Epistemic Relativism and the Gettier Problem:
Insights from Philosophy of Science.

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Abstract. The aim of this article is to present a variant of epistemic relativism that is compatible with a language practice especially popular among scientists. We argue that in science, but also in philosophy, propositions are naturally 'relativized' to sets of hypotheses or theories, and that a similar language practice allows one to interpret canonical problems of epistemology. We apply the model to Gettier's problem, and derive a condition under which counterexamples *à la Gettier* to Plato's account of knowledge do not arise. We argue that these findings give further content to a well-known result by Zagzebski (1994). Our interpretation points to a type of epistemic relativism having links with contextualism in epistemology, and perspectivism in philosophy of science.

1. Introduction.

Recent literature shows that the debate between relativism and absolutism is vivid in several fields of philosophy, such as philosophy of language, ethics, and epistemology (for reviews, cf. Harré and Krausz 1996, Boghossian 2006, Baghramian and Carter 2020). Relativism comes in many flavours even within each field, but a common feature of all relativistic models is that they consider their central object of interest (be it concepts, propositions, ethical values, truth, knowledge or even reality) to be *relative* to something else – to some referent, or parameter. Following Harré and

Krausz (1996), Boghossian (2006), and Baghramian and Carter (2020), perhaps the most general types of referents are 'conceptual frameworks' or 'evidential systems'. But there seems to be a consensus that this general relativizing parameter is determined by something else, and that one gains in narrowing the 'conceptual framework' down to 'language', 'culture', 'historical epoch', 'time' etc. In modern epistemology, a much investigated type of relativism is contextualism, so called because it takes the essential referent (for knowledge, or rather knowledge attributions) to be a 'conversational context' (cf. e.g. Lewis 1996, Cohen 1998, 1999, DeRose 1999, 2009, Rysiew 2016).

One goal of the present article is to take one step back, and to argue that for some typical epistemological problems one gains in keeping as referent 'conceptual frameworks', rather than contexts. Now, instead of 'conceptual framework', we prefer the notion '(coherent) body of information' or 'set of hypotheses' or 'theory'; note that there is a semantic continuity between these concepts (see further). We feel that 'set of hypotheses' and 'theory' are the more precise concepts, at least in a scientific or philosophical context, since these notions are familiar from philosophy of science; 'body of information' seems more appropriate in everyday contexts. (For our purposes, we do not need an elaborate account of wat theories are. It suffices to assume, following a long tradition in philosophy of science, cf. e.g. Popper 1959, Hempel 1965, that theories are hypothetic-deductive systems of propositions closed under deduction – one could add that they are based on a (small) number of base hypotheses, laws, principles, axioms[1].)

The background of our proposal lies in the observation that in (natural) science relativizing to hypotheses and especially theories seems an everyday, even inescapable practice. It seems therefore worthwhile to investigate whether a similar practice is instrumental in epistemology; and, especially, whether it solves problems. We will study this practice starting from a linguistic entrance. Actually we could, for our purposes, remain essentially on the pragmatic-linguistic level throughout this article. But linguistic habits may have interesting semantic-epistemological grounds, and by applying this practice (or rule) to Gettier's problem we will bring the discussion inevitably on the grounds of epistemology. Indeed, we believe the interpretation of Gettier's problem that we will propose in the following points to a form of epistemic relativism that connects interestingly with a wide variety of positions in epistemology and philosophy of science. However, we can here only make a succinct comparison with the most saliently related views, namely with comparable linguistic studies (notably

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[1] Note that 'theories' can be considered, in first approximation, as 'sets of hypotheses' – this follows from the definition we just gave –, so the latter is perhaps the most general of the interpretations of 'conceptual frameworks' we will privilege here.

Bach 2005, Ludlow 2005), with contextualism, and with scientific perspectivism; the latter is a position in philosophy of science (Giere 2006 and Massimi 2012, 2018, 2019).

In an article entitled 'Realism and Relativism', Field (1982) comes close to what we have in mind: he takes as relativizing parameter an 'evidential system'. Field defines epistemological relativism as follows (p. 563):

> "I understand it as the doctrine that the basic epistemological properties are not such properties as that of belief *B being justified*, but rather such relativized properties as that of belief *B being justified relative to* evidential system E. (An *evidential system* is, roughly, a bunch of rules for determining under what conditions one is to believe various things; a belief is justified relative to an evidential system in certain circumstances if the rules license the belief under those circumstances.) To make relativism a believable doctrine, we have to show that all legitimate epistemological reasoning can be reconstructed with such relativized notions and without the absolute or unrelativized ones."

If we see the latter as a research programme, then the aim of this article is to present an entry into such a programme. Indeed, we will present arguments for the thesis that the basic notions of epistemology, namely truth, knowledge and justification, can be considered as being relative to (coherent) bodies of information or theories, in a well-defined sense to be spelled out below. As said, 'theory' has to be understood here in the usual sense of philosophy of science; so not really in the sense of 'evidential system' as Field defines it – but there seems to be room for overlap between the two views. Clearly, very many authors have defended some form of relativistic epistemology (for a most recent review, see Baghramian and Carter 2020, notably § 1.3. on the 'hidden parameter' view of relativism, perhaps closest to ours). But it seems that none of them has claimed that the concept of 'theory' should be put at the heart of the matter.

The article is organized as follows. We will start with a study of a language practice that is especially popular among scientists, but also among philosophers, and that amounts to 'embedding' propositions, more precisely an expression as 'p is true', in theories. This habit is less frequent among philosophers, presumably because it is less straightforward in philosophy to relate a given problem or claim or proposition to a well-defined (and widely accepted) theory[2]. In Sections 2 and 3, we will investigate in some detail how expressions as these are used in science and philosophy. We will have a look at related linguistic studies such as those of Bach (2005) and Ludlow (2005) (Section 3). In Section 4 we will formally apply the same language practice to Gettier's problem (1963). We will argue that it leads to a quite straightforward semantic interpretation if a certain condition (which we will call the 'condition of consistent referencing') is fulfilled. Notably, we will

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[2] In a field as physics one can, in principle, identify for any proposition, hypothesis or claim to which subfields and therefore theories (in a broad sense) it can 'belong'. Also, in philosophy subfields are usually more strongly intertwined.

argue that counterexamples to Plato's account *à la Gettier* only arise when the mentioned condition of consistent referencing is violated (Section 5). We will also show that our analysis is in full agreement with, and gives further content to, a well-known and logically compelling result due to Zagzebski (1994) (Section 5). Finally, we will briefly compare our relativist model to contextualism and identify some commonalities but also differences (Section 5). We will suggest that the results we present in this article could support a moderate epistemic relativism, which we would dub 'theory relativism' if we were asked to name the baby.

A few words of caution are in place, in order to better situate this paper within the broader philosophical landscape. First, as many authors (e.g. Field 1982, Harré and Krausz 1996, Boghossian 2006) have convincingly shown, relativism of the type we have in mind is not contradictory to realism. Indeed, as will become clear in the following, our moderate epistemic relativism is most naturally understood within realism. Also, as many have emphasized (e.g. Field 1982), relativity of propositional truth has very little or nothing to do with extreme relativism as subjectivism – the position that all opinions are valid. Our account is well compatible with the idea that some theories describe reality better than others; moreover, with reference to a given theory, it is of course possible to distinguish true propositions from false ones. Thus our position appears to be at odds with, for instance, the strong relativism of Kuhn and his 'incommensurability' of rival scientific paradigms (we will have much more to say about rival theories below).

Next, even within epistemology alone, the views proposed here open a wide array of questions regarding the deeper nature of knowledge and truth. We find these questions fascinating, but even listing them and sketching possible answers within different schools would bring us far beyond the scope of this article. We will have to remain essentially on the pragmatic-linguistic level in this article. Yet we believe it is useful to give some sense of a few broader conjectures that are compatible with our findings, and for which we have sympathy, even if we cannot justify any of such claims in detail. As an example, one immediate (and perhaps not particularly original) conjecture one is tempted to draw from our analysis is the following: the truth-value that one is (or should be) willing to attribute to an utterance depends on the (truth-value of the) hypotheses/theories one assumes. In Section 5 we will briefly suggest that this claim bears a meaningful connection with Quine's holism (1951). Another such conjecture is that *scientific knowledge is solidly embedded in theories alone* (again, many philosophers will not be surprised by such a claim, others will vehemently reject it); but more generally, that *any* knowledge (even of everyday things) is embedded in (coherent) sets of hypotheses. Even (the truth-value of) a banal statement as 'this is a tree', or 'the dog Droopy just bit me' depends, in a sense, on (the truth-value of) a set of hypotheses – including

for instance the assumption that one's senses are not manipulated, that a certain dog really is called Droopy, etc. We will not elaborate; but we hope that others will.

Finally, one could seek for connections with well-known accounts from the philosophy of science. Indeed, theory relativism could be interestingly compared to, for instance, the scientific perspectivism of authors as Giere (2006) and Massimi (2012, 2018, 2019), which are perspectival realisms. Again, such a comparison goes far beyond the scope of this article, but one could consider the following view as a natural companion to the epistemological results we will argue for here: that what we can scientifically 'know' are (ultimately) not objective truths but *theories*, which offer perspectives to the objective universe – hence a connection with Giere's and Massimi's views. (This connection might be rather loose, as we will briefly note in the Conclusion, Section 6.) Again, the perspectivalism we have in mind is not in contradiction with realism, and with the idea that a given theory may describe reality (!) better than a competing one. As said, we can unfortunately not elaborate here on these important issues, but we hope that our findings can be an input in such discussions.

We will focus, instead, on Gettier's problem. We do not claim to have found 'the' solution to Gettier's problem, but we believe we have found one logically coherent interpretation.

2. How the words 'true', 'know' and 'justified' are used in natural science.

We propose to start with a note on a conversational habit that is perhaps most widespread in natural science, physics in particular[3].

Suppose that a physicist measures the speed of a satellite by using optical techniques, and finds x meters per second, or rather x±Δx, where Δx is the measurement precision. Suppose that other physicists confirm the measurement, and that all agree that the speed of the satellite during measurement was x±Δx (expressed in m/s). Is it 'true' that the speed of the satellite was x±Δx ? If we would ask the physicists, insisting that we indeed are inquiring about the 'absolute' truth of the measurement value, the question might spark hesitation. One of them might remember, for instance, that the measurement technique neglects relativistic effects; and that spurious phenomena (e.g. due to unstable atmospheric conditions) perturbing the measurement can never be fully excluded. We believe that after some reflection they would agree on an answer as the following: "well, *within* our hypotheses (by applying a non-relativistic model calculation on the experimental data, and as far as

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[3] One of the authors of this article is a philosopher who also has professional experience as a physicist.

our measurement assumptions are valid), it is indeed true that the speed of the satellite was $x \pm \Delta x$." That is a different answer than "it is absolutely true that the speed was $x \pm \Delta x$".

In many fields of physics and science, professionals doubtlessly find it quite clear which theory describes a given phenomenon best. For instance, for mechanical phenomena such as the flight of a satellite, it is generally agreed that relativity theory does a better job than classical Newtonian mechanics (even if the difference in the predicted velocities may be very small). But at the forefront of scientific research, it happens often that it is not yet decided which theory is most efficient: competing frameworks are proposed to explain the *same* data. For instance, for the phenomenon of superconductivity (i.e. the disappearance of all electric resistivity in metallic materials at low enough temperatures), several competing theories exist, of which it is not (yet) clear which one will prove most adequate – if any. Suppose now that two theories allow one to calculate a same variable, for instance the superconducting transition temperature for a given material, t_s. Theory 1 predicts $t_s = x1$ (expressed in degrees Celsius), while theory 2 implies that $t_s = x2$ (suppose that $x1 \neq x2$). Finally, suppose that t_s has not yet been measured, at least not with enough precision to discriminate between the two different numerical values. *It is clear, then, that in certain contexts it is ambiguous to state that "it is true that $t_s = x1$"* – as ambiguous as it is to say that "it is true that $t_s = x2$". No-one really knows. Both values are deduced from theories that experts consider as valuable but competing potential candidates for explaining superconductivity. What *could* be said with less ambiguity in such a context, is a phrase like: "*within theory 1* (i.e., *while assuming the validity of theory 1*), it is true that $t_s = x1$".

That an expression as "within theory T, p is true" (or more generally "within the hypotheses T, p", where p is a given proposition) is frequently used in the natural sciences is easily verified in scientific texts. "Within this theory" or "within this model" can also be found in philosophical texts of course; a related expression is "on this account"[4]. Some further examples: "Within the ideal gas model, molecular collisions are elastic". Or: "the measured chemical equilibrium constant is K, assumed that one can neglect temperature effects". Notice that if we would take the authors of above written sentences aside and ask them whether "p is true", they should reply, for full clarity, something like: "p is true *within theory T*" or "p is true *within hypotheses T*". Within another theory T[*], p might not be true at all.

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[4] Notice that the expression "p is true" is for obvious reasons not very popular in scientific *literature* (as opposed to speech), since scientists 'neutrally' infer or discuss p without explicitly stating in written that "p is true"; they implicitly assume that p is true. But scientists do *write* the equivalent expression "within theory T, p *holds*" or "within theory T, p *is valid*", especially when controversial topics are discussed, or when approximations are used (and that is often the case).

The only point we need for our subsequent discussion, is that it is a frequent *language practice* in the scientific community to state that "p is true within T", instead of "p is true" *simpliciter*. We will term this here, in a self-explaining manner, a 'perspectivist' language practice for using the word 'true' as qualifying a proposition 'p'. According to this usage, one adds information to the word 'true' by specifying a 'perspective' (a theory or a set of hypotheses T) within which p is true. Let us emphasize that this perspectivist practice is needed for clarity, i.e. to remove ambiguity from speech, as is illustrated in above given examples. Let us introduce following convention: we abbreviate 'p is true within T' as 'p is true_T'.

[Even if we can remain on the linguistic-pragmatic level for our purposes, the language practice just illustrated does resonate quite strongly with well-known debates on theories of truth. Indeed, we believe it points to the idea that there are two aspects to the truth of a proposition p, a coherence and a correspondence aspect, at least in science, but possibly in general (cf. Kirkham 1992, Ch. 2). The first (coherence) aspect concerns the truth of p as logical consistency of p *within* a theory T (so this aspect asks whether p is logically consistent with T, notably, whether p can be logically inferred from T). The second (correspondence) aspect is the 'truth' or adequacy or verisimilitude of T (as a whole) for describing aspects of reality (pointed to by p). In sum, in our preferred interpretation, the highlighted perspectivist parlance points to a mixed coherence – correspondence theory of truth. Explicitly, this hints to the idea that scientists consider a proposition p as being 'true' if p is logically consistent with a theory T, and if T (as a whole) is believed to be an adequate description of reality. In Section 5 we will recall that this view well fits to Quine's interpretation (1951). When speaking, people usually do not *consciously* adhere to such a complex theory of truth; but when uttering phrases as "p is true", we submit that they in effect do rely on such a somewhat complex epistemological reality. But as said, we will not elaborate here.]

It appears that a very similar perspectivist language practice exists in discussions among scientists when they use the words 'know' and 'justified' – even if we gladly admit that especially in the case of 'justified' such a hidden perspectivism is not immediately obvious (but see already hints in the above quote from Field 1982). Again, it appears that contexts in which several competing theories co-exist are most relevant for the discussion. Suppose that 'p_c' is a proposition from classical mechanics, such as "the kinetic energy of this object is E". Also suppose that a calculation using the relevant formula of classical mechanics indeed allows to infer that the kinetic energy of the object in question *is* E – in other words: p_c is true within classical mechanics. First note that, in general, p_c is *not* true within relativistic mechanics: the latter theory will in general predict a different energy E^* for the object in question. Relativistic and classical mechanics are 'co-existing' theories:

some physicists use on a daily basis the relativistic variant, while others (the majority) use the classical one, since the latter is often a good approximation of the former. Now, one can easily imagine contexts in which it is not *a priori* clear which theory is used or referred to. Suppose, then, that in such a context the two physicists Alice and Bob are discussing the calculations of their colleague Cecil, who just submitted to Bob the result 'p_c' ("the kinetic energy of this object is E"). If Bob would ask Alice "Is it true that p_c ?", Alice might find this question ambiguous (all depends on whether one refers to classical or relativistic mechanics). But she can bring some clarity into the debate and answer in an unambiguous manner: "p_c is true within classical mechanics" (she would be right to top). If Bob would ask "Am I justified to believe that p_c ?", Alice, decided to keep the debate as clear as possible, could answer: "You are justified to believe that p_c if you assume (the validity of) classical mechanics", or shorter "You are justified to believe p_c within classical mechanics". And finally, to Bob's question "Does Cecil know that p_c is true?", Alice would have to answer something like: "Cecil knows that p_c is true if one assumes the validity of classical mechanics", in short "Cecil knows that p_c within classical mechanics". If the latter expression sounds awkward, remember it is just a shorthand expression, and that it is a (necessary) way to bring clarity in discussions.

As a next example, consider two psychologists, Carl and Anna, discussing prehistoric cave paintings. One of them, Carl, is a fan of Jung, Anna not at all. Carl suddenly says: "Archetypes play an essential role in prehistoric art. But would Brian know that ?" The latter question may seem awkward, at least to some (it does to Anna). Can one really know that Jung's archetypes play an essential role in prehistoric art ? That depends on whether it is *true* that p_a, where p_a = "Jung's archetypes play an essential role in prehistoric art". On usual interpretations, one cannot know a proposition that is false. And whether p_a is true is certainly a matter of debate among the expert psychologists and anthropologists. In sum, one can only avoid confusion if one says something like: "Brian knows that p_a if one assumes the validity of Jung's anthropological theory". In order to be coherent with the language use we highlighted before, let us abbreviate above perspectivist expression by "Brian knows that p_a *within* T_a". With exactly the same convention as already used, both expressions can formally be rewritten as "Brian knows_T_a that p_a".

We believe that similar remarks hold for 'justified' in these contexts. Justified is a notoriously vague word – how justified is justified ? Is one justified to believe that the theoretical value of the transition temperature $t_s = x1$? That depends on the theory one adheres to or uses. Proponents of T1 will agree, proponents of T2 will not. Is one justified to believe that Jung's archetypes play a role in prehistoric art ? All depends. Our point is that there exists a trick, a shorthand expression by which the use of the word 'justified' can be rendered unambiguous in certain contexts. As the above

examples show, the trick – or rather the practice – is to reference 'justified' to a conceptual framework, a set of hypotheses, a theory, or at any rate to talk about 'justification within a theory', rather than justification *simpliciter*; so to use 'justified_T' rather than 'justified'. An expression as "S is justified to believe that $t_s = x1$ *within* T1" is in agreement with a common language practice of science (and of course philosophy, see next Section), and avoids above indicated ambiguity. Similarly, one could say that "S is justified, within Jung's anthropological theory, to believe that archetypes play a role in prehistoric art". Here 'within' is shorthand for 'by assuming the validity of', or 'if one assumes the validity of' (or equivalent expressions). Under our convention, this can formally be abbreviated as "S is justified_T_a to believe that p_a".

Let us summarize this Section as follows. In certain contexts, notably in contexts where several theoretical frameworks can co-exist (can be referred to), it appears that a kind of ambiguity linked to the use of the words 'know', 'true' and 'justified' may be dissolved by specifying a 'perspective': a conceptual framework, or rather a theory or a set of hypotheses. We have illustrated our claim by providing several examples. One community in which this practice, or if one likes this 'reasoning within a theory or model'[5], is particularly widespread is computational science. We tentatively attribute this habit to the fact that researchers in these areas are used to manipulate different computational models/theories, and jump from one model to another (within one discussion, or within one chapter of research) in order to compare the (numerical or other) results to which these different models lead. By stating the theory or model they use for a given research effort (expressed in propositions p), they *ipso facto* indicate the assumptions or approximations they made to perform their calculations. By the same token, they can indicate standards of accuracy; different theories are usually associated with different degrees of accuracy. (Notice this remark suggests a link between our position and contextualism, for which context-dependent epistemic standards are essential.) Stating the theory used is thus the most economic way to allow other persons to *verify* these results. In formal and written form, under the convention we introduced, this perspectivist practice amounts to replacing 'true' by 'true_T', 'know' by 'know_T', and 'justified' by 'justified_T', where T is a to-be-specified theory, or, more generally, a set of hypotheses. For our purposes, the only claim we need in the following is that this practice is sometimes useful for rendering conversations less ambiguous[6], as we hope our examples have shown. This usage corresponds to a realistic language practice, traceable in the literature.

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[5] Or still more precisely, this awareness that expressions as 'p is true' are, in certain contexts, in need of specification of a theory, model, or set of hypotheses.

[6] 'Ambiguous' seems to be preferable over 'vague', especially to those who leave 'vague' for predicates that cannot be clarified by explicit referencing. More on the vagueness of 'know' in Heller (1999).

3. Usage in philosophy and beyond.

The question that arises now is whether the above discussed language practice is useful for tackling epistemological problems. There are, *a priori*, several indications this may be the case. For instance, those who believe that essential philosophical problems are solved by clarifying language, or those who believe that theorizing in philosophy and natural science are on a par, might be favorably inclined towards such a position. Other arguments can be found in the recent literature (see e.g. Bach 2005, Ludlow 2005, discussed at the end of the Section).

To start with, let us stress that there is no real obstacle to use 'true', 'know' and 'justified' in a perspectivist manner in everyday speech – as a matter of fact, that is doubtlessly done. As an example, consider following situation. Ann and Bill are visiting Cyrus, who is an illusionist and a notorious fan of the latest, most sophisticated holographic imaging techniques. While Ann and Bill are waiting in Cyrus's house for him to appear, they nervously discuss whether Cyrus, whom they barely know, will play a trick on them. Suddenly they see a small alligator entering the room. Bill shouts: "That's an alligator". Ann whispers : "That's true if assuming he's playing no tricks on us". Or "That's true if we can trust our eyes". Or "That's true on / within the usual assumptions". Abbreviated: "That's true_T", with T = the set of normal assumptions, or the hypotheses one starts from during normal visits. Other examples are easily found. Is Kosovo an independent country after its recent declaration of independence? That is true if accepting the now predominating 'international' viewpoint, not if one adheres to the vision of many Serbians (who some time ago would have been right at any rate). "It is true within the official political viewpoint" (or on the official viewpoint) is a legitimate expression. Of course, in everyday discussions, 'T' will seldom represent a full-blown theory. Normal people rarely relate their propositions to scientific theories. T will rather be a '(more or less coherent) body of information', e.g. provided by common sense, or a set of hypotheses / assumptions[7]. One would think that these hypotheses are rarely *explicitly* stated, *except* if this omission entails ambiguities, or more generally if explicit referencing helps the understanding. Consider the sentence "Aldo knows that p", with p = "Aldo's horse Pegasus will win

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[7] 'Coherence' here refers to logical consistency within the body of information, but also to 'external' coherence with generally accepted information. This type of coherence is also demanded of scientific theories, be it in a more logically stringent guise. From this point of view, the concept of 'coherent body of information' could be seen as the mundane version of 'theory'; at least, there is a semantic continuity between the concepts. We therefore often use 'theory' in a meaning that comes closer to 'coherent body of information'. We also sometimes use the concept 'model', largely in a meaning overlapping with that of theory.

in the races next Sunday". Can one know that p ? Common mortals surely cannot. But Aldo may know, for instance if he has a long tradition of administering judiciously chosen injections to the competitors of Pegasus before the races. *Within* the information set he has access to, he may well know that p. Am I today justified to believe that it will rain next Wednesday ? I am, *if assuming the validity of* the latest meteorological predictions. Abbreviated, "I am justified_T to believe it will rain next Wednesday", with T = the latest meteorological information. Notice that it is well conceivable that I was justified_T* to believe it will *not* rain next Wednesday, with T* = the meteorological information that was at hand *yesterday*[8,9].

In sum, examples as those presented above show, we believe, that a certain type of perspectivist language use is helpful in everyday life too, in certain contexts. Let us, as for science, very broadly attribute this benefit to the clarity of speech it allows to introduce. It simply makes discussions clearer, by specifying crucial information as to how 'true', 'know' and 'justified' are used and meant.

We have now set the linguistic stage to make the step to philosophy, in particular Gettier's problem. We will, in essence, simply apply our linguistic findings concerning the use of 'know' etc. to Gettier's problem, and see if we can learn something. Linguistic studies as entrance for epistemological investigations are not abundant, but exist. Ludlow (2005) has recently presented detailed arguments in favor of such a linguistic support for more fundamental interpretations, building on work of e.g. Vendler (1967) and even Wittgenstein. In particular, the author provides concrete linguistic evidence that 'knows' has an "implicit argument position for standards of knowledge" (a phrasing that is reminiscent of authors in the contextualist tradition). Along similar lines, Bach (2005) mentions an *indexed* or *relativized* form of using 'know', which he represents as: "S knows$_D$ that p", where D is again a standard of knowledge (what these standards precisely are is not further detailed). The latter formal representation immediately suggests a link with the model we presented above. The fast answer is that D is best interpreted, at least in certain contexts, as a theory or set of hypotheses T (or the standards imposed by T). We believe that insight can be gained here, by associating 'D' and 'T', in other words by linking the mentioned standards to the theory or the set of hypotheses that are subjacent in the discussion. As illustrated in examples from science given

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[8] Notice that this set of information can, in a sense, largely be considered as a set of assumptions / hypotheses. Meteorological models start from 1) sets of data (measurements), and 2) mathematical equations or algorithms, which are assumed to correctly predict the weather. The weather forecast is based on the latter assumptions – it represents hypotheses itself, in a sense. In a very similar way one could associate theories to sets of hypotheses. Therefore 'set of hypotheses' is maybe the most general type of 'T'.

[9] It can thus be seen that our (formal) approach allows to succinctly formulate (and tentatively elucidate) following point: subject S1 may be justified_T1 to believe that p, while S2 is justified_T2 to *not* believe that same p.

above, by specifying a theory one also specifies epistemic standards, for instance the accuracy (of the observational propositions one deduces from the theory). But we cannot provide here a more detailed analysis; let us here just conclude that the mentioned results of Ludlow (2005) and Bach (2005) are, it seems, certainly not contradicting our findings concerning the use of 'know'. An important difference is that our investigation points to the idea that 'know', 'true' and 'justified' can be treated on the same footing. This allows us to analyze Gettier's problem, to which we turn now.

4. Application to Gettier's problem.

As is well known, Gettier's analysis (Gettier 1963) can be seen as a critique or extension of Plato's analysis of knowledge. More precisely, on Plato's account following equivalence holds:

S knows that p $\leftrightarrow$ (p is true & S believes that p & S is justified in believing that p).   (P1)

The three "right hand side" (RHS) conditions of Plato's thesis 1 (P1) are each a necessary condition for S knowing that p, and they are jointly sufficient for S knowing that p[10].

Gettier is widely believed to have shown that this analysis is not always correct, by constructing examples in which the three RHS conditions are all fulfilled, and yet S does not know that p. Take for instance Gettier's 'case I' in which Smith (S) detains information by which he is justified to believe 1) that Jones will get the job for which they both are applying, and 2) that Jones has ten coins in his pocket. Then, according to Gettier, Smith is justified to believe that "the man who gets the job has ten coins in his pocket" (= p) is true. Suppose, further, that in reality not Jones but Smith gets the job, and that Smith also has, by pure chance, ten coins in his pocket. Then by chance p is true. Thus, the three RHS conditions of (P1) are satisfied and yet Smith doesn't detain real knowledge; he does not really *know* p – one might say.

Let us now apply the perspectivist language rule introduced before; we first apply it as such, and leave a detailed interpretation to the next Section. So we replace in (P1) 'true' by 'true_T1', 'know' by 'know_T2' and 'justified' by 'justified_T3'. In the most general analysis, T1, T2, T3 could be different conceptual frameworks, but (P1) relates the three terms to each other, so explains one concept by using the others, and therefore it seems we should take T1 = T2 = T3 – else our expression (P1) cannot be given a sense, as will soon become clear. Thus according to a natural application of our perspectivist rule, (P1) should be replaced by (P2):

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[10] "S knows that p" is the "left hand side" (LHS) term of the equivalence. One could abbreviate (P1) thus: K = JTB.

$$S \text{ knows\_T1 that } p$$

$$\leftrightarrow$$

(p is true_T2 & S believes that p & S is justified_T3 in believing that p), where T1 = T2 = T3.

(P2)

This expression has a clear meaning; it is shorthand for: S knows that p within a set of hypotheses or a body of information T1, IFF he believes that p, AND p is true within that same T1, AND S is, within T1, justified to believe p. After the examples we gave in the former Sections, an expression as this should sound familiar and meaningful enough (as always, remember if helpful that 'within' is shorthand). Notice that (P2) could not be given a sensible meaning without the condition T1 = T2 = T3, as we will further argue in the following.

At this point one could wonder: why not relativize also the verb 'to believe' to a conceptual framework? If K = JTB, and if one assumes that K, J, and T can be relativized or perspectivized, why not B? One answer to this question is that there is a categorical difference in these concepts: K, J, and T can be subject to epistemic standards, while B is a psychological concept, in essence. This being said, we believe one could also relativize B; but it seems this needlessly complicates the analysis, and therefore we refrain from it in the following.

Let us, in anticipation of the next Section, briefly see what (P2) may teach us. According to the perspectivist conception we introduced in the former Sections, (P1) would contain three terms that are potentially ambiguous, and that can be clarified as in (P2), by specifying a body of information or a set of hypotheses (T1) as a reference. According to what we learned from both common speech and science talk, (P2) would be a more precise version of (P1) (see next Section).

The essential point we want to highlight here is that Gettier's analysis *does not satisfy* (P2), in particular it does not satisfy the condition T1 = T2 = T3. The condition T1 = T2 = T3 is a symbolic expression implying that, when analyzing 'know' as in (P1), and introducing in (P1) for clarity three references each defining a 'perspective', these references should be the same. In other words, this condition stipulates that one can only compare 'knowledge within a perspective T1' to justified true belief *within that same* T1. Let us call the condition T1 = T2 = T3 the condition of 'constant or consistent referencing'. At least two attitudes are possible towards this condition at this point: either one may already accept it as reasonable; or one may remain skeptical and ask what its heuristic benefit is. To the least, we intend to show that the analysis (P2) allows for a coherent analysis of Gettier's account.

As an example of an application of (P2), and as an immediate benefit, notice that (P2) provides an explanation of following problem: how can one know something that is not really true ? (Even if we will only superficially treat this question here, answering it would not represent a small

advantage: this is a well-known problem in epistemology.) Indeed, it is natural to consider that one can know something even if it is not fully, not really true. For instance, one could state that many physicists know propositions (p_c) of classical mechanics, even when these are not really true, when these propositions slightly differ from what relativistic mechanics (a stronger theory) predicts. This case can be rephrased and analyzed within our model (P2), as follows: S knows that p_c within classical mechanics, if S believes p_c, if p_c is true within classical mechanics, and if S is justified, within that theory, to believe p_c. This is a straightforward application of (P2) (with T1 = T2 = T3 = classical mechanics). Importantly, such a statement, even if cumbersome, does not conflict with scientific language practice. Hence the analysis (P2) answers, at least partially, the initial question.

Gettier's analysis is however not in agreement with our analysis of 'know' condensed in (P2): it violates the condition of consistent referencing. Closer inspection shows that in Gettier's counterexamples T1 ≠ T3. Indeed, when Gettier uses 'to know', he means 'to really know', as seems clear from the examples he gives. Therefore, if we wish to represent this in our (P2), T1 would be the 'best possible theory' or 'the best possible information set at hand'. In Smith's case, this best possible information is the information that is at hand *after* the job is attributed – when one indeed really can know who got the job. But the 'justification' of Gettier's examples is only justification within a truncated information set T3. Indeed, Smith was justified to believe that Jones would get the job *based on preliminary information (T3)* about the boss's future decision[11] – but information that turned out to be inadequate: the boss changed his mind. Therefore, T3 is in any case not the same information or set of hypotheses as T1; T1 is a revised and improved body of information with respect to T3 (one could write T1 > T3). In sum T1 ≠ T3, in violation of the condition of consistent referencing.

An identical analysis is valid for Gettier's 'case II'. Now p = "Either Jones owns a Ford, or Brown is in Barcelona". If Smith has no clue where Brown is, but has evidence that Jones owns a Ford (he always had one in the past), he is justified to believe that p, based on the hypothesis that there is constancy in Jones's car possession. If in reality Jones doesn't own a Ford any longer, but Brown is by chance in Barcelona, p would be true and yet Smith would not really know that p. In our formalism, Gettier's counterexample would be analyzed as follows. Smith is justified_T3 to believe that p, with T3 = the body of information that includes the hypothesis of constancy in Jones's car possession. At the same time p is true_T2 with T2 = the best possible body of information (including the information that Jones has no Ford and that Brown is in Barcelona). Smith does not know_T1

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[11] So, we understand T3 as a body of information that includes, for instance, a promise of the boss regarding his future decision.

that p, with T1 = T2 = the best possible 'theory'. But the latter conclusion is only a counterexample to (P1), not to (P2), since, again, T1 ≠ T3.

5. Interpretation; Comparison to Zagzebski (1994) and Contextualism.

Here we will further comment on the findings of the preceding Section, notably by putting them in a wider context by comparing them to Plato's theory of ideas, to Zagzebski's analysis of the inescapability of Gettier cases (1994) and to contextualism.

In the preceding Sections we showed that in certain discussions it is useful to remember and specify the body of information or theory one relates to. Obviously *explicit* referencing towards a theory or information set is an uncommon practice in daily conversations: it is not only cumbersome, but often also unnecessary. On the view that is explored here, one could say that explicit referencing is often unnecessary because in a non-ambiguous context the 'background theory or set of assumptions' is broadly shared by all parties of the discussion: it is the body of information that is available to common sense, or that is shared by people engaging in a 'usual' or 'normal' discussion – a discussion that is not in need of special epistemic standards or precautions. Still, it may be that on some occasions explicit referencing is as useful and practical in philosophy as it is in other fields; we submit that this is the case for Plato's and Gettier's analyses of knowledge. On this view, then, we are lead to consider (P2) as a more precise variant of (P1).

The above claim helps to make Gettier's counterexamples to (P1) more transparent. As shown in the former Section, Gettier's counterexamples seem to be based on a shift in the reference or perspective (the set of hypotheses, assuming the role of the 'theory' in daily speech). In the light of this analysis, if to the left and right of the IFF-arrow in (P2) one uses a different measure or reference of justification and knowledge (i.e. if T1 ≠ T3), it seems not surprising anymore that the IFF condition is not valid – as Gettier has shown. Indeed, (P2) contains in particular the condition of consistent referencing (T1 = T2 = T3), which emerges, we submit, as a direct consequence of perspectivist language use and the fact that (P2) relates 'know', 'p is true' and 'justified'. If one uses a reference for these words, they should be the same if one defines one concept by the others; without this condition (P2) would have no sense.

On this view, one lesson that can be learned from Gettier's analysis is, stated in a slogan, that *real* knowledge is not the same as *partially* justified belief – a phrasing that gets a more precise meaning in our model. By the same token, (P2) suggests an answer to following question: Under which conditions justified true belief *is* knowledge ? Our model suggests that this condition is,

15

formally and succinctly: if T1 = T2 = T3 in (P2) – so if the condition of consistent referencing is satisfied.

Notice that Plato's account can be seen to be in agreement with (P2). Indeed, on Plato's classic view, real knowledge (*episteme*) is knowledge of the eternal truths, the Ideas; an important part of Plato's philosophy was aimed at distinguishing it from 'common belief', or 'opinion' (*doxa*). Therefore, it seems very natural to associate Plato's *episteme* to (fully) justified belief in (absolutely) true propositions. Thus, Plato's thesis (P1) can be seen as a *natural limit case of (P2)*, with T1 = T2 = T3 = the best possible theory or information set, or the final or 'divine' theory if one likes. (We believe that when one uses 'to know' and 'true' in everyday speech, one uses them in general in this platonic sense: one means 'to really know', and 'really true'.) Note that this concept of absolute, or infinite or divine knowledge seems to be a natural limit case or 'asymptote' of our conception of knowledge – if we may rely on the frequency with which it appears in the history of philosophy.

Of the many investigations that have contributed to penetrate the core of Gettier's analysis, in the present context the well-known account of Zagzebski (1994) is particularly pertinent. In her 'The inescapability of Gettier problems', the author gives a logical analysis of Gettier's account that leads to a condition on all usual accounts of knowledge, whether of Plato's type or involving a fourth, fifth,… RHS condition. An essential idea of the article is that all counterexamples to (P1) *à la Gettier* arise when "an accident of bad luck is cancelled out by an accident of good luck" (Zagzebski 1994, 66). And such a cancelling-out can only occur when there is a type of '*independence*' between knowledge and justification. In the author's words (Zagzebski 1994, 73):

> "The notion of knowledge requires success, both in reaching the goal of truth, and in reaching it via the right cognitive path. The notion of justification or warrant is less stringent, requiring only that the right path is one that is *usually* successful at getting the truth. It is this difference between the notion of knowledge and the notion of justification that is responsible for Gettier problems."

This is a major, indeed often considered compelling, result of the Gettier literature, attributing the possibility of counterexamples to (P1) to the 'difference' or 'independence' between knowledge and justification. Indeed, the author concludes (Zagzebski 1994, 71):

> "It appears, then, that no account of knowledge as true belief plus something else can withstand Gettier objections as long as there is a small degree of independence between truth and the other conditions of knowledge."

Zagzebski does not explain in more detail what this 'difference' or 'independence' amounts to; but the context makes the meaning clear enough. Important for us is that it is not difficult to recast her claim in terms of our perspectivist interpretation. Within our model, the counterexamples arise when

T3, the reference for justification, is different from, less adequate than, T1, the reference or perspective of knowledge; we wrote T3 < T1. This very well fits to, and explains further, the first of the above quotes ("It is this difference between the notion of knowledge and the notion of justification that is responsible for Gettier problems"). We also argued that in order to be 'Gettier-proof', one should 'consistently reference': T1 must be equal to T2 and equal to T3. This condition of consistent referencing seems to correspond to the condition of absence of independence Zagzebski refers to. Thus both analyses do seem to agree: even if there is only a small degree of independence, *even if the (implicit) references of the words 'know', 'true' and 'justified' are almost the same* (T1 ≈ T2 ≈ T3), "justified true belief will never be sufficient for knowledge" (Zagzebski 1994, 69).

Our analysis adds to Zagzebski's account, since we provide an interpretation that succinctly characterizes the 'difference' or 'independence' between knowledge and justification (and truth) Zagzebski identifies as the core of Gettier's analysis. According to our model, the latter is a difference in the information / hypotheses (the T's) that are implicitly referred to.

The above presented model is closely related to a major position in epistemic relativism, namely contextualism. As mentioned in the introduction, our goal was to take a step back, and to follow Field's injunction to inquire whether key concepts of epistemology can be relativized to 'evidential systems' – sets of hypotheses, theories, etc. in our phrasing. We can only compare our model here to the most salient positions of contextualist epistemology, and unfortunately only in a sketchy manner. One alleged solution to Gettier's problem within contextualism was offered by David Lewis (1996), but his solution relies on a large set of (to our taste non-intuitive) rules; it seems generally considered as controversial (see e.g. Cohen 1998, Heller 1999).

In its paradigmatic form epistemic contextualism states that the propositions expressed by 'knowledge sentences' (such as 'S knows that p') depend upon the conversational context in which they are uttered (see e. g. Lewis 1996, Cohen 1999, DeRose 1999, Rysiew 2016). Now, it seems rather obvious that the key idea of this version of contextualism and of our relativist view based on (P2) can be 'translated' into each other. In short, if knowledge attribution depends on the context, it depends on a given body of information: a conversational context is trivially linked to a body of information – without which the conversation would not be possible. Conversely, if the verb 'know' depends on a to-be-defined body of information T, knowledge sentences (KS) indeed depend upon context, because the information set T in which one 'embeds' a knowledge type depends in general on the context. In somewhat more detail: since there are infinitely many theories / sets of hypotheses, and since in most contexts several of these are likely to have some pertinence, the attributor of a KS can, a priori, refer to a few of these theories when he utters the (often ambiguous) phrase 'S knows

that p'. In context 1 he may mean 'S knows_(T1) that p', and in context 2 he may want to say 'S knows_(T2) that p' (or 'S does *not* know_(T2) that p')[12].

In sum, it would appear that 'context relativism' and 'theory relativism' at least broadly overlap. The added value of our model lies in its consistency with (language) practices in science and philosophy at large; and in the fact that it can offer a precise and straightforward interpretation of Gettier's problem. Here is one further argument in favour of theory relativism: *in one and the same context* several theories can be discussed or referred to (by a group of philosophers or scientists for instance), and in that case the expression 'to know that p' must be accompanied, if full clarity is required, by a specification of the theory, not the context. There is obviously much room for a deeper comparison with contextualism, but this can unfortunately not be done here.

Note, finally, that it would be interesting to make precise the link with Quine's epistemological holism as developed in his (1951). Quine has famously argued that propositions cannot be verified or tested *individually* by direct empirical observation; what one tests or verifies is a whole web of hypotheses, a whole theory one could say. This resonates well with the spirit of the results expounded here, it seems. One could state in theory-relativized parlance: propositions are solidly embedded in theories (sets of hypotheses) T; the truth-value of propositions is attributed via the truth of a whole theory or even a web of theories (recall the mixed coherence-correspondence position on truth we endorse, cf. Section 2); with as consequence that propositions cannot be truer than the hypotheses T on which they necessarily rely. If this view is of any value, it seems then also quite compelling that the *meaning* of propositions derives from its meaning within T. This resonates in turn again with a view attributed to Quine, stating that epistemological/verificationist holism and semantic holism are inextricably related.

6. Conclusion.

We have investigated here a certain perspectivist language practice, that amounts to specifying a conceptual framework (a body of information, a set of hypotheses, a theory) when using an expression as 'p is true'. We have argued that certain contexts demand such specification, and

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[12] See the examples given above, and see Cohen (1999, p.58) for a well-known example, which can easily be analysed in relativized parlance. Following the example of Cohen, Smith may know that Mary's plane stops in Chicago based on common sense and the assumption that official schedules are usually reliable. So Mary might say (or mean) that Smith knows the fact *within* the body of information offered by common sense and that assumption. But the same Mary might also say (or mean) that Smith doesn't know the fact for sure if one takes potentially more reliable data into account (the same body of information plus the information gathered by checking with an airport manager). Relative to a potentially more complete body of information, Smith *doesn't* know for sure.

suggested that an essentially identical practice might be helpful for, and applicable to, an epistemological problem as Gettier's. We borrowed from philosophy of science to back-up our claims or to make them more precise – which is not a luxury since we rely on the concept of 'theory' and the like, analyzed in philosophy of science. One idea we proposed is that counterexamples *à la Gettier* to Plato's analysis only arise if a certain 'condition of consistent referencing' is violated. We argued that the latter result gives further content to a well-known analysis of Zagzebski (1994) as to the inescapability of Gettier cases. It can be made precise under which conditions Gettier cases are escapable or not.

As announced in the introduction, and even if it is not really the focus of this article, we believe that these ideas point to a type of epistemic relativism, and to a form of perspectivism in philosophy of science, which could be called theory relativism (or 'theory perspectivism' in philosophy of science). In the context of epistemology, we have stressed that 'theory' should be interpreted in a very broad sense, since the word may also refer, in certain contexts relevant for epistemology (notably Gettier cases), to '(coherent) body of information'. We believe it would be interesting to investigate the potential implications of this type of epistemic relativism (which we believe to be more powerful if married to realism) both for theories of knowledge (general and scientific)[13] and for the scientific perspectivism of authors as Giere (2006) and Massimi (2012, 2018, 2019) (see interesting discussions of perspectivism also in, e.g., Chakravartty 2010 and Callebaut 2012). Unfortunately, here we cannot do much more than express our belief that such comparisons would be fruitful, and potentially lead to converging conclusions. Let us just note that many types of scientific perspectivism exist, but that, as far as we know, none of them puts 'theories' at the center of the vantage point. Our epistemological investigation points to the idea that this move should be taken seriously.

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[13] Of course, and as already mentioned in the introduction, among the most immediate and radical (and therefore surely controversial) inferences would be the following: 1) All rational knowledge should be considered as referenced to, or embedded in, sets of hypotheses or theories; and 2) Any mature scientific or philosophical knowledge resides in theories (understood as hypothetic-deductive systems, cf. introduction).

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