Non-propositional intuition, intuitive belief and 'intuition that p'

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According to a popular view in philosophy, intuition is a singular propositional attitude. In this paper, I outline an opposite account on "garden-variety intuition", i.e. intuition that people experience in their daily lives. The account is based on a distinction between intuition on the processing level, 'intuitive belief' and 'intuition that p'. Immediacy and certainty prove to be the phenomenal features of intuitive beliefs and intuitions that p. Regarding the processing level, I suggest to combine dual-process theory and the theory of mental models, and I claim that this results in non-propositional intuitions. Finally, I argue that non-propositional intuitions are fundamental for garden-variety intuition: They constitute inclinations to believe, possibly resulting in intuitive beliefs or intuitions that p.

intuition – propositional attitudes – non-propositionality – dual-process theory – mental models

1. Introduction

A friend of mine recently told me: "I often have intuitions, but I don't know whether I should trust them." In our further discussion, we clarified what she meant by this: My friend often comes to believe something that feels quite certain in the first place. At the same time, she has no clue where this feeling of certainty comes from. In what follows, I am interested in intuitions like the ones my friend experiences. They are representing facts (correctly or not) and therefore have a mind-to-world direction of fit. I am leaving aside other uses of 'intuition' that do not have these characteristics (or where it is uncertain whether they do or not), as in 'intuitive design' or 'moral intuition'. My aim is to elucidate what we refer to when we talk about intuition in the meaning mentioned. Before I can state my aim and the plan for this paper more precisely, some background is needed.

The literature on intuition is vast and still growing. Originally, it is a philosophical notion with a long history, going back to Epicurus, being central for rationalist authors like Descartes

and Spinoza (among many others) and still extensively discussed in contemporary analytic philosophy. Besides philosophy, a younger tradition of intuition research stems from psychology and cognitive science. Despite the variety of accounts, there is a main difference between the philosophical and the psychological understandings of intuition. While philosophical understandings predominantly have taken intuition to be a rational, a priori source of justification (in classical accounts even infallible), quite the opposite is the case in more recent uses of 'intuition' influenced by psychological research: This research tells us about 'gut feelings' (Gigerenzer 2007), intuitive biases (Kahneman 2011), expert intuition (Klein et al. 2010) and the like. Such research has also influenced more recent philosophical work on intuition, most notably the work on intuitions to thought experiments in the field of experimental philosophy.

In this broad field, where do we find the intuition which my friend is talking about? First, it is clear that it is not the kind of intuition philosophy has been concerned with for the longest time in its history. For example, when my friend has the intuition that something happened to her grandfather and she should go to visit him, this is certainly not a thought that is a priori, solely based on the understanding of concepts or even infallible.

Accordingly, a traditional philosophical reaction to the example about my friend would be: "We are not concerned with this kind of intuition". See two quotes from Alvin Goldman:

> Garden-variety intuitions include premonitions about future events, intuitions about a person's character (based on his appearance, or a brief snatch of conversation), and intuitions about probabilistic relationships. These are all quite prone to error. (Goldman, 2007, 3)

> All intuitions have this opaqueness-of-origin phenomenology, including garden-variety intuitions like baseless hunches and conjectures, which are rightly disparaged as unreliable and lacking in evidential worth. Grouping application intuitions with this larger, "trashy" set of intuitions is likely to contaminate them, not demonstrate their evidential respectability. (Goldman, 2007, 11)

Unlike Goldman, I *am* concerned with "garden-variety intuitions". Garden-variety intuitions are important for people in their daily life, as my friend's statement shows. I take this to be reason enough to think about their nature.

Goldman is certainly right in saying that such intuitions are fallible. However, he exaggerates in further claiming that they are "rightly disparaged as unreliable and lacking in evidential worth." As an instructive analogy, take visual perception: We would not limit ourselves to the perception of nearby objects in clear vision. We would not constrain our thinking about perception in this way, for we are interested in perception as a general source of justification. In the same

vein, we should not limit our thinking to a kind of intuition that is a priori, solely about understanding concepts or even infallible. So, as in perception, it is certainly worth examining what garden variety intuition is. Such an examination can pave the way for further reflection about the evidential worth of such intuition: When does it lead to knowledge, when does it lead astray?

My overall goal in this paper is to clarify what intuition in this garden-variety sense is. It will involve relating intuitions to beliefs as well as to subpersonal cognitive processes. These clarifications will lay the groundwork for an account of intuitive justification.

In sect. 2, I will suggest an explication of garden-variety intuition that distinguishes between two levels of intuition: propositional intuition (including intuitive beliefs and intuitions that p), and subpersonal cognitive processing. Sections 3–5 will further examine both levels. Regarding the propositional level, sect. 3 will describe the phenomenological properties of intuitive beliefs and intuitions that p: immediacy and certainty. Sections 4 and 5 will turn to the processing level: In sect. 4, I will suggest a combination of dual-process theory and the theory of mental models as a way to capture the processing specifics of garden-variety intuition. In sect. 5, I will defend the claim that intuition on the processing level is mainly non-propositional. Sect. 6 will concern the relation between the propositional and the processing, i.e. non-propositional level. Here, I will suggest that non-propositional intuitions constitute inclinations to believe. Finally, sect. 7 will include an outlook on intuitive justification.

2. Intuition, intuitive belief and intuition that p

In this section, I will propose an explication of garden-variety intuition. The explication shall gain its initial plausibility from a series of related examples.

For a first distinction, consider the initial example again: My friend has the intuition that something has happened to her grandfather. What exactly is the intuition here? First, 'intuition' could refer to the mental state my friend has: she has an *intuition* that something happened to her grandfather, rather than a belief or a mere supposition. Second, 'intuition' could refer to the content of this state: that something happened to her grandfather. For disambiguation, we can call the first use 'intuiting', the latter 'intuited' (Cf. Earlenbaugh & Molyneux 2009, 97). The intuiting-intuited distinction is probably quite uncontroversial. Still, it is important to mention, since it adds a further dimension to the explication.

For proceeding with the explication, let's consider some further examples:

> *(1) Gambler's fallacy, intuitive believer*
> A statistically uninformed gambler believes that previous outcomes affect future probabilities
> in a fully randomized game. If we asked him about his gambling behavior, he would express
> this belief (it doesn't matter whether he expresses it differently). If we further asked him why

he holds his belief, he would hesitate: "Why do I believe this? Actually, I don't know. Still, I am sure about it; it's just obvious!"

(2) Gambler's fallacy, Knowing mathematician

A statistically skilled person (say, a mathematician) "has the intuition" that previous outcomes affect future probabilities in a fully randomized game. The knowing mathematician realizes that she has the fallacious intuition that previous outcomes affect future probabilities. She knows that this is wrong, so she doesn't believe it. Still, she experiences the same feeling regarding the fallacious proposition as the intuitive believer in (1) does.

(3) Gambler's fallacy, ignorant mathematician

Again, a mathematician "has the intuition" according to which previous outcomes affect future probabilities in a fully randomized game. However, this mathematician is not aware that she has the intuition. If we asked her about it, she would deny the gambler's fallacy proposition to be true. She would also deny that she has such an intuition or even a belief. Still, in a game of roulette, she acts according to the fallacious intuition.

My first claim regarding examples (1)–(3) concerns a widespread use of the term 'intuition' (always in the garden-variety meaning): In each example, it is common to attribute an intuition to the relevant subject. In (1), it is just as natural to say that the gambler has an intuition than to say that he has a belief. In (2) and (3), it is equally common to attribute intuitions to both mathematicians, even though one is aware of it (and declines its content), but the other is not.

While I do not expect much resistance to this claim regarding (1) and (2), it may be more controversial to attribute an intuition to the ignorant mathematician in (3). However, just think about how often we say things like "she did this intuitively" or "he had this intuition, even if he wasn't aware of it". Biases are particularly salient cases. For example, think about job recruiters who unconsciously prefer to invite people with "western" sounding names to job interviews (Bertrand & Mullainathan 2004). It is right to say that such a recruiter had a discriminatory *intuition*, although he was not aware of it. Also, think of a process in which you switch from (3) to (2), so you "become aware of your intuition". To say so already implies that you had the intuition previously. To deny this would deem such utterances false. Strangely, we would have to say that only now that you became aware of it – even if you refuse it – an intuition is born. That seems absurd. Therefore, I think it is correct to say that we attribute intuitions in cases like (3).

Let's have a closer look at what 'intuition' denotes in (1) – (3) to see what the differences are. In doing so, I will also introduce new terms for each of these uses of 'intuition'. Of course, these are artificial terms that are not common. This doesn't matter, for these terms are used to outline an explication of garden-variety intuition. Radically, such an explication could lead to the

elimination of 'intuition', stating that there is nothing identifiable the expression 'intuition' denotes in the different uses. However, this is not the road I wish to take. It is hopeless to look for a particular thing called intuition. Even on the processing level, 'intuition' does not plausibly denote a psychological kind (Chudnoff 2019, 7). Still, even if 'intuition' in the usual meaning is unprecise, the common term gives us a hint that the different things that 'intuition' denotes could be somehow related to each other. To explore the relations, we first need to know the differences. The following explication should contribute to this aim.

To get the explication off the ground, let's have a closer look at the examples. What does 'intuition' refer to in each one of them?

(1) attributes 'intuition' to a kind of belief; I will call it an *intuitive belief*. How to identify intuitive beliefs? To start with, we could ask the subject how it feels for her to have the belief (or we could introspect how we feel about our own beliefs). Most of the time, beliefs are dispositional, which implies that it doesn't feel like anything to have them. As soon as we ask the question to the subject or ourselves, our belief is occurrent. What then gets revealed is the belief's phenomenology: "I don't know why, but it somehow just feels certain that it is so." It is debated whether beliefs have a phenomenology at all (see Kriegel 2015, Hansen 2020). I think that intuitive beliefs suggest that they do. However, I will leave this for now; in the next section, I will turn to the phenomenology of intuitive beliefs.

Regarding the intuiting-intuited distinction mentioned above, we need to be aware that if we use 'intuition' in the sense of (1), we sometimes refer to the propositional attitude, so to the kind of belief, and sometimes to the proposition intuited.

In (2), the subject has the intuition that p without believing that p. Here, intuition appears to be a propositional attitude different from belief. I will call this an *intuition that p*. Such cases reveal that we cannot reduce intuitions to beliefs (see also Bealer 1998, 208; Chudnoff 2013, 41–43). It feels similar to hold the intuition that p as it does to hold the belief that p. In both cases, we could paraphrase the feeling along the same lines: "I don't know why, but it somehow just feels certain." However, in the case of an intuition that p, it goes on: "still, I know that it isn't true." Here, we see what intuition and perception have in common at the phenomenal level: Concerning how it is like to have this intuition, the 'intuition that p'-case is similar to clearly perceiving something as p while you know that not p. The Müller-Lyer-Illusion is a well-known example (see Bealer 1998, 208; Chudnoff 2013, 27–31): Even if you know that both lines are equal in length, you still have the impression that one line is longer.

The intuiting-intuited-distinction is present in the same way as in (1): In (2)-style-cases, 'intuition' can denote either the propositional attitude different from belief or what is intuited (but not believed), so 'p'.

(3) attributes 'intuition' to a kind of subpersonal cognitive processing. Plausibly, this kind of processing is also underlying intuitive beliefs and intuitions that p. In this sense, the processing is fundamental (I will come back to this aspect in sect. 6). Therefore, I leave the simple term *intuition* for denoting subpersonal cognitive processing of the relevant kind.

As we see in examples like (3), an intuitive belief or 'intuition that p' does not need to be present for this kind of intuition. In (3), the mathematician holds neither the respective belief nor the 'intuition that p'. Still, he has an intuition in the relevant sense.

According to the intuiting-intuited distinction, we can differentiate between denoting the cognitive processing or the representations that are the result of it. If we use 'intuition' in the sense of (3), we can refer to both the processing or the representations.

I will now discuss two objections against the explication proposed: The first objection concerns the distinction between propositional intuitions and intuition in the sense of (3). The second objection cocnerns the distinction between intuitive beliefs and intuitions that p.

The first objection is that there is no reason to abandon a purely propositional account of intuition. "We see the same difference between processing and propositional content concerning any kind of belief", the objection goes. "Sometimes, psychologists are interested in the subpersonal cognitive processes that lead to beliefs, but we do not need a new explication for 'belief' to accommodate this fact. Of course, researchers may be a bit vague in saying "we are investigating subject's beliefs", but it is trivial that they refer to the *processes* that lead to such beliefs – so why it isn't the same for intuition?"

As a preliminary answer to this objection, I think that we should be aware of the vital role subpersonal processes and representations play in instances of garden-variety intuition. As we see in the expression "I feel kind of certain, but I don't know where this feeling of certainty comes from", the subpersonal genesis of intuition takes center stage in common descriptions of garden-variety intuition. Therefore, these cognitive processes and representations are an indispensable part of what 'intuition' refers to in the case of garden-variety intuition. Contrast this with belief (other than intuitive belief): Normally, it is not part of what 'belief' means that any kind of cognitive process generates it. We can investigate these processes, but this is different from intuition, where reference to a "mysterious" process is directly tied to the intuition concept. For this reason, an explication of garden-variety intuition needs to differentiate cognitive processing from propositional intuition, both as indispensable parts of the overall intuition concept.

As I said, this answer is preliminary. One can still doubt that what is realised by subpersonal processes needs to be differentiated from propositionality. So, more needs to be said in defense of intuition's fundamental non-propositionality (see sections 4 –5). For doing so, I think it was helpful first to outline the explication and to lend some initial plausibility to it.

The second objection concerns the distinction between intuitive beliefs and intuitions that p. Some will prefer the picture of generalizing my "intuition that p" to intuition as a whole and to treat beliefs separately. "Sometimes, you come to hold a belief because of an intuition you have", they will say.

My main worry with this view is that it cannot differentiate between two cases:

In the first case, we have an intuitive belief, like in the first of the gambling examples. So, this is a belief that feels intuitive in the meaning described: the gambler believes that p, feels certain about it but doesn't know why (more on phenomenology in sect. 3).

Now, contrast this with a second case: It is basically example (2), involving the intuition that p. Consider the case in which someone does not straightforwardly deny the intuition (as the knowing mathematician does) but is suspending judgment to some extent. This is what happens in the example of my friend. Like the knowing mathematician, she has an intuition that p, not an intuitive belief (she doesn't believe that something has happened to her grandfather, she is uncertain). Imagine further that she convinces herself that her intuition is correct, so she comes to believe what she intuits. One possible reason for doing so could be that she generally has good intuitions. Alternatively, she could become aware of the evidence she has for the fact.

In this situation, the subject has both: the intuition that p and also a belief. However, crucially, this belief is not intuitive. Fully aware, she derives her belief from some piece of evidence (about her general reliability as an intuiter or the underlying facts), so this is not intuition anymore.

The problem with the generalizing view is that it cannot convincingly describe case (2) since this view does not differentiate between intuitions that p and intuitive beliefs. In case (2), we see that a belief stemming from an intuition that p does not need to be an intuitive belief. On the opposite, the distinction suggested here can account for this fact: We can have either beliefs that feel intuitive from the start (= intuitive beliefs) or "regular" beliefs we derive from intuitions that p but which do not feel intuitive themselves.

To recapitulate: I suggested that in garden-variety cases 'intuition' can refer to three different elements, two of them propositional (intuitive belief, intuition that p), the third consisting in a kind of subpersonal processing. In each of these possible meanings, we can additionally differentiate between intuiting and intuited. Accordingly, the explication yields 3 x 2 = 6 meanings of 'intuition' in the garden-variety sense.

It is not by accident that the six meanings are often expressed by the same general term 'intuition'. Instead, it can be explained by how the elements are related to each other. The remainder of the paper will concern these relations. I will begin with the propositional level. Regarding this level, I will say more about the phenomenology of intuitions.

3. Phenomenology of intuitive beliefs and intuitions that p

In examining what intuition is, phenomenology plays a key role. To see this, consider the philosophical roots of the term: the Latin verb *intueri* means 'to look at'. Accordingly, 'intuition' came to denote a kind of cognition that *feels like* visual perception in some ways. Various notions of intuition have been proposed throughout the history of philosophy. Most of them have in common that they start with descriptions of what it is like to have an intuition. Equally, more recent accounts have stressed the defining role of phenomenology for the nature of intuitions (see Chudnoff 2013, Bengson 2015).

What is it like to have an intuition? As in common perception, a fact is immediately presented to us. Accordingly, we usually don't know how our representation of the fact is produced. At the same time, it feels certain that the fact obtains. This phenomenological description is valid for historical philosophical accounts on intuition (e.g. Descartes, Spinoza, Locke) as well as for our everyday intuition talk.

Phenomenology occurs on the propositional level, linked to intuitive beliefs and intuitions that p. In opposition, where 'intuition' denotes a subpersonal process, it has no phenomenology: If it is like something to have an intuition, one must be aware of it. So, in order to describe what it is like to have an intuition, we have to consider intuitive beliefs and intuitions that p. These two propositional attitudes are the bearers of intuitional phenomenology.

So, what is it like to have an intuitive belief or an intuition that p? Let's start with the familiar example of my friend's intuition, which is an intuition that p: She has the intuition that something happened to her grandfather. Although she feels *certain* about something, she feels quite uncertain whether to trust her feeling or not (therefore, it is not an intuitive belief she has). The reason for her doubt is that she does not know where her feeling of certainty comes from; the intuition feels *immediate*. It is neither transparently inferred from other beliefs nor from basic sources of evidence, e.g. perception. Plausibly then, intuition that p has two phenomenal features: *immediacy* and *certainty*.

Immediacy and certainty are the phenomenal features of intuitions that p as well as of intuitive beliefs. We can see this in the roulette examples again: The knowing mathematician has the intuition that previous outcomes will affect the next ones. Plausibly, she has this thought immediately, so she does not infer it from other beliefs or sources of evidence. It just strikes her to be this way. Also, she feels certain regarding the fallacious thought. We can paraphrase her feelingalong these lines: "I don't know why I think so, but somehow it seems to me that it *must* be so!"

Some further remarks about both phenomenal features are in order.

Immediacy

Note that in some sense, intuitive beliefs and intuitions that p are mediated: They are the results of cognitive processing. However, this is a description from the third-person perspective and not a phenomenological one. From the phenomenal perspective, immediacy is probably quite uncontroversial as a key feature of intuition.

In order to make clear what immediacy regarding propositional intuition implies, perceptual belief may be a helpful contrasting example. Perception itself is immediate, but the belief you base on your perception is not: Even if you just instantly form a belief according to your perception, being asked why you believe that p, you will answer: because I see it! It may seem that we could give an analogous answer to "why do you believe that p?": "because I intuit it!" However, different from the case of seeing, the meaning of this statement would be unclear. It would rather repeat the intuitive belief itself or stress the phenomenal features it has.[1]

In sum, I think we can take it for granted that immediacy is a phenomenal feature of intuitive beliefs and intuitions that p.

Certainty

Much more needs to be said about certainty. First, certainty as a phenomenal feature does not imply that if you have an intuitive belief or an intuition that p, it is certain that p. Intuition is fallible; a contemporary theory of intuitioncan hardly deny this. Still, intuitions *feel* certain, and the initial feeling of certainty is somehow preserved, even though you can come to doubt what you intuit. My friend's uncertainty about her grandfather-intuition illustrates this fact.

Some may hold this description to be contradictory: How can an intuition that p feel certain and at the same time be doubted?

I don't see a contradiction here. Phenomenal certainty does not mean that you cannot doubt the relevant intuition that p. Descartes' treatment of intuition in the Meditations helps to see this. To Descartes, intuitions are intellectual insights into self-evident truths. He thinks that one cannot possibly doubt self-evident truths, e.g. "2 + 3 = 5". At the same time, an evil demon may deceive us by manipulating our faculty of intuition. Seen this way, Descartes also doubts that "2+3=5". At first sight, it looks like Descartes contradicts himself in saying that such intuitions can and cannot be doubted at the same time. However, a closer look reveals a distinction between *first order* and *second order doubt*: There is no first-order doubt regarding the intuitive propositions like "2+3=5". Still, there can be second-order doubt regarding the truth of these intuitions (Kenny 1968, 184–186).

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[1] This argument is inspired by Sosa (2006, 208).

Descartes' two levels of doubt mirror the difference between *phenomenal* certainty and certainty tout court. While we experience what we intuit as somehow certain (phenomenal certainty), we can still doubt it (no certainty tout court). My friend is in this very situation: Somehow, she feels certain that p, but at the same time, she does not know whether she should trust her intuition. Still, it is more than just a hunch, 'gut feeling' or seeming that something could be wrong with her grandfather; the difference lies in phenomenal certainty.

The example about my friend also helps to illustrate that the *combined* presence of immediacy and certainty is essential for intuitive beliefs and intuitions that p. It feels certain to my friend that something has happened to her grandfather. *At the same time*, she does not know where this thought comes from; it is immediate. To see that both features must be present, we can compare the situation in the example with two different situations: Certainty without immediacy and immediacy without certainty.

First, consider certainty without immediacy. In such a situation, my friend comes to consider something because of direct experience or testimony: E.g., she got a call from the hospital. In this case, the belief that something happened to her grandfather feels certain but not immediate, since she forms the belief based on what she learned from the hospital staff. People do not normally refer to anything like this by "intuition".

The contrasting case is immediacy without certainty: Here, the thought "something happened to my grandfather" suddenly comes to my friend's mind, without an accompanying feeling of certainty. The situation of a mere thought coming to one's mind is nothing unusual: it can be an instance of imagination, for example. Imagining something can be conscious and effortful, but sometimes, thoughts just come and go. In any case, you can have such thoughts without the slightest feeling of certainty (maybe, you are even convinced that what you are imagining is wrong). Surely, this is not what intuition is like. Only in combination, immediacy and certainty describe how it feels like to have an intuitive belief or an intuition that p.

The phenomenal features belong to both 'intuitions that p' and intuitive beliefs. To see this, remember the gambling example: Both the gambling mathematician (intuition that p) and the intuitive believer will feel certainty and immediacy regarding the proposition that previous outcomes influence future probabilities. The intuitive believer just finds himself having the belief, not knowing where it comes from, but still feeling certain somehow. It feels the same for the mathematician, except for her not holding it as a belief that past outcomes affect future probabilities.

On a traditional view, beliefs do not have phenomenal features at all (see Hansen 2020). In contrast, what I have said so far commits me to the claim that beliefs have phenomenal features. Plausibly, it is like something to believe that p. I can't defend this claim here, but it has been defended convincingly by David Pitt (2004). Pitt's main argument relies on phenomenal contrast.

It can be adapted to intuitive beliefs: Compare an intuitive belief with a non-intuitive one, say a belief based on a deduction. It seems natural to hold that it feels different to intuitively believe that p then it does to believe that p based on a deduction.

In the previous section, I discussed an objection against the distinction between intuitive belief and intuition that p. It was related to the contested claim that beliefs have phenomenal features: Advocates of the objection, who hold that intuition is what I have called 'intuition that p' entirely, think that only intuitions that p need phenomenal features. Seemingly, this is an advantage of the generalizing view: it is not committed to the claim that beliefs have phenomenal features, as I am. However, I don't think the advantage is obvious. To see this, remember two things that have been mentioned: First, there are good arguments for attributing phenomenal features to beliefs. Second, the generalizing view has an important explanatory disadvantage: It cannot account for the difference between intuitive beliefs and beliefs formed based on intuitions that p.

4. Processing level: Dual-process theory and mental models

In sect. 2, I proposed to distinguish between intuition on the propositional level (intuitive beliefs, intuitions that p) and on the processing level. I will now turn to the processing level. The task is to specify the psychological mechanism underlying garden-variety intuition.

We need this explanation to be more specific than psychological understandings of the intuition concept often are. Namely, our psychological explanation should account for the phenomenological characteristics of intuitive beliefs and intuitions that p: It should explain how such beliefs and intuitions that p come to have the phenomenology they have. It should also accommodate the fact that intuitive beliefs and intuitions that p have the same phenomenological characteristics (immediacy, certainty) despite their being different propositional attitudes.

I think that two psychological theories are particularly enlightening regarding these requirements if applied in combination: *dual-process theory* and the *theory of mental models*. In this section, I will outline how these theories might describe what intuition on the processing level is. My explanation will be rather speculative. It may well be that other psychological explanations are superior to the present one, or that empirical findings could lead to modifications. Nevertheless, dual-process theory and mental models seem to be very apt to fill in the psychological part in the overall picture of garden-variety intuition. I will first give a short overview of both theories and then apply them to examples of garden-variety intuition.

I will begin with dual-process theory. In the past decades, there has been an increased amount of empirical research on intuition. Most of this work has a common understanding of

intuition within the framework of dual-process theory. According to this theory, information processing belongs to two types: a fast, effortless, often subconscious, high-capacity type 1 versus a slow, effortful, conscious, low-capacity type 2 (Evans 2010a, 2010b). The high speed in information processing of type 1 comes at the cost of more errors. Type 2 processing, which is slow and effortful, could never guide us through life on its own, but it leads to conclusions that are relatively safe and transparent. A paradigm case of type 2 processing is deductive reasoning.

Intuition is often described as a typical case of type 1 processing. Some dual-process theorists even generally label type 1 processes 'intuitive' and type 2 processes 'reflective', or they distinguish the intuitive from the reflective mind (Evans 2010a, 2010b, 4–5; Kahneman 2011). Within the dual-process framework, we can understand why having an intuition feels immediate and yet certain: Because we have no direct access to our high-capacity type 1 processing, we are not aware of the respective inferences. We arrive at a result, but we don't know how we got there.

A major amount of research has stressed the shortcomings of intuition resulting from type 1 processing. Most well-known is the work of Daniel Kahneman and his colleagues (e.g. Tversky & Kahneman 1974, Kahneman, 2011). In opposition, further research revealed that intuitions often are helpful guides, e.g. in expert intuition or for building heuristics in decision-making. Therefore, it generates better results than deductive reasoning (e.g. Gigerenzer 2007; Kahneman & Klein 2009; Klein et al. 2010).

Could we just stop at this point by saying that intuition is cognitive processing on the type 1 level (and maybe results in intuitive beliefs)? Such an account would not be satisfactory, mainly for two reasons: First, type 1 processing is a very broad category. When we are brushing our teeth or driving a bicycle, we are relying on type 1 processing. Even if some people may be happy to call these processes 'intuitive', they would hardly think that we have intuitions in the same sense in which my friend has the intuition about her grandfather. Of course, there can be such intuitions in this domain, but the mere fact that type 1 processing is taking place does not amount to this. Second, with dual-process theory standing on its own, we just have explained processes, but we need representations with content in order to give intuition a proper epistemic standing. Otherwise, it stays as mysterious as ever why our intuitive beliefs, ultimately deriving from type 1 processes, could be justified. So, how exactly type 1 processing can derive content from previous information and experiences? Fortunately, a well-founded theory can explain this: the theory of mental models.

Philip Johnson-Laird started developing the theory of mental models in the 1970s as an account of human reasoning.[2] The theory is highly accepted in current psychology because it is "well-confirmed and fits the data" (Rosa 2017, 117). According to the theory, reasoning proceeds in two steps: First, subjects "construct" mental models of situations. Second, they "read off" conclusions from these models.[3] For example, mental models based on visual perception represent how the elements in a given perceptual experience are related to each other (A is in front of B, but behind C, etc.).

Iconicity and *richness* are the two key features of mental models. 'Iconicity' means that the representations contained in mental models stand in a relation of similarity to what they represent. Iconicity implies richness: Other than a propositional representation, say a belief, subjects can come back to their mental models and read off new information from it.

Johnson-Laird originally developed the theory of mental models for explaining explicit reasoning in rather complex tasks (1983, Ch. 5). However, we can directly move on to implicit reasoning, where conclusions are immediately inferred from mental models since this is the relevant part for intuition. Johnson-Laird gives the following example:

> Suppose, for example, you were to read in the paper: There was a fault in the signalling circuit. The crash led to the deaths of ten passengers ... then you might well infer that the passengers were killed in the crash. The text does not make this assertion [...]. Plainly, you jumped to a conclusion based partly on the content of the passage and partly on your general knowledge. You make such inferences automatically, almost involuntarily, and often without being aware of what you are doing. (Johnson-Laird 1983, 27)

The mental model we build from reading the newspaper article already represents the passengers as being killed in the crash. The example demonstrates the importance of richness. Besides the explicit facts, elements based on experiences and associations are included in our mental model. Since the description in the article is necessarily incomplete, like any other piece of information about a complex situation, we immediately integrate this new element in our previous knowledge and experiences and thereby construct a rich mental model of the situation. Constructing mental models and reading off information from them is a way how subjects effectively deal with their

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[2] Johnson-Laird gives comprehensive introductions to the theory of mental models in *Mental models* (1983) and *How we reason* (2006). For an epistemological perspective on the theory, see Rosa (2017).

[3] The quotation marks for "construct" and "read off" are meant to signalize that these expressions are used in a metaphorical sense. The relevant processes are type 1, people do not consciously construct or read anything.

limitations in information processing.

In combination, dual-process theory and the theory of mental models plausibly explain what is happening at the level of cognitive processing when subjects have intuitions. Dual-process theory is helpful but too general to capture intuition since the epistemically relevant aspect is not properly delineated. In focusing on type 1 processing deriving content from mental models, we can single out intuition.

A further example will be helpful to see how dual-process theory and the mental model account could work together in practice.

(4): fireground commander

Claire is an experienced fireground commander. She has developed the ability to make *intuitive* judgements about fire. For example, she has the intuition that a building is going to collapse soon, and as a result, she tells her men not to go in there. After a short while, the building collapses. Intuitions as this one often occur to Claire in these situations, so they have a significant link to truth and are a source of evidence for Claire and her firefighters.[4]

This example can lend further support to the hypothesis that intuition is type 1 reasoning departing from mental models. Claire represents the situation on the fireground in a mental model. This model consists of current perceptions as well as past experiences and background knowledge. Alternatively, several mental models could be relevant in representing the situation in combination (the details would still need to be worked out in a psychological examination). Remember that the mental model is iconic: The structure of the contents in the mental model is isomorphic to the structure of the elements on the fireground. For example, the mental model could iconically represent wind directions and sources of the fire together with elements of previous knowledge about fire.

As an expert, Claire will probably have a superior model of the situation compared to a layperson.[5] This concerns both the contents in the mental model related to the experience at the fireground, which are probably more detailed and more accurate, and the connection to past knowledge and experience. From the iconic representation in her mental model, which is rich and

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[4] The example is inspired by an existing psychological study about fireground commanders' expert intuitions (Klein et al. 2010).

[5] Helen De Cruz (2015) distinguishes between maturationally and practiced natural psychological intuitions. While the initial roulette examples and intuitive biases probably are maturationally natural, Claire's expert intuition is practiced natural. In the present account, this distinction would not only concern a difference in type 1-processing but also (and probably even more) how the mental models have been built.

accurate, Claire can read off how the fire develops.[6] Plausibly then, both the cognitive process (intuiting) and its result (intuited) can be called intuition.

I think that the psychological explanation based on dual-process theory and mental models implies that intuition is fundamentally non-propositional. The next section aims to show this.

5. Non-propositional intuition

Most contemporary philosophers working on intuition take intuition to be a propositional attitude. In their view, having an intuition means having an intuition that p (McGahhey & Van Leeuwen 2018, 74). In contrast, garden-variety intuition is fundamentally non-propositional.

In the present section, I will outline my argument for this claim. It has two parts: In the first part, the argument focuses on the level of psychological processing that I already differentiated from the level of intuitive beliefs and intuitions that p. I will rehearse some reasons for holding that intuition on this level is a non-propositional mode of thinking – accordingly yielding *mainly* nonconceptual representational content as its results. In the second part, I will explain why we should think of this kind of intuition as the basic one, which accordingly grounds intuitive beliefs and intuitions that p.

To start with, here is the argument in favor of non-propositional intuition on the processing level:

(1) When a subject has a propositional attitude (e.g. a belief that p), the content of this attitude (p) can be entirely specified by concepts the subject herself possesses.

(2) Intuitions (= the content of intuition) cannot always be entirely specified by concepts the subject herself possesses.

(3) Therefore, intuition is not a propositional attitude, and relatedly, intuitions are nonconceptual (contents of intuition not entirely specified by concepts the subject herself possesses).

Just to remind: In the argument above, 'intuition' constantly refers to intuition on the processing level, it does not refer to intuitive beliefs or intuitions that p. I will now give reasons for holding both premises.

Premise (1) is a restatement of the *conceptual constraint* on propositional attitudes, as Bermúdez and Cahen call it:

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[6] To remind: We are examining type 1 reasoning, it is not Claire actually reading anything.

> Specifications of the content of a sentence or propositional attitude should only employ concepts possessed by the utterer or thinker. (Bermúdez & Cahen 2015, §2)

The conceptual constraint corresponds to the Fregean view on propositions. I will just assume that it is correct. Therefore, the argument only works by assuming the Fregean view on propositions. However, this is unproblematic to admit, for it is exactly the interesting fact about intuition that there is a level of intuitional content not exhausted by concepts the subject himself possesses.

In arguing for premise (2), I come back to the application of dual-process theory and mental models in example (4) from the previous section. It should become clear that if we constrain our view to the propositional aspect (that is, to content exhausted by the concepts the fireground commander possesses), we will miss a crucial part of intuition in such cases.

I begin with two preliminaries. First, probably, Claire's inclination to believe that it is too dangerous for her men to enter the building is due to her cognitive processing of previous information and experience. There must be something from which she derives her intuition that p. In light of the psychological explanation just given, it is well plausible that this 'something' is the content that arises by type 1-processing from mental models.

The second preliminary question: Who does the processing and deriving? In a way, it is Claire. However, sentences like "Claire derives the intuitional content from her mental models", can easily be misunderstood, meaning that she would do so consciously. In this case, we would not have a case of intuition. Therefore, it always needs to be remembered that all the deriving and "reading off" is a subpersonal cognitive process.

In relating the example to premise (2), it should be clear that the content of intuition cannot always be entirely specified by concepts the subject herself possesses. Think about Claire: Is she able to conceptually grasp *all* the elements and relations in the iconic and rich mental model? I take this to be not probable. Of course, she may have some concepts for the contents in her mental model, e.g. 'height', 'warmth' or 'direction'. Still, it is plausible that the contents from the mental model will exceed her conceptual capacities in both *richness* and *fineness of grain* (see sect. 4 on mental models).[7]

For richness, think about how complex the relations in the mental model must be regarding the situation on the fireground: The mental model contains and relates perceptions from the building, from wind, direction and warmth of the fire, from where the firefighters are located, etc. Also, it contains memories from previous situations in a similar complexity. (Or maybe these

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[7] The arguments from richness and fineness of grain have their origins in Evans (1996). Both arguments are mainly discussed within the debate between conceptualists and non-conceptualists regarding visual experience (see Tye 2006, Byrne 2005).

memories are stores in another model that becomes related to the present one.) It would be implausible to demand that the contents of such a rich mental model are exhausted by concepts the subject herself possesses.

The same goes for fineness of grain: Claire may well have the concept 'warmth', but not concepts for the different degrees or kinds of warmth she is still able to detect and re-identify.

In conclusion, if Claire does not possess all the concepts for the representations she "derives" from her mental models, the intuition cannot be conceptual itself. This claim is further made plausible by considering cases in which non-propositional intuition directly leads to action. Think about a situation in which Claire directly acts based on her intuition. It is coherent to think about her having the intuition regarding the situation of the fire without having the relevant concepts.

In light of these considerations, I think it is well plausible that intuition on the processing level is non-propositional. It may well be that subjects possess *some* concepts that describe the contents of their mental models, but this does not exhaust these models in terms of richness and fineness of grain.

In the remainder, I will call intuition on the processing level 'non-propositional intuition', and in doing so, we have a natural counterpart to propositional intuition that contains – as we already know – intuitive beliefs and intuitions that p.

So far, I have argued in favor of the non-propositionality of intuition on the processing level. Why should we think of this processing, i.e. non-propositional level as fundamental for garden-variety intuition as a whole? To answer this, we can see how non-propositional intuitions constitute inclinations to believe.

6. Inclinations to believe

Sometimes, what we know differs from what we intuit. We have seen this in the examples of 'intuitions that p'. First, these cases imply that intuitions cannot be equated to beliefs (see also Bealer 1998, 208) How are intuitions and beliefs related to each other instead? To make the question more specific for our purposes: What is the relation between non-propositional intuitions, intuitions that p and intuitive beliefs?

When confronted with an analogous question concerning the relation between perception and belief, David Armstrong claimed that perceptions are *inclinations* to believe (Armstrong 1968, 221). In the Müller-Lyer example, we can then say that the subject does not believe that one line is longer, but she is inclined to believe so. The same goes for the parallel cases about intuition:

The mathematician does not believe that past frequencies affect future probabilities, but still, she is inclined to this belief.[8]

In this section, I will defend a similar claim: that intuitions *constitute* inclinations to believe. If stated correctly, the inclination view does justice to psychological findings. Moreover, it helps to understand the relation between non-propositional and propositional intuition.

First, what is an inclination? I will follow Ryle (1949) in conceiving of an inclination as a *disposition* a subject has to react in a certain way. Seen this way, a familiar example of inclinations are character traits. A generous person is inclined to react in generous ways. Importantly, for a subject to be inclined does not presuppose that she is conscious about her inclination. For inclinations to believe, the claim then amounts to this: For a subject to be inclined to believe that p is to be liable to come to believe that p, when a particular condition is realized (Ryle 1949, 43).

Two features of this understanding are particularly important: First, due to the conditional, a subject could well be inclined to believe that p but never come to believe that p. Second, even if the conditions are fulfilled, it is not certain that the subject will come to believe that p. To ascribe an inclination to believe that p, a sufficient condition is that the subject is liable to come to believe that p.

For intuition, inclination best describes how the non-propositional and the propositional level of intuition are related to each other. The claim is that non-propositional intuitions constitute inclinations to believe. Accordingly, if a subject has an intuition, she is *disposed* to believe what she intuits.

The following conditions must be met for this disposition to be actualized: First, a process of belief-formation needs to take place. Sometimes, this does not happen: The intuitive believer can have a faulty intuition directly manifesting in his behavior in the roulette game, even if he has no corresponding belief (maybe, he never reflected on probability so far). Second, the intuition must stay undefeated: The mathematician who still has the gamblers fallacy intuition, while believing that this intuition is wrong, is inclined to believe the relevant proposition. Nevertheless, she does not believe it, for her knowledge about probability defeats her intuition. Accordingly, she arrives at an intuition that p instead of an intuitive belief.

In sum, the claim that intuitions constitute inclinations to believe is threefold:

(1) If a belief-forming process takes place and the relevant non-propositional intuition stays undefeated, the subject is liable to come to believe that p.

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[8] For the claim that intuitions are inclinations to believe, see Sosa (2007, 62), Williamson (2007, 3) Earlenbaugh and Molyneux (2009) and Nimtz (2010). However, these inclination views differ significantly from the one that is proposed here, corresponding to their different accounts of intuition.

(2) If a belief-forming process takes place and the intuition is defeated, the subject is liable to come to have the intuition that p.

(3) If no belief-forming process takes place at all, the intuition stays non-propositional (but could still directly lead to action).

Is an inclination to believe a belief (or a "proto-belief") itself? Thinking about defeasibility could lead to this assumption, as we can see in Armstrong:

> What is an inclination to believe? I think it is nothing but a belief that is held in check by a stronger belief. (Armstrong 1968, 221)

However, we cannot accept this view for intuition, since we would then again face the objections against equating intuitions with beliefs.[9]

Fortunately, the dispositional view described above does not lead to the consequence that we have to treat inclinations to believe as beliefs, proto-beliefs, half-beliefs or the like. For why should what makes you inclined to a belief be a belief or belief-like itself? In analogy, an inclination to act generously is not an act of generosity itself. In the dispositional understanding, 'inclination' refers to the liability to behave in a certain way because of underlying structures. Therefore, it is more precise to say that intuitions *constitute* inclinations to believe instead of saying that they *are* such inclinations. As a result, the objections against equating intuitions with beliefs do not count against the inclination view about intuition, if this view is carefully stated.[10]

An important advantage of the inclination view is that it allows for an explanation of the similarity in phenomenal features of intuitions that p and intuitive beliefs. This similarity originally rendered plausible the opposite claim that we should just have intuitions that p (and regular beliefs on top). On the present view, the inclination explains the phenomenal similarity, since it is the same inclination for an intuitive belief and an intuition that p.

For clarification, our initial examples are helpful again: The knowing mathematician has the intuition that past outcomes affect future probabilities (= intuition that p). However, she does not believe this. If we compare this to the intuitive believer (= intuitive belief), similarities and differences are instructive: Both propositional attitudes have the same content. Furthermore, a belief-forming process has been initiated in both cases. The third similarity is that the phenomenal

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[9] For a further against the view of intuitions as proto-beliefs, see Koksvik (2011, 52–55).

[10] For an elaborated view on intuition and inclination, see Nimtz (2010). Nimtz claims that intuitions are either beliefs or inclinations to believe. He sees this as a possibility to reduce intuitions to the doxastic level. In contrast, my claim that intuitions *constitute* inclinations to believe does not lead to doxastic reductionism.

features (immediacy, certainty) are present in intuitive belief as well as intuition that p.[11] This similarity is particularly important since it relates both instances of propositional intuition back to the common level of non-propositional intuition. The difference between intuitive belief and intuition that p then is this: Whereas in the case of intuitive belief, the inclination to believe constituted by intuition results in a belief, in the case of intuition that p a defeater prevents this.

In sum, this is the explanation why intuitions that p and intuitive beliefs have the same phenomenal features and can have the same content: both propositional attitudes stem from an inclination to believe that is constituted by non-propositional intuition. In this sense, non-propositional intuition is fundamental.

A remaining worry might be that the inclination claim is too weak: If we just say that intuitions constitute inclinations to believe, do we learn something specific about intuition? An account of intuition that gives too much weight on inclination is not convincing since it is not informative enough. Various sorts of cognitive processes incline subjects to various propositional attitudes.

However, the present account does not stop at inclinations. There are other elements crucial for understanding what intuition is: First, we have a clarification on different levels of intuition (non-propositional and propositional). Second, we have phenomenal features linked to propositional intuitions (immediacy, certainty). Third, we have the specification on the non-propositional level, drawing from dual-process theory and the theory of mental models. Finally, as a part of the whole story, we have the inclination relation.

7. An outlook on intuitive justification

To resume, the garden-variety understanding of intuition is widespread and relates to familiar examples, ranging from intuitive biases to expert intuitions. The centerpiece of the proposed account on garden-variety intuition is an explication of 'intuition' that helps distinguishing between 1) intuition as a cognitive process, and 2) propositional intuition that can be sub-divided into 2a) intuitive belief and 2b) intuition that p. Regarding 2), intuitive beliefs and intuitions that p have the same phenomenal features: immediacy and certainty. Regarding 1), dual-process theory and the theory of mental models explain in combination what goes on when subjects have intuitions.

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[11] Note that the phenomenal features are only present when the intuitive belief or the intuition that p is occurrent. However, we can still ascribe intuitive beliefs or intuitions that p to the subject when they are dispositional (before and after the episode of occurrence).

I claimed that intuition on the processing level is non-propositional. Regarding the relation from 1) to 2), I suggested that non-propositional intuitions constitute inclinations to believe.

My friend's question from the beginning has not been answered yet: Can she trust her intuition? I hope to have laid the groundwork for addressing this further question about intuitive justification. I will conclude by sketching the direction this examination should take.

The terminology I have introduced could help to frame the question about intuitive justification more precisely. First, we have two cases in which we can sensibly ask for justification: The straightforward case is the intuitive believer: Is his intuitive belief justified? For instance, in the opening example of the gambler who thinks that past outcomes affect future probabilities, a correct theory on intuitive justification should deliver a 'no'.

The second, slightly more complicated case where we can ask the justification question concerns intuition that p. Note that this is the situation my friend is in, and she asked something like the justification question herself: "Can I trust my intuition?". Something causes her to hesitate. That is, a defeater is blocking the way from her inclining non-propositional intuition to the corresponding intuitive belief. Such a defeater could be paraphrased like: "I haven't seen my grandfather for ages, didn't receive a message or anything, so why should I know anything about his current condition?" Maybe, my friend then remembers that she often had correct intuitions about friends or family not being well (for whatever reason; this would be less mysterious in the case of an expert intuition like the one of the fireground commander). If so, she would form a belief that p based on her intuition that p. Remember that this "belief on top" is not an intuitive belief.

In any case, an answer to the justification question will have to address the non-propositional level of intuition that constitutes the inclination. Probably, it will concern the quality of the mental models to which the cognitive processing recurs, the aptness of these mental models with respect to the intuition (take prejudiced and biased mental models as a negative example) and the correct working of type 1 processing. Together, this would also allow for making a difference between expert intuitions (e.g. the fireground commander) and intuitive biases (e.g. the gambler's fallacy).

Furthermore, a successful theory of intuitive justification has to explain how intuition can deliver reasons *for the subject*. If you take internalist worries into account (and I think we should do so), it is not obvious how non-propositional intuitions can be reasons for subjects.[12] Stopping

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[12] Here, I refer to McDowell (1996). McDowell thinks that for a content to be a reason for a subject, the content needs to be conceptual (see also Brewer 1999, Ch. 5). In contrast, I think that nonpropositional intuitions can be proper reasons for subjects. However, I have to postpone the task of working this out.

at propositional intuition is not an alternative since the intuitive beliefs are already in need of justification. So, we need an account that can tell us how intuition contents that are sub-personally derived from mental models and thereby often exhaust subjects' conceptual capacities can be proper reasons for subjects.

Accordingly, it will need more work in order to develop an account on intuitive justification in the domain of garden-variety intuitions. The way of thinking about garden-variety intuition that I have proposed here could be a reasonable starting point.

References

Armstrong, D. M. (1968). *A materialist theory of the mind.* London: Routledge.

Bealer, G. (1998). Intuition and the autonomy of philosophy. In M. R. DePaul & W. Ramsey (Eds.), *Rethinking intuition: The psychology of intuition and its role in philosophical inquiry* (pp. 201–239). New York: Rowman & Littlefield.

Bengson, J. (2015). The Intellectual Given. *Mind 124*(495), 707–760. http://dx.doi.org/10.1093/mind/fzv029

Bermúdez, J. & Cahen, A. (2015). Nonconceptual mental content. *The Stanford Encyclopedia of Philosophy (Fall 2015 Edition).* http://plato.stanford.edu/archives/fall2015/entries/content-nonconceptual/.

Bertrand, M. & Mullainathan, S. (2004). Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *The American Economic Review 94*(4), 991–1013. http://dx.doi.org/10.1257/0002828042002561

Byrne, A. (2005). Perception and Conceptual Content. In E. Sosa & M. Steup (Eds.), *Contemporary Debates in Epistemology* (pp. 231 – 250). Malden, MA: Blackwell.

Chudnoff, E. (2013). *Intuition.* Oxford: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199683000.001.0001

Chudnoff, E. (2019). In Search of Intuition. *Australasian Journal of Philosophy,* http://dx.doi.org/10.1080/00048402.2019.1658121

De Cruz, H. (2015): Where Philosophical Intuitions Come From. *Australasian Journal of Philosophy 93*(2), 233–249. http://dx.doi.org/10.1080/00048402.2014.967792

Earlenbaugh, J. & Molyneux, B. (2009). Intuitions are inclinations to believe. *Philosophical Studies 145*(1), 89–109. http://dx.doi.org/10.1007/s11098-009-9388-4

Evans, J. St BT. (2010a). Intuition and reasoning: A dual-process perspective. *Psychological Inquiry 21*(4), 313–326. http://dx.doi.org/10.1080/1047840X.2010.521057

Evans, J. St BT. (2010b). *Thinking twice: Two minds in one brain.* New York: Oxford University Press.

Gigerenzer, G. (2007). Gut feelings: The intelligence of the unconscious. New York: Viking.

Goldman, A. (2007). Philosophical intuitions: Their target, their source, and their epistemic status. *Grazer Philosophische Studien 74*, 1–26. http://dx.doi.org/10.1163/9789401204651_002

Hansen, M. K. (2020). Cognitive Phenomenology. *The Internet Encyclopedia of Philosophy.* https://www.iep.utm.edu/cog-phen/. Accessed 24 June 2020.

Johnson-Laird, P. N. (1983). *Mental models.* Cambridge, MA: Harvard University Press.

Johnson-Laird, P. N. (2006). *How we reason.* New York: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199551330.003.0028

Kahneman, D. (2011). *Thinking fast and slow.* New York: Farrar, Straus and Giroux.

Kahneman, D. & Klein, G. (2009). Conditions for intuitive expertise: A failure to disagree. *American Psychologist 64*(6), 519–526. http://dx.doi.org/10.1037/a0016755

Kenny, A. (1968). *Descartes. A Study of His Philosophy.* New York: Random House.

Klein, G., Calderwood, R. & Clinton-Cirocco, A. (2010). Rapid decision making on the fireground: The original study plus a postscript. *Journal of Cognitive Engineering and Decision Making 4*(3), 186–209.

Koksvik, O. (2011). *Intuition*. PhD Thesis. Australian National University, Sydney. http://www.koksvik.net/files/koksvik_intuition_monochrome.pdf. Accessed 25 June 2020.

Kriegel, U. (2015). The character of cognitive phenomenology. In T. Breyer & C. Gutland (Eds.), *Phenomenology of thinking: Philosophical investigations into the character of cognitive experiences* (pp. 25–43). New York, NY/London: Routledge.

McGahhey, M. & Van Leeuwen, N. (2018). Interpreting Intuitions. In J. Kirsch & P. Pedrini (Eds.), *Third-Person Self-Knowledge, Self-Interpretation, and Narrative* (pp.73–98). Cham: Springer Nature Switzerland. http://dx.doi.org/10.1007/978-3-319-98646-3_5

Nimtz, C. (2010). Saving the doxastic account of intuitions. *Philosophical Psychology 23*(3), 357–375. http://dx.doi.org/10.1080/09515089.2010.490942

Pitt, D. (2004). The Phenomenology of Cognition or 'What Is It like to Think That P?' *Philosophy and Phenomenological Research 69*(1), 1–36. http://dx.doi.org/10.1111/j.1933-1592.2004.tb00382.x

Rosa, L. (2017). Inferential basing and mental models. *Philosophical Psychology 30*(1–2), 102–118. http://dx.doi.org/10.1080/09515089.2016.1266318

Ryle, G. (1949). *The concept of mind.* London: Hutchinson's University Library.

Sosa, E. (2006). Intuitions and Truth. In P. Greenough & M. P. Lynch (Eds.), *Truth and Realism* (pp. 208–226). Oxford: Clarendon Press. http://dx.doi.org/10.1093/acprof:oso/9780199288878.003.0013

Sosa, E. (2007). *A virtue epistemology.* New York: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199297023.003.0002

Tversky, A. & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science 185*, 1124–1131. http://dx.doi.org/10.1126/science.185.4157.1124

Tye, M. (2006). Nonconceptual Content, Richness, and Fineness of Grain. In T. S. Gendler & J. Hawthorne (Eds.), *Perceptual Experience* (pp. 504–530). Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199289769.003.0016

Williamson, T. (2007). *The philosophy of philosophy.* Malden, MA: Wiley-Blackwell. http://dx.doi.org/10.1002/9780470696675

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