presence and intensity of a FOK. Once we understand that this is the mechanism by which FOK operates, we can see why a high FOK can sometimes fail to predict the sought-after information: the accuracy of FOK reports will depend on the reliability of the related information that comes to mind when making the judgment, and such information may not always be reliable.

These findings support the interpretation that subjects who have high FOK possess knowledge that is temporarily inaccessible to them. Of course, FOK and TOT sometimes occur in cases in which the target information is not subsequently recalled. In these

[13]See Schwartz (2008) for a discussion of the relationship between these two closely related metacognitive feelings.

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cases, there is no way to detect whether the target information is really stored in memory, and so one might be reasonably reluctant to call these instances of knowledge. However, in a majority of cases, high FOK predicts successful retrieval. In these cases, it seems clear that the target information was known, but non-occurrent.

KIK claims not only that temporarily irretrievable information is known, but also that subjects often *know that they possess this knowledge*.[14] In support of this secondary knowledge claim, we can draw a parallel with the operation of our senses. Our senses are a reliable but not infallible guide to the world around us. It is widely acknowledged that our senses are sufficiently reliable to furnish us with knowledge of our surroundings, despite the existence of illusory sensory experiences. Like our senses, the mechanisms that generate FOK and TOT yield metacognitive feelings that are a reliable but not infallible guide to whether target information is stored in memory. Although both our senses and the mechanisms that produce our metacognitive feelings are fallible, and can even be deliberately manipulated to produce illusions (Schwartz 1998; Whittlesea 1993), this need not undermine the claim that both are sufficiently reliable to supply knowledge.[15]

Returning to Emma's case, if Emma experiences a strong FOK about the location of her keys, then it will be true of her that (i) she knows her keys are in her tennis bag, (ii) she is experiencing difficulty retrieving from memory the knowledge that her keys are in her tennis bag, and (iii) she knows that she knows where her keys are, despite her difficulties in retrieving this information. Put slightly different: Emma can accurately and justifiably represent herself as knowing the answer to the question *Where are my keys?* even if she cannot currently recall what that answer is.

Of course, persons in cases like Colleague and Keys will not *necessarily* experience FOK. They may, sometimes, represent themselves as not knowing the answer to the question that they seek. But given the prevalence of FOK, there will be many cases in which subjects in those kinds of situations do experience FOK. And in many of these cases, they will have both temporarily irretrievable knowledge as well as awareness that they possess this knowledge. Therefore, it is a mistake to conceive of subjects like Claire and Emma as necessarily or characteristically mistaken about whether they possess the knowledge that is the target of their inquiries. Rather – as KIK claims – cases are common in which agents know that they possess knowledge that is temporarily inaccessible to them.

4.2. Permissible Curiosity

Now we come to the second claim, Permissible Curiosity (PC):

> **Permissible Curiosity (PC):** In the presence of a feeling that one knows the answer to Q^P, curiosity about the answer and the attempts at retrieval from memory it motivates are permissible.

[14]In cases of temporarily irretrievable knowledge, the secondary knowledge in question will be knowledge of a proposition of the form *I know the answer to* Q^P, not, of course, knowledge of a proposition of the form *I know P*.

[15]If these considerations are not compelling, we can substitute for KIK the weaker claim that cases are common in which agents possess knowledge that is temporarily inaccessible to them, yet justifiably and truly believe that they possess this knowledge. Nothing of importance for my argument depends on the truth of the stronger claim that agents possess second-order knowledge in these cases rather than second-order justified true belief. The claim that is relevant for my purposes is that it is a mistake to see these agents as *justifiably yet falsely believing that they lack knowledge.*

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Metacognitive feelings such as the FOK and the TOT state are remarkable phenomena: they allow humans to know whether a particular piece of information is stored in memory without actually retrieving that information. But why should we have this ability? The leading view that has emerged among cognitive psychologists is that metacognitive feelings and judgments serve to *monitor* our own cognitive processes and to *control* our behavior in ways that facilitate learning (Nelson and Narens 1994; Son and Schwartz 2002). In the previous subsection (4.1), we saw that metacognitive feelings serve to "monitor" what is stored in memory, supplying a person with information about what memory contains. Information that is yielded by this monitoring process is then used to guide a person's behavior: to determine whether to initiate, continue, or stop some action pertaining to the learning process. This "control" function of metacognitive feelings and judgments was first hypothesized in the late 1970s and early 1980s at a time when there was little direct evidence to support it (A. L. Brown 1987; Flavell 1976; Kluwe 1982; Cf. Son and Schwartz 2002). Since this initial hypothesis, studies have repeatedly confirmed that metacognitive feelings and judgments exert influence over a person's learning strategies.

For example, it has been shown that the intensity of FOK predicts whether a subject will initiate a search of memory for the target information (Barnes et al. 1999), as well as how long subjects will continue a search before terminating it (Young 2004). Feelings of knowing guide subjects' choices about which inquiries to prioritize. Maciej Hanczakowski and colleagues (2014) asked participants to study 60 pairs of words (cue and target). Then, in the test phase portion of the experiment, subjects were shown a cue, and in cases where they did not answer with a target, were asked to provide a FOK judgment and asked whether they would like to restudy that cue-target pair. Participants more frequently chose to restudy items for which they had a high FOK – a result that held both when subjects were instructed to choose for restudy pairs that they believed they would be successful in learning, and when subjects were given no directions about which pairs to choose for restudy. Janet Metcalfe and colleagues obtained similar findings with an experiment designed to measure the relationship between being in a TOT state concerning the answer to a question and desiring to see the answer later (2017).[16]

The findings discussed so far support the "control" function of metacognitive feelings over subsequent inquiry, since they establish clear relationships between the presence of feelings of knowing and subsequent decisions about which inquiries to pursue, and for how long. But how is curiosity involved? PC concerns curiosity – specifically, it assumes that curiosity plays a role in retrieving information from memory in the relevant cases – so, it is crucial to establish the presence of curiosity in these cases.

As with any mental state with motivational force, there are two main approaches to measuring curiosity: observing subjects' behaviors and relying on self-reports. Both are common in the psychological literature, and both are used in experiments designed to study the relationship between curiosity, metacognitive feelings, and inquiry.

First, behavioral measures. Since curiosity is, by definition, an intrinsic motivation to engage in question-driven inquiry, it is reasonable to infer the presence of curiosity from certain observed search behaviors. Indeed, in the case of nonhuman animals, we have no other way to ascribe curiosity. It is not uncommon for researchers to assume that the conceptual link between curiosity and information-seeking obviates the need for self-report and justifies an exclusive reliance on behavioral measures to gauge curiosity. For example, in a recent study by Gregory Brooks and colleagues, one of the primary goals of

[16]In a series of experiments by Brooks and colleagues, FOK judgments were found to predict later restudy choices (2021).

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the researchers was to learn more about the role played by curiosity in controlling a subject's information-seeking decisions (2021, p. 153). In their pursuit of this end, the researchers inferred the presence of curiosity from subjects' decisions to prioritize certain inquiries over others. Brooks et al. defend the decision not to ask subjects to self-report their own levels of curiosity by appealing to the definition of curiosity and to the established norm of using behavioral measures in studies on state curiosity in children and nonhuman animals (2021, pp. 155, 163).[17] The researchers are correct to interpret subjects' choices to restudy or investigate certain items over others as an indication of higher levels of curiosity about the chosen items. When a person chooses, in the absence of any instructions about how they should make a restudy choice and any incentives that would reward greater accuracy in learning, to restudy information that would allow them to answer one question rather than another, a plausible explanation of this fact is that they are intrinsically motivated to obtain the answer to the former question – in other words, that they are curious.

In addition to using behavioral measures to infer curiosity, we can also try to determine the presence of curiosity through self-report, by asking subjects how curious they are about the answer to some question. In a series of experiments, Jordan Litman and colleagues (2005) found that people self-report higher levels of curiosity about questions when they have a strong feeling that the answer is on the tip of their tongue. In one experiment, participants were given 12 general knowledge questions ranging over topics in history, literature, and science, each of which could be answered with a single word (e.g., Q: "What is the name of the man who began the reformation in Germany?" A: "Luther"). For each question, a metacognitive judgment was elicited by asking participants whether they knew the answer, did not know it, or whether the answer was on the tip of their tongue. Participants were then instructed to write down the answer (if they had reported having known it) or to report the intensity of their metacognitive feeling by indicating on a 5-point Likert scale how confident they were that they could identify the correct answer on a multiple choice test (if they had reported not having known it, or that it was on the tip of their tongue). Finally, subjects were asked to indicate how curious they were to see the answer to each question on a 4-point scale ranging from "not at all curious" to "very curious." In a subsequent phase of the same experiment, subjects were given an opportunity to see any of the answers to the general knowledge questions that they wished. Each subject was given a stack of twelve envelopes, sealed with wax. Each envelope had one of the general knowledge questions written on the front and contained an index card with the answer to that question printed on it. Subjects were told that they could open as many of the envelopes as they wished ("feel free to look in some, all, or none") and that they should open only the envelopes corresponding to the questions for which they genuinely wanted to see the answers. Subjects reported the highest levels of curiosity for questions whose answers were felt to be on the tip of their tongue. In addition, the highest levels of exploratory behavior (opening envelopes) occurred for questions for which subjects had reported being in a TOT state.

Both search behavior and self-reported feelings of curiosity increase when metacognitive feelings of knowing are present. These findings support the view that curiosity accompanies feelings of knowing. Having argued that curiosity is often *present* when agents are trying to retrieve a known proposition from memory, the last step in a defense of PC is to establish that curiosity and the question-driven inquiries it motivates in such cases are *permissible*.

[17]See (Loewenstein, 1994) for an overview of curiosity research from the 1960s through the early 1990s that provides additional insight on the prevalence of behavioral measures in the study of curiosity.

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Why think that it is permissible to allow one's curiosity to motivate an inquiry that aims at retrieving a known proposition from memory? In short: because it is helpful. Curiosity's presence in these situations supplies the motivational force that impels a subject to retrieve desired information from memory, helping to secure the epistemic good of the retrieval of dispositional knowledge from memory. Because curiosity contributes to the epistemic good of knowledge in these cases, curiosity is epistemically appropriate. By way of analogy, consider another motivational force: hunger. Hunger-driven food consumption is, in many situations, helpful in ensuring that a subject receives the good of nourishment. In these contexts, we think of hunger and the food consumption it instigates as entirely appropriate. Similarly, in situations where curiosity is helpful in ensuring that a subject obtains the good of occurrent knowledge, we should think of curiosity and the question-driven inquiry it instigates as entirely appropriate.

While it is difficult to establish causal relationships, a reasonable hypothesis is that metacognitive feelings induce curiosity, which serves as the motivational force behind mental search in the relevant cases. Litman and colleagues write that their findings support the conclusion that feelings of knowing "contribute to the arousal of curiosity states to motivate exploratory behavior" (2005, p. 579). Metcalfe interprets her team's findings as suggesting that the TOT state "prompts" or "induces" curiosity (2017, p. 2), and Brooks and colleagues posit that metacognitive feelings generated by unsuccessful retrieval of information from memory "induce" curiosity, which in turn motivates inquiry (2021, p. 153). Curiosity is crucial in this process because it supplies the motivational force that gives rise to the question-driven inquiry.[18]

There is empirical evidence that the process by which metacognitive feelings and the curiosity they induce guides subsequent inquiry really does promote epistemic goods for the subject. For instance, in a subsequent analysis of subjects' test performance on cue-target word pairs, Hanczakowski's team found that subjects more effectively learned pairs for which they reported a high FOK and a desire to restudy (2014, pp. 1620–1621). The presence of curiosity in the cases under consideration does not appear to be pathological. Rather, cases in which curiosity drives a person to focus on a particular question or to search a little longer for information stored in memory appear to be an adaptive feature of our experience as fallible human knowers.

The data discussed in this section support the conclusion that the FOK and the curiosity that accompanies it exercise a control function over mental search, helping to determine which inquiries to pursue and sustaining those inquiries until target information is retrieved from memory or learned. In other words, both FOK and curiosity play an important role in effective inquiry in the cases under consideration. But, if curiosity plays a beneficial role in effective inquiry, including instances of mental search in which the target information is known, curiosity in these circumstances seems entirely appropriate – not normatively problematic. Therefore, agents who experience curiosity about some question while trying to retrieve its known answer from memory do so permissibly.

[18]Theoretical support for this hypothesis comes from George Loewenstein's (1994) influential theory of curiosity as a perceived gap in knowledge or understanding. Loewenstein hypothesized that strength of feeling of knowing would correlate with strength of curiosity, a prediction based on the phenomenon whereby the intensity of motive states (in this case, curiosity) strengthens as one approaches the achievement of a goal. The more strongly one judges that the answer to a question is "within reach," the more intensely one's curiosity to recover that answer will be aroused. See also (Kang et al., 2009; Kidd et al., 2012).

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5. Two objections

Let's take stock. Cases in which a subject is curious about a question whose answer they already know feature prominently in the literature on norms governing inquiry. One common take on these kinds of situations is that they involve (possibly blameless) violations of the Ignorance Norm. This norm is supported by a popular view of curiosity as a goal-directed state that aims at and is satisfied by knowledge.

I have argued that it is common for people to be in situations in which they possess knowledge that is temporarily inaccessible to them yet know that they possess this knowledge: this occurs in many situations in which agents have a strong FOK. Therefore, it is a mistake to represent agents who are curious about what they know as characteristically believing that they lack knowledge. I have also argued that since the curiosity of such subjects plays an epistemically beneficial role in the retrieval of the target information, curiosity about what is known is normatively appropriate in these situations. If this is correct, there are situations in which it is not just permissible, but proper, to be curious about Q at t and know P^{Q}. In other words, the Ignorance Norm is false.

This view has the advantage of being in harmony with strong evidence in the psychological literature that FOK and other metacognitive feelings along with the curiosity induced by these feelings can contribute productively to our learning, helping to provide us with information about where to focus our attention and energy. This is a starkly different picture to one on which being curious about what you know is inappropriate, excusable only when you *lack* metacognitive knowledge, representing yourself as failing to know.

I want to wrap up by discussing two objections, as well as gesture at some implications of this picture for the view that curiosity aims at knowledge.

5.1. First objection: Temporarily irretrievable information is not knowledge

The first objection I will consider denies that temporarily irretrievable information is knowledge. This move preserves the Ignorance Norm, because it entails that cases where agents are curious about temporarily irretrievable information stored in memory are not cases that involve being curious about a question whose answer is known.

There are a couple of reasons to reject this suggestion. First, it is ad hoc, drawing an arbitrary division in our concept of knowledge. Why should some information stored in memory have less of a claim to be knowledge than information that is more easily retrievable? Second, and more importantly, denying that information stored in memory is knowledge is at odds with widely accepted views of knowledge and belief. Epistemologists standardly draw a distinction between occurrent and dispositional beliefs (sometimes also called "standing" beliefs). A belief that consists of a representation of the propositional content P is dispositional just in case, in the right circumstances, it can be retrieved from memory for use in planning and reasoning. A belief is occurrent when it is conscious and available for use in planning and reasoning (Goldman 1976, p. 88).[19] At any given time, most of one's beliefs are dispositional; only a small proportion are occurrent. The occurrent/dispositional distinction also applies to knowledge, since knowing P entails believing P. On the standard way of thinking about knowledge and belief, then, information stored in memory but retrievable is dispositional knowledge.

[19]See (Bartlett, 2018) for a recent discussion of occurrent mental states.

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One might object that there is an epistemically relevant difference between *easily retrievable* propositional content stored in memory and propositional content stored in memory that is *temporarily inaccessible*, such that the former but not the latter counts as knowledge. However, it is hard to see what rationale could be provided for this distinction. In both cases, propositional content that meets the criteria for knowledge (whatever those may be) is stored in memory. Sometimes, that information comes easily to mind when bidden; at other times, retrieval is more challenging. But so long as the target content comes to mind in the end, it is hard to see why functional difficulties with retrieval would make a difference for the stored information's status as knowledge.

5.2. Second objection: Failure to explain intuitions about cases

A second objection to the view I've defended here is that it fails to explain our intuitive reactions to cases like Idle Curiosity 2, Colleague, and Keys. Part of what was so attractive about the Ignorance Norm is that it could explain intuitions that something is going wrong in these cases. So if, as I've argued, the Ignorance Norm is false, we will need another explanation. Why is it that these cases seem problematic to many, if not that they involve subjects who inquire into what they know?

In response, we can begin by noting that Idle Curiosity 2, Colleague, and Keys are all framed in a way that encourages the hearer to think of the subject as being conscious of the relevant propositional content that constitutes an answer to their question. Emma, for example, is described as knowing *that her keys are in her tennis bag*, rather than being described as knowing the answer to the question *Where are my keys?* Ben is described as knowing *that Daniel Craig starred in Layer Cake and Munich.* This framing primes us to think of the content that constitutes an answer to the subjects' respective questions as occurrent for the subject.

This opens the way for an alternate explanation of the cases: that our intuitions that something is amiss are not due to the fact that we see the subjects as being curious about Q^P while knowing P, but because we see them as being curious about Q^P *while P is occurrent for them*. This hypothesis can be tested by rewriting the cases in such a way that makes it clear that the requisite knowledge is *not* occurrent and seeing what intuitions result. If curiosity seems unproblematic in cases where we represent the subjects as failing to be conscious of the content that answers their question, this supports the hypothesis that it is being curious about a question whose answer is *occurrent* that is problematic, rather than being curious about a question whose answer one *knows*. Consider the following variant of Keys:

Keys 2

While preparing to leave for the gym, Francine put her keys in her tennis bag. Francine knows that she put her keys in her tennis bag, but now, having finished her preparations and ready to walk out the door, despite feeling that she knows where she put her keys, she's having trouble recalling their location. She spends 10 minutes feeling intensely curious about where she put them. Eventually, Francine recalls what she's done and locates her keys.

Keys 2 stipulates that Francine knows where she put her keys but that she is having trouble recalling where she put them, suggesting that her knowledge is dispositional, not occurrent. To my mind, Francine's curiosity in Keys 2 seems entirely unproblematic. To be sure, Francine's situation is subpar in some respects. For instance, it's unfortunate for her that her memory is working so poorly right now. But none of this entails that Francine's curiosity, given her circumstances, is inappropriate. It is plausible, then, that what is going wrong in cases like Idle Curiosity 2 and Keys is that the subjects are curious about a question

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whose answer is occurrent for them, and not that they are violating the Ignorance Norm. If this line of reasoning is correct, it suggests an easy modification of the Ignorance Norm:

Non-occurrent Knowledge Norm: One ought not: be curious about Q and occurrently know P^{Q}.

At first glance, this modification to the Ignorance Norm might seem trivial. If there is a prohibition on being curious about something you occurrently know, then there is still some form of incompatibility between curiosity and knowledge – albeit an incompatibility between curiosity and a certain subset of known propositions.

However, if the Non-occurrent Knowledge Norm is correct, I think the alternative it posits is less superficial than it might first appear. I want to conclude by gesturing toward a couple of areas in which I think that this norm, if true, could help us to deepen our understanding of curiosity and curiosity-driven inquiry. These concluding thoughts will necessarily be sketchy, since I don't have the space to fully develop them here.

Another thing I do not have space for is a thorough evaluation of the Non-occurrent Knowledge Norm. The norm strikes me as plausible, since it both provides a good explanation of intuitions about what is going wrong in cases where agents are curious about something they (occurrently) know, and it accommodates cases involving subjects who are permissibly curious about what they (dispositionally) know. However, there are also reasons for skepticism. Perhaps, it is psychologically impossible to be curious about what one occurrently knows. If so, this would obviate the need for a norm prohibiting agents from being so. Perhaps, there are counterexamples to the norm. For instance, perhaps it is permissible to be curious about a question whose answer one occurrently knows if one fails to recognize that the known proposition constitutes an answer to one's question. For these reasons, the Non-occurrent Knowledge Norm deserves further scrutiny. However, since a thorough and systematic assessment of the norm is beyond the scope of this paper, the remainder of my remarks should be taken as conditional. *If* the Non-occurrent Knowledge Norm is correct, it is more than just a superficial revision of the Ignorance Norm.

One interesting feature of the Non-occurrent Knowledge Norm is that it is a product of recognizing the deep commonalities between inquiries that are *external* to ourselves and those that are *internal*. Some curiosity-driven inquiries primarily involve seeking information from sources outside of ourselves. Paradigmatic examples include reading a new biography about a favorite actor or visiting restaurants in a new neighborhood. Other inquiries primarily involve seeking information that lies within ourselves. The internally-directed curiosity I have been focusing on in this paper motivates inquiry that is directed at retrieving information from memory. This is an instance where the aim of an inquiry is retrieving existing knowledge. But there may be other kinds of internal curiosity-driven inquiry whose target is *new* knowledge: working out the entailments of a statement in propositional logic, for instance, or engaging in self-directed questioning to gain insight into one's own feelings, beliefs, or values.

The contemporary philosophical literature on inquiry and curiosity has, to the best of my knowledge, focused on externally-directed inquiry. This is understandable: there is plenty to probe, think about, and understand even if one limits one's focus in this way. But the result is that similarities and differences between externally-directed and internally-directed inquiry have been overlooked. At best, bracketing internally-directed inquiry means that we miss out on some interesting data when theorizing about inquiry and question-directed attitudes. At worst, doing so results in a myopic perspective that leads to false conclusions about the nature of inquiry and the norms that govern it.[20]

[20]The possibility of internally-directed inquiry is briefly considered by Friedman (2017, pp. 313–314), who quickly rejects the idea that "deciding" whether an answer to a question is likely to be stored in memory

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Examining internally-directed forms of inquiry may yield new insights about the nature and aims of curiosity and question-driven inquiry.

Recall that the Ignorance Norm and the view that curiosity aims at knowledge are believed by some to go hand in hand: if the point of curiosity is to acquire knowledge, it is inappropriate to continue being curious when I know the answer. However, once we recognize that some curiosity-driven searches are properly directed at knowledge an agent *already possesses*, the view that curiosity aims at knowledge can seem less plausible. If the Non-occurrent Knowledge Norm is correct, it suggests the alternative view that curiosity and curiosity-driven inquiry aim at *occurrent knowledge*. Perhaps, curiosity aims at putting an agent in a position not merely to know, but to make use of what is known in deliberation and action. Doing so requires not merely that the agent possess relevant knowledge, but that the knowledge be occurrent. Dispositional knowledge is of no use to an agent in planning and deliberation if it does not rise to the level of consciousness.

Another way of reconciling the view that curiosity aims at knowledge with the reality of agents whose curiosity targets what is known would be to regard instances of mental search as occasions on which the knowledge that is the target of one's curiosity lies within one's own mind. While this position preserves the view that the aim of curiosity is knowledge, it also raises further questions about how to interpret this claim in a way that does not yield a general prohibition on inquiring into what is known.

Summing up, I have argued that the Ignorance Norm is false. There are circumstances in which it is permissible to be curious about a question whose answer one knows. I have also suggested that the considerations used to establish the falsity of this norm raise interesting questions about the relationship between internally- and externally-directed inquiries, the significance of occurrent knowledge for curiosity-driven inquiries, and for the claim that curiosity aims at knowledge. Exploring the implications of curiosity-driven mental search for these issues will lead to a clearer view of the nature and purpose of curiosity.

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(and subsequently retrieving that answer) is genuine inquiry. Contrary to the empirical evidence, she also expresses the view that one cannot be genuinely curious about the answer to a question until one determines that the answer is not stored in memory.

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Julia Smith is an Assistant Professor of Philosophy Instruction at Hope College in Holland, Michigan. Her work focuses on the nature of our responsibilities as epistemic agents and frequently draws on empirical findings to address topics such as disagreement, inquiry, and human reasoning.

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