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A Critique of the Argument View: Why Thought Experiments Are More Than Arguments

Una crítica a la Visión Argumental: Por qué los experimentos mentales son más que argumentos

Uma crítica à Visão Argumentativa: Por que experimentos mentais são mais que argumentos

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Abstract: The Argument View posits that thought experiments are merely arguments in disguise, deriving their epistemic power from logical inference. This paper challenges this view, arguing that it rests on a fundamental category error by mischaracterizing the cognitive activity of thought experimentation. We demonstrate that the process of running a thought experiment is phenomenologically and structurally distinct from executing an inference. Specifically, it fails to satisfy the necessary *taking condition* – where a thinker must take their premises to support their conclusion – a core feature of genuine, person-level reasoning. This critique is shown to be decisive against the strong *Execution Thesis*. We then extend our analysis to the weaker *Reconstructibility Thesis*, arguing that it severs the link between a subject and their justification and makes a fatal concession about the indispensable epistemic role of the narrative itself. We conclude that the *Argument View* is an untenable model because it conflates the imaginative process of discovery with its potential post-hoc logical validation.

Keywords: thought experiments; argument view; inferential reasoning; taking condition; justification.

Resumen: La *Visión Argumental* postula que los experimentos mentales son meros argumentos disfrazados, derivando su poder epistémico de la inferencia lógica. Este artículo desafía esta visión, argumentando que se basa en un error categorial fundamental al caracterizar erróneamente la actividad cognitiva de la experimentación mental. Demostramos que el proceso de llevar a cabo un experimento mental es fenomenológica y estructuralmente distinto de ejecutar una inferencia. Específicamente, no satisface la condición de asunción necesaria – donde un pensador debe asumir que sus premisas apoyan su conclusión – una característica central del razonamiento genuino a nivel personal. Se muestra que esta crítica es decisiva contra la fuerte *Tesis de la Ejecución*. Luego extendemos nuestro análisis a la más débil *Tesis de la Reconstructibilidad*, argumentando que esta rompe el vínculo entre un sujeto y su justificación y hace una concesión fatal sobre el papel epistémico indispensable de la propia narrativa. Concluimos que la *Visión Argumental* es un modelo insostenible porque confunde el proceso imaginativo de descubrimiento con su potencial validación lógica *post-hoc*.

Palabras clave: experimentos mentales; visión argumental; razonamiento inferencial; condición de asunción; justificación.

Resumo: A *Visão Argumentativa* postula que experimentos de pensamento são meros argumentos disfarçados, derivando seu poder epistémico da inferência lógica. Este artigo desafia essa visão, argumentando que ela repousa sobre um erro categorial fundamental ao caracterizar erroneamente a atividade cognitiva da experimentação de pensamento. Demonstramos que o processo de conduzir um experimento de pensamento é fenomenológica e estruturalmente distinto de executar uma inferência. Especificamente, ele falha em satisfazer a condição de tomada necessária – na qual um pensador deve tomar suas premissas como



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suporte para sua conclusão –, uma característica central do raciocínio genuíno em nível pessoal. Essa crítica se mostra decisiva contra a forte *Tese da Execução*. Em seguida, estendemos nossa análise para a mais fraca *Tese da Reconstituibilidade*, argumentando que ela rompe o vínculo entre um sujeito e sua justificação e faz uma concessão fatal sobre o papel epistêmico indispensável da própria narrativa. Concluimos que a *Visão Argumentativa* é um modelo insustentável porque confunde o processo imaginativo de descoberta com sua potencial validação lógica *post-hoc*.

Palavras-chave: experimentos de pensamento; visão argumentativa; raciocínio inferencial; condição de tomada; justificação.

1 Introduction

The use of thought experiments has been acknowledged for a considerable time as effective means for sparking fresh perspectives on reality. They are commonly applied in various fields including literature, ethics, philosophy of mind, epistemology, and the natural sciences. Despite their significant and long-lasting impact, there is ongoing discussion regarding the specific ways in which these creative scenarios lead to knowledge or validate beliefs. Central to this debate is the fundamental inquiry into how mental exercises alone can reveal authentic truths about the physical world.

The *Argument View*, championed notably by empiricist philosophers like John Norton, posits that thought experiments are disguised arguments rather than relying on a mystical, non-empirical source like rational intuition for their epistemic impact². Instead, their strength lies in their capacity to restructure and improve existing knowledge through valid reasoning steps. A key, contentious outcome of this perspective is the elimination thesis, which argues that thought experiments are theoretically dispensable without causing any real loss of knowledge.

Despite its prominence, the *Argument View* faces significant opposition, with the broader

discussion often portrayed as a clash between empiricist doctrines, exemplified by Norton, and rationalist viewpoints. James Brown, for example, has famously supported a Platonist stance suggesting that certain thought experiments provide a direct, non-inferential understanding of relationships between universals³. Others have proposed an alternate approach, positing that thought experiments function as a type of *mental modeling*, wherein individuals create and manipulate cognitive models of the world to enhance their comprehension⁴.

This paper, however, offers a different line of critique. We move away from proposing a competing mechanism for thought experiments and instead question the very basis of AV, showing its fundamental implausibility. Our central thesis is that the *Argument View* fails because it mischaracterizes the cognitive activity essential to thought experimentation. We argue that what a thinker does when conducting a thought experiment is not what they do when executing an inference⁵. By focusing on the nature of inferential reasoning itself – a person-level, conscious mental action – we will show that AV rests on a category error, conflating the epistemic process of imaginative exploration with its potential *ex post facto* logical validation. This critique holds even against weaker versions of the view, revealing a flaw at its very core.

A preliminary clarification is in order. Our critique does not target the trivial claim that thought experiments involve thinking, nor does it conflate the imaginative activity of thought experimentation with mere daydreaming or unconstrained fancy. Not every thought is a piece of reasoning: reasoning is an inferential, normatively governed process in which a thinker moves from premises to a conclusion because she takes those premises to support it. Thought experimentation, as we

² Despite small divergences, the following authors endorse some version of the *Argument View*: Bunzl (1996), Forge (1991), Häggqvist (1996), Irvine (1991), Norton (1991, 1996, 2004a, 2004b), Rescher (1991), Williamson (2007).

³ It is reasonable to say that Norton's account is a direct response to the Platonic account proposed by James Brown (1986, 1991, 1992, 2004). Brown's perspective is characterized by a rationalist quality. He suggests that in order to explain the success of scientific thought experiments, we must be open to the idea of comprehending the connections between universals through direct rational means.

⁴ For accounts that understand thought experiments as *mental models*, see: Bishop (1999), Bokulich (2001), Brendel (2004), Buzzoni (2008), Davies (2007), Elgin (2014), Gendler (2004), Gooding (1992, 1994), Mišević (2007), Nersessian (1992, 2007), Sorensen (1992).

⁵ In our "New Problems for the Argument View of Thought Experiments" (Rodrigues; Nitsche, 2021), we briefly mentioned this objection. However, we did not have the opportunity to develop it fully.

shall argue, is also a disciplined, rigorous cognitive practice – but its discipline is of a different kind. It is structured by narrative, constrained by background knowledge, and regulated by something closer to quasi-empirical simulation than to logical deduction. Our thesis is not that thought experiments are epistemically inferior to arguments, but that they are epistemically *distinct* from them – and, in the context of discovery, epistemically richer.

To develop this argument, we structured it in the following way. In Section 2, we will lay out the core tenets of the *Argument View*, highlighting a crucial ambiguity between its stronger *Execution Thesis* and its weaker *Reconstructibility Thesis*. Section 3 will clarify the concept of inferential reasoning, establishing Paul Boghossian's *taking condition* as the key criterion for our analysis. Subsequently, in section 4, the core of our critique, we will demonstrate that the cognitive activity of running a thought experiment fails to meet this condition, analyzing the process from both the *hearer's* and *speaker's* perspectives. In this section, we will also address the *Reconstructibility Thesis*, arguing that it cannot save AV from our critique. Section 4 then turns to the positive question: if thought experiments are not arguments, what are they? We outline their distinctive epistemic character as tools of imaginative discovery, grounded in quasi-observational simulation and structured by narrative. Finally, in section 5, we will conclude by summarizing our case that the Argument View is untenable because it is based on a mistaken identity.

2 The Argument View and Its Core Ambiguity

The *Argument View* (AV) offers a powerful and deflationary account of the epistemic power of thought experiments. Rooted in an empiricist tradition, its primary motivation is to demystify the process by which an exercise of pure thought can yield new knowledge about the world. Proponents of AV reject any appeal to special cognitive faculties or *epistemic magic*, such as a Platonic eye that allows for direct rational insight

into the nature of reality (Brown, 1991; Norton, 2004b, p. 45). Instead, they argue that thought experiments are epistemically potent for a much more mundane reason: they are, at their core, nothing more than arguments. They operate not by accessing a new source of data, but by taking information we already possess and transforming it through logical, inferential steps (Irvine, 1991).

Different advocates articulate this central idea with slight variations, but the common thread is the reduction of thought experimentation to argumentation. Patrick Irvine argues that thought experiments “are simply arguments concerning particular events or states of affairs of a hypothetical (and often counterfactual) nature which led to conclusions” (1991, p. 150). Nicholas Rescher (1991, p. 31) describes the process as an “attempt to draw instruction from a process of hypothetical reasoning that proceeds by eliciting the consequence of a hypothesis”. Bunzl (1995, p. 391) supports this assertion by analyzing specific examples of thought experiments, arguing that their epistemic value derives from the logical connections between premises and conclusions rather than any unique cognitive process; for him, thought experiments are “simply inferential in nature”. He also claims that “the force of the [thought experiment] relies on much more mundane matters of deductive logic” (Bunzl, 1996, p. 232). Williamson claims thought experiments should present a logically valid argument involving modal concepts (such as possibility or necessity) that leads to a conclusion about what is possible or necessary. He holds that they must embody “a straightforward valid modal argument for a modal conclusion” (Williamson, 2007, p. 187). But the most influential and detailed defense comes from John Norton, who claims that thought experiments are “arguments which: (i) posit hypothetical or counterfactual states of affairs, and (ii) invoke particulars irrelevant to the generality of the conclusion” (Norton, 1991, p. 129). For Norton, the conclusion of a thought experiment is “elicited from information we already have by an identifiable argument, although that argument might not be laid out in detail in the statement of

the thought experiment" (1991, p. 129).

This view holds that the narrative or *picturesque* elements of a thought experiment – the drugged physicist in Einstein's elevator, for example – are epistemically inert particulars. They may serve a psychological or heuristic purpose, making the underlying argument easier to grasp, but they do no *genuine* justificatory work. The epistemic force comes entirely from the logical structure of the argument that the narrative conceals. This leads directly to the *elimination thesis*: any conclusion reached by a thought experiment can be reached by a non-thought-experimental argument without any relevant epistemic loss (Norton, 1996). The narrative is a dispensable shell. As Norton famously asserts, "a good thought experiment is a good argument; a bad thought experiment is a bad argument" (1991, p. 131). The criteria for evaluating a thought experiment, therefore, are simply the criteria for evaluating an argument: logical validity and soundness.

However, a crucial ambiguity lies at the heart of AV's central claim that "the actual conduct of a thought experiment consists of the execution of an argument" (Norton, 2004b, p. 50). This statement can be interpreted in two fundamentally separate ways, and the plausibility of the *Argument View* depends heavily on which interpretation is adopted⁶.

1. *The Execution Thesis*: It presents a robust, literal viewpoint. It asserts a psychological argument concerning the mental operations when an individual contemplates a hypothetical scenario. According to this perspective, envisioning the situation and following its storyline equates to engaging in a form of reasoning. Whether consciously or subconsciously, the thinker navigates through the components of an implied argument and reaches a conclusion by understanding, albeit faintly, the underlying reasoning. The narrative acts as the conduit for the unfolding of inferential reasoning.

2. *The Reconstructibility Thesis*: It represents a more modest and justifiable interpretation. Instead of characterizing a cognitive process, it focuses based on validation. In this context, a thought experiment can function as a heuristic tool for exploration rather than inference. However, the conclusions it proposes are considered valid only to the extent that one could theoretically reconstruct a coherent argument linking the initial scenario (the premises) to the result (the conclusion). In this perspective, validation hinges not on the mental processes of the thinker but on the objective possibility of establishing a logically sound argumentative framework.

While most of the textual evidence from AV proponents suggests a commitment to the stronger *Execution Thesis*, the *Reconstructibility Thesis* represents a viable fallback position. Distinguishing between them is essential, as they require different lines of critique. The former is a claim about cognitive science and phenomenology; the latter is a claim about abstract epistemic grounding.

To fully appreciate the depth of this distinction, consider an analogy from geometry. Imagine a geometer trying to prove a theorem about triangles. She draws a diagram, adds a few auxiliary lines, and, in a moment of insight, '*sees*' that the theorem must be true. How is her new belief justified? The *Execution Thesis* is analogous to claiming that as the geometer was drawing and observing the diagram, she was executing a formal, step-by-step deductive proof in her mind. The visual process of '*seeing*' was, in fact, a disguised form of logical inference. The *Reconstructibility Thesis*, by contrast, would claim that her intuitive '*seeing*' of the solution was merely a heuristic discovery. Her belief is only truly justified because she (or someone else) can later write out a formal, axiomatic proof that validates what she saw. The justification lies in the existence of the formal proof, not in her intuitive cognitive act.

⁶ This distinction between a psychological claim (*Execution Thesis*) and a purely epistemic one (*Reconstructibility Thesis*) is a crucial axis for critiquing the *Argument View*. While proponents like Norton often use language that suggests the *Execution Thesis*, most substantive critiques focus on the *Reconstructibility Thesis*, as it represents the more philosophically defensible version of the view.

We can apply this same logic to a classic thought experiment, such as Galileo's well-known rejection of the Aristotelian view that heavier objects fall faster than lighter ones. In the thought experiment, we are asked to imagine a heavy cannonball (H) and a light musket ball (L) tied together.

According to the Execution Thesis, when a person runs this thought experiment, they are psychologically performing an inference that approximates a *reductio ad absurdum*:

- (Premise 1) Assume the Aristotelian view: $\text{Rate}(H) > \text{Rate}(L)$.
- (Premise 2) When tied together, L should act as a drag on H, so $\text{Rate}(H+L) < \text{Rate}(H)$.
- (Premise 3) When tied together, the composite object (H+L) is heavier than H alone, so $\text{Rate}(H+L) > \text{Rate}(H)$.
- (Conclusion) Premises 2 and 3 form a contradiction. Therefore, Premise 1 must be false.

The strong version of AV claims that the act of imagining the balls tied together and feeling the intuitive pull of the contradiction is the cognitive process of running this very argument.

In contrast, the *Reconstructibility Thesis* presents a divergent argument. It acknowledges that mentally visualizing a scenario like falling balls might act as a non-inferential, quasi-observational practice. However, it disputes that this visualization alone justifies rejecting Aristotle's explanation. According to this perspective, the actual justification stems from the ability to reconstruct the scenario as a formal *reductio* argument. While the thought experiment aids in reaching a conclusion, it is the structured argument that holds the weight of justification.

It is crucial to clarify this distinction. If the Ar-

gument View is seen as supporting the *Execution Thesis*, it could face challenges related to the mental processes and cognitive aspects involved in conducting a thought experiment. Conversely, if it aligns with the *Reconstructibility Thesis*, a different issue emerges: how can a formal argument, which the thinker may not have explicitly articulated, still form the basis for their justification?⁷ By establishing this differentiation, we can now evaluate the Argument View under both interpretations.

3 The Nature of Inferential Reasoning

To critically assess the *Argument View's* claim that conducting a thought experiment is equivalent to executing an argument, we must first establish a clear and precise understanding of what constitutes inferential reasoning. The literature often uses the terms *argument* and *reasoning* interchangeably, but for our purposes, the distinction is vital. An argument, in the logical sense, is best understood as an abstract object: a set of propositions structured in such a way that some (the premises) are offered in support of another (the conclusion)⁸. An argument can exist on a page or as a formal proof, independent of any thinker or cognitive process⁹.

Reasoning, or inference, on the other hand, is not an abstract object but a psychological process, but a mental action that a subject performs (Broome, 2001). The *Argument View*, particularly in its strong form, makes a claim not merely about the abstract structure that a thought experiment might map onto, but about the very nature of the cognitive activity involved. It is this psychological claim that requires a robust account of inference as its standard of evaluation¹⁰.

Not every sequence of mental states, even

⁷ This touches on a classic problem of epistemic justification. If the justification for a belief is a logical argument that the thinker herself is not aware of, it raises questions about whether the justification is accessible to the thinker in a way that can guide her reasoning.

⁸ In support of this claim, see: Bassham, Irwin, Nardone and Wallace (2005); Copi and Cohen (2005); Govier (2010); and see, for discussion, Johnson (2000).

⁹ This distinction between an argument as a *product* (a set of propositions) and reasoning as a *process* (a cognitive act) is fundamental in argumentation theory. Theorists like Johnson in *Manifest Rationality* emphasize that argumentation is a socio-cultural activity that involves more than just the logical structure of its products. David Hitchcock (2007) further clarifies that an argument is an abstract object, a *claim-reason complex*, that can be the content of a speech act of arguing.

¹⁰ John Broome (2001) argues that reasoning is a conscious, rule-governed activity aimed at revising our beliefs or intentions according to normative requirements (e.g., requirements of logical consistency). The *normativity* here implies that reasoning is something that can be done correctly or incorrectly, according to rules that specify how one ought to reason, which aligns with this paper's later emphasis

if causally linked, qualifies as an instance of reasoning. A thinker may drift from one thought to another in an episode of daydreaming, or a particular memory might trigger an emotional response, which in turn leads to another thought. These are causal chains of mental events, but they lack the defining characteristics of inference. Genuine inferential reasoning is a distinctive, person-level activity governed by epistemic norms. When a subject reasons correctly, we judge that she has conducted herself as she should, epistemologically speaking. This normative dimension suggests that reasoning is something we do, not merely something that happens to us. It is an active, self-governed process of drawing a conclusion from premises¹¹.

The key feature that distinguishes *genuine* inference from a mere association of thoughts has been powerfully articulated by Paul Boghossian (2014) as the *taking condition*¹². According to this condition, "inferring necessarily involves the thinker taking his premises to support his conclusion and drawing his conclusion because of that fact" (Boghossian, 2014, p. 5). This means that for a transition between thoughts to count as an inference, it is not sufficient for the premise-beliefs to simply cause the conclusion-belief. The thinker must, in some sense, appreciate the support relation between them. She must see the premises as constituting a reason for the conclusion and form her belief in the conclusion based on that perceived support. This *taking* is the active ingredient in reasoning; it is the endorsement of the inferential step, the recognition that the conclusion is warranted by the premises. It is what makes reasoning a paradigm of active, rational thought.

To make this crucial concept more vivid, consider the difference between a deliberate navigator and a drifting raft. The deliberate navigator exemplifies the process of inferential reasoning,

the navigator has a destination she wants to reach (the goal), the ships and navigational charts tell her which islands are on which course (the body of knowledge or because premises), and the compass with which she does all this work is her understanding of the logical relations that are in play. Accordingly, she consults her navigational charts and sets her compass to the course she wants, then turns the rudder to put her ship on that course, thus guiding her ship to a particular destination (the conclusion). Her movement is intentional, governed by reasons, and at every step, she takes her information to support her actions. She is in control of the process, and we can rightly evaluate her navigation as either skilled or unskilled.

The drifting raft, by contrast, represents a non-inferential sequence of thoughts. The raft is also moved by a series of causes: the push of the wind, the pull of the currents, a bump from a floating log. Its final position is causally determined by its prior positions and the forces acting upon it. However, there is no intention, no governance, and no recognition of reasons. The raft does not *take* the current as a reason to move south; it is simply moved. This is analogous to a purely associative or emotional chain of thoughts. For instance, the thought 'I have an important exam tomorrow' might cause a feeling of anxiety, which in turn causes the thought 'I'm going to fail.' While the thoughts are causally linked, the thinker may not be endorsing the first as a good reason to believe the second; rather, the transition is driven by an emotional, non-rational mechanism. The *taking condition* is absent.

Let us apply this to a clear case of inference from the literature. Consider a thinker who reasons: 'I always keep my ID either in my jeans pocket or in my wallet; it's not in my wallet; so, I must have left it in my jeans pocket.' This is a paradigm of deliberate navigation. The thinker holds the two

on epistemic norms.

¹¹ See Kahneman (2011) for a distinction between the concepts of 'person-level' a 'sub-level' activities.

¹² Boghossian's *taking condition* is influential but also faces significant debate. A primary challenge concerns whether the *taking* must be a conscious, explicit thought. Critics argue that this makes reasoning overly intellectualized and fails to account for inferences that seem more *automatic* or *implicit*. For example, McHugh and Way (2016) argue against the *taking condition*, proposing that reasoning is better understood as a process guided by appreciating reasons, which does not necessarily require a separate mental state of *taking* the premises to support the conclusion.

premise-beliefs. She actively sees that these two beliefs, taken together, provide decisive support for the conclusion. Finally, she forms the belief in the conclusion because she recognizes this support. The *taking* is manifest; she has guided her thoughts to a rational conclusion¹³.

This model of inference – as a person-level, reason-guided mental action characterized by the *taking condition* – provides the necessary standard for our critique. If the *Argument View's* Execution Thesis is correct, then the psychological process of conducting a thought experiment must meet this standard. It must be shown to be a case of deliberate navigation, not aimless drifting. As we will see, this is precisely where the *Argument View* fails.

4 Why Thought Experiments Are Not Inferences

Our central objection to the *Argument View* is that it rests on a fundamental category error. It mistakes the product of a cognitive process – a conclusion that can often be validated by a formal argument – for the process itself. Having established a philosophically robust, person-level account of inferential reasoning in the previous section, we will now demonstrate that the cognitive activity of engaging with a thought experiment fails to meet this standard. By examining the phenomenology of the experience, the psychological mechanics of the process, and the source of the resulting justification, we will show that thought experimentation and inferential reasoning are distinct epistemic kinds. This critique is fatal not only to the strong *Execution Thesis* but also to the more defensible *Reconstructibility Thesis*, revealing a flaw at the very foundation of the *Argument View*.

4.1 The Phenomenological Disconnect

The most immediate and intuitive problem for the *Argument View*, particularly its strong *Execution Thesis*, is its deep implausibility from a first-person perspective. There is a profound, qualitative difference between the experience of running a thought experiment and the experience of executing a formal inference. The *Argument View* requires us to believe that these two distinct phenomenologies are, at their core, the same cognitive process. This is not just a matter of subjective '*feel*'; the very structure of the conscious mental activity is different. To ignore this difference is to fundamentally mischaracterize the epistemic process at work.

Consider again the classic example of Galileo's refutation of the Aristotelian view that heavier objects fall faster. The process, as experienced by the thinker, is one of active, imaginative engagement. We begin by visualizing two distinct objects: a heavy cannonball and a lighter musket ball. We then mentally perform an action: we tie them together with a rope. The critical moment is what follows. We do not consult a set of abstract premises about mass, velocity, and composition; instead, we attempt to '*see*' what happens in this imagined scenario. A cognitive tension arises. This is not the abstract tension of logical contradiction but a felt conflict between two intuitive, *quasi-physical* expectations¹⁴. On the one hand, our experience suggests the lighter ball should act as a drag, slowing the cannonball. On the other, the composite object is now heavier and so, by the same initial intuition, should fall faster. The conclusion, that the Aristotelian theory is incoherent, emerges from this *quasi-observational* conflict. It seems that it is less like deducing a theorem from axioms and more like discovering a kind of glitch in a mental simulation we are running¹⁵. The

¹³ This clear case of reasoning corresponds to the valid deductive argument form known as a *Disjunctive Syllogism*. The structure is: (1) P or Q; (2) Not P; (3) Therefore, Q. This illustrates the relationship between the psychological process of inference and the abstract, logical structure of an argument which that process can instantiate.

¹⁴ This *felt conflict* is precisely what Daniel Dennett (2013) describes when he calls thought experiments *intuition pumps*. According to Dennett, they are not formal arguments, but rather carefully constructed stories designed to prime a thinker's intuitions, leading them to a particular conclusion by making one outcome feel more plausible than another. The power of Galileo's experiment lies in its ability to pump the intuition that the Aristotelian view leads to a physically absurd result.

¹⁵ The *mental models'* approach, developed by scholars like Nancy Nersessian (2007) and Nenad Mišćević (2007), posits that thought experimenting involves the construction and manipulation of a dynamic mental representation of a scenario, rather than the execution of a formal proof. On this view, the thinker reasons by simulating the behavior of the model, which allows them to *run* the experiment in

justification, from our point of view, is grounded in this imaginative engagement.

This phenomenological character is not unique to physics. Consider Searle's (1980) famous *Chinese Room* thought experiment. The power of the scenario comes from first-person identification. We are asked to imagine being the man in the room. We visualize the setting: the piles of Chinese symbols, the rulebook in English, the slots for input and output. We then simulate the activity: receiving a squiggle, looking it up in the book, and passing another squiggle out. The crucial insight arises from a direct question we ask our imagined self: 'Do I understand Chinese?' The answer, which feels immediate and self-evident, is no. The conclusion that syntax is not sufficient for semantics arises from this simulated experience of performing a task and finding a key element (comprehension) to be absent. This is a cognitive act of imaginative projection and introspection, not a formal deduction from premises about computation and meaning¹⁶.

To see the disconnect clearly, we can use an analogy: *navigating a city*. Executing a formal inference is like navigating with a map and explicit directions. The process is symbolic, and rule based. You are given a starting point (premises) and a set of instructions ('Turn left at Main Street', 'Proceed three blocks', etc.). A systematic approach inevitably ensures that the result leads to the desired conclusion if the underlying premises are correct and the applied rules of inference are sound. This process emphasizes the need to maintain logical coherence throughout the symbolic thinking process.

Running a thought experiment, by contrast, is like navigating by walking the streets. You are

placed within a simulated environment and must find your way through exploration. You're not following a pre-written itinerary. You're observing landmarks, testing routes, and developing an intuitive and holistic understanding of the city map. You're likely to discover a shortcut not marked on any map or realize that a promising path is a dead end when you hit an obstacle. The justification for your belief about the best route comes from this immersive, *quasi-empirical* exploration. An analyst might later be able to draw a map of the path you took and represent it as a series of logical steps, but that map is a *post-hoc* abstraction; it was not the tool of discovery¹⁷.

The *Argument View* requires us to believe that walking the streets is just a picturesque way of reading a map. It demands we treat the rich, dynamic, and quasi-sensory experience of Galileo's falling bodies or the first-person perspective of the *Chinese Room* as just the execution of a formal argument. This is phenomenologically false. For the person conducting the thought experiment, the *picturesque* details are the very substance of the cognitive event. They are the landmarks and pathways of the mental city we explore. To dismiss them as irrelevant is to ignore the manifest character of the epistemic journey itself¹⁸.

4.2 The Failure of the 'Taking Condition'

The Hearer's Context: When a hearer is presented with a thought experiment, it is highly unlikely they are executing an argument in any sense that would satisfy the taking condition. First, the premises of the underlying argument are often complex and, crucially, unarticulated. A hearer simply cannot *take* premises as support for a conclusion if they are not even consciously

their mind and observe the outcome, much like a scientist runs a computer simulation.

¹⁶ The reliability of the first-person intuition in the *Chinese Room* is the central point of contention in the extensive debate it generated. Critics, notably Paul and Patricia Churchland (1990), argue via the *Systems Reply* that focusing on the phenomenology of the man in the room is misleading. While the man (a single component) does not understand Chinese, the system as a whole (man, room, rulebook) might. This critique directly challenges the idea that the immediate, introspective result of the thought experiment is epistemically decisive.

¹⁷ This critique is closely aligned with the fundamental differentiation in the philosophy of science known as *context of discovery* versus *context of justification*, a distinction first articulated by Hans Reichenbach. We argue that the *Argument View* commits a category error by mistaking a tool from the context of justification (a formal, *post-hoc* reconstruction of an argument) for the actual process that occurs in the context of discovery (the imaginative, quasi-empirical exploration).

¹⁸ Contra Norton, who dismisses these details as *irrelevant particulars*, many philosophers argue they are epistemically essential. Catherine Elgin (2014), for example, argues that thought experiments function like works of fiction that *exemplify* properties and relationships, making them salient in a way an abstract argument cannot. David Gooding (1992) also emphasizes that these narrative elements help construct a *workable model* that allows the thinker to engage in a form of *vicarious experience* that is crucial to the experiment's success.

aware of what those specific premises are. When engaging with Judith Jarvis Thomson's (1971) famous violinist scenario, for instance, a person does not begin by assenting to a list of explicit moral principles ('P1: The right to life does not entail the right to use another's body without consent,' 'P2: Bodily autonomy is a fundamental right,' etc.) and then deducing a conclusion about abortion. They begin with a story. The moral judgment arises from contemplating the specific, concrete details of the imagined situation. The hearer is not inferring from principles; they are forming a judgment about a case, a judgment which might later be used to formulate or test principles. To take a premise is to endorse it as a reason, an act that requires one to first grasp the proposition itself. In most thought experiments, these propositions are simply not on the table¹⁹.

Second, inference as a rational process typically involves moving from *beliefs* one holds to a new belief. However, the starting point of a thought experiment is explicitly hypothetical; it operates on *supposition*. The hearer does not believe that a famous violinist has been surgically attached to her, nor does she believe there is a man in a room manipulating Chinese symbols he does not understand (Searle, 1980). She is asked to suppose or imagine these things²⁰. Supposition is a distinct mental state from belief, characterized by a provisional and unendorsed acceptance for the sake of exploration. It is therefore not at all clear that the *taking condition* applies in the same way. One cannot *take* a proposition one does not believe as a reason for a conclusion one is now

supposed to adopt as a genuine belief. The cognitive stance is wrong. The move from 'suppose P' to 'conclude Q' is not a standard inference, which moves from 'believe P' to 'believe Q'²¹.

The Speaker's Context: The failure of the taking condition is just as clear from the perspective of the creator of the thought experiment. The AV model implies that the speaker first devises or grasps a formal argument and then *dresses it up* in a narrative to make it more persuasive or digestible. This profoundly misrepresents the process of scientific and philosophical *discovery*. It is far more plausible that the narrative and the imaginative exploration are the very tools of that discovery²². Historical accounts suggest that many of Einstein's breakthroughs arose directly from his engagement with these imaginative scenarios – imagining a man falling from a roof or a physicist in an accelerating elevator (Norton, 1991)²³. The thought experiment was the engine of his insight; the cognitive tool he used to probe the limits of existing concepts.

To assume that Einstein *could have* simply presented a formal argument for the equivalence principle without the thought experiment is to assume he had access to that argument independently of the thought experiment itself. This reverses the causal and, more importantly, the epistemic order of discovery. The speaker often does not have the argument to execute until after the thought experiment has done its groundbreaking work. The formal argument is an *ex post facto* rationalization of the insight gained through the imaginative process²⁴. Therefore,

¹⁹ This line of argument presupposes a form of *epistemological internalism*, the view that the factors that justify a belief must be cognitively accessible to the subject. The claim is that because the premises of the supposed argument are not accessible, they cannot be what justifies the hearer's conclusion. An externalist, by contrast, might argue that the belief is justified by the reliability of the thought-experimenting process itself, regardless of whether the thinker can articulate the underlying logical structure.

²⁰ The broader epistemological debate on whether one can gain knowledge from false or merely supposed premises is complex and touches on issues of fallibilism and epistemic justification. For a recent discussion on the possibility of acquiring knowledge from falsehood, see Rodrigues (2017).

²¹ Philosophers like Timothy Williamson (2007) argue that our ability to reliably evaluate counterfactuals through imagination is a key source of modal knowledge. This process, however, appears to rely on different cognitive mechanisms than simply drawing out the consequences of what one already believes to be true.

²² This critique aligns with historical and cognitive models of scientific change, such as Thomas Kuhn's theory of *paradigms*. Kuhn (1962) argued that scientific breakthroughs, or *paradigm shifts*, often arise from anomalies that cannot be resolved by the inferential rules of the existing paradigm. The *discovery* of a new paradigm is often a creative, holistic insight – akin to a gestalt switch – rather than a step-by-step deduction from old premises. Thought experiments can be seen as tools for precipitating such conceptual shifts.

²³ The role of visual imagery and simulation in scientific thought is well-documented. In his book *Imagery in Scientific Thought* (1984), Arthur I. Miller provides detailed case studies showing how scientists like Einstein, Poincaré, and Faraday relied heavily on non-propositional, visual thinking to develop their revolutionary theories. This historical evidence strongly supports the view that the *engine of insight* is often imaginative rather than purely argumentative.

²⁴ The idea that a formal argument serves as a *post-hoc* rationalization aligns with the *Argumentative Theory of Reasoning* suggested

the creator also fails the taking condition during the crucial moment of discovery, as there is no *pre-existing* argument to execute. The process is not one of *exposition*, but of *exploration*.

4.3 The Problem with Reconstructibility

Faced with the overwhelming psychological and phenomenological evidence that people do not execute arguments when they run thought experiments, the proponent of the *Argument View* can make a strategic retreat. They can abandon the strong, psychological claim of the Execution Thesis and fall back on the weaker, more abstract *Reconstructibility Thesis*. This view concedes that the psychological process might be a *non-inferential heuristic* (a clever tool of discovery) but maintains that the justification for the conclusion comes from the objective, logical fact that a formal argument can be constructed *post-hoc*. This move, however, while avoiding the direct phenomenological objections, is epistemologically fatal²⁵. It creates two new, insurmountable problems: it severs the vital link between a subject and their justification, and it implicitly concedes the very point it seeks to deny – that the narrative elements of a thought experiment are epistemically indispensable.

First, the *Reconstructibility Thesis* creates a deep and troubling gap between the subject's cognitive process and the source of her justification, raising the *Accessibility Problem*. If the justification for a belief rests on a complex formal argument that the subject never consciously entertained, in what sense can the subject be said to be justified²⁶? This account makes the justification external and inaccessible to the very

person whose belief it is meant to support. The logical reconstruction becomes an epistemological post-mortem – it is a way for a third-party analyst to validate the conclusion, much like a coroner can determine a cause of death long after the event. But the coroner's report is not what killed the person, and the logician's reconstruction is not what justified the thinker in the first place.

This leads to a deeply counterintuitive picture of rational belief formation. A subject runs a thought experiment, arrives at a conclusion, and feels rationally compelled to believe it. According to the *Reconstructibility Thesis*, her feeling of justification is mistaken; her true justification lies in an abstract argument she has never seen and may not even be capable of articulating. Epistemologically, she is in a bizarre position: she holds a belief that is justifiable in principle, but for which she personally has no accessible justification. She has, in a sense, reasoned *blindly* (Boghossian, 2003)²⁷. This severs the vital link between a belief being justified and the subject's own rational activity, making the account of knowledge acquisition from thought experiments deeply mysterious and alienating.

Take the case of a mechanic very experienced that stands beside the car which is the engine running. She listens to the engine's operation, lets it hum for a brief moment, and then spontaneously makes a simple, precise technical adjustment that solves a problem no one else was able to diagnose. Her belief that "this specific adjustment is necessary" is entirely justified. An automotive engineer could later spend weeks creating a detailed computer model and a set of differential equations proving that, indeed, her adjustment

by Mercier and Sperber (2011). According to them, the primary evolutionary function of human reasoning is not necessarily to enhance individual knowledge and make better decisions, but to devise and evaluate arguments intended to persuade. On this view, an insight gained through an intuitive or imaginative process would naturally be followed by the construction of a formal argument to justify it to others.

²⁵ While framed here as a *strategic retreat*, proponents of the *Argument View* might contend that the *Reconstructibility Thesis* was always the core of their position. From this perspective, the claim was never about detailing the precise psychological steps of the thinker, but about the ultimate, objective grounds for the belief's justification. The focus is on what makes the conclusion true or warranted, which, for an empiricist like Norton, must be a reconstructible, non-mysterious argument.

²⁶ This critique highlights the crucial distinction between *propositional justification* and *doxastic justification*. A belief has *propositional* justification if there *exists* a good reason or argument for it. It has *doxastic* justification only if the believer holds the belief *because of* that good reason. The *Reconstructibility Thesis*, at best, secures propositional justification (an argument exists) but fails to explain how the thinker achieves doxastic justification, as their belief is formed through the imaginative process, not by grasping the formal argument.

²⁷ In *Blind Reasoning* (2003), Paul Boghossian examines cases where a person follows a logical rule without any appreciation for *why* the rule is valid or how it confers justification on their conclusion. He argues that such reasoning is epistemically defective. The charge here is that the *Reconstructibility Thesis* places the thinker in a similar position: she arrives at a conclusion via a process (the thought experiment) whose justificatory power is, on this view, opaque to her, as the *real* justification lies elsewhere in an unarticulated argument.

was the optimal solution. The *Reconstructibility Thesis* is analogous to claiming the mechanic's justification came from the engineer's equations, which she had never seen. This is absurd. The mechanic's justification came from her years of tacit knowledge and her well-honed diagnostic process²⁸. The engineer's proof validates her conclusion, but it is not the source of her justification. Similarly, a formal reconstruction validates a thought experiment's conclusion but is not the source of the thinker's original justification.

Second, by framing the thought experiment as a *heuristic* for grasping an argument, the Reconstructibility Thesis makes a fatal heuristic concession. Norton himself admits that the formal arguments that replace thought experiments "might well be harder to follow" (2004b, p. 50). This is not a trivial pragmatic point; it is an admission that the narrative form is performing an indispensable epistemic function. If the imaginative scenario is what makes a conclusion cognitively accessible to a thinker, then it is not mere dressing – it is the very vehicle of justification for that thinker.

This directly contradicts the elimination thesis. If removing the narrative makes the conclusion harder, or perhaps even impossible, for a rational thinker to grasp, then something of profound epistemic significance has been lost. The argument and the thought experiment are not epistemically equivalent for the subject. As Tamar Gendler (1998) has argued in her influential analysis of Galileo, the thought experiment has a cognitive and justificatory force that the bare formal argument lacks²⁹. The narrative elements are not eliminable because they structure the problem in a way that allows our specific cognitive faculties – visualization, pattern recognition, modal intuition – to engage with it and produce a justified belief. By admitting the narrative is a necessary heuristic, the AV proponent implicitly concedes

that the narrative is doing genuine, ineliminable epistemic work, thereby collapsing the central pillar of their own view. If the *picturesque details* cannot be eliminated without epistemic loss, then the thought experiment is not *just an argument*. It is something more.

5 Thought Experiments as Tools of Imaginative Discovery

Having shown what thought experiments are not – namely, disguised inferences governed by the *taking condition* – the question arises: what, positively, are they? Our critique would be incomplete, and potentially misleading, if it merely established a negative result. The claim that thought experiments are not arguments might suggest they are epistemically suspect, perhaps mere rhetoric or psychological manipulation. But this would be to swing too far in the opposite direction. Our thesis is not that thought experiments fail to generate knowledge or justification, but that the *mechanism* by which they do so is irreducibly different from inferential reasoning. In this section, we offer a positive, if necessarily sketch-like, characterization of thought experiments as complex epistemic instruments whose power flows from three interlocking features: their *quasi-observational* character, their *narrative structure*, and their role in the *context of discovery*.

The first and most distinctive feature of thought experiments is their *quasi-observational* character. When a thinker runs a thought experiment, she does not deduce a conclusion from propositions she already endorses; she *observes* what happens in a simulated scenario. The outcome is not willed or derived; it is, in a phenomenologically significant sense, *discovered*. Galileo's thinker does not calculate the falling rate of the composite object; she notices a tension, a kind of conceptual friction that resists resolution within

²⁸ The mechanic's skill is a paradigm case of what the philosopher Michael Polanyi (1966) termed *tacit knowledge* – knowledge that we *know more than we can tell*. This form of justification is rooted in experience, intuition, and embodied skill, and it resists full articulation into a set of explicit propositions or rules. The analogy suggests that thought experiments may provide justification via a similar, *tacit* grasp of principles, which is distinct from the *explicit*, propositional knowledge represented by a formal argument.

²⁹ Gendler's (1998) argues that the thought experiment allows for a form of *structured pre-empirical reasoning* where the narrative details enable the thinker to mobilize a rich set of background beliefs and sensorimotor knowledge in a controlled way. By imagining a concrete scenario, the thinker can grasp the implications of a physical principle with a force and clarity – what Gendler calls "*representational force*", that a purely formal argument lacks. This makes the narrative an ineliminable part of the justification.

the Aristotelian framework. Searle's thinker does not prove that syntax is insufficient for semantics; she finds, upon imaginatively inhabiting the room, that understanding is simply absent. This quasi-observational quality explains why thought experiments can genuinely surprise us – a feature that is structurally impossible for a well-formed deductive argument, whose conclusion is already implicit in its premises. The capacity to generate cognitive surprise is a mark of something epistemically irreducible to inference.

The second feature is the epistemic indispensability of *narrative structure*. Arguments are best presented stripped of particulars: their logical force is enhanced, not diminished, by abstraction. Thought experiments are precisely the reverse. The particular details (the violinist's identity, the color of the cannonball, the English rulebook in Searle's room) are not decorative; they are constitutive. They do not merely make the scenario vivid; they constrain the simulation, determine which background beliefs are activated, and shape the phenomenological 'feel' of the result. As Gendler (1998) has argued, these narrative particulars allow the thought experimenter to mobilize a rich body of sensorimotor and modal knowledge that no abstract propositional list could replicate. The narrative is, in this sense, the vehicle of epistemic access: it is what gives the thinker 'grip' on the conceptual terrain. This is why, as we argued in section 3.3, the elimination thesis is not merely false but incoherent: to eliminate the narrative is not to preserve the thought experiment in purer form, but to destroy the very mechanism by which it works.

The third feature concerns the ontological distinction between the *context of discovery* and the *context of justification* (Reichenbach, 1938). The *Argument View*, by treating thought experiments as arguments, systematically assimilates the first context to the second. It treats the cognitive process by which a thinker arrives at a new insight as if it were structurally identical to the logical procedure by which that insight is subsequently validated and communicated. This conflation is not merely a technical error; it reflects a deeper

misunderstanding of the phenomenology of thinking. There is a genuine ontological difference between the lived experience of intuitive grasping, the moment of discovery in which a scenario is 'run' and its implications 'seen', and the reflective, second-order activity of constructing an argument to justify what one already knows. The former has the character of unveiling; the latter, of demonstration. Thought experiments, at their best, belong paradigmatically to the first register. They are instruments of conceptual revelation, not logical proof.

This positive characterization clarifies the scope of our critique and the claim embedded in the revised title. To say that thought experiments are *more than* arguments is to say that they constitute a sui generis epistemic category – one that can accommodate the subsequent construction of a formal argument as a tool of justification and communication, while being irreducible to it. The formal argument that might be reconstructed *post hoc* is a valid tool of justification and communication; it is not, however, the cognitive act that generated the insight, nor is it the primary source of the thinker's original justification. The mountain map is useful; but it is not the climb. Recognizing this distinction is not a concession to irrationalism or mysticism. It is, rather, a demand for a more cognitively realistic epistemology, one that takes seriously the full range of epistemic activities through which human beings actually come to know the world.

6 Conclusion

This paper has presented a critical evaluation of the *Argument View* (AV) of thought experiments, contending that this widely accepted perspective, despite its logical appeal and parsimony, fundamentally misinterprets the nature of these cognitive tools. The core of our critique is that the AV commits a profound category error by treating the *outcome* of a cognitive process as equivalent to the process itself. By equating thought experiments with mere arguments that can be formally reconstructed, proponents such as John Norton fail to distinguish between the

abstract, atemporal, and structured nature of a logical argument and the vivid, dynamic, and psychologically immersive process of imaginative exploration that defines a thought experiment. Our analysis reveals this conflation to be untenable. To claim a thought experiment is an argument is akin to claiming that the arduous, experiential process of climbing a mountain is identical to the cartographical map that depicts its route. While the map is a valid, static representation of the journey's logic, it cannot capture the discovery, the physical struggle, or the panoramic perspective gained from the summit. Similarly, the AV's focus on the reconstructable argument overlooks the very cognitive work that makes the thought experiment a powerful engine of discovery, thus proving inadequate in explaining how these imaginative scenarios genuinely contribute to knowledge and justification.

Our critique's foundation is a rigorous philosophical criterion, rooted in Paul Boghossian's concept of the *taking condition*, which serves to define genuine inferential reasoning at the personal, conscious level. We have demonstrated that the cognitive activity involved in conducting a thought experiment fails to meet this crucial standard. An inference, properly understood, requires a thinker to consciously *take* their premises as providing *support* for their conclusion. This essential experiential quality is conspicuously absent in thought experimentation. When engaging with a thought experiment, one does not begin by accepting a set of premises as reasons; rather, one constructs a scenario and observes what unfolds, often with a sense of surprise. The conclusion emerges not as a willed deduction but as a discovery revealed through the mental simulation. This epistemic *gap* exists for both the *originator* of the thought experiment, whose justification arises from this act of imaginative insight, and for the *recipient*, who is invited not merely to check a proof but to perform the imaginative act themselves.

Furthermore, we argued that even the most robust and defensible form of the AV, the *Reconstructibility Thesis*, ultimately falls short. By positing that the justification for a thought experiment's

conclusion lies not in the experiment itself but in a formal argument that can be constructed *post-hoc*, this view creates a problematic gap between an individual and their justification. It implies that the person who first has the imaginative *insight* is not truly justified until it is formalized, an intuitively implausible picture of knowledge acquisition that alienates the thinker from their own cognitive achievement. Moreover, in conceding that the thought experiment is often an indispensable heuristic for discovering or making an argument persuasive, the *Reconstructibility Thesis* undermines its own core *elimination thesis*. If the imaginative narrative is necessary to produce the insight, then it is performing unique and ineliminable epistemic work, proving it is far more than just decorative wrapping around a logical core.

The shortcomings of the *Argument View* have broader implications, urging us to transcend a solely logical analysis and embrace a more cognitively realistic epistemology that acknowledges the experiential reality of thought experiments. The narrative, simulative, and quasi-observational aspects of thought experiments are not incidental embellishments or heuristic crutches, as the AV implicitly suggests. They are, in fact, fundamental to the epistemic function of the thought experiment itself. The narrative provides the essential framework that constrains the problem, guides the simulation, and allows our cognitive faculties to engage with complex concepts in a controlled environment. The simulative quality enables us to manipulate variables and explore counterfactual worlds, while the quasi-observational nature of the outcome – the sense that we are '*seeing*' a conceptual truth – is what lends these experiments their compelling psychological and justificatory force. A comprehensive epistemology must recognize how these characteristics are not only psychologically persuasive but are also integral to the justificatory process, forming the very mechanism by which we gain new knowledge.

By demonstrating that thought experiments differ from arguments in motion – that is, in their procedural and phenomenological character – we pave the way for a more nuanced and psycholo-

gically realistic comprehension of these powerful cognitive instruments. The goal is not to deny that thought experiments possess a logical structure or that their conclusions can be rationally defended. Instead, it is to insist that their epistemic power and unique contribution to human inquiry stem from a distinctively human ability for structured imagination. Although the results of thought experiments can be articulated through formal logical structures, the primary epistemic impact of these experiments depends on a cognitive process that, despite its creative aspects, is subject to a certain degree of rigor. Beyond the restrictive definitions of the argumentative view, thought experiments are recognized not simply as imperfect, partial, or disguised arguments, but as complex and important cognitive tools that play a crucial role in discovery and reasoning, both in scientific research and in philosophical discourse.

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