Enriching the Framework of Experimental Philosophy

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Abstract: Despite its historical neglect, intuition is currently a scholarly focus in such a broad range of behavioural and social sciences, as psychology, cognitive science, economics, education, medicine, management, and so forth. Moreover, intuition is expected to be a 'fundamental bridging construct' (Hodgkinson et al., 2008) to unify inquiries in these areas. Experimental philosophy – socio-experimental psychological research on intuitions about philosophical cases – may be reckoned part of this fascinating, interdisciplinary movement.   Little attention, however, has been paid, in experimental philosophy, to the movement, since the prevailing practice of experimental philosophy is mainly modeled on the *heuristics and biases approach* (HB), i.e., one, albeit paradigmatic, restrictive approach to intuition among many. Thus, reconsidering the practice of experimental philosophy in light of other approaches to intuition will suggest further possible directions it can take, or so I shall argue.

The paper consists of five parts. In Section 1, the concept(s) of intuition that both traditional and experimental philosophers make use of is described. In Section 2, the two main positions in experimental philosophy, *experimental restrictivism* (ER) and *experimental descriptism* (ES), are delineated. Then, I will describe the common framework shared by ER and ES, which stems from HB. In addition, I reconstruct ER's arguments against the evidential value of philosophical intuition. The reconstruction reveals several commitments of ER. In Section 3, *naturalistic decision making* (NDM), another prominent approach to intuition, is introduced and compared with HB. In Section 4, I will

draw out implications of NDM for experimental philosophy. In light of NDM, the framework of experimental philosophy may be enriched. Section 5 summarizes the claims I make in this paper.

1. What is Philosophical Intuition?

'Intuition' is no doubt an ambiguous term in our language, and its meanings and connotations are diverse and even divergent. Furthermore, it is not obvious that what we colloquially call 'intuition' constitutes one single, homogeneous kind. Although intuition is currently a scholarly focus in such a broad range of behavioural and social sciences, as psychology, cognitive science, economics, education, medicine, management, and so forth, the ambiguity of 'intuition' carries over to these disciplines.[1] Philosophy is no exception in this regard. Thus, it is necessary to elucidate the usage of 'intuition' in philosophy at the outset.

Abernathy & Hamm (1995) investigate the usages of 'intuition' in psychology, medicine, and education, and their survey is reported in Hammond (1996), as Fig 1.

> **Intuition is different from other thinking**
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> Intuition is thought without analysis.
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> Intuition produces different results than analytic thinking.
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> Intuition is different from everyday thinking.
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> Intuition is infallible.
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> Intuition is a sense of a solution not yet fully developed.
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> Intuition has a feeling of certainty.

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[1] For a recent overview of the uses of 'intuition' in various fields, see Hodgkinson et al. (2008). As overviews in particular fields, Franz (2006) and Symons (2008) focus on behavioural economics and analytic philosophy, respectively.

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Intuition uses specific information

Intuition is visual insight.

Intuition requires attention to one's own internal feelings.

Intuition is characteristic of people's performance of familiar tasks.

Intuition is fast and easy.

Intuition is pattern recognition.

Intuition arises from complex systems of symbolic rules.

Intuition is nonsymbolic thought, as in a neural network.

Intuition involves functional reasoning.

Intuition is an option: If one can choose to do it, one can choose not to do it

Intuition is just lazy thought.

Intuition is an unavoidable necessity.

Intuitive cognition can outperform analysis.

Intuition is the prudent voice in some situations.

Intuition is the use of fallible heuristic strategies.

Intuition involves judgement of importance

Fig 1, from (Hammond, 1996, p. 63)

Hammond reckons the various uses of 'intuition' collected here to be reflective of our ordinary concept of intuition, and construes its core as follows: "a cognitive process that somehow produces an answer, solution, or idea without the use of [an analytical] process" (Hammond, 1996, p. 60). Intuition, then, is

characterized negatively, i.e., as the opposite of the process of analytical thinking, which is "a conscious, logically defensible, step-by-step process." (ibid.) In addition, Hammond emphasizes the elusive feature of intuition, viz., that even the intuitor is not accessible to how it works.

The philosophical tradition in the western world has been using the concept of intuition in a way more or less similar to Hammond's construal.[2] To name a few, Plato held that the Form, the essence of a sensible object lying beyond the sensible world, is grasped by intuition (*nous*) without the mediation of the senses (201a–c); Spinoza, in his *Ethics*, took intuition to be a faculty that, just like reason, brings knowledge of the essence of a particular, but, unlike reason, does not require any inferential step. The type of intuition that these figures envisage is referred to as *intellectual* intuition; John Locke claimed that *perceptual or sensory* intuition occurs when "the mind perceives the agreement or disagreement of two ideas *immediately by themselves,* without the intervention of any other." (IV. II. 1) Contrasted with such intuition is reasoning, in which the mind perceives the (dis)agreement of two ideas indirectly, i.e., with the mediation of other ideas. Locke shares with Spinoza the idea that reasoning is mediated intuition in this sense, and intuition is immediate reasoning (cf. IV. II. 2); Thomas Reid argued that the common sense is the source of intellectual intuition, by which one can know the first-principles, i.e., those principles that are self-evident, fundamental, and constitutive of a science. He also remarked that intuition and reasoning are two aspects of reason, and they are "commonly joined together in speech and in writing, they are inseparable in their nature" (VI, II, III, p. 362); however, reasoning is more difficult to perform, since it requires "reflecting upon this operation of his own mind" (VII, I, I, p. 425), i.e., recognizing all the premises necessary for deriving the conclusion and their logical connections.

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[2] Bunge (1962) contains a historical overview on intuition in philosophy. Franz (2005) is a historical survey of intuition in economics, and includes discussions on the two great economists/philosophers, Adam Smith and John Stuart Mill. This book is written from a perspective of dual-process theory.

The main focus of the philosophical tradition has been intellectual intuition, as opposed to sensory intuition. It is a faculty or process that delivers *a priori* discovery or knowledge of the essences of things or the first-principles independently of analytical or logical thinking, though their independence may be a matter of degree. The philosophical tradition, however, gives no substantive account of how such a faculty exists and works. Quite naturally, then, the importance of intuition for science has been questioned in analytic philosophy – the style of philosophy mainly conducted in the contemporary Anglophone world –, due to the positivist movement in the early 20th century: Hans Reichenbach (1938), one of the leading philosophers in this movement, distinguished between the contexts of discovery and justification. Scientific discovery is, in part, a product of not only rational factors but also miscellaneous factors, such as hunch, guess, and intuition, and thereby the target of philosophical investigation into scientific knowledge must be the context of justification rather than of discovery. The context of justification, roughly speaking, is the context where questions about the justification of a theory, e.g., how it is rationalized or justified by observations and logic, are pursued with the aid of logical analysis.

Being influenced by the positivist movement, contemporary analytic philosophers do not endorse the traditional concept of intuition as a magical cognitive faculty or process. However, after the failure of the positivist movement, they still accept intuition as a distinctive source of justification, if not of knowledge (on the standard philosophical theory of knowledge, justification is a necessary condition for knowledge). Thus, most analytic philosophers still maintain that our beliefs are justified on the basis of intuition, in the circumstances where the process of intuition is legitimately exercised.[3] In particular, intuitions of interest for philosophers are those about actual or hypothetical philosophical

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[3] Intuition is often held to be the source of non-inferential justification. But it is not clear to me whether philosophers accept that it is possible for intuition to give inferential justification. Reid seems to endorse inferential justification by intuition, when he mentions 'intuitive proof.' In this paper, I leave this question open.

cases, and they are thematically categorized as 'philosophical intuition.' Then, philosophical intuition

is a source of *a priori* justification, insofar as philosophy is *a priori* armchair inquiry. As we will see,

philosophical intuition, as analytic philosophers conceptualize it, shares the characteristics of Reid's

intellectual intuition.[4] It is commonsensical rather than mysterious or magical, as it were.[5] This much

being granted, however, analytic philosophers have not reached consensus on the nature of intuition in

general, let alone that of philosophical intuition. In what follows, I describe different views on the

nature of intuition along the following dimensions: (a) what type of mental state the process of

intuition produces as output, (b) what content the output has, and (c) why the process of intuition is

reliable.

(a) What type of mental state does the process of intuition produce as output? Intuition is a

psychological process which takes sensory or non-sensory cues as input and results in a certain mental

state or event as output. The output in question is commonly called 'intuition' as well (to avoid

wordiness, I will henceforth follow this convention, and if needed, refer to intuition in this sense as

'the output of intuition.') Philosophers disagree over what mental state the output of intuition is. Peter

van Inwagen (1997) holds that intuition is simply belief. On this view, the process of intuition is

simply a belief-forming process. Sosa (1998) argues that inclination to believe is distinguished from

belief *per se*. For one cannot believe p if one believes that p is false, even though one may still have

the intuition (as the output) that p. Similarly, Williamson (2004, 2007) takes the output of intuition to

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[4] Hintikka (1999) remarks that the term 'intuition' is revived in the 1980's, due to the influence of Chomsky's linguistics:
Chomsky argues that native speakers' intuitions about grammar are to be used as the basis for grammatical theory.
However, it seems to me that the influence of Moore has been enduring, and Moore shares the tradition of Scottish
philosophy with Reid.

[5] For example, Bealer (1992, p. 101) claims that "[b]y intuition, we do not mean a supernatural power or a magical inner
voice or anything of the sort. When you have an intuition that A, it seems to you that A."

be judgement or inclination to judge.[6] However, Bealer (1992, 1998), on the same ground as Sosa's, concludes that the output of intuition is a *sui generis* mental state, an intellectual impression – *seeming that p*. Despite these differences, the philosophers at least agree that the output of intuition is a mental state with propositional content, content described by a that-clause.[7]

(b) What content does the output of intuition have? The output of intuition is identified with a mental state with propositional content. Philosophical intuitions, by definition, are all intuitions about philosophical matters. In addition, some philosophers further specify the content of philosophical intuition. Goldman (2007) claims that the most frequent type of philosophical intuition is 'classification intuition,' simply of the form 'a is F.' However, many argue that philosophically interesting intuitions have modal contents, contents about possibility and necessity (Bealer 1998; Sosa 2006; Ichikawa & Jarvis, 2009). This somewhat corresponds to intellectual intuition in the traditional sense. For the contents of intellectual intuition are essences or first-principles, i.e., the features things *necessarily* have and the principles they *necessarily* follow, even though many contemporary philosophers offer some naturalistic account of modal intuitions (more on this below).[8] Williamson (2004, 2007) takes philosophical intuition to have the form of a counterfactual conditional.[9]

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[6] Williamson (2007) proposes not to use the term 'intuition,' since it involves unnecessary connotations. I ignore this complication here.

[7] The two views presented here are reminiscent of Reid's and his contemporaries' view on intuition. Reid, on the basis of analysis of ordinary language, objects to other philosophers who hold that intuition is "the means of furnishing our minds with ideas, without including any kind of judgement." (VI, II, I, p. 350) As Reid makes explicit, 'ideas' here include impressions.

[8] I use 'naturalistic' to mean 'not conflicting with natural science' here and elsewhere in this paper, since the term is commonly used in philosophy this way. 'Naturalistic' in 'naturalistic decision making' below does not have this meaning.

[9] I am a bit unclear if this captures the view Williamson holds. For, in his (2004) and (2007), he is mainly discussing the 'formalization' of a philosophical thought-experiment as an argument, in which a counterfactual appear as a premise. This

(c) Why is the process of intuition reliable? This question is most important, insofar as philosophical intuition is the source of *a priori* justification. It is commonplace in contemporary analytic philosophy to account for the reliability of non-inferential belief in terms of the reliability of the process that produces it; a belief is *prime facie* justified only if the cognitive process that produces it is reliable, i.e., the process leads to truth with sufficiently high actual or counterfactual frequency – note that the justification reliability confers on intuition is defeasible, and analytic philosophers, unlike some of the historical figures mentioned above, do not endorse the traditional idea that intuitive knowledge is infallible. Philosophers, thus, endorse the idea that sensory intuition gives justification for perceptual belief, given that the senses function reliably, and that its reliability is naturalistically elucidated. But how is philosophical intuition naturalistically accounted for? Many, such as Bealer (1998), Ichikawa & Jarvis (2009), Kauppinen (2007), and Ludwig (2007), suggest that the reliability of philosophical intuition is intimately related to conceptual competence. Once one acquires conceptual competence, one can reliably form intuitions about the concepts one is using. Precisely for this reason, analytic philosophy has been reckoned to be conceptual analysis, i.e., its job is to analyze our concepts by appeal to intuitions. However, Sosa (2007) and Williamson (2007) reject this picture of analytic philosophy and philosophical intuition. Philosophical intuitions are simply about things rather than concepts. As for the reliability of philosophical intuition, they suggest that philosophical intuition is not relevantly different from perception, and equally reliable. It, however, is questionable, as Lynch (2007) remarks, whether this view can fully account for the reliability of intuition, without having a flavour of magic.

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is consistent with the idea that the content of intuition formed on the occasion of the thought-experiment is not counterfactual. In the meantime, Williamson also mentions the psychological features of such intuitions.

2. Two Approaches to Philosophical Intuition in Experimental Philosophy

Experimental philosophy is a new and growing field in analytic philosophy. Its core consists in applying socio-experimental psychological methods to philosophical intuitions, and thereby differs markedly from *traditional philosophy* within analytic philosophy.[10] Traditional philosophy is typically done from an armchair, only relying on philosophers' first-person intuitions. However, experimental philosophers disagree over questions as to what purpose experimental philosophy has and what philosophical significance it has for traditional philosophy. Nadelhoffer & Nahmias (2007) pick out three positions within experimental philosophy, of which only two are relevant here:

> Experimental Descriptivism (ED): explore[s] human psychology by testing how various manipulations to scenarios influence the intuitions people express. One goal of this project is to better understand the nature of the underlying psychological processes and cognitive mechanisms that produce our intuitions and explore the relevance of this research to philosophical questions. (Nadelhoffer & Nahmias, 2007, p. 127)[11]

> Experimental Restrictionism (ER): [its goal] is to show that some of the methods and techniques that philosophers working in the analytic tradition have taken for granted are threatened by the gathering empirical evidence concerning both the diversity and the unreliability of folk intuitions. (ibid., p. 128)

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[10] For concrete experiments and results of experimental philosophy, see papers collected in Knobe & Nichols (2008).

[11] In what follows, I refer to the following as the proponents of ER: Alexander & Weinberg (2007), Machery et. al (2004), Mallon et. al (forthcoming), Nadelhoffer & Feltz (2008), Nichols et. al (2003), Sinnott-Armstrong (2005; 2006; 2008), Swain et. al (2008), Weinberg (2007, 2009), and Weinberg et. al (2001).

Experimental philosophy began in Weinberg et at. (2001). Although the promoted project there is ER, much of the common framework for experimental philosophy is set by this paper. The framework proposed is highly influenced by Kahneman & Tversky's 'heuristics and biases approach' (HB). This approach has been widely adopted in the study of judgement and decision-making. Kahneman & Tversky (1996), in retrospect, summarize their approach, as follows:

(i)   The main goal is to understand the cognitive processes that produce both valid and invalid intuition (intuitive judgements) of probability and statistics.

(ii) Intuitive judgements and predictions are often mediated by *judgemental heuristics*.

(iii) Judgemental heuristics are often useful but sometimes lead to characteristic errors and biases.

(iv) The study of systematic error can illuminate the psychological processes that underlie perception and judgement.

(i) is the goal of ED, and its way to proceed towards (i) is related to (ii); it attempts to identify the intuition processes by finding the heuristics involved. By contrast, ER's focus is, in particular, on (iii): it purports to show that the use of philosophical intuition as evidence for or against philosophical theories must be severely restricted. The ground for such restriction is that the experiments conducted in ER are taken to show that the processes underlying philosophical intuitions are unstable or unreliable. Weinberg et at. (2001) propose four hypotheses concerning epistemic intuition, a subset of philosophical intuitions about knowledge and the like: epistemic intuitions (A) vary from culture to culture; (B) vary from socioeconomic group to another; (C) vary as a function of how many philosophy courses a person has had; and, (D) depend, in part, on the order in which cases are presented. (A) and (B) are experimentally verified in Weinberg et at. (2001); (C) is in Nichols et al.

(2003), and (D) is in Swain et al. (2008). These ER researchers, in effect, offer several different arguments against the unrestrictive use of intuition in epistemology on the basis of these experimental results (also see, Alexander & Weinberg, 2007, Weinberg, 2007). Moreover, similar arguments are proposed in other domains of philosophy (in philosophy of language, Machery et. al, 2004; Mallon et. al, forthcoming; in ethics, Nadelhoffer & Feltz, 2008; Sinnott-Armstrong, 2005, 2006, 2008), though I am primarily concerned with ER in epistemology.[12] I elsewhere (Kasaki, m.s) reconstructed the arguments against the use of epistemic intuition in detail, but, for the present purposes, the simplified reconstructions will do.[13] The first argument one can find in ER is formalized as follows:

1. Philosophers and participants both have at their disposal all the conceptual and epistemic resources required for forming correct epistemic intuitions in ideal circumstances.
2. Philosophers, in ideal circumstances, have epistemic intuition A about a certain case.
3. Participants, in equally ideal circumstances, have epistemic intuition B about the same case.
4. A and B are inconsistent.
5. If A and B are inconsistent while being epistemically on a par, neither A nor B is justified.

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[12] If the occurrences of 'epistemic' in the following reconstructions of argument are replaced with 'semantic' or 'moral,' the arguments offered in each of these domains are attainable. For more on differences among ER's arguments, see footnote 14.

[13] The following arguments reconstructed are minimalist, in the sense that they mainly take account of the epistemic side of ER's arguments rather than the conceptual side. ER practitioners point out that the current practice of analytic philosophy purports to analyze 'folk-concepts,' concepts that all competent and rational user of concepts share. It, in fact, is true that many philosophers reckon their job analysis of folk-concepts. If this is what they indeed do, ER's results of the diversity of intuition are enough to show that the current practice of analytic philosophy is seriously flawed, insofar as concepts are intimately related to what intuition one has. But this picture of the practice of analytic philosophy may be misplaced (cf. Williamson, 2007). However, some ER practitioners take their arguments to be *mutatis mutandis* applied to Williamson's picture of philosophy (Alexander & Weinberg, 2007; Weinberg, 2009). It seems that the ground for this extension is the epistemic side of ER's arguments, on which I focus here.

6. If a mental state is not justified, it cannot function as justifying evidence for further claims, beliefs, and theories.

7. Therefore, A is not evidence for a philosophical theory (neither is B).

This argument is valid, and I do not question its soundness here. In particular, I assume that (3), the results of the experiments conducted by the practitioner of ER, are accurate. But, even if it is sound, the argument, at best, shows that philosophers' intuitions of a *particular case* do not have probative value, and therefore is insufficient to establish ER's intended conclusion that philosophers' intuitions *in general* do not. Another argument, however, can be reconstructed from ER's writings:

1'. Philosophers and participants both have at their disposal all the conceptual and epistemic resources required for forming correct epistemic intuitions in ideal circumstances.

2'. The processes that participants exercise in forming epistemic intuitions are systematically unstable or unreliable, even when they are exercised in ideal circumstances.

3'. The processes that form epistemic intuition are generally unstable or unreliable, even though they are exercised in ideal circumstances.

4'. Mental states formed by unreliable process are not justified.

5'. If a mental state is not justified, it cannot function as justifying evidence for further claims, beliefs, and theories.

6'. Therefore, epistemic intuitions in general are not evidence for a philosophical theory.[14]

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[14] The argument may go further as follows:

7'. Given the general unreliability of epistemic intuition, in order for philosophers to be justified in their intuition of a particular case, they must have evidence that their intuition of that case is reliable.

8'. There is no such evidence available to philosophers.

This argument is much stronger than the first one, in that it, if successful, deprives most epistemic intuitions of probative value all at once.[15] Before proceeding, some gloss is in order. To begin with, (1') – and (1) – can be read differently, depending on how 'conceptual' and 'epistemic' resources are construed. I take it that the conceptual resources in question are conceptual competence, i.e., competence normal users of concepts exercise to understand and use concepts. The epistemic resources in question can be reckoned normal intellectual factors, such as rationality, literacy, and common knowledge, necessary for being in a position to generate correct intuitions. Thus, if a person is intellectually deficient, say, irrational, she needs to be excluded from the experiment. Moreover, it is known that reliability needs to be relativized to a type of environment or a domain of subject matter. The ER researchers accept that epistemic intuition is reliable with regard to the domain of clear, quotidian epistemic cases; in one of the experiments, conducted by Weinberg et al. (2001), participants are asked to judge whether a person who believes things merely on the basis of a 'special feeling'

9'. Therefore, philosophers' epistemic intuition of the particular case is not evidence for philosophical theory.

This argument, of course, can be repeated for any particular case, and has generic force. Indeed, the arguments very similar to the one consisting of (1') through (9') are proposed in Nadelhoffer & Feltz (2008) and Sinnott-Armstrong (2005, 2006, 2008). The differences between their arguments and the one reconstructed here are the following: first, their arguments are about moral intuition; second, they are directed at a particular position in ethics, moral intuitionism; third, their primary target is every competent user of ethical concepts, not only philosophers (though, this is part of the arguments in epistemology too). Further complication arises since Sinnott-Armstrong employs a version of Pyrrhonian skepticism about justification.

[15] Thus, a difference between the first and the second argument is generality of scope. Another difference, to use philosophical jargon, is put as follows: in the first argument, the experimental data, (3), is used as a rebutting defeater for justification of epistemic intuition; whereas, in the second argument, the experimental data generalized, (3'), is used as an undercutting defeater.

really knows or not. By far the majority answer 'no,' and this result is used to ensure that the participants understand the concept of knowledge correctly. The relevant domain, then, is that of quixostic, unfamiliar epistemic cases, e.g., the case in which a person's brain is envatted and hooked up to the computer which feeds the same sensory experience as she does in the actual world.

On this reading, the argument can be questioned in multiple ways: the first way is to deny (1'), either by arguing that non-philosophers do not share the conceptual resources with philosophers, or by arguing that they do not share the epistemic resources. The former objection takes the form that the participants are using different concepts in reading the vignette and responding to it than philosophers do (Goldman, 2001; Jackson, 2001; Sosa, 2007, 2009); the latter objection is the so-called expertise defence: philosophers are endowed with expertise or skills as a result of academic education and training, and so are epistemically better off than the participants (Ludwig, 2007; Sosa, 2007; Williamson, 2007). (2') involves a generalization from ER's experimental data, and so this generalization can be put into doubt (Kasaki, m.s). A more direct objection to (2') is to question the data, typically, by pointing out the possibility of performance error (Kauppinen, 2007; Ludwig, 2007; Sosa, 2007).

All of these objections presuppose that if every premise of the second argument and ER's rendering of the first premise are accepted, the argument establishes the unreliability of philosophical intuition in general. Here, I want to consider the argument from a different angle, and analyze what presupposition it has. The first thing to note is that there is a gap between (2') and (3'): (2') is the results of ER's experiments, which, as we have seen, confirm that epistemic intuitions vary with philosophically irrelevant factors, such as culture, socioeconomic status, philosophical courses taken, and the order of cases presented. All of these are about the instability of intuition, not the unreliability thereof. However, (3') requires unreliability; (4') is simply a consequence of reliabilism, and thus, reliability is relevant for the step from (3') and (4') to (5'). As we have seen, the reliability of a

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process is a high frequency of mental states with true content produced by it. Thus, predicating (un)reliability of a process presupposes that it is evaluated in terms of truth or falsity. But, how is this possible for the process of philosophical intuition, let alone epistemic intuition? Such evaluation is quite difficult, since most philosophical intuitions are about controversial and relatively complex philosophical issues. And, we cannot always let philosophical theories adjudicate this problem, since, in most cases appeal to intuition is relevant, intuition is expected to play a role in determining which philosophical theory is right, not *vice versa*.

Hastie & Rasinski (1987) point out that the difficulty of evaluating the accuracy of judgement and performance arises in social psychology (also, see Hastie, 2001). By surveying the literature, they find four different criteria for accuracy: (a) objective norms, (b) disagreements between subjects, (c) 'using a bad cue,' and (d) 'missing a good cue'. HB commonly uses (a), with the specification of the relevant norm as Bayesian probability theory. On this model, judgements violating the rules of Bayesian theory are inaccurate. (b) is a simple measure: if two or more subjects disagree with one another, at least one is inaccurate. (c) is to evaluate the accuracy of judgement in terms of whether subjects use a cue that does not correspond to a norm, and (d) in terms of whether subjects use a cue that does correspond to a norm. (c) and (d) are indeed used in HB to factor out biases.

Criterion (b) underlies the first argument of ER. For its gist is to show that philosophers and the subjects of the experiments differ in intuition. Then, what criterion underlies the second argument? Swain et. al (2008) claims that their finding of an order effect on epistemic intuition raises the question as to which intuition is reliable. This suggests that the underlying criterion there is (c); the order in which cases are presented is generally a bad cue, and thereby the order effect generally results in biased intuitions. Similarly, culture, socioeconomic status, and education are regarded as having nothing to do with truth of philosophical claims, in most cases. This is the reason why such factors are

often called 'philosophically irrelevant.' The practitioner of ER, then, reckons them as bad cues, not good indicators of truth.[16]

I have no query about the validity of criterion (c). However, it reveals a deeper commitment of ER. In order for the second argument to go through, it needs to be added that the participants and philosophers use the same type of intuition processes; otherwise, the premise (2') is not generalizable to (3'), which is about everyone's intuitions including philosophers'. ER does not provide a ground for this step. Notwithstanding the lack of ground, however, it seems to follow from the characteristics of HB: the order effect reveals the nature of human intuition-producing mechanism, i.e., the intuition process is that which takes the order of cases presented as a heuristic. In addition, it is such that it is cued by cultural, socioeconomic, and educational factors. Thus, not only ER but also ED shares with HB the notion that judgemental heuristics are components of the intuition processes. Given this, ER, at least in part, involves the same goal as HB and ED, of identifying the intuition process.

This section has exposed the two commitments of experimental philosophy: first, the one concerning the way for the intuition process to be experimentally identified, which is shared in ED and ER; and second, the one concerning the criteria of an intuition's reliability, used in ER. As a matter of fact, both are much discussed in the recent literature of other academic fields, to which I will turn in the next section.

3. Two Approaches to Intuition in Socio-Experimental Psychology

As said at the beginning of the paper, intuition is currently a focus in a broad range of behavioural and social sciences. Moreover, Hodgkinson et al. (2008), in surveying the recent studies

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[16] This difference in criterion underlies the difference mentioned in footnote 15. Sinnott-Armstrong (2006, 2008) is explicit about the two differences.

of intuition, proclaim it to be a 'fundamental bridging construct' to unify those sciences. As they report, an emerging consensus in the behavioural and social sciences is that there are two distinct kinds of systems of information-processing. Those theories that posit the two systems and pursue the functions of them are subsumed under the label of 'dual-process theories.' Despite differences in details and forms, the dual-process theories agree on the fundamental characteristics of the two systems – System 1 and System 2, following Stanovich (1999) and Stanovich & West (2000)'s terminology.

System 1 is a preconscious, rapid, context-dependent, domain-specific, associative, heuristic, tacit/implicit, automatic system; whereas System 2 is a conscious, relatively slow, context-independent, domain-general, rule-based, analytic, explicit, deliberative system. Proponents of the dual-process theories typically regard System 1 and System 2 to correspond to what we call 'intuition' and 'analysis,' respectively.

Indeed, Kahneman recently re-formulates HB in light of Sloman (2002)'s dual-process theory (Kahneman & Frederick, 2002; Kahneman, 2003). HB, thus re-formulated, is an approach to System 1 processing, and is compared and contrasted with other approaches to System 1, among which most prominent is the *naturalistic decision making approach* (NDM) (for a concise overview, see Klein, 2008).[17] In what follows, I describe the contrast between HB and NDM.

NDM started in the 1980's with the goal of studying how people make judgements and decisions in natural, real-world settings, not in controlled laboratory settings as HB studies. NDM and HB shares the assumption that intuitive judgements and decisions have the characteristic of System 1,

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[17] Lipshitz et al. (2001) compare NDM with other approaches to judgement and decision-making, and also review various positions within NDM.

and both attempt to identify the processes implemented in System 1. However, the two approaches are markedly different in many respects, only some of which are relevant here.[18]

First, NDM and HB focus on different points of view from which the study of intuition in judgement and decision-making is to be conducted. Following Hogarth (2001) and (2008)'s suggestion, the focus of HB can be reckoned the 'context of justification,' and NDM the context of discovery.' In the context of justification, people are expected to provide a final answer to some specific question or stimulus; whereas, in the context of discovery, people diagnose the facing situation or problem in light of past experience and make a hypothesis to handle or explain it (cf. Bowers et al., 1990). The contexts of discovery include various situations, ranging from trivial (e.g. crossword puzzle) to important ones (e.g. scientific discovery). These two contexts do not necessarily refer to different situations. One and the same situation can be viewed as a context of discovery or justification, depending how the researcher conceptualizes it.

Second, HB and NDM conceptualize intuition processes differently. On the one hand, HB is concerned with the intuition-*qua*-heuristic process, i.e., the processes whose input is a cue for running simplifying heuristics. Lipshitz et al. (2001) call this feature of HB the 'input-output orientation.'[19] On the other hand, NDM is concerned with the intuition processes whose input is mostly provided by knowledge stored in long-term memory that has been acquired from specific experience *via* implicit learning. Lipshitz et al. (2001), again, call this feature of NDM the 'process orientation'. It is not necessarily the case that HB's and NDM's interests are in *different types* of process. More properly, HB and NDM focus on *different aspects* of System 1. For System 1 is usually regarded as a set of subsystems with some autonomy rather than a single unified system.

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[18] (Kahneman & Klein, 2009) is an exchange between two representative researchers of HB and NDM, Daniel Kahneman and Gary Klein. This paper illuminates where HB and NDM agree and where they do not.

[19] This term originally comes from Funder (1987).

Reflecting these differences in focus, NDM researchers have been studying professional experts' judgements and decisions in difficult conditions, such as uncertainty, time-pressure, ambiguous information, high stakes, vague goals, and unstable conditions. Experts under such conditions give a good model to investigate System 1, since what cues and information are involved in the intuition process is otherwise inaccessible even to the experts, let alone to novices. For this purpose, statistical survey methods, as practitioners of HB utilize, are inadequate, and the NDM researchers typically apply cognitive task analysis methods (see Crandall et. al, 2006). In one of the early works of NDM, Klein et al. (1986) investigated how fire commanders could make good decisions under conditions of uncertainty and time-pressure. They found that the fire commanders usually generated only one option without comparing alternatives, by relying on the repertoire of patterns that they had compiled during more than a decade of experience.[20] In retrospect, Klein (2008) summarizes their finding as follows:

> These patterns describe the primary causal factors operating in the situation. The patterns highlight the most relevant cues, provide expectancies, identify plausible goals, and suggest typical types of reactions in that type of situation. When people need to make a decision they can quickly match the situation to the patterns they have learned. If they find a clear match, they can carry out the most typical course of action. In that way, people can successfully make extremely rapid decisions.
>
> … We found that the fireground commanders we studied evaluated a course of action by using mental simulation to imagine how it would play out within the context of the current situation.

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[20] Klein et al. (1986) use a model, now named the 'recognition-primed decision' (RPD) model, to describe the fire commanders' decision processes. Though there are multiple such models used in NDM, RPD is prevailing. For more on RPD, see Klein (1989, 1993, 1997, 1998).

If it would work, then the commanders could initiate the action. If it almost worked, they could

try to adapt it or else consider other actions that were somewhat less typical, continuing until

they found an option that felt comfortable. (pp. 457-8)

Similar results are now replicated in various domains, ranging from system design, military

command and control, management, to chess (see Klein, 2002). Experts, mostly preconsciously, avail

themselves of a vast amount of past experience, and rapidly process it in the forms of pattern-matching

and mental simulation. This process involves making expectations of patterns and, if necessary,

revising them as more information becomes available, just like a scientist makes a hypothesis for a test,

and revises it as recalcitrant experience arises (hence, it is exercised in the context of discovery). The

stored patterns are so complex and subtle that only experts can categorize a new situation as

prototypical. The researchers of NDM collected ample evidence that intuition in this sense often

outperforms analytical thinking (Betsch, 2008; Klein, 2002, 2009; Myers, 2002; Plessner & Czenna,

2008), and even that when explicit analytical thinking interrupts, performance ends up inferior (Klein,

2002, 2009).

NDM, thus understood, may seem strikingly differ from HB in distrusting expert's performance.

One of the early works in HB, Tversky & Kahneman (1971), found that even those psychologists who

were familiar with statistics were susceptible to biases and their intuitive judgements failed to conform

to principles of statistics. And, such evidence has since accumulated.[21] However, there is no reason

that HB must submit to skepticism of intuitive expertise and skills. For, as Samuels et al. (2002)

correctly point out, HB is not committed to the claim that the processes that involve simplifying

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[21] Thus, Kahneman states that "[t]here is much evidence that experts are not immune to the cognitive illusions that affect

other people." (Kahneman, 1991, p. 144)

heuristics are all and only what we have at our disposal, and thereby it is consistent with the existence of different processes in judgement and decision-making.[22]

In the next section, I will argue that NDM has significant ramifications for experimental philosophy, and moreover, I propose that it may enrich the framework of experimental philosophy.

4. Ramifications of NDM for Experimental Philosophy

The current practice of NDM, by its nature, is mostly devoted to research on those domains that require working under time-sensitive and high-stress conditions, such as firefighting, aviation, management, medical care, and so forth. Thus, it is not clear whether the methods of NDM are applicable to philosophy, since it has no such constraint. Be that as it may, rethinking experimental philosophy in light of NDM, or more broadly, of the context of discovery rather than justification, is worthwhile, or so shall I argue.

First, as I argued in Section 2, experimental philosophy, as it is practiced at the present time, is modeled on HB. In particular, it shares the input-output orientation with HB. This orientation is in part determined by the methodological limitation of current experimental philosophy: by far the most experiments have been conducted in the form of statistical surveys. So the input-output orientation seems merely a historical contingent, and there is no reason to refuse a richer repertoire of methods. Provided that a central goal shared by the two positions in experimental philosophy, ED and ER, is to understand the processes underlying philosophical intuition, there seems more reason than not to pursue this goal with the process orientation (though, as we have seen, the process and the input-output orientation are not incompatible). Even putting aside the issue of which orientation experimental

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[22] This is evident in Kahneman & Klein (2009).

philosophy should take, no doubt other sophisticated methods, such as cognitive task analysis, would help experimental philosophy, especially because it is designed to analyze cognitive processes.

Methodological questions become more acute, if the difference between System 1 and System 2 is taken seriously. Many dual-process theorists hold that System 1 and System 2 are jointly working in any mode of cognition, though how much each contributes to cognition differs from case to case (cf. Betsch, 2006). Thus, Hammond (1996) refuses the dichotomy of intuition and analysis; on his view, intuition and analysis *simpliciter* are two extremes, and any judgement is placed at some point on the continuum of these two polar extremes. Haberstroh (2008) reports the experiment conducted by him and his colleagues, in which they manipulated the judgement mode as an independent variable: after watching a video, one group was instructed to judge spontaneously, whereas another was instructed to think carefully, of how often they saw animals of a certain genus in the video. The result is, surprisingly, that the availability heuristic is not observed in the frequency judgements of the former group, whereas it is in those of the latter group. As this experiment shows, experiments need to be carefully designed, if experimental philosophers are concerned with philosophical *intuition*. It may be the case that some heuristic and bias becomes into play only when System 2 largely governs philosophical thinking.[23]

Second, more importantly, NDM and other related fields of study are suggestive in pursuing the question of how philosophical intuition is to be evaluated. For most domains of interest in NDM are those where, just as in philosophy, criterion (a) in Hastie & Rasinski (1987)'s list, objectively optimal norms, is inapplicable. The following are the criteria I found in the NDM literature, and they are alphabet bulleted continuously with Hastie & Rasinski's list:

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[23] One finer way to investigate the functioning of each system may be to use neuroscientific methods. For the implications of such methods for the study of intuition, see Volz and von Gramon (2008).

(e) Peer Judgement: Shanteau (1992) suggests using peer judgement to evaluate expertise in a certain domain. First, an expert in a domain is defined by *quantitative* measures, such as years of experience, depth and extent of knowledge, job titles, and academic credentials, with regard to that domain. Then, a performance therein is evaluated by the performance standards that are set by the ones who satisfy the qualitative measures to a high degree.

(f) Speed: If tasks are time-sensitive, how rapid judgement is made is an important factor for performance evaluation (Hogarth, 2001).

(g) Adjustment: Funder (1987) and Hogarth (1981), from the vantage point of what is now expressed as the context of discovery, argue that heuristics, even though they may lead to biases at the moment, are useful in the long run for making a hypothesis and adjusting it on account of corrective feedbacks. Especially when tasks are continuous rather than discrete, what is important is how well judgements are adjusted against varying experience.

(h) Natural Environment: Biases found in the laboratory are not a big deal in natural, real-world environments, insofar as they are not easily replicated in the latter. This entails that the reliability of performance is to be relativized to natural environments. 'Natural' here needs not be understood in evolutionary terms. Social environments, as we find ourselves in today, can be natural in the relevant sense (cf. Funder, 1987; Klein, 2009, ch. 4).

(i) Kind Environment: A proper learning environment is no doubt important for being an expert. Hogarth (2001) and Kahneman & Klein (2009) remark that not every environment, however, is effective for cultivating one's intuitive expertise. To use Hogarth's terminology, in 'kind' environments, one receives accurate and timely feedback that promotes implicit learning for shaping intuitions; whereas, in 'wicked' environments, no feedback, or else misleading feedback is provided. In the latter environments, System 1 is barely tied with the

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environmental cues relevant for yielding accurate intuition. Of course, what environment counts as kind differ from domain to domain. Thus, one's intuitions in a domain are evaluated depending on whether the environment one is facing is relevantly similar to the kind environment or not for that domain.[24]

(j) Representation of the Problem Situation: On Klein's models, experts, in dealing with a specific situation, use implicit knowledge of what pattern to expect in that situation, and rapidly diagnose it in virtue of pattern matching. In this regard, experts see the situation differently than novices. This model matches findings in other studies of expertise. Larkin et al. (1980) conduct experiments to figure out what role 'physical intuition' plays in the problem-solving in elementary physics between experts and novices. They conclude that the experts interpret or represent the problem situation by different representation schema than novices'. The experts interpret or represent the problem situation in accordance with physical principles by referring to and adjusting the representation schema relative to the cues given in the problem description as they read it, whereas novices' representations are led by concrete variables specific to the problem situation (for more on this, see VanLehn & van de Sande, 2009). Ericsson & Charness (1994) summarize that similar results have been obtained in the domains of chess and medicine. Given such results, then, the quality of representation schema is an important dimension along which intuitions are evaluated.

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[24] Ericsson et. al (2006) and Ericsson (2009b) emphasize that such factors as strong motivation, deliberate practice, and challenging environment, are also necessary for developing expertise. Klein (2009, ch. 11) warns not to put too much emphasis on feedback. Furthermore, Schooler & Anderson (1990) report that immediate feedback is not always effective for learning.

Granted, these are criteria suitable for some domains. But we have to be careful about whether and to what extent they are relevant for philosophy.[25] First, (e), peer judgement, is a traditional one in philosophy: 'good' philosophers' judgements have been used as norms for evaluating intuitions of not only novices' but also less proficient philosophers. I do not doubt that there is a set of skills and expertise that genuinely deserves the name 'philosophical,' such as skills of logical thinking, argumentation, and philosophical analysis. They, however, seem to belong to activities of System 2, and it is not clear what influence they have over skills germane to philosophical intuition. Moreover, as a matter of dialectical dynamics, assuming (e) begs the question against ER; second, (f), speed, has no direct significance for philosophical cases, since they are, by their nature, time-insensitive. In addition, speed is a different variable than truth, and related to reliability in no obvious way[26]; third, the importance of (g), adjustment, is defended with regard to social judgements in action. But again, philosophical cases do not require timely adjusting intuitions about them (perhaps, only if the cases in question are such that some sort of contextualism holds for them, (g) becomes relevant). I take it that (e) through (g) are largely irrelevant for evaluating philosophical intuition.

Fourth, some philosophers, such as Kornblith (2002) and Plantinga (1993), already have argued that the reliability of a process or faculty in general is relativized to 'natural' environments, i.e., environments to which our cognitive systems are adapted. Criterion (h), natural environment, is

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[25] Philosophy, indeed, contains many sub-domains. I do not deny that the importance of each criterion may differ across sub-domains of philosophy.

[26] Goldman (1986, ch. 1-1) takes speed and power as two evaluative factors of cognition, but he is aware that they are not directly related to reliability. What he calls 'power' is how much information a process can handle at a time, and 'speed' how fast it can so. I am using 'speed' in the sense that involves both.

proposed in a similar vein.[27] If this is right, one way to evaluate the reliability of an intuition process is to see how natural the environment is in which it is exercised. On a simplest measure, the reliability, then, is proportional to the naturalness of the environment. Such a measure is consistent with ER's claim that only intuitions about humdrum, quotidian cases must be appealed to in philosophy, assuming that such cases are those with which we have evolved. It is controversial, however, whether and to what extent (h) is applicable to philosophical cases about non-natural matters.

Fifth, use of criterion (i), kind environment, may circumvent the problem of (h) just mentioned. Kind environments involve certain cues correlating with certain consequences. Such environments are essential for developing and exercising reliable intuitive abilities. Then, if the situation were not relevantly similar to the kind environments in which one has had specific experience and/or education, intuition might end up ill. This point seems to be recognized, at least implicitly, among philosophers: for example, Brendel (2004, pp. 97-8) remarks, in analyzing what makes hypothetical philosophical cases 'legitimate,' that "if we invent a scenario in which we manipulate or change data in an unfamiliar way, the effects of these manipulations or changes should always be under control, i.e., we should understand how they can affect other implicit assumptions of the thought experiment and whether these effects can still justify the intended conclusion of the thought experiment." His point may be construed as the idea that enough cues must be given in forming intuitions of unfamiliar cases, and moreover, that such cues must be controlled so as to keep the correlative relations that are confirmed in familiar cases. Once these conditions are met, a case is legitimate, and the intuition thereof is trustworthy.

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[27] Klein, in suggesting (h), refers to Gigerenzer (1991), whose ecological approach to judgement and decision-making is similar but distinguished from NDM, in that it still shares the input-output orientation with HB. Todd & Gigerenzer (2001) try to minimize the difference.

Sixth, criterion (j), representation of the problem situation, seems most important for at least two reasons: for one, a group of NDM researchers, Adelman et al. (1996), by investigating how information order influences tactical control officers for the U.S. Patriot air defence system, conclude that "the resulting judgement and decision are not the function of an anchoring adjustment heuristic that differentially weights the importance of recent (or prior) information but, rather, a pattern-matching process that attempts to explain the particular sequence of information." (p. 258) Different orders of information elicit different patterns, and thereby the control officers 'interpret' the situation differently. Another group of NDM researchers, Perrinet et al. (2001), replicated the same result for active-duty U.S. Navy officers. These results are especially relevant if we want to understand the process underlying the order effect on philosophical intuition reported in Swain et al. (2008).

This point does not yet touch on the issue of how representation of the problem situation is to be evaluated. Some researchers of NDM, e.g. Fischer & Orasanu (2003), attempt to confirm that experts, selected by the *quantitative* measures used in (e), are on good footings by certain *qualitative* measures of expertise. For this purpose, Fischer & Orasanu adopt Chi et al. (1981)'s free sorting task method. Although their method involves sophisticated hierarchical clustering and multidimensional scaling, I here focus on Chi et al.'s method, mainly for the sake of simplicity. They attempt to compare novices and experts with regard to how each represents the problem situation. The participants, graduate students in physics and undergraduate students who have just completed a physics class with an A grade, receive the stack of twenty-four index cards stating different problems, and are instructed to sort them by similarity measure, and also to explain the reasons for their sorting. Chi (2006) succinctly re-describes the result as follows:

Based on analyses of both the problems that the participants categorized into the same groups as well as their explanations for the sortings, it became apparent that the undergraduates grouped problems very differently from the graduate students. The undergraduates were more likely to base their sorting on literal surface features, such as the presence of inclined planes or concepts such as friction, whereas the graduate students were much more likely to base their sorting on domain principles that would be critical to the solutions (e.g., such as problems that involve Newton's Second Law or the laws of thermodynamics such as conservation of energy). (p. 175)

Thus, how well the representational pattern or schema, as one uses in forming intuition in a domain, matches fundamental principles of that domain is a qualitative standard for intuition evaluation. Moreover, Chi (2006) suggests that how integrated or consolidated the representational schema is is another qualitative standard.[28] [29]

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[28] The significance of Chi's methods is further inquired in VanLehn & van de Sande (2009). Their work seems relevant for modeling philosophical expertise. For what they investigate is conceptual skills in physics, and one of the methods used to measure such conceptual skills is conceptual inventory, a qualitative multiple choice test containing a vignette designed to examine subject's knowledge of physical concepts. Conceptual inventory is similar to the type of test used in experimental philosophy.

[29] Findings in the study of expertise often entail that that experts have better representational or conceptual knowledge. An important issue, then, is what structure such representational knowledge has; this is a hot topic in the study of conceptual change. There are mainly two views on this issue: the view that it has a theory-like unified structure, and the one that it is a collection of quasi-independent elements. For an overviews of the debate, see Özdemir & Clark (2007); diSessa (2006) is a historical guide to the debate. Indeed, DiSeesa (1988, 1993) identifies the fundamental conceptual knowledge with intuition. Clement (2008) contains a series of throughout experiments about what role intuition in DiSeesa's sense plays in the problem-solving in physics between experts and novices.

Criterion (a), some established norm of truth, being absent, the criteria (b) through (j) can be employed in philosophy – though I am skeptical of the importance of (e) to (g). The question of how philosophical intuitions are to be evaluated is indeed to the heart of the debate between the ER researchers and their opponents. As we have seen in Section 2, a group of the opponents question the first premise common in ER's first and second argument, viz., that participants and philosophers are conceptually and epistemically on the same footings, by pointing out that that philosophers' expertise make them epistemically better off. The idea implicit in this expertise defence seems criterion (e). Thus, the ER researchers and the opponents are using different criteria for evaluating philosophical intuition. As mentioned above, merely appealing to (e) begs the question against ER. This is because we, at the moment, do not know what expertise, if any, professional philosophers have, and how it is relevant for generating philosophical intuition. Then, a way to settle the debate is, as Fischer & Orasanu (2003) do, to investigate whether the quantitative measures in (e) correspond to the qualitative measure in (j).[30] This, of course, requires more experimental investigation. It is an open possibility that intuitive expertise in philosophy, in the final analysis, is a hallmark of reliability and truth with regard to philosophical matters.

Part of this problem is motivated by the Chomskian interest in how conceptual knowledge is stored and implemented in the brain (and also, how much of it is innate). For more on this, see, e.g. Carey (2009). The same type of interest is found in experimental philosophy, e.g. in Weinberg et. al (forthcoming).

[30] If philosophers are better than novices with regard to the quality of representational or conceptual schema, it may as well suggest that they are conceptually better, and support that the conceptual relativity defence is on the right track. But we need to be careful here. For what is called a 'concept' or 'conceptual' in the psychological study as mentioned in footnote 29 is much different from what is so called in philosophy, and even psychologists have not agreed on what the concept of 'concept' is (see, diSessa & Sherin, 1998; Machery, 2009). Indeed, 'concept' is no less ambiguous than 'intuition' in many domains.

Furthermore, given the variety of criteria specified here, an important question is how much weight is to be allocated to each. Unless both experimental and traditional philosophers are careful to specify their answer to this question, it is likely that they are simply talking past each other, either applying different criteria, or applying a set of criteria with different weight. Thus, to pursue this question is a way to make the debate between the two camps more fruitful. Indeed, Brendel argues that Gettier cases satisfy his criterion (i), whereas Weinberg et al. (2001) use a certain Gettier case in their experiment. Of course, those criteria besides (a) are all indirect measures of truth. But note that (i) is not dependent on cultural or socioeconomic factors, and provides a more detailed account for the reliability of an intuition about a given case; the ubiquity of bad cues, revealed in ER, does not even hint at which intuition about a case is false. Thus, if Brandel is right, (i) may well trump (c) and (d). However, it, at least in part, is an empirical question whether non-philosophers and philosophers use the cues he specifies in forming intuitions of Getteir cases. Furthermore, in order to see whether (i) is applicable to other cases, it needs to be specified what cues they contain and how they are similar to familiar cases. This simply means that more theoretical and experimental jobs remain for both traditional and experimental philosophers.

5. Concluding Remarks

This paper is not intended to be an objection to the current practice of experimental philosophy. Rather, I have suggested that experimental philosophy is, and should be, part of the growing interdisciplinary inquiry into intuition. For this very reason, the framework of experimental philosophy can be enriched in light of NDM.

The first problem raised by experimental philosophy is what process underlies philosophical intuition. NDM's process orientation would offer more directions experimental philosophy can take in dealing with this question. The second problem of interest for both experimental and traditional philosophers is how philosophical intuition is evaluated. With the help of the NDM literature, I have shown that there are more evaluative criteria than those currently used, though, of course, each criterion needs to be further qualified for use and experimentation.

Another important dimension of inquiry experimental philosophy can contribute to is philosophical expertise. I have argued that ER's second argument requires for its soundness an empirical assumption that participants of the experiments and philosophers exercise the same types of processes when prompted to yield intuitions about philosophical cases. Findings in NDM and the psychological study of expertise, including those relevant for (j), however, provide ample evidence across many domains that experts and novices process information in different ways. Such evidence might be taken to put into doubt ER's empirical assumption. But this is too hasty. For, again, we are yet oblivious of intuitive expertise in philosophy. However, experimental philosophy can contribute to elucidating this otherwise perplexing entity. From this perspective, Nichols et al. (2003)'s experimental data, that the students who have taken a couple of philosophy courses are more likely to have the same intuitions as philosophers than the students who have not, is even more interesting. What is going on in philosophical education, and what epistemic difference does it make? Inquiry into these questions is a way to see whether or to what extent (i) and (j) are applicable to philosophy. It may turn out that the students with philosophical education were indeed tracking truth, in terms of (i) and (j), and consequently (e).

The core idea behind NDM is the privilege of the context of discovery over the context of justification. Experimental philosophers are all descendants of Reichenbach in their naturalistic spirit.

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NDM, however, resurrected the context of discovery in a naturalistic coat. So, no worry exists about the context of discovery anymore.[31]

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[31] The revival of the context of discovery is on-going among philosophers of science and psychologists studying creative thinking. Some works mentioned in fn. 29 comprise this movement. Moue et. al (2006) describe the history of philosophy of science in the 20th century from this perspective.

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