JUSTIFIED TRUE CRISIS

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Abstract:
Gettier cases reveal the paradoxes within the universally applied, but therefore misunderstood, framework of Plato's "justified true belief" (JTB). By identifying and addressing five challenges this analysis highlights the limitations of JTB in dynamic contexts.

The resulting instabilities and contradictions necessitate a shift toward a dualistic model of knowledge, distinguishing between static knowledge (SK), which is timeless and unchanging, and dynamic knowledge (DK), which can adapt and evolve with changing circumstances. In this framework, Gettier cases will be explained as conceptual coincidences.

In dynamic environments, knowledge claims demand methodologies that transcend the limitations of JTB to adapt to evolving information. Assertions in this regard, with their critical moments procedurally lead to more useful conceptualizations. Consequently, DK offers tools for epistemological analysis with both an idealistic and a pragmatic approach, the latter defined as "justified true crisis" (JTC).

Keywords:
Conceptual Coincidence; Dualism; Gettier Cases; Identity; Induction Problems; Knowledge; Paradoxes; Time;

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"[…] it is the struggle itself that is most important. We must strive to be more than we are, Lal. It does not matter that we will never reach our ultimate goal. The effort yields its own rewards."[1]

Lt. Cmdr. Data to his daughter Lal
Star Trek: The Next Generation

[1] "Lt. Cmdr. Data to his daughter Lal," *Star Trek: The Next Generation*, Season 3, Episode 16, "The Offspring," directed by Jonathan Frakes, written by René Echevarria, aired March 12, 1990 (Paramount Television).

Commander Data's reflection, "We must strive to be more than we are," captures the pursuit of an unattainable ideal within constantly changing and chaotic circumstances—symbolizing epistemology. Yet, as he observes, the journey itself—shaped by justifications and adaptations—yields its own rewards: e. g. personal growth, deeper understanding, meaningful connections. This frames knowledge not as a fixed state ("more than we are") but as a dynamic process of (self-)discovery and growth, mirroring a modern odyssey defined by challenges. The quote encapsulates the essay's central idea, portraying knowledge as a dichotomy of static and dynamic characteristics, with an evolving orientation that continually adapts to new frontiers.

1. Introduction

Imagine a businessman at a train station who looks at a stopped clock, believing it is working as usual, and coincidentally sees the correct time, allowing him to catch his desired ride.[2] Did he know the time? Regarding the dominant interpretation of Plato's definition of knowledge, which requires a justified true belief (JTB), he should have known.[3] But over six decades ago, Edmund Gettier challenged this tripartite definition with similar thought experiments, now known as Gettier cases. These counterexamples, presented in his paper *Is Justified True Belief Knowledge?* (1963), revealed the paradox that while JTB was present, knowledge seemed intuitively absent due to coincidence, demonstrating that these conditions alone are not sufficient.[4] Since their rediscovery[5], epistemologists have challenged themselves to do the impossible: develop a definition that avoids these cases.

This work unfolds in two key steps. First, it examines five challenges to the JTB definition of knowledge within its widely accepted yet paradoxical monistic interpretation, which struggles with universal applicability. These challenges reveal the inadequacy of JTB in dynamic contexts, offering a pathway out of the conceptual "fly-bottle."[6] While doing so two further counterexamples against JTB as monistic knowledge will be presented: the "Fastest Way to Work" example and the *Rashomon effect*. Building on this, I propose a dual framework of knowledge: Static Knowledge (SK), defined by unchanging and timeless qualities, and Dynamic Knowledge (DK), shaped by timely and evolving elements. In the second step, I develop a dynamic definition of knowledge, introducing the concept in both idealistic and pragmatic forms with its "Justified True Crisis" (JTC). This approach necessitates addressing the interplay between knowledge management, perception, and assertion, reflecting the distinct traits of knowledge. The discussion further explores the implications of epistemological dualism, critiques knowledge monism, and highlights dynamic knowledge concepts, illustrated by the Ship of Theseus and applied to ethical and modern challenges.

2. Bridging Gettier's Gap

In *The Inescapability of Gettier Problems* (1994), Linda Zagzebski argues that the Gettier Problem is unavoidable for any definition of knowledge based on the traditional tripartite model of justified true belief. She proposes three possible reactions: (1) giving up on the independence between justification and truth, (2) maximizing this independence, or (3) accepting luck as a fixed component of knowledge.[7] The problem has remained unresolved despite numerous attempts at a solution, emphasizing the existence of what can be termed *Gettier's gap*. This gap specifically denotes the conceptual disconnect between JTB and certain knowledge, accentuates a fundamental epistemological challenge.

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[2] Cf. Bertrand Russell, *Human Knowledge: Its Scope and Its Limits* (London: George Allen & Unwin, 1948), 170-171.

[3] See Plato, *Theaetetus* 201c.

[4] Edmund Lee Gettier, "Is Justified True Belief Knowledge?" *Analysis* 23, no. 6 (1963), 121.

[5] Nagel notes that the Indian philosopher Dharmottara, around 770 AD, and Bertrand Russell, prior to Gettier, identified inherent contradictions within JTB.

See Jennifer Nagel, *Knowledge: A Very Short Introduction*, 1st ed. (Oxford, United Kingdom: Oxford University Press, 2014).

[6] Wittgenstein, Ludwig. *Philosophische Untersuchungen*. 3rd ed. Suhrkamp Taschenbuch, vol. 14. Frankfurt am Main: Suhrkamp Verlag, 1971. Originally published by Basil Blackwell, 1958, 162.

[7] Linda Zagzebski, "The Inescapability of Gettier Problems," *The Philosophical Quarterly* 44, no. 174 (1994): 65, 122.

Gettier's initial thought experiment, the job application scenario, serves as a basis for analysis in Table 1, before I proceed to argue for a definition that integrates coincidence.[8] Despite its complexity this scenario offers illustrative advantages over the clock case. Gettier cases, as illustrated in my analysis, can be described as *conceptual coincidence*. This term captures the phenomenon of accidental knowledge within non-transitive frameworks like JTB that can arise in dynamic scenarios. They occur when an assertion is randomly confirmed by the alignment of relevant aspects, without the original conditions objectively enabling the assertion. This scenario unfolds over at least two points in (epistemic) time and relies on different but similar and not necessarily distinguishable concepts, with the aspect crucial for the confirmation of the assertion changing in such a way that it validates the assertion. In a metaphorical sense they are like a puzzle that can be completed with a piece from a different set. Although the final piece structurally fits, it is incongruous with the overall depicted image.

Table 1. Formal Analysis of Temporal Assumptions and of Conceptual Coincidence

Time	Key Point	Formal Notation	Description
t_1	**Assumptions**		
	Single Job Position	$\exists!x\ P(x)$	There is exactly one job position.
	Applicants	A(s), A(j)	Smith and Jones are applying.
	Coins (General)	C(x)	x has a certain number of coins in his pocket.
	Smith's Implicit Assumption	$\neg C(s) = 10$	Smith believes he does not have 10 coins in his pocket, but he does.
	Smith's Specific Assumption (α)	$\exists!z\ (A(j) \wedge P(j) \wedge C(j) = 10) \wedge \forall z ((A(z) \wedge P(z) \wedge C(z) = 10) \rightarrow z=j)$	Knowledge is claimed before the fact: α. Smith believes that Jones is the (sole) man who will get the job (definiendum) and that Jones has ten coins in his pocket (definiens).[9] The justification for Smith, while seemingly justified and true at t_1, rests on false premises, such as the assumption that the word of the president of the company is reliable (testimony) or that possessing ten coins is a unique factor in who receives the job; Smith counted Jones ten coins. The truth value of the outcome is contingent.
	Smith's Generalized Assumption (α_1)	$\exists!y\ (A(y) \wedge P(y) \wedge C(y)=10) \wedge \forall z ((A(z) \wedge P(z) \wedge C(z)=10) \rightarrow z=y)$	Smith infers and strongly believes that Jones is the (sole) man who will get the job (definiendum) has ten coins in his pocket (definiens): α_1
t_2	**Assumptions vs. Actual Event**		
	Smith's Situation Jones' Situation	$P(s) \wedge C(s) = 10$ $C(j) = 10$	Smith unexpectedly receives the job and has as well 10 coins in his pocket. This contradicts α. There are two man who meet the once unique definiens of Smith's assumption α_1. They are now a class.
	Conceptual Coincidence	<u>Assumption α:</u> $\exists!y\ (A(y) \wedge P(y) \wedge C(y)=10) \wedge \forall z ((A(z) \wedge P(z) \wedge C(z)=10) \rightarrow z=j)$. But it is true that $P(s) \wedge C(s)=10$.	<u>α:</u> Jones (and not Smith) should be the (sole) man that gets the job. He should be the (sole) man that has 10 coins in his pocket <u>α_1:</u> It turns out Smith as well meets α_1. This unexpected alignment between Smith and the assumption's condition stresses the coincidental nature of the truth of the assumption as conceptual coincidence. α is neither sound nor valid as it is based on false premises and incorrect reasoning. α_1 is valid but not sound. It is formally correct in its structure but coincidentally true rather than being true based on sound reasoning or accurate premises.

[8] Gettier "Is Justified True Belief Knowledge?", 122.

[9] This definitional proposition can be confusing because it involves a non-parallel coordination, blurring the distinction between a descriptive statement (proposition) and the explicit relationship that defines the link between a definiendum and its definiens.

I will now demonstrate further how inflated expectations of the traditional JTB definition, give rise to these cases due to five causes: (1) violating Leibniz's law and the resulting inadequacy of definitions, (2) confusing of deductive and inductive reasoning, (3) overlooking Plato's first (indivisibility), (4) disregarding his second restriction (timelessness), and (5) temporal indexing of concepts. These factors collectively reveal that Gettier cases are not mere anomalies but systematic failures of the JTB framework to account for the dynamic and context-dependent nature of knowledge.

(1) The first Gettier case violates Leibniz's law as illustrated in Table 1 and 2. At t_1, a scenario is presented with a unique job position and two applicants, Smith and Jones. Smith's belief is built around the assumption (α) that the job recipient, whom he believes to be Jones, has ten coins in their pocket. This assumption is generalized (α_1) and is critical as it forms the basis of his expectation. However, t_2 unveils a surprising twist. Contrary to his belief, Smith ends up with the job, and, unknowingly, he also has ten coins in his pocket, just like Jones.

This leads to a paradox where the assumption (α_1) and the actual situation are at odds. Now, two individuals, Smith and Jones, fulfill the criteria initially thought unique to one. This occurs due to changing information, without the original assumptions being updated accordingly. The singular terms in this case undergo a referential shift which is defining for Gettier cases: Initially, "the person who gets the job" uniquely refers to Jones, but at t_2, it instead refers to Smith. Likewise, the condition "has ten coins in their pocket" first applies to Jones but later to Smith. Smith's belief, however, does not track this change, leading to a misalignment between reference and truth-maker. This instability violates Leibniz's Law, as the substitution of co-referential terms within an intensional context result in an epistemic collapse.

This highlights the role of *referential opacity* in the paradox: the phrase "the person who gets the job has ten coins in their pocket" appears to be a uniquely identifying condition, but it is intensional rather than extensional. This means that Smith's belief about the truth of the statement is based on a mistaken assumption about its *truth-maker*[10].[11] He assumes that the truth-maker is Jones, while in fact, it is Smith.

The case highlights the epistemic opacity of truth-making: $P(j) \wedge C(j, 10)$ and $P(s) \wedge C(s, 10)$ has been treated as epistemically equivalent, despite their actual difference. This confusion between epistemic and metaphysical grounds for truth is at the core of the Gettier paradox. The Gettier problem can be seen as a digitization issue because it shows that knowledge systems, which abstract and reduce real-world experience, can produce accidentally true but epistemically flawed beliefs. Smith's belief relies on a referentially opaque expression, as the identity of the job recipient retrospectively turns out to be ambiguous. This elucidates the

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[10] David M. Armstrong defines a truthmaker as "some existent, some portion of reality, in virtue of which that truth is true". He emphasizes that every true proposition must have an ontological grounding in reality.

David M. Armstrong, "Truths and Truthmakers," in *Volume 1: What is Truth?*, ed. Richard Schantz (Berlin, New York: De Gruyter, 2001), 27–37.

[11] Cf. Quine, Willard Van Orman. 1960. *Word and Object*. Cambridge, MA: MIT Press, 148.

Quine defines referential opacity as the failure of substitutivity in intensional contexts, particularly in belief statements. In such contexts, an agent may accept a proposition under one description while rejecting the same proposition under another, even if both descriptions refer to the same entity. This distinction between intensional and extensional contexts is central to the Gettier problem. Smith believes that "the person who gets the job" is Jones, based on his assumption that the defining property is "having ten coins." However, due to referential opacity, this description does not allow for straightforward substitution: he does not recognize that the same description also applies to himself once new information becomes available. This is an example of how intensional contexts resist substitution; a problem Quine identifies in *Word and Object*.

aspect and the illusory semblance of the notion of originality and distinctiveness in conceptual construction.

Table 2. Leibniz's law Violation

Time	Key Point	Formal Notation	Description
t_2	Paradox	$\exists!y\,(P(y) \land C(y)=10) \land (P(s) \land C(s)=10) \land (\neg P(j) \land C(j)=10)$, where $s \neq j$.	The situation and α are in contradiction: Two men meet the once-unique condition. The paradox illustrates the critical nature of Smith's initial reasoning, as the outcome contradicts his assumptions, even though α_1 happens to be true. Neither is α_1 unique and defined nor sufficient for the outcome.
	Leibniz's Law Violation	If $C(s)=10 \rightarrow y$ and $C(j)=10 \rightarrow y$, then $s = j$, which is obviously not the case.	Leibniz's Law says that if $x = y$, then every property that x has must also be had by y and vice versa.[12] The violation arises because, it is known that Smith (s) and Jones (j) are different individuals.

This is where the inadequacy of the definition becomes evident. The phrase "the person that gets the job has ten coins in their pocket" is an insufficient definition. The definition describes a condition but fails to distinguish effectively between individuals *salva veritate*[13]. This lack of precise definition results in a *false equivalence*, leading to an erroneous conclusion. The problem lies in the referential opacity of this statement: While it seemingly establishes a unique identity, it is dependent on epistemic variables that change with additional information. What becomes evident is the need for a robust definition that adequately differentiates the two applicants. Imagine a situation like this in front of a nightclub, where the VIP area has been reserved to celebrate the placement. The president of the company, who made the hiring, gives the bouncer just this piece of information for the guest list: "Only let in the (sole) person who has ten coins in their pocket!" When the time comes, the bouncer finds himself in a crisis because Smith and Jones arrive simultaneously, each with ten coins in their pocket (definiens). His original concept of the sole VIP guest (definiendum) isn't enough to resolve the situation. Jones is unaware of the reservation of his favorite club. But the bouncer must decide on who gets entry and who doesn't. Since it can't be more than one person, he needs to refine the criteria further because it is too vague to identify a single guest.

In this situation, the *present induction problem*, as I classify it, arises when individuals or objects must be identified based on limited information. This is a defining characteristic of Gettier cases. Similar to the classic problem of *(prospective) induction* where conclusions about general rules are drawn from observed instances, there is a risk of erroneous inferences.[14] However, while the classic induction problem focuses on the uncertainty of future events based on past observations, the problem of inductive identification concerns the present.[15] Specifically, inadequate or overly broad definitions can lead to different entities being mistakenly considered identical, as occurs in cases of conceptual coincidence. This issue is further complicated when an individual, like Smith in the Gettier case, mistakenly treats a non-

[12] Gottfried Wilhelm Leibniz, *Philosophical Papers and Letters*, 2nd ed., trans. and ed. Leroy E. Loemker (Dordrecht: D. Reidel Publishing Company, 1969), 308.
[13] "Salva veritate" means "with the preservation of truth". It refers to the interchangeability of expressions in a statement without altering the truth value of the statement.
[14] David Hume, *An Enquiry Concerning Human Understanding*, ed. Tom L. Beauchamp (Oxford: Oxford University Press, 1999), 109.
[15] The classic induction problem appears in the Gettier case when Smith's assumption (α) at t_1—that only Jones has the job and 10 coins—is refuted at t_2.

rigid description as a rigid designator, leading to a false sense of epistemic certainty and an erroneous identification of distinct entities as necessarily identical. Given these risks the question arises: "To what extent can entities be considered original, specific, or uniquely defined and delimited in such contexts?"

Taking this further, the *retrospective induction problem* can be described as the challenge of accurately identifying for example historical figures or events: "How do limited information influence retrospective identification?"[16]

The Gettier cases underscore the risks of depending on inadequate definitions when determining identity and sameness. This reveals that dynamic belief systems are susceptible to errors and must be reevaluated to remain pertinent. Although their conclusions might be accurate at one point in time, the premises upon which they are based may have shifted. The paradox proves insofar the inconsistency of the belief system. Without all relevant information and reevaluation, there could be instances of accidental knowledge, as demonstrated by Gettier, Russell (functional and dysfunctional clock), or Dharmottara (cloud of insects and cloud of fire) which are depended on the circumstances like the perspective of the agent or the observer.[17]

By contrast, in the second Gettier case, the issue does not hinge on two people sharing one unique property. Instead, it arises from treating two unrelated conditions—Jones's alleged Ford ownership and Brown's location—as though one could substitute for the other in justifying the truth of a claim. This leads to what can be termed *conflation* of truth-makers. This refers to the subtle merging of distinct concepts or conditions, treating them as if they were interchangeable. Unlike a direct violation of Leibniz's Law or an explicit claim that two entities are identical, conflation occurs in referentially opaque contexts when separate, unrelated factors are implicitly accorded the same justificatory role: e. g. the disjunction[18]. This blurs the boundary between distinct conditions and undermines the clarity and coherence necessary for knowledge. Conceptual coincidence arises when Smith, relying on a once justified but now false assumption ("Jones owns a Ford"), arrives at a conclusion of a inferred disjunction that happens to be true. This result stems from the accidental convergence of two unrelated factors: the belief about Jones and Brown location.

(2) The Gettier cases demonstrate an interplay of deductive and inductive reasoning as presented in Table 3, underscoring the imperative to integrate a priori as well as a posteriori knowledge in the analysis. As Schurz explains deductive reasoning involves drawing specific conclusions from general premises. If the premises are true, the conclusion is necessarily true: timeless and unchangeable. Inductive reasoning, on the other hand, starts with specific observations and attempts to draw general conclusions: temporal and changeable. Conclusions

[16] A thought experiment in this setting could proceed as follows: In Athens, there exist two traditional ideas of the "Ship of Theseus". The heroists view it as a simple, robust vessel embodying Theseus' heroic deeds, while the royalists regard it as a royal luxury ship. The ambiguity surrounding its original form and history fuels debates over its identity and the authority to define it. This scenario illustrates the Rashomon effect, highlighting the relative nature of knowledge within the framework of the JTB definition and emphasizing the pivotal role of context and interpretation in shaping understanding of history and identity. This concept will be explored in greater depth later. In Plutarch's original and dogmatic version of the Ship of Theseus, Plutarch posits that the ship retains its identity despite the gradual replacement of all its parts, thereby questioning whether it remains the same (Plutarch 1914, Lives, XXIII). Hobbes introduces a skeptical variation with two identical ships, challenging the recognition of the original ship through conceptual knowledge of its reconstruction (Hobbes 1967, 114). This new version complements the discussion with a relative version of the thought experiment.

[17] See Nagel, *Knowledge,* 58.

[18] A disjunction is true if at least one part is true, this does not ensure that the essential component is true.

are not necessarily true, but only probably true.[19] These cases utilize therefore both deductive and inductive elements, demonstrating the interplay between rigid logic and flexible, probability-based reasoning.

Initially (t_1), Smith lays the foundation for his assertion by employing deductive reasoning, based on the testimony of the president of the company and the data regarding the coins in Jones' pocket. At t_2, the foundation of his understanding is called into question as new information emerges, necessitating an inductive adaptation of his reasoning. His conclusion is correct only by chance, not logic.

Table 3. Deductive and Inductive Reasoning in Gettier Cases

Case	**Type**	**Description**	**Smith** (subjective)	**Observer** (objectifying/socializing)
t_1	Ded.	Smith statements: - Jones will get the job. He has 10 coins in his pocket (α) - inferred: There is one man who will get the job. He has ten coins in their pocket (α_1).	Smith beliefs that Jones will get the job. The man who gets the job will have 10 coins in their pocket (α_1).	The man with 10 coins will get the job (α_1).
t_2 1/2	Ind.	Quasi-empirical: Smith gets the job and has unexpectedly 10 coins.	Smith might be surprised to get the job and to have 10 coins as well in his pocket.	Smith's initial deduction was false (α), but his belief (α_1) was coincidentally true.
t_2 2/2	Ded.	Smith gets the job and has 10 coins. Jones doesn't get the job while he is a man and has 10 coins in his pocket.	Smith might conclude that (α) was false but had coincidentally knowledge: α_1. He must conclude that (α_1) was insufficient, as two men meet the definiens.	Smith fulfilled the conditions for JTB, but it is not knowledge because the justification for his belief was based on false premises.

This scenario highlights the limitations of deductive reasoning in dynamic environments. What initially seems true and certain as knowledge may later prove false as new information emerges, underscoring the challenges of relying solely on provisional deduction when the foundation is subject to change over time.

(3) Gettier cases involve, in contrast to Plato's first restriction, variable concepts instead of static, non-transitive[20], indivisible[21], and always true ideas[22]. The problem that arises from disregarding the first restriction becomes evident in t_2, where knowledge is enabled by chance. Therefore, in Gettier, there are two transitive concepts (t_1 & t_2), instead of just a non-transitive model for the process of knowledge acquisition. In Plato's view, variations of t_1 or transitive concepts would be excluded. There are therefore only static concepts for knowledge, which can be referred to as conceptual identity. This excludes a dimension for chance.

(4) JTB is timeless due to Plato's second restriction[23]. However, Gettier still employs time as a means, leading to dynamic and temporal concepts. This also poses problems with non-transitivity. Therefore, Gettier cases must work with uncertainties, probabilities, and expectations, while JTB cannot do so. These insights thus rehabilitate JTB, as it has been proven that Gettier uses a vague definition and transitive concepts instead of non-transitive models,

[19] See Gerhard Schurz, *Erkenntnistheorie: Eine Einführung,* 1st ed. (Stuttgart: J.B. Metzler, 2021), 58.
[20] See Plato, *Symposium* 175c-d.
[21] See Plato, *Republic* 479a2f.
[22] See Plato, *Phaedrus* 247c.
[23] See Plato, *Republic* 479a2f.

while inadequately addressing the factor of time. The JTB definition was used beyond its intended purpose. For the static dimension of knowledge, JTB is thus again to be seen as necessary and sufficient. This satisfies the needs of infallibilism which demands absolute certainty and infallibility for a true belief to qualify as knowledge: beliefs (true or false). In conjunction with the factor of time, JTB is necessary but only uncertain or probably sufficient: credences (degree of belief: probably true or false).

A challenge to this view is that while narrative time may not always be essential—a point a clever critic could argue—*epistemic time*, the introduction of new information, is crucial. Gettier cases depend on observers responding to situations and incorporating new information, which reshapes the evaluation of justification and truth. This highlights a central issue: justification is not merely a fixed state but is subject to epistemic updates over time. Consider a student who believes "2+2=4" solely because their teacher told them so. The proposition is necessarily true, making the belief true. It also seems justified because the student trusts an authority. However, the student is unaware that the teacher is generally unreliable and usually provides incorrect mathematical statements but happens to be correct in this instance by sheer coincidence. This creates a situation where the student's justification is flawed, yet the belief remains true. The problem arises when an external observer gains new information about the teacher's general unreliability, shifting the assessment of the student's justification. This highlights that Gettier cases are defined not by an evolving sequence of events but by the temporal structure of epistemic updates. Justification and belief assessment are modified as new information emerges, whether from the subject or an external observer. The mistaken reliance on an unreliable teacher illustrates an epistemic disconnect that remains even in atemporal domains but is reassessed over time.

The *atypical* Fake Barn case exemplifies the importance of epistemic context and perspective. Unlike other Gettier cases, the belief itself would qualify as knowledge when considered in isolation. Only when the broader environment is revealed from an external standpoint does luck appear as a factor, making the belief seem unjustified. Unlike cases where justification itself is flawed from the start, Fake Barn cases introduce epistemic luck externally, through retrospective contextualization rather than inherent justificatory failure. This distinction clarifies the role of epistemic updates in Gettier scenarios: while some cases hinge on newly introduced information that reveals an internal flaw in justification, others expose epistemic luck depending on the observer's epistemic standpoint. This case serves not just as an additional counterexample to typical Gettier cases, but as a challenge to JTB after Gettier by demonstrating that the status of knowledge can depend on the perspective from which it is evaluated.

(5) Without considering temporal indexing of concepts and adaption while using deduction, Smith's belief appears inconsistent: he initially believes that Jones will[24] get the job and has ten coins in his pocket but later discovers that he himself fulfills these conditions. This seeming contradiction is resolved when time is introduced as framework: (see law of non-contradiction). Time indexing, as revealed in Table 4, shows that the situations at times t_1 and t_2 are distinct, and Smith's belief at t_1 was accurate. The change in his belief at t_2 is a rational response to new information, underscoring the dynamic nature of knowledge and the importance of temporal context in evaluating beliefs.

[24] The term „will" is the only reference in regard to time which is ignored in his consequences to change and time.

Table 4. Instability without Temporal Indexing of Concepts

Without Time		
Aspect	**Formal statement**	**Description**
Implicit (t_1)	$\neg\exists x\ (P(x) \wedge C(x) = 10 \wedge x = s)$	There is no man x who gets the job, has ten coins, and is Smith.
Explicit (t_2)	$P(s) \wedge C(s) = 10$	Smith gets the job and has ten coins.
Contradiction	$\neg\exists x\ (P(x) \wedge C(x) = 10 \wedge x = s) \wedge (P(s) \wedge C(s) = 10)$	These statements cannot both be true without time. If one is true, the other must be false. The contradiction signals a flaw.

Traditional deductive reasoning operates under the assumption of static premises, failing to account for potential changes over time. This static approach proves inadequate in scenarios like Smith's, which exemplify Gettier-type problems, where the truth value of knowledge claims fluctuates due to temporal and situational factors. Since the validity of an argument is contingent upon the enduring accuracy of its premises, knowledge itself is subject to continuous revision.

This highlights the limitations of *modus ponens* when dealing with temporal dynamics. The Gettier case, analyzed within a knowledge monism framework reliant on JTB, demonstrates how Smith's belief—that Jones will get the job and has ten coins—becomes unstable due to new information revealing that Smith himself fulfills these conditions. This temporal shift exposes a crucial flaw: modus ponens[25] loses its reliability when premises are dynamic and subject to change. To uphold modus ponens in Gettier cases, temporal indexing and adjustment are necessary when evaluating knowledge claims. Otherwise, static knowledge monism fails to distinguish between stable knowledge and knowledge contingent on change.

These five aspects illustrate the limitations of the JTB model across its scope of application, ranging from the timeless and unchanging to the temporal and dynamic. As these aspects demonstrate, the expectation of a reliable JTB definition was unrealistic.

In this context the *identity problem of knowledge*, as I call it, arises. It represents the conflict of how knowledge can be considered stable in changing contexts, even though it must adapt to new conditions. While JTB functions in stable contexts, it shows weaknesses in dynamic scenarios where adaptability and historical development are required. A state of knowledge is regarded as the definitive basis for a judgment to produce certain knowledge; however, an unexpected change in circumstances prevents the anticipated outcome and creates a new basis for evaluation: e. g. the observer in the application scenario. In such cases, knowledge either becomes outdated or is modified, which questions its identity as "knowledge" and highlights the need for a more flexible definition of knowledge. These challenges are closely linked to the induction problem, which addresses how reliable general knowledge can be derived from specific observations. In contrast, the identity problem of knowledge examines how general knowledge can retain stability and validity when adaptation becomes necessary. Both problems grapple with the same fundamental tension—how knowledge can balance stability and adaptability, whether in its formation or its persistence. DK offers a potential solution to this problem by balancing these aspects, as will be demonstrated.

From here, further challenges to JTB as a rigid knowledge monism will be explored, including the need for revision, the coexistence of competing knowledge bases, the emergence

[25] Modus ponens is a standard form of logical inference, starting with a conditional statement, "If P, then Q". Upon establishing that P is true, it logically follows that Q must also be true. This deductive reasoning ensures that if the premises are correct, the conclusion necessarily holds.

of epistemic pluralism, and the implications for the scientific method and dualism. Two further counterexamples will be presented.

If this monistic interpretation of the JTB definition of knowledge is accurate, knowledge claims within this system should remain knowledge. Monistic knowledge must be infallible and exclude coexisting, contradictory knowledge claims to be considered certain and necessarily true. Gettier cases, scientific findings, and even everyday beliefs initially accepted as knowledge but later revised (e. g. through falsification, invalidation, or paradigm shifts) challenge the JTB definition as counterexample. For example, knowledge such as the "Fastest Way to Work" often shifts over time due to changing conditions (e. g. traffic, construction). In such cases, knowledge initially considered justified and true becomes invalid when new information arises, illustrating that knowledge is often provisional and context-dependent rather than timeless or universally certain. If falsification is absent after an assertion and is replaced by invalidation—such as in the application scenario—it might be due to tunnel vision or institutional blindness; the falsification is a hypothetical as Gettier comments. Rather than refuting false assumptions and the JTB definition, the former are merely invalidated retroactively, despite having been previously accepted as knowledge. However, the invalidation leads to confabulation, which focuses on the content of the assumption and implicitly expands definitional constraints, such as differing points in time, thereby reducing any perceived cognitive dissonance. For example, in the job application scenario, Smith's belief that Jones would get the job because he had 10 coins in his pocket was invalidated by the observer when Smith himself got the job, despite Smith's original justification being invalid. While this may be pragmatic, it contradicts the JTB definition if knowledge is to be considered reliable and certain. Therefore, either the definition becomes invalid in such dynamic cases where the underlying information changes, as I argue, or the paradox of uncertainty within knowledge and the certainty of knowledge is tolerated, as has been the case in knowledge monism so far.

The issue with monism becomes even more pronounced when diverse perspectives can legitimately coexist. This has been demonstrated by the example of Smith and the more informed observer in the job interview scenario. However, the culmination of such cases is exemplified by the Rashomon effect, which further provokes a knowledge dualism. This effect, as Anderson explains, is that different people recount the same incident differently, often with contradictory details. These differences arise from individual faculties: e. g. perceptions, experiences, and personal biases.[26] The effect shows that, in complex situations, there does not necessarily have to be an objective, unambiguous truth within the framework of identification. The scenario of the Rashomon effect originates from the film *Rashomon*[27] (1950) which is about an incident in ancient Japan in which a samurai is killed, and a woman is raped. Four witnesses—the bandit, the woman, the samurai's ghost, and a woodcutter—describe the event from their own perspectives. Each of these versions contradicts the others, as each witness interprets the events differently. The central problem is that despite multiple reports, the "true" version of the events remains unclear.[28] The Rashomon effect illustrates that knowledge in dynamic scenarios is not only dependent on premises and logical inferences but is also shaped by subjective faculties. In his autobiography, *Something Like an Autobiography* (1983), Akira

[26] Anderson, Robert. "The Rashomon Effect and Communication." *Canadian Journal of Communication* 41, no. 2 (May 2016): 250.
[27] Rashomon, directed by Akira Kurosawa (BFI, 2015), 1 hr., 25 min.
[28] Anderson, "The Rashomon Effect and Communication," 254.

Kurosawa articulates his central thematic concern in Rashomon as the human ego's obstruction of truth. He posits that egoism prevents individuals from achieving self-honesty, a failing he identifies as a fundamental character flaw.[29]

The Rashomon effect leads to a relapse into a plurality of knowledge bases up for discussion, which the monism seeks to overcome. Anderson summarizes the framework conditions of the Rashomon effect as arising when differing perspectives intersect with a lack of decisive evidence to confirm or refute any particular version of events, combined with the pressure to reach a conclusive resolution.[30] These three aspects are insofar significant within the context of DK. In contrast to JTB the Rashomon effect shows that asserted knowledge in dynamic and complex contexts is often multidimensional and cannot necessarily be reduced to a single, objective, and timeless truth, as there is, from a game-theoretic perspective, no finality or completeness of information.

The Rashomon effect serves as both a direct and indirect counterexample to the JTB definition because it demonstrates that multiple JTBs can coexist, not all of which need to be true. As a result, none of these beliefs can be confirmed as definitive knowledge, and it remains possible that objective bodies of knowledge may only be attributed later or not at all. Directly, because the Rashomon effect illustrates that multiple justified true beliefs can exist simultaneously, even though not all of them are true. Indirectly, because it highlights that the JTB definition may be insufficient to adequately capture complex epistemic situations involving conflicting perspectives. This does not demonstrate that knowledge is relative—where truth and knowledge depend entirely on individual perspectives, cultural backgrounds, or specific situations, negating absolute truths—but rather relational, meaning that knowledge is shaped by interactions and relationships between individuals and their contexts. For example, in a classroom discussion, students may interpret a text in various ways based on their unique experiences. By sharing and debating these interpretations, the group develops a deeper understanding of the material. In contrast, if knowledge were treated as relative, each student might hold onto their interpretation without synthesis, leading to a fragmented understanding.

Paradoxically, the Rashomon framework gives rise to an interpersonal knowledge multiplicity that is enabled with DK as organizational. Instead of relying solely on a rigid definition like JTB, asserted knowledge in DK can be seen as a product of discourse and information processing, where the most informed and capable agent plays a crucial role. This is evident in Gettier cases, where an observer with a broader perspective can identify flaws in the justification that the individual within the scenario might miss. Ultimately, the Rashomon effect underscores the importance of epistemic humility and the need for the ongoing process of knowledge refinement through dialogue and the integration of diverse viewpoints. At least in this regard DK is both a place of origin and a goal or destination: see Timothy Williamson's *Knowledge First* (2000) approach.

Drawing connections between the philosophical analysis of Gettier cases and the scientific method, it is possible to gain a more nuanced understanding of the challenges and limitations of knowledge acquisition. In the field of science, the incongruent nature of the current understanding of knowledge becomes also evident, as static and dynamic conditions are often unknowingly blended, much like an emulsion, as shown in the Gettier cases. This aspect

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[29] Akira Kurosawa, *Something Like an Autobiography*, trans. Audie Bock (New York: Vintage Books, 1983), 183.
[30] Anderson, "The Rashomon Effect and Communication," 258.

of thought experiments is critical, as Hume's Fork illustrates. The job application case in the Gettier scenario falls outside of Hume's Fork because it is neither a purely analytical truth nor an empirically verifiable fact.[31] The case combines logical assumptions and quasi-empirical observations that, by coincidence, lead to a true belief without the justification being based on sound premises. This mix of analytical structure and contingent chance fits neither "Relations of Ideas" nor "Matters of Fact" and therefore isn't fully captured by Hume's dichotomy. Since it relies, in part, on random, contingent factors, it lies outside what can be considered valid knowledge, as it is not conclusively grounded in either strict logic or established experience. For Hume, such statements are meaningless or unsolvable and are thus unverifiable.[32]

This Emulsion might occur because experiences are rationalized through digitalization, ultimately leading to manageable concepts that, like axiomatic mathematical truths, are deducible through logical reasoning while lacking an absolute relation to reality; In the words of Karl Popper: "Theories are nets cast to catch what we call 'the world': to rationalize, to explain, and to master it. We strive to make the mesh ever finer and finer."[33] In static scenarios, reasonable conclusions prove to be inevitably true. In dynamic, predicting the future with absolute certainty and reliability becomes a challenge, equivalent to Gettier cases.

Plato was aware of a dualism similar to the one discussed here, though he approached it differently. This is highlighted in his discussions of the relationship between reality and things as they are, the perceivable images, and the "refuge in thoughts"[34], which may not correspond to reality as debated in the *Phaedo*.[35] As a basis for this duality, as Staudacher points out, Plato draws on the conceptions of Parmenides and Heraclitus. Parmenides shall understand being as immutable and eternal, just as Plato characterizes the ideas. Heraclitus, on the other hand, held the view that the world is in constant flux, summarized in the phrase "Everything flows" ("panta rhei"). For him, the world is characterized by change and opposites, as seen in the perpetual process of becoming and passing away. Plato incorporates this idea in his distinction between the sensory world, from which no knowledge, just opinion, can be derived in his view, and the world of ideas[36].[37] To expect Plato to understand the concept of knowledge without his refined conception of ideas or the unstable and changing world lacks a comprehensible foundation. This is implied by the discussion and the resulting consequences concerning the modus ponens principle and his understanding of safety and security within his "refuge," as well as by his rejection of sensory perception as a source of knowledge-generating evidence, which is only made possible through the unchanging realm of the forms.[38] This evidences his reliance on immutable ideas as the true foundation of knowledge as JTB.

Plato's metaphor of Daedalus' statues, within the discussion on the differentiation between knowledge and correct opinion, which is framed by the debate on the teachability of virtue, deepens the theme in the dialogue *Meno* by focusing on the aspect of transience and the

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[31] See Hume, *Human Understanding*, 108-109.
[32] See Hume, *Human Understanding*, 208-211.
[33] Karl Popper, *The Logic of Scientific Discovery* (London and New York: Routledge, 1992), 37-38.
[34] Plato, *Phaedo*, trans. by Friedrich Schleiermacher, in *Works: Volume 3*, ed. by Gunther Eigler, 7th ed. (Darmstadt: Scientific Book Society, 2016), 145. "refuge in thoughts" refers to the platonic forms.
[35] See Plato, *Phaedo* 99e-101c.
[36] See Plato, *Politeia* 534a.
[37] Peter Staudacher, "Denken" (Thinking), in *Platon-Lexikon: Begriffswörterbuch zu Platon und der platonischen Tradition*, ed. Christian Schäfer (Darmstadt: Wissenschaftliche Buchgesellschaft, 2007), 80–81.
[38] See Plato, *Parmenides*, 135b-c

necessity of justification, which offers stability.[39] In Plato's view, statues hold great value only when secured, as otherwise, they are at risk of disappearing. The same applies to true opinion, as it depends on chance, which is conditioned by the external world. In contrast, recollection through rational understanding of causality is like tying down the statue. This is, firstly, certain knowledge, and secondly, it makes the knowledge stable, which explains the higher value of knowledge compared to correct opinion. In the continuing conversation with Meno about the teachability of virtue, Plato ironically refers to politicians as "divine" men, as they resemble soothsayers and seers who, in divine inspiration, randomly proclaim truths without having genuine insight into the things and their justification that they announce. Virtue is neither innate nor teachable, which makes it a divine gift. Thus, for Plato, the virtuous man stands like a real object in contrast to mere shadows; tangible and explainable, or justifiable, to other people, while the shadows—the supposedly divine politicians—are fleeting due to their lack of genuine justification.[40]

Similarly to Plato, Hume distinguishes between "relations of ideas" that are certain and "matters of fact" that are probably true or false.[41] In this context, Hume argues that the demonstrative sciences (e. g. mathematics or chemical equations), which enable certain and infallible beliefs, can produce errors in their application to reality (e. g. industrial chemistry).[42] It's problematic that mathematics and chemistry are sometimes mistakenly seen as identical in their predictive capacity, while asserting the status of knowledge upon these sciences; see low epistemic standards. Yet, like the two houses in the biblical parable that are built on distinct foundations, these disciplines have fundamentally different bases for their construction.[43] One discipline is founded upon logical reasoning and deductive principles, leading to certain and infallible conclusions. The other discipline, rooted in the empirical world, provides only probabilistic knowledge, subject to the inherent uncertainties of observation and experimentation. Both, Plato and Hume, effectively dismiss the possibility of certain knowledge in dynamic scenarios like reality without sufficiently addressing the material and the cognition from which one can derive conclusions for a dynamic definition of knowledge, as broadly used in low standard epistemic contexts.

In Kantian terms, the judgments in the Gettier case are primarily synthetic a posteriori, because they involve quasi-empirical data and depend on the outcomes of specific situations. There are no analytic a priori judgments in the analysis, as these would involve truths known solely through the meanings of the terms themselves. Additionally, there are no synthetic a priori judgments, which would entail necessary truths known independently of experience but pertaining to the world, such as mathematical truths. Instead, the judgments made hinge on specific scenarios and quasi-empirical data, like the number of coins someone possesses or who ultimately secures the job, which are time-dependent. In comparison, static and dynamic knowledge concern the structure and mutability of knowledge, while a priori and a posteriori knowledge refer to the method of acquisition—knowledge through reason or experience, respectively. Static knowledge does not necessarily have to be a priori; it can also be a posteriori

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[39] Plato's use of Daedalus might contrast implicitly with Icarus, as Daedalus represents skill and control, while Icarus embodies failure through hubris. This contrast highlights the importance of stability in knowledge, as opposed to the instability caused by ungrounded or reckless actions.
[40] See Plato, *Meno*, 95b-100c
[41] Hume, *Human Understanding*, 108–9.
[42] David Hume, *A Treatise of Human Nature*, ed. L. A. Selby-Bigge (Oxford: Clarendon Press, 1965), 180-181.
[43] Cf. Matthew 7:24-29 (NABRE)

if it consists of experiential knowledge that remains unchanged. There is an overlap in that a priori knowledge is often considered static because it is independent of experience and consistent. A posteriori knowledge, on the other hand, is frequently more dynamic, as it is based on ongoing observation and can adapt to new experiences. Dynamic knowledge, therefore, often relies on a posteriori process because it responds flexibly to new information.

Popper's *The Logic of Scientific Discovery* (1934) mentions four critical points when applying the deductive testing of a theory.[44] Gettier cases highlight in this regard (1) logical inconsistencies by presenting scenarios where beliefs are justified and true yet fail to constitute knowledge due to unforeseen factual coincidences, or conceptual coincidences.[45] For example, Smith's justified belief that Jones will get the job, based on the evidence of coins, turns out to be true for Smith himself, albeit unexpectedly. This outcome, which arises from coincidences rather than a reliable deductive process, undermines the expectations of deductive soundness. Additionally, these cases involve a violation of Leibniz's Law. The resulting paradox challenges the premise of unique identity based on coincidental attributes, exposing a critical logical flaw in the foundations of the JTB model as exemplified in Gettier scenarios. Gettier cases are (2) quasi-empirical because they do not rely on tautological sentences but instead hinge on unpredictable, timely, and variable circumstances.[46] For example, Smith's belief that Jones has 10 coins and will get the job—which turns out to be true for entirely coincidental reasons—demonstrates how these cases depend on dynamic conditions rather than static logical constructs. (3) Although the cases appear subjectively corroborated, this was due to luck. Smith's belief was ultimately true, but not for the reasons he assumed. This is as demonstrated a hallmark of Gettier problems: drawing correct conclusions from flawed premises.[47] Just like the classic example of the induction problem with black swans, where a generalized or absolute statement cannot be inferred from a single observation, it is likewise impossible in Gettier cases to conclude that "x will get the job" in all possible scenarios because the subject lacks complete information.[48] Therefore, the statements in Gettier cases cannot be verified, only corroborated, which suggests that certain knowledge in the strict sense is not possible.[49] The presumed knowledge in this context can therefore be categorized as *pseudo-knowledge*. This status marks a shift from perceived credences to dogmatic[50] beliefs and counters while doing so the credence-belief-dualism with a subjective layer level within DK. In this setting, pseudo-knowledge is dogmatic with the expectation of determinism while being affected by the problems of induction, which necessitates tracking and evaluation over time to be the most realistic. It gives a false sense of security and safety. The (4) principle of falsification is thus the adequate tool for the subject and not verification which can give a false sense of certainty in dynamic

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[44] Popper, *The Logic of Scientific Discovery*, 9-10, 54-55.
[45] See Popper, *The Logic of Scientific Discovery*, 9-10, 50-51.
[46] See Popper, *The Logic of Scientific Discovery*, 9-10, 3, 54-55.
[47] See Popper, *The Logic of Scientific Discovery*, 9.
[48] See Popper, *The Logic of Scientific Discovery*, 83-84.
[49] See Popper, *The Logic of Scientific Discovery*, 42.
[50] Richard Feldman and Earl Conee, "Evidentialism," in *Epistemology: An Anthology*, 2nd ed., edited by Ernest Sosa, Jaegwon Kim, Jeremy Fantl, and Matthew McGrath (Malden, MA: Blackwell, 2010), 315.

"WF S's doxastic attitude D at t toward proposition p is well-founded if and only if (i) having D toward p is justified for S at t; and (ii) S has D toward p on the basis of some body of evidence e, such that (a) S has e as evidence at t; (b) having D toward p fits e; and (c) there is no more inclusive body of evidence e had by S at t such that having D toward p does not fit e."

scenarios.[51] The Gettier cases, as counterexamples, further highlight the critical role of Karl Popper's principle of falsification. However, ironically, falsification itself also serves as a form of corroboration. Gettier cases falsify the JTB model in dynamic scenarios through accidental knowledge, which occurs via the corroboration of expected circumstances that confirm hypotheses, such as those of Smith, even though they could have turned out differently. In this way, Popper's approach to science finds its equivalent in the realm of defining knowledge.

It was later found that Graham Dawson also integrates Popper's critique of traditional epistemology in his *paper Justified True Belief Is Knowledge* (1981) by emphasizing the rejection of ultimate justificatory sources, which Popper deemed indefensible. Instead, Dawson aligns with Popper's view that knowledge should be approached as a social activity governed by public criticism and rule-based adjudication. This perspective shifts the focus from individual mental states to the communal testing of propositions, marking a departure from authoritarian, subjectivist criteria such as sense experience or self-evidence. Dawson highlights that knowledge claims depend on public, objective criteria rather than epistemological ancestry, reinforcing the necessity of critical appraisal in the justification process.[52]

Knowledge is from here on understood as static when the model used is non-transitive and does not have a temporal dimension. Justification and truth in this environment are absolute. Examples of this can be found in Euclidean geometry, where many principles and theorems are defined as absolute truths. These principles apply regardless of the real world as Kant explains in the *Critique of Pure Reason* (1781), referencing Thales and the example of the isosceles triangle.[53] For instance, in Euclidean geometry, the theorem that the sum of the interior angles of a triangle always equals 180 degrees represents a non-transitive model, as it does not allow for change over time and remains constant in every context.[54] This type of knowledge is grounded in unchanging truths that remain consistent in their application or interpretation across different points in time. These truths consist of fully identifiable, timeless, and universal forms that can be recognized by all reasonable individuals. However, it is important to note that not all geometric principles remain constant across different models of geometry with additional assumptions. For example, in hyperbolic geometry, the sum of the interior angles of a triangle is less than 180 degrees, while in spherical/elliptical or Riemannian geometry, the sum exceeds 180 degrees.[55] These variations point out that the theorem about the sum of the interior angles of a triangle being 180 degrees is specific to Euclidean geometry.[56] In these non-Euclidean geometries, principles adapt to different curvature contexts, demonstrating that knowledge can be dynamic and model-dependent, varying with the foundational assumptions of the geometric framework.

Alternatively, knowledge is dynamic when concepts are transitive or changeable and extend over time. Justification in this regard is perspectival, and truth depends on the underlying

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[51] See Popper, *The Logic of Scientific Discovery*, 10.

[52] Graham Dawson, „Justified True Belief Is Knowledge," *The Philosophical Quarterly* 31, Nr. 125 (Oktober 1981): 317-318, https://www.jstor.org/stable/2219402.

[53] See Immanuel Kant, *Critique of Pure Reason*, ed. and trans. Paul Guyer and Allen W. Wood (Cambridge: Cambridge University Press, 1998), B XI – B XII.

[54] Guido Walz, ed., „Dreieck," in *Lexikon der Mathematik: Band 1: A bis Eif*, 2nd ed. (Berlin, Heidelberg: Springer Spektrum, 2016), 450.

[55] Andreas Filler, „Hyperbolische Geometrie," in *Lexikon der Mathematik: Band 2*, 2nd ed., ed. Guido Walz (Berlin: Springer Spektrum, 2016), 40-41.

[56] Andreas Filler, „Euklidische Geometrie," in *Lexikon der Mathematik: Band 2*, 2nd ed., ed. Guido Walz (Berlin: Springer Spektrum, 2016), 85-86.

information. This could mean that a person's everyday navigational knowledge changes, such as finding the quickest way to work, due to the emergence of construction sites or different objectives being pursued. In the job application scenario, this corresponds to the employer's altered choice, and the additional information that there are ten coins in each trouser pocket. This illustrates a kind of *epistemic permeability*, where new information penetrates the system, reshaping initial beliefs or their evaluation and revealing the dynamic interplay between subjective assumptions and objective reality, which can, in turn, lead to the emergence of coincidental or accidental knowledge.

Gettier cases, defined by their occurrence across multiple time points, necessitate an analysis that addresses variability and temporality. In this sense, they are a characteristic of the factor of incomplete information within dynamic knowledge. The concept and methodology of DK, which will now be presented, offer a way to explain conceptual coincidences through a nuanced differentiation of knowledge, while providing a definition capable of addressing crisis situations where the future cannot be determined with certainty or necessity.

3. Dynamic Knowledge

Common ground for knowledge in SK is established through immutable and universally true ideas that are in principle accessible to everyone and build upon each other.[57] These ideas embody the qualities of reliabilism as promoted by Descartes[58] and fit within the foundational theory[59]. This is not absolutely the case in the domain of DK[60], where subjects confront an evolving reality that varies with each individual's cognition, requiring discourse as an organizational method, as further discussed within coherence theory[61].[62] Beliefs in DK are only potentially sufficiently justified and true, as demonstrated by Gettier cases. This distinction between the foundational and coherence theory is especially relevant within the conception of DK because it has implications for the interdependence of SK and DK.

An example of integrating DK into SK can be seen in a mathematical formula with variables: the structure of the formula remains constant (SK), while the variables can be flexibly adjusted to different values (DK). Conversely, the integration of SK into DK can be illustrated through a production process. In this scenario, a specific and precisely measured consistent material[63] (SK) is used to create various products. While the material itself remains constant and unchanging in its qualities and quantities, the production process is dynamic, leading to the creation of different products over time, which alters the relations and modes of the parts. This process necessitates the introduction of new categories and classifications, as the material is

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[57] As Plato demonstrates, even for the most menial servants, the capacity for recollection highlights the universality of static knowledge (see Plato, *Menon,* 81-84). It is to note that this does not extend to every facet of DK.

[58] See René Descartes, *Regulae ad Directionem Ingenii*, texte de l'édition Adam et Tannery, notice par Henri Gouhier, 4th ed. (Paris: Librairie Philosophique J. Vrin, 1965), 36-45.

[59] Thomas Grundmann, *Analytische Einführung in die Erkenntnistheorie*, (Berlin; Boston: De Gruyter, 2017), 208-209.

[60] The phonetic accentuation of "DK" as "decay" elucidates the ephemeral nature of dynamic scenarios.

[61] Thomas Grundmann, "Gibt es ein subjektives Fundament unseres Wissens?", *Zeitschrift Für Philosophische Forschung* 50, no. 3 (1996): 210-211.

[62] An example is Wilfrid Sellars' tie scenario, where the same tie appears either green or blue (secondary qualities) depending on the light source used in the room. This can be further subjective by including color blindness.

Cf. Wilfrid Sellars, *Empiricism and the Philosophy of Mind*, 3rd print (Cambridge, MA: Harvard University Press, 2000), 37-43.

[63] It's questionable whether a consistent material exists over time, but it's pragmatically assumed by having limits for the material within the different processing phases.

divided and transformed. The dynamic production process (DK) allows for continuous changes and adaptations, which influence how the static elements (SK) are understood and applied.

This perceivable subjective reality is aligned and reduced through representations in the form of identities in thought, as an appearing reality that can seem static at certain small or large moments, which allows it to be handled and thought about with a degree of certainty: e. g. patterns. This process is a form of (polynary) digitalization in which fluid experiences are converted into specific, discrete representations. Identity, in the following, is generally understood as that which distinguishes itself from something else. Identity formation is a defining process in that it involves distinguishing from other things that are not of a specific kind to gain *apparent knowledge* which relies on perception. Perception is crucial in this respect because it enables the identification of differences: For example, fundamentals such as black and white, or cold and warm, or more complex concepts as illustrated by the unaware possession of ten coins in Smith's pocket. Identity formation is also an aspect of concept formation and development, as the contents can change over time, as seen in cases of conceptual coincidence—as far as perceivable: Evolution of concepts from perception to conception. When an identity has an indistinguishable alternative, it is referred to as a class, as opposed to its status as the original, which in this sense is lost as a point of reference. However, reality is elusive because it constantly and sometimes imperceptibly changes, which cannot always be traced through representations or identities. The changing nature of reality inevitably leads to belief systems based on incomplete information. This highlights the importance of apparent knowledge that relies on the given essences defining and delineating the thing in question.

Aristotle viewed knowledge as temporally conditioned. He linked the process of cognition with induction and deduction in such a way that he used induction with its new differentiations or identities as a basis for more realistic deductions, to enable a detailed conception and a better understanding.[64] This emphasizes the interplay between identity development and the evolution of *conceptual knowledge* which will be discussed later. Over time, changes in identity can lead to shifts in understanding.

If something is asserted with absoluteness, there may be a high probability that it will occur because the premises are stable and act consistently over time. Nevertheless, these premises could change, as easily demonstrated in Russell's clock example. Absolute knowledge encompassing all information and reality is unattainable in dynamic environments because, as Aristotle suggests, future events are contingent, and their truth is determined only by their actual occurrence.[65] Thus, knowledge as JTB, which inherently implies truth, cannot be applied to future events, while DK represents an ongoing process aimed at achieving the ideal of knowledge. This ideal must be viewed both as a moment of change and in its historicity to provide justification for the development necessary for knowledge over time.

Virtue epistemology, as discussed by Linda Trinkaus Zagzebski and Ernest Sosa, fittingly highlights the connected and necessary virtues that require knowledge to adapt as contexts evolve. In her critique of reliabilism presented in *From Reliabilism to Virtue Epistemology* (2000)[66]*,* Zagzebski examines the limitations of reliability as the sole metric for assessing epistemic value. She argues that the mere reliability of a belief-forming process is

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[64] See Aristotle, *Anal. post. I,* 8 75b24.
[65] See Aristotle, *Categories and De Interpretatione*, 19a 23-39.
[66] Originally published in 2000: Linda Zagzebski, "From Reliabilism to Virtue Epistemology," *The Proceedings of the Twentieth World Congress of Philosophy* 5 (2000): 173-179.

insufficient for determining the true epistemic value of a belief. She proposes that the virtues and character of the epistemic agent are crucial in enriching the true value and depth of knowledge. Zagzebski emphasizes the importance of epistemic virtues such as adaptability, which are essential for validating and assessing knowledge in continuously changing environments. She advocates for an expanded understanding that incorporates qualitative aspects of belief formation, emphasizing that knowledge should not only be true but must also be resilient to changing conditions.[67] In Ernest Sosa's *A Virtue Epistemology: Apt Belief and Reflective Knowledge, Volume 1* (2007), adaptability is highlighted as an essential epistemic virtue. Sosa argues that true knowledge requires the ability to adapt beliefs to changing circumstances: „A belief must not only be true and competently formed but must also be adaptable to changing circumstances to maintain its status as knowledge".[68] This adaptability is crucial for maintaining the appropriateness and relevance of knowledge.

The formalization of DK aims to facilitate more precise analysis, management, and integration. This formalization can accommodate the nature of concept change across multiple timeframes, introducing the aspect of sets into the domain of knowledge definition. Sets of knowledge exceed the capabilities of JTB because they encompass change and time. Changing a concept to an alternative alters the foundation of the original, which, as in Gettier cases, affects subsequent statements and can result in possible conceptual coincidences.

A way to represent the evolution of a concept along with its status is through a time-change diagram, which allows the organization and visualization of sets of knowledge: e. g. the blood sugar levels of a patient with diabetes. In a minimalistic version of such a diagram, the horizontal axis (DK_h) could represent time, showing the progression of events or the accumulation of knowledge. The vertical axis (DK_a) could illustrate the concept or belief in question, indicating the relevant changing parameter, like blood sugar levels. Key points or nodes in the diagram would represent significant moments in the conceptual evolution, such as excessively high or low blood sugar levels: see virtue epistemology. Lines or arrows between nodes could show the transition from one state of belief to another, marking how changes over time affect the belief's justification and validity. Depending on the complexity of the changes, the representation may become multidimensional. It is crucial that both aspect—change and time—are considered, depending on the focus, as they shape the entity that can be perceived and with which a relationship can be established. In this context, these viewpoints are referred to as nodes, representing significant moments in the conceptual evolution, which also matter as a whole because they capture the entirety of the concept in question and offers insights on its own, similar to the long-term blood sugar values of a diabetic, known as HbA1c[69].

DK integrates subjective and objective dimensions, such as induction and deduction, to further develop concepts. It is structured into two complementary pairs, each necessary and jointly sufficient to define dynamic knowledge: DK_a/DK_h and DK_{org_a}/DK_{org_h}. Adaptability

[67] Linda Trinkaus Zagzebski, "From Reliabilism to Virtue Epistemology," in *Epistemic Values: Collected Papers in Epistemology* (New York: Oxford University Press, 2020), 141-151.
[68] Ernest Sosa, *A Virtue Epistemology: Apt Belief and Reflective Knowledge, Volume 1* (Oxford: Clarendon Press, 2007), 32.
[69] Similarly to how HbA1c integrates average blood sugar levels over several weeks, making trends visible, a time-change diagram provides the ability to view individual data points (nodes) in the context of their entirety. This enables a deeper understanding of the dynamics (short-term changes) and stability (long-term development) of a concept, as well as the interactions between individual moments and their significance within the overall framework.

describes the change in a state at a given point in time, representing the micro-level focus on situational adjustments and immediate responses to context. Historicity considers the various time points of an identity or concept in relation to each other, embodying the macro-level perspective that emphasizes the long-term coherence and narrative development of knowledge. These pairs operate ensure that knowledge remains contextually responsive while retaining consistency and justification over time, highlighting their mutual interdependence.

While the causal theory of knowing requires a causal connection between belief and fact[70], and the tracking theory requires that beliefs track the truth[71], DK combines these ideas into a dynamic process. DK_a reflects the need for knowledge to adapt to new information and changing contexts, similar to how the causal theory insists on a causal link between belief and fact.[72] DK_h ensures that beliefs remain consistent and sensitive to truth across different times, aligning with Nozick's tracking theory's conditions for sensitivity[73]: variation and adherence.[74] This dual approach allows DK to address the limitations of static theories by incorporating temporal and contextual dimensions, ensuring that knowledge is not only justified and true but also relevant and adaptable in a changing world.

While DK_a/DK_h enables the development of identities or concepts, such as objects or abstract entities, DK_{org} represents organizational forms like individuals and groups. The difference between these is that DK_{org_a}/DK_{org_h} can consider (self-)reflexive processes, such as state changes occurring over time, and incorporate them into its organizational structure.

The terms "concept" and "identity" are interdependent, much like knowledge and identity. There are no concepts without identities, and there are no identities without concepts, just as this applies to the relationship between knowledge and identity. The ability to differentiate between identity and concept depends on the perception of differences in the thing in question and the epistemological virtue needed to establish a suitable starting point for conceptual applications: see infinite regress. A concept, which is an abstract idea or a general notion, necessitates identities to provide specificity and substance. Conversely, identities, which define the essence of entities, rely on concepts for understanding and communication. This interdependency is also evident in the relationship between knowledge and identity. Knowledge, encompassing information and understanding obtained through experience or education, shapes identity by influencing perception of self and the world. Similarly, identity, encompassing individual characteristics and (self-)awareness, affects the acquisition and interpretation of knowledge. Thus, both pairs are essential to each other, underscoring their integral role in the comprehension of reality. The difference between a concept and knowledge lies in the fact that a assertion is based on a concept. The concept provides the causality through which a justification is developed, enabling knowledge.

DK continuously adapts by transforming from a timeless and unchangeable static equation (SK = JTB) into a function. It presupposes a concept at a specific time and allows for tracking the historicity. DK thus differs from defeasibility theory by not only considering potential defeaters but actively seeking new information to continuously update credences.[75]

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[70] See Alvin Goldman, "A Causal Theory of Knowing," *The Journal of Philosophy* 64, no. 12 (1967): 372.
[71] See Robert Nozick, *Philosophical Explanations* (Cambridge, MA: Harvard University Press, 1981), 172-178.
[72] See Stephen Hetherington, ed., *The Gettier Problem* (Cambridge: Cambridge University Press, 2019), 87.
[73] Nozick, "*Philosophical Explanations," 175-178.*
[74] Nozick, "*Philosophical Explanations," 212.*
[75] See Keith Lehrer and Thomas Paxson, "Knowledge: Undefeated Justified True Belief," *The Journal of Philosophy* 66, no. 8 (1969): 225-237.

This proactive approach aligns with Bayesian epistemology in its emphasis on continual refinement by using Bayes' theorem to update credences based on new evidence. [76]

The complementary formulas for dynamic knowledge, DK_a and DK_h, serve this process of knowledge change and adaptation over time in specific contexts (see Table 5).

Table 5. DK_a & DK_h

Formula	Description	Key Idea
$DK_a(K,t,) = \lim_{\varepsilon \to 0} f\ (JTC(K,t), A(K,t,C))$	Adaptation of concept K and to context C at time t	How a concept changes to fit a situation at a specific time.
$DK_h(K,t,) = \lim_{\varepsilon \to 0} f\ (JTC(K,t), A(K,t,))$	Preservation of knowledge through adaptation	How a concept's meaning remains consistent despite changes.

The complementary formulas DK_a and DK_h model dynamic knowledge from distinct perspectives. DK_a focuses on how a concept *K* adapts and optimizes itself to a context *C*. It integrates JTC, adaptability (*A*), and the limit ε in a function f — JTC will be discussed in more detail later. DK_h focuses on preserving the identity of K throughout adaptation, omitting C to illustrate identity development. While both formulas share common elements like JTC, A, and ε, their differences are significant. DK_a prioritizes adaptation to context, whereas DK_h emphasizes the temporal evolution of the concept itself. Both, however, depict DK as an ongoing pursuit of an ideal state of knowledge, akin to Zeno's paradox of Achilles and the Tortoise, where continuous improvement never quite reaches an absolute endpoint.[77] Both formulas are indispensable as they ensure the relevance and justification of adaptations while maintaining the coherent evolution of knowledge/identity over time.

The complementary formulas of organizational dynamic knowledge, DK_{org_a} and DK_{org_h}, relate to the processes of knowledge change and adaptation over time within organizational structures, going beyond the mere capture of state changes in the basic formulas. DK_{org} fundamentally enables the tracking of structures such as needs or self-reflective processes by conceptually capturing situations (see Table 6).

Table 6. DK_{org_a} & DK_{org_h}

Formula	Description	Key Idea
$DK_{org\_a}(K_{org}, t,)$ $= \lim_{\varepsilon \to 0} f\ (JTC(K_{org}, t), A(K_{org}, t, C))$	Evolution of identities and knowledge within organizations	The dynamic interplay of knowledge and identities within groups and structures.
$DK_{org\_h}(K_{org}, t,)$ $= \lim_{\varepsilon \to 0} f\ (JTC(K_{org}, t), A(K_{org}, t,))$	Historical knowledge and self-reflexivity of organizational forms	The unfolding narrative of a group's collective knowledge and self-understanding.

DK_{org_a} examines how identities and knowledge evolve within organizations over time. This organizational form addresses the ability of knowledge to represent changes and

[76] According to Titelbaum, every approach in Bayesian epistemology has two starting points: "1. Agents have doxastic attitudes that can usefully be represented by assigning real numbers to claims. 2. Rational requirements on those doxastic attitudes can be represented by mathematical constraints on the real-number assignments closely related to the probability calculus."

Michael George Titelbaum, "Beliefs and Degrees of Belief," in *Fundamentals of Bayesian Epistemology 1: Introducing Credences*, online edition (Oxford: Oxford University Press, 2022), 12.

[77] See Aristotle, Physics, 239b14-30.

The limit value in DK formulas, like Achilles' pursuit of the tortoise, symbolizes the perpetual yet unattainable nature of perfect knowledge in a constantly changing reality.

adaptations in identities, marking the mutual relationship between dynamic knowledge and identities. It illustrates how identities and knowledge manifest through different organizational structures while simultaneously influencing them.

DK_{org_h} embraces the concept of temporal boundedness and examines how identities and knowledge evolve within organizational forms over time. It captures the historical knowledge of identities and organizational forms and serves as a meta-level that underscores awareness of identity and the development of knowledge within organizational forms. This self-reflexivity enables organizational forms to reconsider and adapt their structures and concepts.

Furthermore, the interactions between actors within the organizational form also play a crucial role. Through exchange and collaboration, they contribute to the development and adaptation of knowledge and identities. DK potentially has social aspects in this regard. It is not just about the mere collection and processing of information but also about how this information is shared and utilized within an organizational form. It is influenced by and influences factors such as the culture, norms, and values of the organizational form.

To illustrate this further, consider e. g. Odysseus and his odyssey. He can be seen as a material identity (body; DK_a & DK_h) and as a personal identity (mind: DK_{org_a} & DK_{org_h}).

Table 7. DK in the case of Odysseus

Type	Description	Example: Odysseus
DK_a	Documents the physical attributes and state of an entity at various points in time.	t_1: Fit warrior, t_2: Exhausted castaway with a scar, t_3: Older but still strong king with battle scars.
DK_h	Provides a historical record of the physical changes documented in DK_a, often with causal explanations.	Causality/Narrativ of Odysseus material identity connects changes as justification: Odysseus' physical changes resulted from battles, shipwrecks, aging, and the trials of his journey.
DK_{org_a}	Snapshot of an entity's organized identities (roles, relationships, self-concept) at a specific time.	t_1: Leader of Ithacan forces at Troy, t_2: Castaway in the Land of the Cyclops, t_3: King of Ithaca reunited with family.
DK_{org_h}	Historical narrative of how organized identities evolve over time, influenced by physical changes (DK_a) and priorities (DK_{org_a}).	Odysseus' journey transformed him from a warrior focused on glory to a leader yearning for home, ultimately and mainly a wise and seasoned ruler.

The DK model provides a tool to understand of Odysseus as a dynamic entity. It views him not only as a material identity (body) but also as a personal identity (mind) that changes over time, particularly during moments of crisis or significant change. Odysseus' physical states, such as injuries and recovery, are captured through DK_a and DK_h. His personal identity, expressed through his roles as father, husband, and warrior, is represented by DK_{org_h} and DK_{org_a}. DK_{org_a} summarizes the organized identities and how they are structured in an organizational design at a specific time, which can be crucial during moments of crisis when roles and priorities may shift. The associated processes may focus on the self (e. g., needs) or roles (e. g., leisure, work, and family). Organizational forms can be reflexive, meaning they not only organize identities and contexts but also the self with its states and changes over time. This self-reflexivity and the self-knowledge gained from it is particularly relevant in crisis situations, as it enables Odysseus to adapt and re-evaluate his priorities. The organizational design itself can dictate how tasks are solved and how resources are allocated, which can be critical during times of crisis. For instance, in a hierarchical structure, the role of a father might take precedence over that of a warrior or king, while in a flatter hierarchy, the focus might shift

towards collaborative problem-solving. The temporal sequence of these changes, both physical and personal, is captured through the historicity of the model. This allows for a narrative connection of the individual time points and thus a deeper understanding of Odysseus' identity as it evolves over time, especially during moments of crisis that can trigger significant shifts in his priorities and behaviors.

For such a dynamic understanding of knowledge, in addition to the classical notion of JTB, the adaptability and historicity of identities are also necessary. Only in this way can it be understood how Odysseus' roles and behaviors adapt in different situations, especially during crises, and how his identity develops over time. The DK model thus offers a defining (necessary and sufficient) or holistic view of Odysseus, considering both his physical states and his changing personal identity, particularly in times of crisis. It shows how Odysseus' behavior and organizational design adapt in different contexts and how his identity evolves over time, shaped by both personal experiences and external circumstances. By integrating the classical notion of JTB with the concepts of adaptability, historicity, and organizational design, the DK model allows for a profound understanding of Odysseus as a dynamic and evolving entity. This approach not only reveals how Odysseus navigates crisis and change but also elucidates the causality of his transformations across time, contributing to a comprehensive understanding of his life's narrative. This complementary approach is therefore crucial for understanding entities that undergo significant changes over time, such as a ship that has had its parts replaced.

To elucidate this complementary approach, consider the observation of an individual from two distinct vantage points: a satellite and a magnifying glass. When viewed through a magnifying glass, all the detailed changes over time can be perceived, such as how they were once young, then aged, and developed wrinkles, which corresponds to adaptability. Conversely, when viewed from the distance of a satellite in outer space, all their broader movements from one location to another (A to B to C) can be perceived, representing their overall journey. This perspective reveals their general progression without the fine details, focusing instead on their superficial development.

Both aspects, that of change and that of historicity, are, for example, aspects of the person, which are each necessary and together sufficient to define them. Only this closure of time and change makes it possible to understand Odysseus in his identity over time. Omitting a part of his journey, such as the conflict with the Cyclops, from the narrative would result in a different Odysseus, compromising the justification. I am alluding to W. V. Quine, who discussed the cognitive dimensions of knowledge in *Epistemology Naturalized* (1969).[78]

3.1. Management

In contrast to Plato's static approach, mutability and temporality must be captured and managed to define identities and knowledge over time. Thus, knowledge and identity management are a central component of DK. The focus of these discussions is on knowledge management to provide a coherent picture of the Gettier cases.

Since the foundation in DK can change, the claim to truth can also change. Statements are therefore only valid at a specific point in time with specific conditions and may become invalid at another time. Given these dynamic circumstances, no knowledge can exist that

[78] See Willard Van Orman Quine, "Epistemology Naturalized," in *Ontological Relativity and Other Essays* (New York; Chichester, West Sussex: Columbia University Press, 1969), 82-84.

remains unchanged over time or changes, as the premises are variable and temporal. Justifications, accordingly, only lead to plausible but not necessarily true conclusions.

However, the status of assertions as credences is unsatisfactory when considering that in everyday life, knowledge is often spoken of, even though this occurs under dynamic conditions. Similar to Zeno's Arrow Paradox, where a flying arrow seems to be motionless at each instant, the problem can be circumvented by analogously pausing time and changes in identities for concepts, thus ensuring knowledge of these concepts at specific points in time.[79]

3.1.1. Perception

Even in the case of Gettier scenarios, it can be observed from an objective perspective that there is a form of pseudo-knowledge in dynamic concepts that expects determinism, even though the premises are variable and temporal. However, this pseudo classification can be bypassed by asserting only knowledge of a concept—in other words, knowledge that derives its claim solely from the concept and does not make an absolute claim to reality—as practiced in the self-reflective aspects of science and especially its history. This means that only a specific point in time is considered, beyond which no statements are made. As a result, the dynamic concept becomes static or non-transitive, as there is no longer any change or temporality that needs to be tracked at this specific moment. This allows for true justified beliefs to be expressed or deductive conclusions to be drawn that apply to the concept associated with the corresponding point in time. This conceptual knowledge is, not the same as static knowledge, but due to the same limitations on change and time, the possibilities are equivalent. It provides a point of orientation to act upon. These excerpts can be shared and discussed, as they, being a non-transitive digital representation, reduce complexity to concrete aspects that can be detached from mere observation. In a metaphorical sense, it's like a snapshot: a framed moment that freezes dynamic change, providing stability for analysis and conclusions.

Differentiation points encompass aspects like future perspectives, including varying standards (high or low), levels of stake, as well as the needs and roles of stakeholders. While SK has an additive character when it comes to concept expansion, conceptual knowledge exhibits a subtractive character when it involves the digitization of perception: see later discussions on bottom-up and top-down processes. This is similar to the *pragmatic maxim* and the *model concept* according to Stachowiak, who assumes that all knowledge arises from models of one's own reality and not from reality itself.[80]

In the Gettier case of the job application scenario, a similar approach is taken, resulting in a different perception of knowledge or a different level of awareness between the subject and the objective observer. This emphasizes the need for updating and the procedural nature of DK.

If the concept is to enable knowledge about reality, it must be continuously checked and updated based on relevant information and changes that are perceived. Relevant information is that which is crucial for the identity formation. Knowing the result may be necessary, but it becomes sufficient only when the associated causality is known. To acquire knowledge, it is not enough to know the result; one must also understand the process or formula

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[79] See Aristotle, *Physics,* 239b5-9.

[80] See Herbert Stachowiak, „Erkenntnisstufen zum Systematischen Neopragmatismus und zur Allgemeinen Modelltheorie," in *Modelle. Konstruktion der Wirklichkeit*, ed. Herbert Stachowiak, Kritische Information, vol. 101 (Munich: Fink, 1983), 118.

that leads to this result, which is to be understood as justification. Mathematics teachers would probably agree with this, as they often emphasize this to their students.

The concepts, along with their identities, are justified by the subject to the extent that it no longer experiences any doubt. It is convinced by the concept, even though it may not necessarily hold up in the interaction with reality. This apparent knowledge remains stable in consequence because reality, as perceived by the subject, can conceal its changes.

Epistemological contextualism, which states that the truth values of statements about knowledge can change depending on the context of utterance[81], deepens this topic with epistemic standards and stakes. This underscores the central role of context in DK in the context of knowledge perception. It becomes evident that the reliability and acceptance of a knowledge claim heavily depend on the individual's subjective doubts and their ability to distinguish within a given context.

The context-dependence of assertions, alongside their associated epistemic standards and stakes, adds a layer of complexity to the processes of knowledge generation and evaluation. It becomes clear that the interpretations and assessments of knowledge are not universally governed but are instead shaped by the specific conditions and circumstances of the context. This context-dependence contrasts with static scenarios, where axiomatic truths are fixed, and interpretations are more constrained. In dynamic contexts, however, the standards and stakes can vary, leading to different evaluations of what counts as knowledge based on the situation at hand. This observation reinforces the dual nature of knowledge, showing that structural differences based on variability and temporality are unique to epistemic standards and stakes found only in dynamic scenarios. Static scenarios present situations in which the outcome is independent of the real world. Therefore, the stakes and standards come into play with their application to real-world scenarios, but not on their own. In mathematics for example, the rule of rounding numbers is always the same: for example, 3.456 is rounded to 3.46.[82] This rule is fixed and independent of real-world conditions. However, in real-world scenarios, such as when a banker calculates interest, rounding can significantly impact the final amount paid to a customer. In such cases, the stakes are high, and additional standards may be implemented to ensure accuracy and fairness. Therefore, while the rounding rule itself remains static, its application involves considering real-world implications, making the stakes and standards relevant only in practical contexts.

My dualistic approach demonstrates insofar, as diagnosed by Blome-Tillmann in *The Indexicality of 'Knowledge'* (2008), how knowledge can simultaneously possess the indexical and factive semantic properties, the non-gradable syntactic property, and the pragmatic function of serving as the norm of assertion.[83] However, without differentiating into a dualism, Blome-Tillmann excludes certain aspects in the differing alternative. SK is characterized by statements that are general and universal, without indexicality: necessarily true or false beliefs. A mathematical law, as contextualized before, is valid everywhere and at all times. In contrast, statements of DK can be indexical, as their validity can change depending on context and time: either dogmatic (only coincidentally true or false) beliefs or potentially true or false

[81] Michael Blome-Tillmann, "Epistemic Contextualism," in *The Semantics of Knowledge Attributions*, ed. Michael Blome-Tillmann (Oxford: Oxford University Press, 2022), 9-11.
[82] Walz, *Lexikon der Mathematik*, 14, 131.
[83] Michael Blome-Tillmann, "The Indexicality of 'Knowledge,'" *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition* 138, no. 1 (2008), 52.

credences. In terms of facticity, SK is absolute; if something is claimed as SK, it implies that it is irrevocably true. DK, on the other hand, has a provisional facticity; knowledge is assumed based on the best available information but can be revised like paradigms. These differences are also evident in the syntactic non-gradability. While concepts in SK are strictly non-gradable because they pertain to absolute truths, DK is also non-gradable in a syntactic sense. However, DK includes through context a level of flexibility and adaptability that allows for some degree of gradation in its application which can be called *quasi knowledge*. This level of gradation depends on the sets of knowledge being applied, for example, in discussions between laypeople and experts concerning the depth and broadness of concepts. This demonstrates the relative character of knowledge, which emerges through reflection within bodies of information over periods of time and thus represents an objectifying moment. The pragmatic function of both types of knowledge also differs: SK serves as a normative fundament for absolute claims and decisions, while DK serves as a normative coherence for decision-making under crisis-like uncertainty and constant review.

3.1.2. Assertion

Statements about specific real things, as discussed, are inherently uncertain due to their variability and temporality and can, at best, have a high probability of occurring. This applies, for example, also to the contextualist thought experiments of the flight case by Stuart Cohen "There will be a stopover of the plane in Chicago"[84] and in the bank case by Keith DeRose "The bank will be open"[85]. While demonstrating the need for a contextual perspective, these cases also reveal that the ability to perceive a crisis depends on individuals and their abilities.

Within the realm of the temporal and the changing, there always remains a perpetual doubt because reality is neither absolutely graspable nor the future predictable. While reality may suggest a certain stability, it is not necessarily true because this reality evolves, sometimes imperceptibly. The absence of doubt plays a central role here, because otherwise doubt would prevent the erroneous perception of knowledge. While a thought experiment or model in deduction may always follow the same course, in reality, elements of the experiment will eventually begin to fail, or external influences will come into play because the concept does not adequately account for these aspects. This consideration provides a basis for understanding why assertion can be intuitively perceived as knowledge under dynamic circumstances, even if it is only knowledge of and about concepts.

Consequently, the subject must trust its uncertain and inherently precarious expectations, whether consciously or unconsciously like in cases with a Gettier gap. This approach inherently embodies a form of skepticism, recognizing the uncertainty and provisional nature of dynamic knowledge. Therefore, in such situations, I refer to a *weiji-jump*. This indicates that every assertion of DK, which can only rely on concepts, involves a crisis that carries risks and opportunities. Like Kierkegaard's notion of a "leap of faith" in the context of

[84] See Stewart Cohen, "Contextualism, Skepticism, and the Structure of Reasons," *Nous* 33, no. s13 (1999): 7-8.
[85] See Keith DeRose, "Contextualism and Knowledge Attributions," *Philosophy and Phenomenological Research* 52, no. 4 (1992): 913.

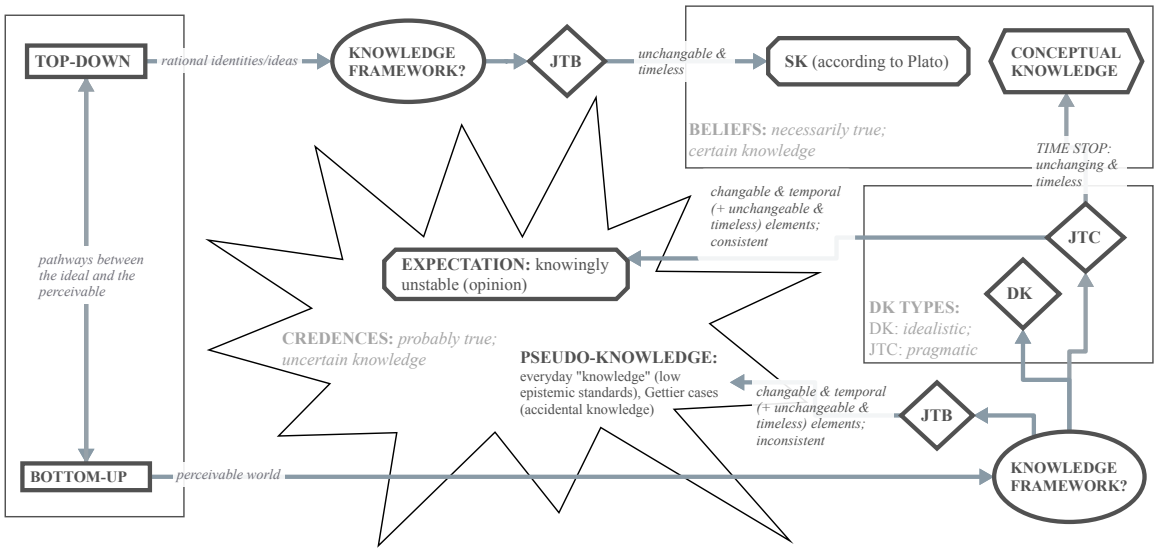

Figure 1. SK & DK as Flow-Chart with JTC

theology, bridging the gap to belief in god[86], in DK, there is a leap that bridges uncertainty with conviction. "Weiji" (Chinese: 危机), meaning crisis, precisely combines this with the risk (危: wei) associated with uncertainty and the opportunity (机: ji) into one term.[87] The weiji-jump combines this dualistic nature as a unity. When one places more trust than doubt in a concept from which a justified assertion is derived, they must take a weiji-jump to be able to act in reality. This sense of hopelessness can be understood as an *aporia*, which can metaphorically be seen as a explosion: one is aware of the impending crisis, in which seemingly stable knowledge will be disrupted, yet it remains, at least, a controlled explosion[88] (see figure 1). Similar is Ernest Sosas aspect of (gradable) safety which takes on the opposite perspective to the weiji-jump which is perceived from the goal of the assertion: "A performance is safe if and only if not easily would it then have failed, not easily would it have fallen short of its aim. What is required for the safety of a belief is that not easily would it fail by being false, or untrue. A belief that p is *safe* provided it would have been held only if (most likely) p."[89]

To differentiate dynamic knowledge with its crisis-like nature at this point, the Platonic conviction, δόξα (doxa), can be substituted with the ancient Greek κρίσις (krisis). κρίσις also means an opinion but more importantly, it conveys assertion and judgment, implying a crossroads. Thus, the structure and effectiveness of the JTB definition are preserved, with the difference that it is adapted to the reality and limits of concept knowledge.

It is important to note that Plato eliminated skepticism and overcame dogmatism with the JTB approach by laying an unchangeable and timeless foundation, which led to an absolute knowledge of his forms: e. g. "2+2=4". However, this differs with JTC, where skeptical questions like "Can I be sure that I have hands?" can be posed, and dogmatic answers such as

[86] See Søren Kierkegaard, *The Concept of Anxiety: A Simple Psychologically Orienting Deliberation on the Dogmatic Issue of Hereditary Sin*, trans. Reidar Thomte in collaboration with Albert B. Anderson (Princeton, NJ: Princeton University Press, 1980), 43.
[87] Lan Xue, Qiang Zhang, and Kaibin Zhong, *Crisis Management in China* (Singapore: Springer Nature Singapore, 2022), 24.
[88] The *Principle of Explosion* (Ex Falso Quodlibet) exhibits aporetic features similar to Gettier cases: contradictions and seemingly justified knowledge lead to paradoxical outcomes.
[89] Sosa, *A Virtue Epistemology*, 25.

"I do have hands" can be asserted over time.[90] However, depending on the epistemic standard, these statements might face a crisis of scrutiny which nonetheless shows the explanatory potency of epistemological contextualism.

The concept of JTC including weiji-jump, which focuses on navigating uncertainty and embracing risks in the generation of dynamic knowledge, exhibits significant parallels to Karl Popper's philosophical approach to science. Popper emphasized the provisional nature and falsifiability of scientific knowledge, implying that knowledge is always susceptible to falsification and can never be conclusively verified.[91] This perspective is reflected in JTC, where uncertainty and the potential for failure are considered essential components of the knowledge process. Moreover, Popper views science as an evolutionary process in which theories are continuously tested and challenged by empirical evidence.[92] This process resembles the continual development and adaptation of theories within JTC. Popper's concept of critical rationalism, which demands a permanent critical assessment of theories through rational discussion and empirical testing, also finds its counterpart in the emphasis on risk and critical reflection that are central to the JTC.[93]

In his exploration of epistemic contextualism, Michael Blome-Tillmann focuses in *Knowledge and Presuppositions* (2009) on the role of pragmatic presuppositions, which serve to stabilize knowledge claims within dynamic contexts. Blome-Tillmann replaces David Lewis's *Rule of Attention*[94] with a *Rule of Presupposition*[95], allowing certain skeptical hypotheses to be ignored unless they are considered serious possibilities within the context.[96] This adjustment aims to maintain the stability of knowledge claims in the face of skepticism by shifting the basis on which knowledge claims are evaluated from fleeting attention to pragmatic presuppositions. Blome-Tillmann's integration of pragmatic presuppositions into contextualism illustrates how epistemic virtues can be modified both in theory and in practical application to effectively meet the demands of a changing epistemic environment.

A concept of knowledge that is to be defined in a dynamic environment and is not conceived as an ideal can therefore be referred to as JTC. In terms of its structure, JTC resembles the JTB definition. However, JTC places a reduced claim to certainty as conceptual knowledge upon reality. The concept of crisis as a belief emphasizes the ambivalence of the assertion and the potential need for adjustments—thus, every perceived crisis provokes the falsification of the chance or risk within the framework of expectation. This distinction aligns with Ernest Sosa's perspective, who argues that knowledge is a kind of performance, and like other performances, it can be done well or poorly.[97] This analogy emphasizes that knowledge must be executed with skill and accuracy, recognizing its limitations and context-dependent nature[98]: "A belief amounts to knowledge only if it is true and its correctness derives from its

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[90] George Edward Moore, "Proof of an External World," in *G. E. Moore: Selected Writings*, ed. Thomas Baldwin (London: Routledge, 1993), 147.
[91] See Popper, *The Logic of Scientific Discovery*, 48, 50.
[92] See Popper, *The Logic of Scientific Discovery*, 37-38, 50, 55-56.
[93] See Popper, *The Logic of Scientific Discovery*, 50-51.
[94] "If w is attended to by the speakers in C, then w is not properly ignored in C" (Blome-Tillmann 2009, 245).
[95] "If w is compatible with the speakers' pragmatic presuppositions in C, then w cannot be properly ignored in C" (Blome-Tillmann 2009, 248).
[96] Michael Blome-Tillmann, "Knowledge and Presuppositions," *Mind* 118, no. 470 (2009), 249.
[97] Ernest Sosa, *Reflective Knowledge: Apt Belief and Reflective Knowledge, Volume II* (Oxford: Oxford University Press, 2009; Oxford Academic, October 3, 2011), 187-189.
[98] See Sosa, *Reflective Knowledge,* 135-138.

manifesting certain cognitive virtues of the subject, where nothing is a cognitive virtue unless it is a truth-conducive disposition."[99]

JTC includes insofar both high and low epistemic standards as well as high and low stakes, as the concept of crisis can be interpreted in terms of such cognitive factors and the demand for real world application. The ability to perceive a crisis is individual and influenced by various factors such as experience and information.

In this context, Thomas Kuhn's theory of the history of science and paradigm shifts, as depicted in his book *The Structure of Scientific Revolutions* (1962), offers a perspective for understanding dynamic knowledge. Kuhn argued that scientific revolutions are triggered by the failure of existing paradigms in the face of new data and insights.[100] This idea is reflected in the dynamics of JTC and the weiji-jump, where the necessity of a paradigm shift becomes apparent through a crisis. Kuhn's concept that scientists, in times of crisis and paradigm shift, are challenged to overcome old assumptions and venture into new paths, corresponds with the idea of JTC.[101] It highlights the significance of flexibility and adaptability in the knowledge acquisition process, especially in situations where conventional theories and methods are insufficient to adequately explain reality.[102] Just as Kuhn views crisis as a catalyst for scientific progress, in the context of dynamic knowledge, crisis can also be seen as a driving force for the development of new, adapted concepts.

While SK encompasses complete information and finite games, DK which includes incomplete information and infinite games, must adapt. Therefore, in dynamic scenarios, an orientation towards efficiency and effectiveness is crucial for the success of assertions over time because resources may not be infinite, and premises may not always be met. This can be seen, for example, in Bayesian epistemology, Pareto optimality, and Nash equilibrium.[103]

While DK, with its ongoing process, represents an ideal knowledge where conceptual knowledge and the weiji-jump represent pragmatic knowledge, the pursuit of an efficient and effective form of knowledge acquisition introduces further differentiation. This can be understood as optimal knowledge, which should not merely be interpreted as a process but as a tactically and strategically structured approach to reaching the highest level of well-founded understanding. This is evident in the distinction between scientific knowledge and everyday pseudo-knowledge, where the epistemological standards and stakes differ because the epistemological virtues may vary. "Optimal" expresses that this represents the best possible state of knowledge at a given time and that it must be adjusted in the event of falsification.

The crisis serves therefore as a sufficient condition for the weiji-jump. This leap is crucial to bridge the gap between uncertainty and conviction. The crisis allows for the acceptance and utilization of conceptual knowledge despite the inherent unpredictability of the future. It also promotes adaptability and flexibility in the knowledge acquisition process. This

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[99] Sosa, *Reflective Knowledge,* 135.
[100] Thomas Samuel Kuhn, *The Structure of Scientific Revolutions*, 2nd ed., enlarged (Chicago, IL: University of Chicago Press, 1994), 5-6.
[101] See Kuhn, *The Structure of Scientific Revolutions,* 10-11.
[102] Kuhn, *The Structure of Scientific Revolutions,* 21-24.
[103] Edwin von Böventer and Gerhard Illing, *Einführung in die Mikroökonomie* (Berlin: Oldenbourg Wissenschaftsverlag, 1997), 255-257, 310-314.
Pareto optimality, from economics and game theory, refers to a state where improving one individual's situation would worsen another's. In contrast, a Nash equilibrium is a scenario in game theory where no player can gain by changing their strategy, assuming others keep theirs unchanged.

reflects the necessity of regularly reevaluating existing assumptions and exploring new paths in the acquisition and application of knowledge, especially when traditional theories and methods are insufficient to adequately explain reality.

The warrant theory that Alvin Plantinga introduced in *Warrant and Proper Function* (1993) can, in parts, be connected with the concepts of JTC and the weiji-jump. Plantinga argues that knowledge arises when cognitive functions operate correctly and are aimed at truth, which aligns with the weiji-jump that overcomes uncertainty through an epistemic leap of trust.[104] Plantinga explains that cognitive processes must operate in a suitable environment (e. g., memories) to generate true beliefs, which corresponds to the weiji-jump, requiring flexible and adaptive thinking processes.[105] Both concepts assume trust in the functionality of cognitive processes. Plantinga demonstrates how correctly functioning cognitive processes lead to true beliefs, even in the presence of uncertainty.[106] Thus, both the weiji-jump and JTC stress the importance of paradigm shifts and new concepts in times of crisis. Therefore, his view that cognitive processes must be flexible to generate knowledge is also suitable, which is crucial for adapting to new insights and paradigms.[107]

Together with the classical aspects of justification and truth, the crisis forms necessary and sufficient conditions for this conceptual approach to knowledge in an ever-changing environment, as demonstrated in the practice of science. JTC emphasizes the importance of continuously questioning and adapting conceptual knowledge to keep pace with the dynamic nature of reality. As mentioned, $_{a}$ & $_{h}$ in DK and DK$_{_org}$ must always be thought of together to be necessary and sufficient. Therefore SK, DK and DK$_{_org}$ are possessed if and only if the conditions listed in Table 8 are met.

This excludes knowledge assertions that are unaware of the crisis. Otherwise, the awareness of DK or the justification would be lacking, which would result in a shift into unreflective dogmatism, as is the case with low epistemic standards. On the other hand, there is the skeptical or reflective dogmatism of JTC, which recognizes its own conceptual limitations due to its high epistemic standards. It maintains a process that remains open to new actualizations, exhibiting a tendency towards realism.

In this context, the question arises as to why falsificationism has not been incorporated into the definition, for example, “Concept K is perceived as true at time t and is not falsified.” This is because, on the one hand, the absence of falsification at a given time is expressed within “perceived as true,” and, on the other hand, falsification as a test describes the process between two points in time. In this sense, the state of knowledge is both the starting point and the product of the process. The respective epistemic standards and the associated virtues therefore also determine what, for example, is identified as a form of knowledge, crisis, or speculation.

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[104] See Alvin Plantinga, *Warrant and Proper Function* (New York: Oxford University Press, 1993), 194.
[105] Plantinga, *Warrant and Proper Function*, 64.
[106] Plantinga, *Warrant and Proper Function*, 164-165.
[107] Plantinga, *Warrant and Proper Function*, 100, 194.

Table 8. Necessary and Sufficient Conditions

	JTB	**JTC**			
	SK[108]	**DK_a**	**DK_h**	**DK_{org_a}**	**DK_{org_h}**
Justification	S is justified in his or her belief that p.	S is justified in his or her belief that concept K holds at time t.	S is justified in their belief that concept K has held true across time and continues to hold at time t.	Organization O is justified in its belief that concept K holds based on its collective knowledge and experience at time t.	Organization O is justified in its belief that concept K holds based on its historical knowledge and understanding at time t.
Truth	The proposition that p is true.	Concept K is perceived as true at time t.	Concept K has been consistently perceived as true across time.	Concept K is perceived as true within the context of organization O at time t.	Concept K has been historically perceived as true within the context of organization O.
(Degree of) **Belief**	S believes that p.	S is convinced[109] at time t that concept K holds.	S is convinced at time t that concept K, which has held true across previous times, holds.	Organization O is convinced at time t that concept K holds.	Organization O is convinced at time t that concept K, which has been part of its historical knowledge, holds.
Belief as **Crisis**	(necessarily true)	S is aware of the crisis that concept p at time t could be false at time t_n.	S is aware that the historical truth of concept p does not guarantee its truth at time t_n.	Organization O is aware that concept p, while true at time t, may need to be adapted or revised at t_n due to changing circumstances or new information.	Organization O is aware that its understanding of concept p may continue to evolve at t_n.

The virtuous epistemological humility demonstrated by Socrates in Plato's *Apology* resonates with the methodology of DK, as exemplified in his initial discourse, translated by Rafael Ferber. Striving for the divine wisdom of Apollo, Socrates tested and attempted to falsify, through his fellow humans, whether he was, as claimed, the wisest man.[110] Thus, in conversations, Socrates faced a crisis, questioning whether Apollo was right or not. This led to the realization that he was wiser than others because he was aware of his limits of knowledge ("I know that I know nothing"), without succumbing to the self-deceptive dogmatism common among his peers, which he demonstrated by exposing the fallibility of their unreliable so-called knowledge. According to Socrates' interpretation, this made him an example of what might be humanly possible following the divine wisdom of Apollo. Man, like Socrates, can only be a seeker of wisdom, as Ferber (2011) points out in his translation: "'This one of you, O men, is the wisest, who like Socrates has recognized that he is in truth nothing in regard to his wisdom [and can therefore only seek it]'".[111]

Plato, as shown, uses Socrates as the embodiment of virtue and elevates the philosopher's status among humanity. In the *Meno*, he subtly suggests Socrates' divine

[108] Cf. Gettier, "Is Justified True Belief Knowledge?", 121.
[109] The moment at which a subject becomes convinced is individual because it depends on speculation. The so-called lottery paradox which Gilbert Harman formulated in his paper *Knowledge, Inference, and Explanation (1968*) is connected at this point. It asks whether it is rational to believe something, even though it cannot be certain to be true. This paradox is also relevant for the "leap of faith" but has different points of saturation for the "leap".
[110] See Plato, *Apology*, 21b-24b.
[111] Plato, *Apology*, 23a - 23b.

appointment, contingent on a readiness to examine. Plato's metaphor of Daedalus' statues, symbolizing impermanence, and his critique of divine rulers whose power is based on accidental true belief, is mirrored in Percy Bysshe Shelley's sonnet *Ozymandias* (1818):[112]

> "I met a traveller from an antique land
> Who said: Two vast and trunkless legs of stone
> Stand in the desert. Near them, on the sand,
> Half sunk, a shatter'd visage lies, whose frown,
> And wrinkled lip, and sneer of cold command,
> Tell that its sculptor well those passions read
> Which yet survive, stamp'd on these lifeless things.
> The hand that mock'd them and the heart that fed:
> And on the pedestal these words appear:
> "My name is Ozymandias, king of kings:
> Look on my works, ye Mighty, and despair!"
> Nothing beside remains. Round the decay
> Of that colossal wreck, boundless and bare
> The lone and level sands stretch far away."[113]

The hubris embodied in Ozymandias serves as a cautionary tale of the impermanence of earthly achievements and the inevitable decay of unchecked authority. In contrast, Socrates' humility in a life of examination and crisis leads to understanding and a virtuous life. Together, Socrates, as one of the first epistemologists, and Ozymandias, as a proclaimed god-king, underscore the fleeting nature of human grandeur when it is divorced from the pursuit of genuine knowledge and virtue. They reveal the precariousness of achievements reliant on probability, chance, risk, or crisis, even when the claimed knowledge seems justified and true within one's own character and ego.

The fragility of knowledge, when detached from its deeper epistemic foundations, reveals a fundamental duty—not only to oneself but also to those to whom knowledge is imparted. Just as any claim to knowledge that rests on probability, chance, or personal conviction alone remains precarious, so too does rigid certainty risk becoming detached from reality. Kant underscores this in his formulation of the categorical imperative, which demands that maxims be universalizable and independent of contingent conditions (cf. Kant [1785] 1998, 4:421, 35). To navigate this, one must adhere to two fundamental *epistemic imperatives* which I propose: first, "Form your knowledge of concepts in such a way that it remains independently justified at all times and unchanged under identical conditions." This ensures that knowledge is not dependent on mere coincidence but grounded in rational, universal justification, aligning with Kant's assertion that moral and epistemic principles must be free from arbitrariness and

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[112] "Ozymandias" by Percy Bysshe Shelley is a poem about the impermanence of power and fame. It describes the ruins of a colossal statue in a desert, once representing the king Ozymandias, who is also known as Pharaoh Ramses II. Despite the boastful inscription on the pedestal proclaiming the king's greatness, all that remains of his "works" are fragments surrounded by endless sands. The poem highlights how even the greatest rulers and their achievements are ultimately destroyed by the passage of time.

Cf. Stephen Burt and David Mikics, *The Art of the Sonnet* (Cambridge, MA: Belknap Press of Harvard University Press, 2010), 125-129.

[113] Percy Bysshe Shelley, "Ozymandias," in *The Art of the Sonnet*, ed. Stephen Burt and David Mikics (Cambridge, MA: Belknap Press of Harvard University Press, 2010), 125.

external influences. Second, "Form your expectations of the real world in such a way that they adapt to new information and embrace epistemic crises as progress in understanding." Since knowledge exists within a changing world, it must remain open to revision, integrating new insights rather than resisting them. Kant's emphasis on autonomy as a guiding principle (see Kant [1788] 1997, 5:124) parallels this epistemic obligation, highlighting that individuals must not passively accept beliefs but actively shape them in accordance with rational scrutiny. By failing to uphold these imperatives, knowledge becomes vulnerable—either collapsing under the weight of its own rigidity or dissolving into arbitrary beliefs. True epistemic responsibility lies in maintaining the balance between justified stability and necessary adaptability. To pursue knowledge is therefore to recognize both the necessity of firm justification and the inevitability of revision, ensuring that understanding is neither frozen in dogma nor lost in uncertainty. As Kant makes clear, an imperative that lacks universality ceases to be an obligation at all, and this holds as much for epistemology as it does for morality (see Kant [1785] 1998, 4:431).

4. Discussion

In the following, I will address and preliminarily explore central aspects and perspectives. I begin by examining the inherent dualism that, to a certain extent, has persisted since Plato and Aristotle and their use of ἐπιστήμη (epistéme). The structures arising from this dualism will then be considered within a broader framework to re-evaluate analytical and continental philosophy from a fresh perspective. This is followed by a critical examination of knowledge monism, referencing the Gettier cases and the Rashomon Effect to illustrate the limitations of this approach and to underscore the utility and necessity of knowledge dualism, exemplified by the Ship of Theseus. Finally, I will relate these considerations to ethical dilemmas and current issues that, through dualism, become more accessible with new analytical tools.

Both Plato and Aristotle, despite their differing approaches, used the term ἐπιστήμη, which later served for distinguishing between knowledge and science: In brief, Plato regards ἐπιστήμη as a form of true, unchanging knowledge, as discussed in his portrayal of the Forms in *The Republic.*[114] Conversely, Aristotle defines it as progressive or scientific knowledge that can be demonstrated through rational argumentation, a theme he elaborates in *Posterior Analytics.*[115] The duality, reflecting the interplay between static and dynamic knowledge, is apparent in the analogous debate between rationalists and empiricists, supporting that the question is not either-or but rather both-and. This brings the fields of the philosophy of science and (social) epistemology, which debate over positivism and constructivism, closer together.

Similarly, the debate between analytical and so-called continental philosophy can be reconsidered. While the analytical approach aims to establish a foundation on which secure knowledge can be built, the continental approach seeks to interpretively and speculatively explore philosophical themes through historical, societal, and cultural perspectives. This reflects on a spectrum the distinction between static and dynamic knowledge, which allows both approaches their space without discrediting one another. What can be derived from this observation, however, are the characteristics of each approach, which depend on the factors of time and change, making their applicability and validity contingent upon their foundation or their coherent context. In this environment, one might refer to the so-called continental

[114] See Plato, *Republic,* 479a2.
[115] See Aristotle, *Anal. post. I,* 10 76b9–11.

philosophy as a φιλοπροσδοκία (*philoprosdokía*: "love of expectation"[116]; as the more practical and speculative aspect of wisdom), which seeks to develop orientation and grasp the placeless, the ἄτοπον (átopon)[117]. Analytical philosophy, on the other hand, could be understood more as a φιλοσοφία (philosophía: "love of (certain) knowledge"; the intelligible and reasonable aspect of wisdom). Both philoprosdokía and philosophía can be seen as complementary approaches which operate on a spectrum similar to Plato's allegory of the divided line[118], where the former embraces the practical orientation of the changeable and timely (bottom-up process), while the latter seeks the clarity and precision of certain knowledge that is unchanging and timeless (top-down process), together offering a more holistic understanding of philosophy in the sense of "love of wisdom".[119] Simply put, it's as if an analytical philosopher were discussing the abstract-mathematical concept of a triangle, while a philosopher aiming to capture real-life experiences would refer to an equivalent brittle cookie shaped like a triangle, which, upon closer inspection, continuously changes its form. In essence, the metaphor shows that both seek truth and complement each other—one with a focus on stability, the other embracing the fluidity of experience. However, both can lose their validity when they encroach too far into the other's domain: continental philosophy when it makes statements about the absolute based on the mutable and temporal[120], and analytical philosophy when it takes the absolute to make statements about the mutable and temporal, as in the case of Gettier scenarios.

Gettier's paper has inspired a range of solution approaches that highlight the complexity of the Gettier gap. However, it becomes apparent that these approaches only partially capture the essential aspect of conceptual coincidences. This is particularly reflected in the fact that while the Gettier gap can be explained, it seems not to be solvable, as there can be no absolute and global certainty in dynamic scenarios. The approaches offer insights into specific facets of the ongoing discourse about the nature of knowledge, addressing these complexities on a detailed level as I tried to show. These insights maintain obviously their

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[116] In the context of dynamic and static understanding, expectations play a crucial role in shaping interpretations of ideas and information. Expectations are central to dynamic perspectives as they involve anticipating changes and adaptations in an evolving context. These expectations guide how concepts are applied and understood in relation to time and change, making them essential in navigating uncertain or variable scenarios.

[117] The *atopon* refers to that which is strange or out of place, something that does not fit within the usual frameworks of understanding and resists easy categorization. The challenge of understanding or the risk of misinterpretation reflects a broader human experience: encountering the unfamiliar, which does not align with established expectations. Hermeneutics, as emphasized by Gadamer, highlights this phenomenon, where, through the process of interpretation, the initially strange becomes familiar. Successful engagement with tradition gradually integrates it into a shared understanding, blending past and present into a common world articulated through human dialogue.

Hans-Georg Gadamer, *Philosophical Hermeneutics*, trans. and ed. David E. Linge (Berkeley: University of California Press, 1976), 25.

[118] See Plato, *Republic,* 509d–511e.

The allegory distinguishes between the visible and the intelligible world, each of which is divided into two realms. The visible world includes images such as shadows and reflections, as well as real objects. The intelligible world is split into one realm that is based on assumptions and uses images, and another that leads to fundamental principles without relying on images. The allegory illustrates knowledge levels.

[119] See *The School of Athens* (1509-1511), a fresco by Raphael, which visually contrasts the ideas of Plato and Aristotle, symbolizing a top-down and bottom-up approach to knowledge.

[120] Carnap criticizes Heidegger for using logically meaningless and grammatically misleading statements, such as "Das Nichts nichtet" ["The nothing itself nothings"], which he argues are syntactically correct but ultimately devoid of empirical or logical content.

See Rudolf Carnap, „Überwindung der Metaphysik durch logische Analyse der Sprache," *Erkenntnis* 2 (1931): 230.

relevance for future research in the realm of knowledge duality, while also offering an avenue to explore areas of conceptual coincidences that were previously not evident.

Proponents of knowledge monism face the challenge of proving that a universal approach works in all epistemological scenarios. However, as discussions around Gettier cases, the modus ponens principle, and conceptual coincidences demonstrate, this approach proves to be inadequate or, at the very least, in a state of compulsion to move. Dismissing dualism as merely semantic overlooks the practical necessity of this differentiation. This is evidenced by debates on the reliability of eyewitness testimony, such as the Rashomon Effect. Therefore, monists are urged to defend the efficacy of a monistic approach and demonstrate that it can adequately meet the diverse and dynamic requirements of epistemology.

The relevance of DK is evident due to its generality. This pertains to concepts such as personal and material identity, whose paradoxes, like the Ship of Theseus (Plutarch), can result from the perspective on DK_a and DK_h. This thought experiment illustrates precisely what dynamic knowledge is about: the interdependence of knowledge and identity, or identification, within the context of changeability and temporality. Like a time-change diagram, variability can be observed between two time points, yet unity is maintained through narration as product of reflexion, thanks to historicity which acts as summary of the thing in question. In this view, the ship can be justified as the same through its narration, even though it changes. An alternative example is Venus, which appears as both the morning star and the evening star (DK_a at two distinct points in time).[121] For unknowingly observers, these are considered different celestial bodies. It is only through understanding, supported narrational justification, that it becomes clear that both manifestations are, in fact, the same planet—Venus in its orbit—previously perceived as incoherent. In this sense, this example is equivalent to the Ship of Theseus, with the difference that there is a more evident informational or identification deficit from the perspective of DK_h. Nevertheless, there is more to explore about perception and the related saturational effects, as illustrated by the example of Odysseus and the varying viewpoints on him from both near and distant perspectives.

In ethics, where classical problems like the Trolley Dilemma[122] cause difficulties in decision-making, comparable problems can be found, as was observed with the Gettier gap. For example, deontology represents an axiomatic construct that, alongside utilitarianism or consequentialism, is supposed to make statements in a temporal and divisible world. Similarly, ideal expectations are mixed here with real states, which can fail in certain situations, like in the Gettier cases, despite familiar and successful practice, when it comes to crisis situations.

Contemporary issues, such as state identity, digital currencies, and artificial intelligence, present questions directly impacted by these challenges. States must redefine their identity in conflict situations while maintaining their fundamental consistency. The development of artificial intelligence requires a flexible knowledge base that can adapt to changing conditions, such as dynamic traffic scenarios where multiple vehicle cameras on a car may experience Rashomon effects due to unclear data[123], or when the development of general

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[121] Frege's example of Venus, used in the context of philosophy of language, has been adapted for this context to illustrate the reciprocal relationship between knowledge and identity.
Cf. Gottlob Frege, "Sense and Reference," *The Philosophical Review* 57, no. 3 (1948): 210–219.

[122] See Philippa Foot, "The Problem of Abortion and the Doctrine of the Double Effect," in *Moral Problems: A Collection of Philosophical Essays*, ed. James Rachels (New York: Harper & Row, 1971), 29.

[123] E. g. variations in perspective, data ambiguity from poor lighting or obstructions can cause discrepancies.

artificial intelligence needs to be made transparent. Additionally, digital currencies require expert oversight to preserve their value within volatile networks by making monetary flows tangible.

Building on these challenges, the differentiated aspects of the induction problem—prospective, identificatory, and retrospective—highlight critical vulnerabilities across domains. The evaluation of economic crises, such as the analysis of past financial collapses to guide future policy, faces retrospective uncertainties when incomplete data or shifting economic conditions distort conclusions. The identification of fakes, particularly in the context of deepfakes or manipulated media, exemplifies identificatory challenges where unclear or deceptive data compromises trust in information. Looking forward, the development of public health strategies, such as predicting the spread of pandemics, underscores prospective uncertainties, as models must adapt to new variables and unexpected developments. These examples underline the urgency of epistemological approaches that can handle dynamic and ambiguous scenarios effectively.

5. Conclusion

My analysis of Gettier cases reveals that the desire for a monistic definition of knowledge is unattainable, as luck—an inherent temporal factor in changing environments—must be accepted as a component of knowledge. These cases, which I classify as conceptual coincidence, demonstrate the phenomenon of accidental knowledge within the JTB framework, which can only arise in dynamic scenarios. This conceptual coincidence occurs when a claim is confirmed through the coincidental alignment of relevant aspects, despite the original conditions not objectively supporting the claim. Such scenarios unfold over at least two points in time and rely on different yet similar and not necessarily distinguishable concepts, with the aspect crucial for confirming the claim changing in a way that ultimately validates it.

Five factors further contribute to the shortcomings of prevailing interpretations of the JTB definition: (1) violations of Leibniz's law and the resulting inadequacy of definitions, (2) confusion between deductive and inductive reasoning, (3) overlooking Plato's emphasis on the indivisibility of true knowledge, (4) disregarding his emphasis on the timelessness of true knowledge, and (5) the necessity of temporally indexing concepts.

The Gettier case of the application scenario (1) violates Leibniz's law by assuming that the definiens "the person that has ten coins in their pocket" uniquely identifies the definiendum "the (sole) person who will get the job", when in fact both Smith and Jones satisfy the definiens condition. This creates a false equivalence between them based on an inadequate definition of "the person who has ten coins in their pocket." This highlights the danger of relying on limited information and overly broad definitions when attempting to uniquely identify someone or something. These cases involve (2) a mix of deductive and inductive reasoning, which can lead to errors because inductive reasoning is inherently less certain, especially in dynamic situations where observed specifics are subject to change. Plato believed (3) that true knowledge resided in unchanging, indivisible Forms. Gettier cases utilize concepts that change over time, violating this principle and allowing coincidence to create "accidental knowledge". He also maintained (4) that true knowledge is timeless. Gettier cases introduce time as a factor, making knowledge claims contingent upon potentially shifting circumstances. Because they involve time, concepts need to be (5) "indexed" to specific moments. Failing to do so can otherwise create contradictions within a changing environment.

The JTB model, while necessary and sufficient in static situations, proves inadequate in dynamic scenarios. Beyond traditional Gettier cases, additional counterexamples further illustrate the limitations of a monistic knowledge concept: The Fake Barn Case (an atypical Gettier case) shows how a belief can be justified and true, yet fail to be knowledge due to epistemic luck imposed by the surrounding context. The "Fastest Way to Work" example highlights the instability of knowledge in dynamic environments, as justified beliefs about optimal routes become invalid when conditions change. The Rashomon Effect reveals that multiple justified true beliefs can coexist, even when they contradict each other, demonstrating the difficulty of establishing an absolute truth in complex epistemic situations.

Each of these cases highlights the inherent limitations of a rigid, monistic view of knowledge. These cases reveal the flaws of a rigid, monistic knowledge model. Instead, epistemology must be flexible, acknowledging context, perspective, and the need for continuous revision. Knowledge is dynamic, not absolute.

DK addresses the limitations of SK in a changing reality. Unlike SK, which relies on immutable and universally true ideas, DK acknowledges that knowledge is an evolving process that adapts to new information and contexts. This is crucial for understanding entities that undergo significant changes over time, such as objects, individuals, or organizations. DK is formalized through two complementary pairs of formulas: DK_a/DK_h and DK_{org_a}/DK_{org_h}. DK_a/DK_h focuses on the adaptation and historicity of concepts or identities, ensuring that knowledge remains relevant and justified while maintaining a coherent evolution over time. DK_{org_a}/DK_{org_h} extends this to organizational forms, capturing the dynamic interplay of knowledge and identities within individuals and groups, including self-reflexive processes.

In DK, unlike in SK, truth is subject to change. Contingence about events and perception are additional factors for error which undermine true knowledge in dynamic scenarios. Knowledge and identity management become crucial, as statements are only valid under specific conditions and at specific times. This means that justification leads to plausible, but not necessarily true, conclusions. DK can be solidified by "pausing" time and change through focusing on a specific point, allowing for justified true beliefs within that specific concept and context. To achieve conceptual knowledge that most closely reflects reality, continuous updates and checks against relevant information are necessary. The subject justifies concepts and their identities until the doubt isn't relevant anymore, even if this perceived knowledge might not align with reality. Contextualism further highlights the role of subjective doubts and context in shaping knowledge perception.

The uncertainty in dynamic scenarios necessitates a "Weiji-jump", a leap of trust in times of crisis which falsifies or verifies assertions, to bridge the gap between conceptual knowledge and uncertain dynamic circumstances like reality. The prevailing interpretation of JTB fails to capture this dynamic, so a new definition is proposed on the basis of the idealistic DK approach: JTC. This aligns with theories of scientific development, which emphasize the provisional nature of knowledge and the importance of falsification and paradigm shifts.

In this approach, a crucial distinction emerges: the necessity of overcoming and integrating Gettier cases, or conceptual coincidences, reveals that the objective, absolute, or monistic concept of knowledge cannot sustain itself in dynamic environments. Instead, a subjective component proves equally essential—a capacity to adapt to the ongoing uncertainties of a changing world. This requires epistemological humility, fostering an awareness of crises and an ability to address both personal and external limitations. Thereby avoiding extremes like

excessive doubt (skepticism) and overconfidence (dogmatism), by neither excessively elevated nor excessively depressed. Equally significant is an exchange of perspectives, a collective engagement in questioning, reflecting, and determining the best course to avoid missteps. The suggested imperatives prove insofar vital because they provide a framework for belief-formation, ensuring that knowledge claims neither hinge on mere coincidence nor dissolve into perpetual uncertainty.

Tennyson's ending verses of *Ulysses*[124] (1842) reflect the essay's conclusion, that knowledge in unstable fields may shift, not fixed in an ultimate ideal. It evolves through humility and measured change, adapting to the complexities at hand and through the will of the agents for whom orientation is at stake:

> "We are not now that strength which in old days
> Moved earth and heaven; that which we are, we are,
> One equal temper of heroic hearts,
> Made weak by time and fate, but strong in will
> To strive, to seek, to find, and not to yield."[125]

[124] In Tennyson's *Ulysses* (Odysseus), the reader encounters a hero who, despite his age and vast experiences, does not rely on the apparent security of his past achievements. The phrase "moved earth and heaven" encapsulates the loss of the expected control over the real world, such as monistic knowledge ("in old days"). While recognizing that all that is left of the ego ("that which we are, we are") after the realization of time and change ("time and fate") is to withstand and adapt to crises with character ("To strive, to seek, to find, and not to yield"), with dedication and in dialogue with others ("one equal temper", "but strong in [a shared] will").

[125] Alfred Tennyson, "Ulysses," in *Essential Pleasures: A New Anthology of Poems to Read Aloud*, ed. Robert Pinsky (New York: W. W. Norton & Company, 2009), 303–305.

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