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HOW DO SKEPTICS "KNOW": DUAL-REPRESENTATION VIEW OF KNOWLEDGE

COMO CÉTICOS PODEM "SABER": VISÃO DE DUPLA REPRESENTAÇÃO DO CONHECIMENTO[1]

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ABSTRACT *The skepticism in the field of epistemology has never lacked advocates and attackers. In order to defend skepticism and answer the question of how skeptics can have knowledge, this article offers a two-step response to the perennial skeptical challenge. First, it strengthens Putnam's classical "brain-in-a-vat (BIV)" scenario by adding both horizontal variation and vertical simulation-depth, thereby generating an Enhanced-BIV model that systematically defeats the three most influential anti-skeptical strategies—sensitivity, safety, and contextualism. Second, by constructing paradoxical propositions P1: I don't know that the skeptic's hypothesis is wrong; and P2: I have perceptual knowledge of the external world, the paper explains how skeptics can nevertheless possess knowledge by distinguishing two independent representational schemes. A representation theory of knowledge about mental states is held when adhering to proposition P1, and a representation theory of knowledge about symbolism*

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is held when adhering to proposition P2. This Dual-Representation View (DRV) dissolves the apparent contradiction without appealing to practical stakes and thereby differs decisively from pragmatic encroachment, knowledge-first contextualism, and structural skepticism. The DRV succeed in explaining how skeptics can "know" while maintaining skeptical intuitions.

Keywords: *Skepticism. Contextualism. Knowledge. Representation.*

RESUMO *O ceticismo no campo da epistemologia nunca teve falta de defensores e opositores. Em defesa do ceticismo e respondendo à pergunta sobre 'como os céticos podem possuir conhecimento', este artigo oferece uma resposta em duas fases ao perene desafio cético. Primeiro, ele fortalece o cenário clássico de Putnam do "cérebro em uma cuba" (BIV, na sigla em inglês), acrescentando variação horizontal e profundidade de simulação vertical, gerando assim um modelo BIV aprimorado que vence sistematicamente as três mais influentes estratégias anticéticas: sensibilidade, segurança e contextualismo. Segundo, ao construir as proposições paradoxais P1: 'Não sei se a hipótese do cético está errada'; e P2: 'Tenho conhecimento perceptivo do mundo externo', este artigo esclarece como os céticos, ainda assim, podem possuir conhecimento ao distinguir dois esquemas representacionais independentes. Adota-se uma teoria da representação do conhecimento sobre estados mentais ao se aderir à proposição P1, e uma teoria da representação do conhecimento sobre simbolismo é adotada ao se aderir à proposição P2. Essa Visão de Dupla Representação (VDR) desfaz a aparente contradição sem recorrer a questões práticas e, assim, difere de modo decisivo da intromissão pragmática do contextualismo, que prioriza o conhecimento em primeiro lugar, e do ceticismo estrutural. A VDR consegue explicar como os céticos podem "saber" enquanto ainda preservam suas intuições céticas.*

Palavras-chave: *Ceticismo. Contextualismo. Conhecimento. Representação.*

1 Introduction

The question of whether skeptics can possess knowledge has long been a contentious issue in epistemology[2]. Traditional approaches to skepticism,

2 Throughout this article, "skepticism" is used in the global sense—viz., the thesis that no knowledge of any kind is possible. This should be distinguished from local skepticism, which denies knowledge only within a specific domain (e.g., induction). The discussion here is restricted to global skepticism.

such as the 'Brain-in-Vat (BIV)' (Putnam, 1981) hypothesis, posing significant challenges to the nature and limits of human knowledge. Many have attempted to address this problem by using principles such as sensitivity, safety, and contextualism. However, these approaches often fall short of fully countering skepticism, particularly when faced with complex skeptical scenarios, such as the one proposed in this paper, which refines the Enhanced-BIV model.

This does not mean, however, that skeptics cannot claim to "know" anything. This paper seeks to explore how skeptics might 'know' by introducing two distinct theories of knowledge representation. Drawing on theories of mental state representation and symbolic representation, this approach proposes that skeptics can 'know' by employing distinct representational frameworks for different types of knowledge claims. By exploring how these dual representations interact, the paper offers a paradoxical yet coherent account of how skeptics can maintain their skeptical intuitions while still laying claim to knowledge.

The argument unfolds in three parts. First, the paper critiques existing epistemological defenses against skepticism and builds an enhanced BIV model on this basis, focusing on the limitations of sensitivity principle, safety principle, and contextualism approach in addressing an enhanced BIV model. Second, it introduces the concept of knowledge representation, distinguishing between mental states and symbolic systems as distinct but complementary ways of knowing. Finally, the paper demonstrates how this dual-representational view (DRV) can solve the apparent contradiction between skepticism and knowledge, thus offering a new lens through which to understand the skeptical challenge. The exploration of DRV also invites further reflection on how knowledge is attributed, contextualized, and justified in the light of skeptical challenges. This analysis contributes not only to the ongoing debate within epistemology but also to broader discussions about the nature of knowledge, representation, and the limits of human cognition.

2 The main argument

Consider the scenario "I know there is a table in front of me." How can one be certain that this belief is true rather than the result of a dream? Skeptics argue that even in a dream, one might still believe "I see a table". Proponents of the sensitivity principle note, however, that genuine perception and dreaming have distinct sources. If there actually were no table, a genuine cognitive process (such as sense perception) would not produce the belief "I see a table". This distinction undermines the skeptic's assumption. Supporters of the safety principle add that in most of our actual or “nearby” circumstances, we are awake rather than dreaming. When beliefs arise from reliable cognitive processes, they remain robust in these nearby contexts, making “I know there is a table in front of me” a safe belief. Both theories thus serve to challenge skepticism.

2.1 Sensitivity Principle and Skepticism

The simplest version of the Sensitivity Principle is: *if a proposition is false, people will not believe it*. Timothy Williamson provides a detailed account of the Sensitivity Principle using counterfactual conditionals (Williamson, 2000, pp. 147-150). Based on Williamson’s text, we can reconstruct its deduction as follows:

Given that, K_sp =S Knows p; B_sp =S believes p;‘If q were true, then r would be true’=‘q£→r’

1.q£→r

2. £（K_sp ⊃ (~p£→ ~B_sp)）

3.‘S sensitively believes P’= B_sp且~p→ ~B_sp

4.（~p£→ ~B_sp ）→（~p ⊃ ~B_sp）

5. K_sp→ B_sp

6.（£（K_sp ⊃ (~p£→ ~B_sp)）→（K_sp →（B_sp and ~p→ ~B_sp）））

7.B_sp and ~p→ ~B_sp

8.p

In natural language, this deduction can be briefly stated as follows: Given the principle :*(1) Necessarily, if S knows p, then if p were false, S would not believe p’* and rewriting it using a counterfactual conditional, we can express the counterfactual ‘If q were true, then r would be true’ as ‘q£→r’. Thus, we can symbolize (1) as: £(Ksp⊃(~p£→~Bsp)). Assuming that ‘S sensitively believes P’ is shorthand for ‘S believes P, and if P were false, S would not believe P,’ and also assuming that ‘S knows P, only if S believes P,’ then principle (1) entails that ‘S knows P, only if S sensitively believes P.’ Because the set of possible worlds characterized by counterfactual conditionals is maximally coherent, it can be used to infer the actual world. Furthermore, since ‘f P were false, S would not believe P’ and ‘P is false, and S believes P’ have incompatible truth values, S sensitively believes P, only if P is not false. Given that P is either true or false, S sensitively believes P, only if P is true.

Based on the Sensitivity Principle outlined in the previous scenario, the following skeptical scenario can be constructed: Given, Good cases: Situations where things appear to be as they are; Bad cases: Situations where one falsely appears to oneself to be in the good case. Then according to the assumption of principle (1): In a good case, one believes truly that one is not in the bad case. Then, the following deduction can be provided:

1. If I know that I am typing, then I know that I am not a "brain in a vat" falsely believing that I am typing. (K(p→q))
2. I do not know that I am not a "brain in a vat" falsely believing that I am typing. (~Kq)
3. Therefore, I do not know that I am typing. (~Kp) （1 and 2， MT）

Therefore, if we adhere to the principle (1), the epistemic closure principle fails.

To respond to the above problem, Nozick align methods with different contexts in this way, revising principle (1) into principle (2) as follows: *(2) Necessarily, if S knows p via method M, then if p were false and S were to use M to arrive at a belief whether p, S would not believe p via M.* (Williamson, 2000, p.153)

In response to the revision of the Sensitivity Principle in (2), Alvin Goldman presents a counterexample (Goldman， 1976). In the good case, I correctly recognize a dachshund as a dog, and at that moment, I know that I am seeing a dog. In the bad case, I see a wolf but mistakenly believe that I am seeing a dog. In these cases, my tendency to recognize the wolf as a dog is consistent with my ability to recognize the dachshund as a dog. Therefore, regarding the proposition p: 'I see a dog', I believe p in both cases using the same method (seeing the animal under similar conditions of distance and lighting). Goldman argues that, even if one could contend that different methods are used in these two cases, it is practically impossible for us to distinguish these methods based on the specific differences in our visual evidence.

In response to this, Luper-Foy proposed a revision to principle (2) by deleting the second conjunct, resulting in principle (3): *Necessarily, if S knows p via method M then if p were false, S would not believe p via M* (Luper-Foy， 1984). Luper-Foy argues that (3) does not lead to skeptical conclusions. Suppose someone in a good case believes, through M, that they are not in a bad case. Then (3) would prohibit the true belief that one is not in a bad case from constituting knowledge if, in a bad case, one were to believe, through M, that they are not in a bad case. In other words, (3) fails to make true belief constitute knowledge that one is not in a bad case only if one, in a bad case, believes through M that they are not in a bad case. In the case of the grandmother, this means distinguishing between the grandmother's evidence and the part of the evidence E that belongs to the person. For instance, if someone's belief is derived in the good case from seeing the person's body, then this should not constitute the method used by someone in the bad case, because that method would be inaccessible to the subject.

As stated in (3), if a person can indeed ensure that different individuated methods are used in good and bad cases, it is possible to exclude the false belief in the bad case and successfully respond to skeptical challenges. However, if M is so internally individuated that whether a person is using method M depends on their mental state or is supervening their brain's physical state, then (3) still fails to exclude skeptical outcomes. This is because, in such a situation, we cannot distinguish whether the methods being used in different cases are genuinely different individuated methods.

In response to this, defenders of the Sensitivity Principle have proposed external rather than internal individuated methods. One of the most representative approaches is that of Keith DeRose. DeRose offers the following qualification to Nozick's principle (1):

> 'We don 't so judge ourselves ignorant of P where not-P implies something we take ourselves to know to be false, without providing an explanation of how we came to falsely believe this thing we think we know. Thus, *I falsely believe that I have hands* implies that I don't have hands. Since I do take myself to know that I have hands (this belief isn't insensitive), and since the above italicized proposition doesn't explain how I went wrong with respect to my having hands, I'll judge that I do know that proposition to be false. But this again is just a preliminary statement, and there's room for a lot more refinement here. What we need now is some assurance that we're headed in the right direction'. (DeRose, 1995)

DeRose argues that we can consider the belief that 'I have hands' to be sensitive, while the belief that 'I am not falsely believing that I have hands' is insensitive in the same context. That is, if p is false, then the consequence that we take ourselves to know— I don`t have hands（~p)— it is falsely believed to be false. By employing this externalist approach, it becomes possible to exclude knowledge in the bad case.

However, Williamson critiques DeRose's account as just stated is insufficiently general (Williamson, 2000, p.158). For example, let ‹ be a case in which I am climbing a mountain and appear to myself to be climbing a mountain; things appear to me as they are. In case ®, I am a brain in a vat (BIV), but things appear to me generally just as they do in ‹. If I were in ®, I should believe that I was not in ®. The proposition p is: I am not in ®, then I do not insensitively believe p. In my current situation, I know that I am not in ®, because I am neither in ® nor ‹; things do not appear to me as they would in ®. I appear to myself sitting in front of a computer screen in an office; I do not appear to myself as climbing a mountain as in ®. Whether I am in ‹ or ®, I cannot sensitively believe p. In response, Williamson offers his own modify (4): *Necessarily, if S knows p then, for some proposition q: q entails p,* *S sensitively believes q, and ~p does not explain how S could falsely believe q.* (Williamson, 2000, p. 159)

Using principle (4) to address the example given:

P1. Assume q is the proposition: It appears to me that I am not climbing a mountain.

P2. Therefore, q entails p (I am not in ®), and thus ~p entails ~q.

P3. If I were in ®, then it would appear to me that I am climbing a mountain.

P4. I believe that I know q; q is a proposition about how things appear to me, and in any relevant scenario, I would not be mistaken about q.

C1. Therefore, if it appears to me that I am climbing a mountain, then I would not believe that it appears to me that I am not climbing a mountain (from P1 and P3-P4, by Modus Tollens). This can be symbolized as ($\sim q£\rightarrow\sim B_s q$), meaning that I sensitively believe q.

Williamson's motivation for replacing principle (1) with principle (4) stems from a contextualist perspective: when we evaluate "S knows p," we need not consider the case in which S falsely believes q, because we lack a relevant explanation for how S could be mistaken in this way (Williamson, 2000, p. 159). In other words, the case where S falsely believes q and the case where q entails p are not within the same context. In the context of a bad case, we cannot understand proposition q and, therefore, cannot entail proposition p. Thus, Williamson argues that in such circumstances, principle (4) can withstand skeptical challenges.

Although Williamson does not fully endorse the Sensitivity Principle, as he subsequently criticizes his own principle (4) from the perspectives of broad content and externalism, he still believes that principle (4) can reject skepticism. However, this paper argues that the skepticism Williamson's principle (4) refutes is only the simple version of the "brain in a vat (BIV)" scenario. If we modify the "brain in a vat" model, it is still possible to challenge principle (4).

2.2 The Enhanced 'Brain-in-a-Vat' Model

Since Putnam's semantic impossibility argument concerning the "brain-in-a-vat", this thought experiment has become a standard test for a wide range of anti-skeptical theories. The classical version, however, contemplates only a single-layer simulation: the subject is either situated in the real world or within a one-shot holographic simulation. Building on this, the present article proposes an "enhanced" model that incorporates a hierarchical dimension: the subject is either situated in the real world or within a one-shot holographic simulation. Extending this further, the model introduces a vertical hierarchy: for any given world W^m, there exists a higher-level simulated world W^{m-1} that is indistinguishable from it in every perceptible respect. This added "depth" not only preserves the original parity of experiential content but also supplies a more finely grained set for evaluating "nearby worlds," thereby undermining many anti-skeptical strategies that rely on coarse-grained modal metrics.

The enhanced BIV model takes the original "Brain in a Vat" hypothesis a step further by making a metaphysical inference, reinforcing it both horizontally and vertically. Horizontally: There exists a BIV-Vn, corresponding to case $®_n$ (n∈N， n≠0). Here, *n* represents the ordinal number of parallel BIV, and *N* represents the set of natural numbers. Thus, V_1……V_n correspond to different case $®_1$……$_n$. Vertically: Building on the horizontal reinforcement, we introduce the hypothesis of a "BIV's BIV's... BIV" model. This is represented by V^m（m∈N， m≠0）, with m denoting the specific level of vertical nesting (i.e., a BIV within another BIV, and so on). The enhanced BIV model can thus be expressed as V_n^m（n∈N， n≠0； m∈N， m≠0）. In this scenario, there exists a case of V_n^m, corresponding to case $_n^m$： I am a "BIV's BIV", but the things that appear to me generally seem as they do in $_n^{m-1}$(which is considered the "actually world" in scase $_n^m$）).

$$
\begin{array}{ccccc}
\vdots & & & & \vdots \\
\cdots & & V_n^{m-1} & & \cdots \\
 & & \downarrow & & \\
V_{n-1}^m & \leftrightarrow & V_n^m & \leftrightarrow & V_{n+1}^m \\
 & & \downarrow & & \\
\cdots & & V_n^{m+1} & & \cdots \\
\vdots & & & & \vdots
\end{array}
$$

2.3 Counterexamples to the Sensitivity principle

The enhanced BIV model responds to the sensitivity principle's attack on skepticism in two ways.

First, the enhanced BIV model can address Williamson's assertion that "I am neither in 〈 nor ®." For Williamson, whether I am in case 〈 or ®, I would believe that I am climbing a mountain. However, if I am currently sitting at my desk drinking coffee, then neither case 〈 or ® would lead me to believe that I am climbing a mountain. This is why Williamson believes that principle (4) can withstand the challenge posed by the BIV. However, in the horizontal sequence of the enhanced BIV model, even if I am currently sitting at my desk drinking coffee, at most, this would indicate that I am not in case

$®_n$, but it still remains possible that I am in another variant $®_{n+i}$ within the same sequence. Therefore, for the enhanced BIV model, proponents of the Sensitivity Principle would need to undertake a more extensive burden of proof to refute this model effectively.

Second, the enhanced BIV model can also address the question of "q entails p." In principle (4), S's false belief in q occurs in the bad scenario, while p being true represents knowledge in the good scenario. Therefore, "q entails p" cannot be realized due to the inconsistency of cases; that is, in the context of the bad case, we cannot truly understand proposition q, and thus we cannot entail proposition p. However, in the vertical sequence of the enhanced BIV model, the epistemic compatibility between different levels is downwardly compatible. This is because the lower-level BIV is constructed by the higher-level "Brain in a Vat," making the knowledge of the lower level transparent to the higher level. This transparency is transitive, meaning that for $BIV\text{-}V_n^m$, all knowledge in the $BIV\text{-}V_n^{m+i}$ is transparent. Due to this downwardly compatible and transmissible model, the higher-level BIV represents the good case for the lower-level BIV, and conversely, the lower-level represents the bad case for the higher level. Therefore, proposition q can be understood in the good case of its respective BIV. As a result, within the vertical sequence constructed by the enhanced BIV model, the "q entails p" of principle (4) can be reasonably compatible. Thus, principle (4) still fails to resist this version of skepticism.

Returning to Nozick's sensitivity principle itself: according to Nozick's truth-tracking theory, if S genuinely knows that p, then in the nearest ¬p-world S would not believe p — the condition of sensitivity. In a single-layer brain-in-a-vat (BIV) scenario, the usual objection is that the subject cannot distinguish the real world from the simulation; hence, were p false (e.g., S has no hands), the subject would still form the same belief, thereby violating sensitivity. Stalnaker's (1968) refinements to the semantics of conditionals, among others, have sought to rescue the principle by sharpening the requirement of method constancy. The enhanced BIV model shows further that, even if one permits methodological variation in the horizontal dimension, so long as the cognitive mechanism employed by the subject remains unchanged across hierarchical levels, there will always exist a nearest world W^{m-1} in which p is false and the subject still forms the same belief; sensitivity is therefore breached. This demonstrates that any attempt to repair Nozick's framework by constraining the "same method" clause cannot block the vertical counterexamples introduced by hierarchical simulations.

2.4 Counterexamples to the Safety Principle

The safety principle developed by Sosa, Williamson, and Pritchard often mitigates skepticism by invoking a method–truth coupling and an anti-luck interpretation.

In contemporary epistemology, the Safety Principle is understood as follows: If S knows p, then Ss belief about p must be safe, where a "safe belief" means a belief that is not easily false. Ernest Sosa (1999) expresses it as: Call a belief by S that p 'safe' if: S would believe that p only if it were so that p. Duncan Pritchard (2005,p.71) describes it as: if an agent knows a contingent proposition p , then, in most nearby possible worlds, that agent only believes that p when p is true. Timothy Williamson articulated the safety principle of knowledge is so that if a subject knows a proposition p, then in all nearby possible worlds where the subject believes p, p must be true. In other words, the safety principle holds that for a subject to know something, their belief in p must be stable across similar situations. That is, if the subject knows p, they would not easily believe p if p were false in similar circumstances. (Williamson,2000, pp. 96-102) This idea emphasizes that knowledge must be resilient to small changes in circumstances that might otherwise lead to false beliefs. Returning to Goldman's example, suppose that the epistemic subject S, in a situation with poor lighting, vaguely sees an animal in the distance and believes it to be a dachshund, thus recognizing it as a dog. However, given the external environment and S's cognitive limitations, S lacks the ability to distinguish between a dachshund and a wolf, and the animal is actually a wolf that looks exactly like a dachshund. In other words, S's belief might be true in the actual world, but in many conceivable possible worlds close to (or similar to) the actual world, S might see a wolf and yet form the mistaken belief 'I see a dog.' According to the Safety Principle, S does not know that he sees a dog because, while the belief might be true in the actual world, it is not safe in the relevantly similar possible worlds.

Haicheng Zhao suggests that, depending on the scope of what is called 'nearby possible worlds', the above Safety Principle can be further divided into two more precise formulations:

> 'Weak Safety Principle: If an epistemic subject S knows a proposition p, then S's belief regarding p must be safe, meaning that the belief is not only true in the actual world but also true in most of the relevantly adjacent (or similar) possible worlds where S believes p. Strong Safety Principle: If an epistemic subject S knows a proposition p, then S's belief regarding p must be safe, meaning that the belief is not only true in the actual world but also true in all of the relevantly adjacent (or similar) possible worlds where S believes p'. (赵海丞，2021)

As described, the Weak Safety Principle and the Strong Safety Principle differ in their tolerance for false beliefs. The Weak Safety Principle requires that the belief be true in most close possible worlds, while the Strong Safety Principle demands that the belief be true in all close possible worlds. For example, suppose the subject S buys a lottery ticket with a very low chance of winning, but the lottery has not yet been drawn. Given the low probability of winning, S believes him or her will not win. Consider the following cases, Case 1: The n numbers on S's lottery, as well as their order, do not match any of the numbers or their order in the final draw. According to the Weak Safety Principle, S's belief that he or she will not win is safe because, in the closest possible worlds, S does not win indeed. Case 2: The n numbers on S's lottery as well as their order, match n-1 of the numbers and their order in the final draw. According to the Strong Safety Principle, S's belief that he or she will not win is unsafe, as this belief is not true in all close possible worlds.

However, the Safety Principle still fails to address the challenge posed by the enhanced BIV model. As the distinctions and explanations of the Safety Principle above suggest, the core difficulty in determining its effectiveness lies in how we judge what counts as "close" in possible worlds. In the enhanced BIV version of the skeptical model constructed in this paper, close possible worlds can be divided into two categories, (i) Horizontally close possible worlds: These are the traditionally understood close possible worlds. (ii) Vertically downward-compatible close possible worlds: In the enhanced BIV model, each column of BIV is epistemically downward-compatible and upwardly transparent. In such a scenario, S, firstly, cannot confirm the truth of their belief in "all" close possible worlds, because the possible world in which S resides may be the "BIV`s BIV" from a higher level. The belief P_i that S holds in possible world can only be confirmed as true when $i \geqq m$. This implies that the Strong Safety Principle fails in this context. Secondly, S cannot confirm the truth in even the nearest possible world. In the vertical sequence of the enhanced BIV model, there exists a higher-level "BIV" above the possible world where S resides. This higher level is epistemically downward-compatible with the lower level, as the lower-level "BIV" is constructed by the higher level. The knowledge of the lower level is therefore transparent to the upper level. However, this transparency also means that S cannot confirm the truth of P at the higher level. Thirdly, the Weak Safety Principle is compatible with the enhanced BIV mode. In the vertical sequence of the enhanced BIV model, the belief P_i that the epistemic subject S holds in possible world can only be confirmed as true when $i \geqq m$. This implies that the number of possible worlds where S cannot confirm the truth-value of P is m-1, while the number of possible worlds where S can confirm the truth-value of P remains $\aleph_0$ ($\aleph_0$ represents the cardinality of the set of natural numbers or a countably infinite set). Since m-1<$\aleph_0$, it is evident that the Strong Safety Principle cannot withstand the challenge posed by this skeptical model, whereas the Weak Safety Principle is compatible with it.

In sum, the Enhanced BIV Model reveals that for any actual world W^0, there exists a world w^1 that is "*ε-close*"[3] to it in both physical and psychological respects, whose simulation depth is lower by one level and in which p is false, while the subject employs exactly the same causal method. If the safety metric fails to assign a significant distance to differences in simulation depth, w^1 will inevitably qualify as a "nearby" world, making the subject's belief easily mistaken in w^1 and thus violating safety. To evade this result, safety theorists would have to append non-modal exclusion clauses for simulation layers—an addition that conflicts with the strictly modal character that the safety condition aims to preserve. Therefore, proponents of the Safety Principle must undertake further argumentation to resist the attack of this skeptical model.

2.5 Counterexamples to Contextualism

In fact, it is not only the sensitivity principle or the safety principle, but any contextualism framework that cannot withstand the objections posed by the Enhanced-BIV model.

Contextualism has long been a key force against skepticism, and "gaining center stage in epistemology mainly through its way with the skeptic" (Sosa,2000). After long development, the classification and various versions of contextualism have become extensive and complex. This paper selects two representative contextualist theories—Stewart Cohen's internalist contextualism and Keith DeRose's externalist contextualism—as the targets for the proposed enhanced BIV model. There are two reasons for this choice: First, there are few prominent theories within the domain of internalist contextualism, with Cohen being the most representative figure. Second, with respect to externalist contextualist theories, DeRose's discussion of sensitivity is considered 'one of the most prominent and influential theories in contemporary epistemic contextualist literature'. (李麒麟,2021)

Cohen's internalist theory cannot exclude the enhanced BIV model. Cohen (Cohen, 1988) argues that his theory of contextualism relies on the following two points to eliminate skepticism: (i) The nature of knowledge is the exclusion

3 "ε-close" is borrowed from standard terminology in mathematical analysis; it denotes that the distance between two objects is less than some arbitrarily chosen, sufficiently small positive number ε (epsilon). In the present context, it means that the difference between W^1 and the actual world W^0 can be reduced to an arbitrarily small value, rendering the two worlds virtually indistinguishable under the stipulated metric.

of all 'relevant alternatives'[4]. (ii) Context sensitivity of knowledge attribution. Cohen describes context sensitivity as follows: 'The standards that determine how good one's reasons have to be in order to know are determined by the context of ascription. Of course, many predicates in natural language are such that the truth value of sentences containing them depend on contextually determined standards… For any such predicate, I would argue, it will be a matter of context the degree to which the predicate must be satisfied in order to be satisfied simplicity (Cohen， 2000). Our task now is to argue that at least one of these two points cannot exclude the enhanced "Brain in a Vat" model proposed in this paper.

Cohen's contextualism deals with the traditional BIV model as follows:

P1: I know I have hands.

P2: If I do not know that I am not a brain in a vat, then I do not know that I have hands.

P3: I do not know that I am not a brain in a vat.

Cohen's response is to accept P2. He argues that in a skeptical context, the BIV is a relevant alternative, so we should accept P2 and P3 and deny P1. In an everyday context, however, the BIV is not a relevant alternative, so we should accept P1 and P2 and deny P3.

Now, by enhancing the BIV model, we can derive the following propositions:

P1*: I know I have hands (in BIV-V_n^m).

P2*: If I do not know that I am not in BIV (V_n^{m+1}), then I do not know that I have hands (in BIV-V_n^m).

P3*: I do not know that I am not in a BIV (V_n^m).

In the traditional model, Cohen believes that it is possible to accept P1 and P2 while rejecting P3 in everyday contexts, thereby countering skepticism. However, in the enhanced BIV model, because BIV-V_n^m is at a higher level than BIV -V_n^{m+1}, and in this model, the higher-level BIV is epistemically downward-compatible with the lower-level BIV, proposition P2* entails proposition P3*. Therefore, in this enhanced model, if Cohen accepts P2*, he must also accept P3*.

The enhanced BIV model can similarly address Keith DeRose's externalist contextualist theory. DeRose emphasizes the importance of the 'strength of the

4 The definition of a relevant alternative is: An alternative hh (to a certain proposition q) is relevant (to a person S) if S's epistemic position towards hh precludes SS from knowing q. According to Cohen, for S to eliminate a relevant alternative h, three conditions must be met:(1) S's evidence for non-h is strong enough to allow S to know non-h; (2) S's evidence for non-h is strong enough to give S good reasons to believe non-h;(3) S's belief in non-h possesses non-evidential epistemic justification.

epistemic position' in contextualist theory, 'according to contextualist theories of knowledge attributions, how strong a subject's epistemic position must be to make true a speaker's attribution of knowledge to that subject is a flexible matter that can vary according to features of the speaker's conversational context'(DeRose,1995). In other words, *if S is in a sufficiently strong epistemic position in context C to form the belief that P is true, then S knows P in C*. The key to DeRose's contextualist theory is that the epistemic subject must be in a sufficiently strong position to make a genuine knowledge ascription.

According to the enhanced BIV model, we can reformulate this as follows: *If S is in a sufficiently strong epistemic position in context C (BIV-*V_n^m*) to form the belief that P (BIV -*V_n^{m+1}*) is true then S knows P(BIV -*V_n^{m+1}*) in C (BIV-*V_n^m*)* . At this point, we can confirm that S is indeed in a sufficiently strong epistemic position because S is at a higher level, and all lower-level BIV are transparent to S. However, S can only justify the truth of a belief with respect to the proposition P at the next lower level. In this case, P and S's context C are not rigidly the same. Therefore, a more precise formulation of 'S knows P in C' would be that: S, in *BIV-*V_n^m, forms the belief that P in *BIV -*V_n^{m+1} is true. Because the context of S is downward-compatible, S can indeed know P. However, the epistemic subject S and the proposition P are in different contexts, making DeRose's formulation ineffective in this case. As a result, this approach fails to eliminate skepticism within the framework of the enhanced BIV model.

2.6 The Limits of Ordinary Modal Resources

Within contemporary anti-skeptical discourse, both the safety and sensitivity frameworks typically rely on a single-dimensional "nearby world" function to delimit the range of possibilities a cognizer must exclude (Nozick 1981; Sosa 1999; Pritchard 2005). This function treats "minimal difference from the actual world" as the sole yardstick of nearness, assumes that all differences can be linearly ordered, and thereby sets a threshold that contains the "closest" worlds. When applied to the classical single-layer brain-in-a-vat (BIV) scenario, such an approach is indeed persuasive: once the gap between a deceptive world and the actual world is judged "too large," the relevant knowledge ascription survives.

The strengthened BIV model proposed here, however, exposes a fundamental blind spot in this one-dimensional metric: it cannot register the vertical dimension of simulation depth. In this model, each physical world w is indexed by a simulation depth k starting from 0. Worlds at different depths are fully isomorphic in all observable respects—physical constants, neural states, and even the subject's entire phenomenal content. The sole divergence lies in the meta-property of “running one level higher in the simulation.” Consequently, under the orthodox metric, whether the subject inhabits m = 0 or m = 1, the two worlds receive a distance of zero.

This structure generates a direct truth-value-flipping sequence: let p be “I am not in a simulation”. If p is true at even depths and false at odd depths, then for any actual world at m = 0 there always exists a nearest world at m = 1 that is equidistant yet falsifies p. More damaging still, the flipping can iterate indefinitely (m = 2, 3, …). The result is an infinitely dense sequence of worlds—indistinguishable by the standard metric—through which the truth value of p continually toggles, thereby cutting across safety- and sensitivity-based evaluations. Because the one-dimensional function assigns no positive distance to differences in simulation depth, it collapses all levels into a single cluster of nearby worlds and thus systematically overestimates the stability of knowledge.

This defect manifests differently across anti-skeptical strategies. Safety theory requires that in all sufficiently close worlds the subject does not falsely believe the target proposition (Williamson 2000). Yet if m = 1 and m = 0 count as the same nearness tier, a true belief at m = 0 is immediately undercut by a false belief at m = 1, defeating safety. Sensitivity theory demands that if the proposition is false, the subject would not believe it (Nozick 1981). Because m = 1 and m = 0 are phenomenally identical, the subject employs the same cognitive method at both depths, and sensitivity likewise fails. Contextualists might attempt to raise the exclusion standard to filter out more skeptical possibilities (Cohen 1988; DeRose 1995), but the hierarchical model shows that once m= 0 is admitted, m = 1 inevitably follows, depriving the contextual threshold of stable support for knowledge claims.

In short, the inability of a single-dimensional proximity function to reproduce the strengthened BIV argument is no mere oversight; it stems from the model’s foundational neglect of the modal complexity introduced by simulation depth. So long as this dimension remains invisible, any theory that evaluates knowledge solely by reference to the “nearest possible worlds” will inevitably underestimate the skeptical threat.

3 How Skeptics ‘Know’

*3.1 On a Pair of Propositions Regarding Skepticism***

From the above arguments, it becomes clear that neither the Sensitivity Principle, the Safety Principle, nor contextualism can fully refute the enhanced BIV model. Although anti-skeptics might claim that the enhanced BIV model cannot provide empirical evidence to confirm its conjecture, this at most demonstrates that all evidence supporting both skeptical and anti-skeptical conjectures is equally underdetermined. However, supporting a skeptical conjecture does not mean that a true skeptic cannot "know" or possess knowledge. If skeptics could not "know", then even skepticism itself could not be "known." Therefore, if skeptics claim that we do not "know" any knowledge, this would contradict our most basic intuitions.

Let's see the following case: When a skeptic claims 'I know p', what does this mean? First, as a skeptic, the "I" in this case would not oppose their own skeptical intuitions. Thus, they would accept proposition P1: I do not know that the skeptical conjecture is false. Second, because they claim to 'know p', they would also accept proposition P2: I have sensory knowledge of the external world. This creates a pair of mutually contradictory propositions, P1 and P2, regarding skepticism. Solving the contradiction between P1 and P2 explains how a skeptic can "know"—specifically, how a skeptic can claim to "know" while maintaining their skeptical intuitions.

3.2 Knowledge and Representation

Knowledge can be represented. The argument that knowledge can be represented has been explored across multiple philosophical domains, particularly epistemology and the philosophy of mind, through the works of various prominent philosophers. Frege, Russell, and Wittgenstein have all argued that knowledge can be accurately represented through linguistic structures, particularly propositions, which reflect and convey reality (Frege, 1980; Russell, 2001; Wittgenstein, 1995). Fodor and Putnam, focusing on mental representation, emphasize that the mind operates through symbolic systems that correspond to external reality, thus allowing knowledge to be captured and processed via mental representations (Fodor, 1975; Putnam, 1975). Together, these philosophical contributions provide a robust framework supporting the idea that knowledge can be effectively represented through symbolic, mental state.

Many philosophers have contributed to the distinction between symbolic and mental state representation. For example, Jerry Fodor (1987, p. xi) argued that both symbols and mental states have representational content. Daniel Dennett (1981), through his 'intentional stance', discussed the representation of mental states in agents alongside the role of symbolic systems. Franz Brentano (2012) introduced the concept of intentionality, emphasizing that mental states inherently possess representational content. Similarly, John Searle's (1983) theory of intentionality focused on how mental states represent the external world, aligning with theories of mental state representation. In contrast, Hilary Putnam's (1975) semantic externalism stressed the external nature of symbolic representations, while Terry Winograd (1986) explored the role of symbolic systems in knowledge representation within artificial intelligence, both supporting symbolic knowledge representation theories. Their work collectively supports that knowledge is represented not only through internal psychological states but also through external symbolic systems—which I call dual-representation view (DRV).

The contradiction between propositions P1 and P2 depends on these two fundamentally different concepts of knowledge representation. The understanding of P1 relies on the theory of knowledge representation concerning mental states, while the understanding of P2 depends on the theory of knowledge representation concerning symbolism. When we encounter a representation R, we can first acquire knowledge of what R represents and then gain knowledge of R itself. For example, in the case of "blue", we can broadly divide this into two parts: first, we can obtain knowledge of what the representation R stands for, that is, the color blue; second, we can acquire knowledge of the representation R itself, such as the fact that the word "blue" is written in black ink. In the former case, knowledge is about the object p being represented by R; in the latter case, knowledge concerns the representation R and its characteristics. There is no conflict between the knowledge gained from the representational fact of R and the knowledge about R itself. However, we experience a contradictory intuition about the relationship between knowledge derived from the representation R of p and knowledge about the representation R.

From the perspective of the representation theory of mental states, we can know p through the content of a representation of p without imposing additional restrictions on this representation or its epistemic source. This means that we do not require that there must be an *a priori* or directly experienced sensory knowledge component behind it, nor do we need to know that representation R is a representation of the object p. In this situation, it is possible to acquire knowledge simply by using a representation. That is:

> *When S encounters a representation R of p, S can know p merely by forming a belief about p based on R, without requiring that R must contain elements that can be analyzed as a priori or* directly experienced *sensory knowledge.*

This understanding of knowledge requires only that we ensure the belief formation process is reliable and follows deductive reasoning rules; then, the belief about p can be justified. For example, if we know "r → s and r," then we can know '*s*,' and we can form a belief about the object of representation *s* based on the representation of *s*, thereby knowing the object of representation *s*. In this situation, we do not even need to know that *s* is a representation of its object. As for the object of *s* and what lies behind it, these can be entirely ignored without hindering the justifying of the belief about the object of *s*. For example, when I believe 'Tiga is an Ultraman',[5] I only need to ensure that the process by which I form this belief is reliable, ensuring that I do not mistake 'Sun Wukong'[6] or 'Tom Cruise'[7] for an Ultraman. I do not need to know whether Ultraman can be analyzed as having a priori or directly experienced sensory knowledge components. Ultraman might even be nonexistent, but this does not prevent me from justifying the belief that "Tiga is an Ultraman". Similarly, because I read a news report, I know that Manchester United defeated Liverpool. What I need to ensure is that the process of forming this belief is reliable; I do not need to analyze whether the news report could be false or whether Manchester United and Liverpool might have rigged the match.

From the perspective of the theory of representation concerning symbolism, we need to focus on the representation R of p itself and its characteristics. In this case, obtaining knowledge of p through the representation R — that is, 'knowing p' —requires having sensory knowledge components about R that can be analyzed as a priori or directly experienced. That is:

> *When S encounters a representation R of p, S can know p through R only if S knows that R is a representation of p and if S possesses sensory knowledge components about R that can be analyzed as a priori or directly experienced.*

This understanding of knowledge requires us to possess sensory knowledge components about the representation R; otherwise, we cannot "know" the object p that R represents. For example, if we see someone recommending a particular dish from a restaurant on a certain app, we cannot claim to know that the dish is good unless we know the reliability of the recommender or have personally tried the restaurant. We must have sensory knowledge components of this representation that can be analyzed as a priori or directly experienced—either previous experience leads us to trust the recommender, or we have personally visited the restaurant.

5 Ultraman is a superhero from a Japanese tokusatsu (special effects) franchise produced by Tsuburaya Productions. Tiga is indeed an Ultraman warrior in the Ultraman series.

6 Sun Wukong (孙悟空), also known as the Monkey King, is a legendary character from Chinese mythology and literature, most famously featured in the classic novel *Journey to the West* (《西游记》), written by Wu Cheng'en during the Ming dynasty.

7 Tom Cruise, an American actor and producer, known for his roles in blockbuster action and drama films.

The reason for these two conflicting theories of knowledge representation lies in the different aspects of attention when we focus on the representation of knowledge. When we concentrate more on the object represented by R, we mainly use R to acquire knowledge about the external world without needing to reflect on or inquire into the sensory knowledge components of R. This aligns with the theory of knowledge representation concerning mental states. On the other hand, when we focus more on R itself and its characteristics, we only claim to "know" when we possess sensory knowledge components of R, which aligns with the theory of knowledge representation concerning symbolism.

4 Objection and Response

Pragmatic encroachment (PE) depicts a landscape in which the truth-value of knowledge ascriptions fluctuates with the practical stakes or risk level of the context (Stanley, 2005; Fantl; McGrath, 2009, 2011). If DRV and PE both permit mutually conflicting yet individually warranted knowledge claims across contexts, one might ask whether DRV is merely PE in new clothes. Because this challenge bears directly on the independent contribution and necessity of the present theory, it warrants a full reply.

First, the two accounts diverge ontologically in their explanatory strategy. PE is grounded in risk–evidence covariance: in high-stakes contexts a subject knows p only with stronger evidence, whereas in low-stakes contexts the same evidential base suffices (Hawthorne, 2004; Fantl; McGrath, 2011). Thus, a single agent may protest in the operating theatre, "I don't know I have sufficient funds," yet concede in a café, "I do know". Risk level therefore becomes the decisive explanatory variable governing the truth of knowledge ascriptions. By contrast, DRV appeals not to practical stakes but to representational category. A single proposition p may be evaluated as mental-state content or as a public symbolic vehicle. At the public-sentence level, the claim "I have hands" is readily knowable; at the level of neural states—especially within the enhanced brain-in-a-vat scenario—the same proposition typically fails to meet knowledge conditions. The resulting tension, therefore, arises quite independently of risk or action. The two theories differ ontologically: PE invokes stakes, DRV invokes representational category.

Second, this ontological divergence yields distinct, testable empirical predictions. Consider a constant-stake, trivially low-risk setting. A researcher casually asserts in the laboratory, "I know I have a left hand." Conversation then shifts to, "Suppose you are one level up in a simulation". The same speaker now appropriately says, "I don't know I have a left hand". Throughout, risk never increases. PE offers no explanation for the reversal[8]; DRV predicts it precisely, for the conversational focus has shifted from the symbolic to the mental representation. Such risk-invariant yet truth-variable data provide empirical leverage distinguishing DRV.

Third, there are different normative commitments and broader philosophical implications between the two accounts. PE's normative upshot concerns practical rationality: high risk calls for more evidence, low risk licenses laxer standards (Fantl & McGrath 2009). DRV's prescription is quite different: one must first specify the representational level when reporting knowledge, lest a category mistake generate the surface paradox "I both know and do not know." This injunction is crucial in skeptical debates, for skepticism exploits slippage between representational layers. DRV thereby supplies a novel semantic self-audit unavailable in PE.

Fourth, complementarity with other recent approaches. DRV also complements knowledge-first contextualism (Blome-Tillmann, 2014) and structural skepticism (Hawthorne; Lasonen-Aarnio, 2009). The former emphasizes pragmatic presuppositions, the latter higher-order defects in evidential structures; both assume a single representational channel. DRV's bifurcation introduces a meta-semantic dimension, filling the gap left by presuppositional theories (by diagnosing category mismatch) and furnishing structural skepticism with finer classificatory tools, thus avoiding "structural vagueness" that breeds excessive doubt.

Taken together, DRV and PE differ fundamentally in explanatory variables, predictive patterns, and normative orientation. PE modulates the knowledge threshold via a stakes–evidence function, whereas DRV shows that even with stakes held fixed, representational misalignment can produce apparently contradictory knowledge ascriptions. Hence, DRV retains theoretical independence and, by providing meta-semantic resources absent from PE, offers an indispensable framework for analyzing hierarchical skepticism. In enlarging both the depth and the breadth of skeptical research, DRV delivers a theoretical value that PE cannot replace.

5 Conclusion

The foregoing argument secures two results. First, by introducing a depth-indexed hierarchy of simulations, the Enhanced-BIV model exposes a blind spot

8 For a critique of the blind spots in pragmatic encroachment, see: Boyd (2016) and Roeber (2018).

common to sensitivity, safety, and contextualist accounts: each relies on a single-axis similarity metric that is indifferent to vertical differences in simulation level. Because for every actual world W^0 there is an indistinguishably "ε-close" world W^1 one layer deeper in which the target proposition is false, no amount of counterfactual tracking, anti-luck robustness, or contextual threshold-raising can guarantee knowledge. Any adequate anti-skeptical theory must therefore replace one-dimensional neighborhood functions with a structure that assigns positive epistemic distance to simulation depth.

Second, the paper shows that collapsing in the face of this strengthened skepticism is unnecessary. The Dual-Representation View demonstrates that conflicting knowledge ascriptions arise from a category mistake rather than from evidential deficiency. When a claim is processed as mental-state content, it inherits the skeptic's underdetermination worries; when the same claim is evaluated as a public symbolic vehicle, it can meet ordinary justificatory standards. Because representational category—not practical risk—drives the shift.

It is important to clarify that the aim of this paper is not to argue that one of the two theories of knowledge representation is correct while the other is incorrect; both are reasonable. The purpose here is to provide an explanation—specifically, to explain how these two theories of knowledge representation arise and their rationality, and to elucidate how we use the term 'know' rather than to impose a normative restriction on its use. Therefore, this paper does not suggest that these two theories of knowledge representation possess normative authority. Moreover, it does not imply that when adopting one theory, we must abandon the other. On the contrary, we can shift our focus to another perspective to enable a flexible viewpoint that allows us to switch between the two theories. The relative importance of each theory depends on the specific content we are focusing on.

Finally, together these contributions recast the landscape of contemporary epistemology. They mandate richer modal topologies for evaluating safety and sensitivity, supply a principled account of how skeptics can coherently claim knowledge, and integrate with (rather than displace) recent knowledge-first and structural approaches. Future research can extend this framework by formalizing multi-dimensional proximity metrics and examining how DRV interacts with empirical models of cognitive representation.

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