University of Tartu

Institute of Philosophy and Semiotics

Body Schema: A Solution to the Epistemic Dilemma of Constrained Imagination

Bachelor's Thesis in Philosophy

Mark Fogel

Supervisor: Uku Tooming

Characters: 59 911

Tartu

2025

Table of Contents

Introduction

The ability of imagination to generate and/or justify knowledge is one of the key topics in contemporary philosophy of mind, philosophy of imagination, and epistemology. Historically, it has been assumed that imagination lacks epistemic power, meaning that it cannot serve as a source of reliable knowledge or play a non-trivial role in its justification. However, several modern philosophers like Amy Kind challenge this view. In her work "Imagination under Constraints", Kind proposes a new framework, arguing that under certain conditions (the reality and change constraints), imagination can not only enrich our understanding of the world but can also play a role in the justification of beliefs.

Critics of this and similar frameworks, Arnon Levy and Ori Kinberg, present a dilemma: if the constraints on imagination are applied explicitly (e.g., as formal rules), its epistemic role collapses into trivial hypothetical reasoning; but if the constraints are implicit, the mechanism by which they operate remains unexplained, which leads to skepticism about the very possibility of the epistemic power of imagination. In this thesis, I argue that the second horn of the dilemma can be refuted by appealing to the concept of the body schema. This pre-reflective sensorimotor system governs bodily movement and physical interaction with the environment. I claim that action-oriented imagination, grounded in the body schema (e.g., imagining physical actions such as jumping or moving through space), is automatically governed by realistic constraints, thus avoiding any need for a mysterious or unexplained mechanism.

This thesis is structured as follows: In the first section, I present the theoretical background through the lens of Amy Kind's work, including the historical reasons for skepticism about the epistemic power of imagination. In the second section, I outline Kind's framework, explaining her proposed constraints and how they are meant to allow imagination to yield or support justified beliefs. In the third section, I introduce the critical argument by Kinberg and Levy, presented in the form of a dilemma, and show why it poses a significant problem for Kind's position. In the fourth section, I offer a response to the dilemma by rejecting its second horn, using the concept of the body schema. I argue that pre-reflective sensorimotor processes provide natural and non-mysterious constraints on imagination. I will also address a potential counterargument concerning the limited scope of my defense of Kind's view. In the last section, I conclude my work by summarizing the key claims and results of the thesis.

1. Imagination and Its Epistemic Power

Imagination is a cognitive process that people use every day. The definition of imagination remains a subject of debate among researchers from various fields. Several definitions have been proposed. However, despite this disagreement, most people agree on how this cognitive process manifests. Thyse functions include mind-reading, creativity, figurative language, daydreaming, and many others. However, despite the wide range of processes in which imagination unfolds, many philosophers have long held the view that, despite the distinctive abilities of imagination, it is incapable of providing new knowledge to individuals. In other words, that imagination lacks epistemic power.

In her article “Imagining Under Constraints,” Amy Kind discusses this issue, recalling Hume, who stated that a person is nowhere freer than in their imagination. However, this freedom itself is a serious basis for the skepticism being addressed here. Even though imagination plays a vital role in modal epistemology (here, it can be understood as imaginative projects with forms like "As if...,” “What if...,” and similar), it cannot provide non-modal knowledge. Kind, disagreeing with this conclusion, sets herself the task of refuting this skepticism. She points to three properties of imagination that are responsible for the skepticism towards the epistemic power of imagination (Kind 2016, p. 2). These properties are as follows:

1. Imagination is under voluntary control.

This property is problematic because the imaginative project[1] is directly created by the person imagining it. This means that the person imagining is free to develop the imaginative project, arbitrarily and independently, determining which objects, conditions, and consequences to include, according to their preferences or at least their representations and interpretations of the added contents. This results in the project not necessarily being required to take into account reality and verified facts or truths[2]. It is precisely this lack of objectivity that raises doubts about the epistemic power of imagination, undermining its potential to produce reliable knowledge.

[1] Imagined project refers to a structured exercise of the immersive/episodic imagination wherein an agent simulates how a particular scenario might unfold under specific conditions.
[2] The laws of gravity or the law of non-contradiction, for instance

2. Disconnection from reality.

The second property is closely related to the first. Since the content of the imaginative project is created by the individual rather than by the world and external stimuli (as in the case of perception), it is difficult for the conclusions and inferences drawn from imagination to necessarily align with the real world. Consequently, the results derived from imagination, while initially appearing plausible or adequate, may end up significantly diverging from the facts of the real world.

3. Imagination is uninformative.

This property refers to the fact that imagination cannot provide us with new information since the content of imagination consists of what the individual has already placed there. Kind used a quote from Sartre, which succinctly explains the essence of this property: "Nothing can be learned from an image that is not already known." (Sartre 1948, p. 12).

If we now examine the epistemic relevance of imagination in light of these properties, it may seem that skepticism towards imagination has a very strong case. However, Kind disagrees with the conclusion drawn from these properties of imagination, arguing that a greater number of epistemically significant imaginings take place in people's everyday lives. For instance, parents' use of imagination to decide on the advisability of having a child[3] might be an example. In this case, they may imagine their state after sleepless nights with a crying baby, but also moments of pride when the child achieves meaningful goals. Among other examples are many cases of epistemically significant imagination, ranging from choosing a new car— attention is directed, for example, to its dimensions to ensure it fits in the garage and the interior design, e.g. to the materials that are easier to clean—to imagining the selection of toys and literature aimed at developing specific necessary qualities and skills in the child. Kind argues that when considering such examples, it becomes clear that imagination holds epistemic significance. This conclusion follows from the fact that imagination largely determines what we want, can, and should do, thereby shaping our beliefs (and decisions on their basis), which in turn demonstrates imaginings as having a justificatory force. In other words, considering her examples, imagination holds epistemic significance because it simulates actionable scenarios.

[3] Referring to L. A. Paul's critical work, Kind clarifies that it makes sense to specify the decision to have a second child, which would be epistemically more accurate due to the experience of having the first. In Paul's view, it is noted that it is impossible to make a well-considered and rational decision about having a child if a person has not had one before. Presumably, this is the case because subjective values intervene in the decision-making process, influencing the preferences of the imaginer(Paul 2014, p. 83).

These imaginings generate hypothetical experiences that can inform beliefs about what is possible, desirable, and feasible, providing reasons to accept or reject propositions (Like „I can handle parenthood“, for example) and thereby granting imagination justificatory force.

Although the aforementioned examples may suggest such a conclusion, they are primarily descriptive and do not adequately explain how imagination can have epistemic value, even within the proposed cases. Due to this, Kind introduces her framework of constrained imagination, which aims to identify the conditions that can guarantee or enhance the epistemic strength of imagination. In the next section, I will discuss these conditions and the general principles of the framework, also demonstrating how, in Kind's view, this approach overcomes the previously outlined problems.

Before turning directly to Kind's framework, I would first like to mention the so-called "Black box" arguments. These arguments also take a positive stance toward the epistemic power of imagination. Within its scope, various authors often present examples of everyday uses of imagination, where people imagine certain spatiotemporal scenarios to mentally unfold a physical event. For example, one might imagine whether a piece of furniture could fit through a doorway (Dorsch, 2016), or whether a tower of bricks is likely to collapse (Myers, 2021). The authors suggest that people frequently arrive at reliable answers to such questions through imagination. Arguments of this kind show that imagination has epistemic significance, regardless of the exact mechanism through which it gains that significance, thus keeping the "box sealed". Kind also uses similar examples, but through her framework, she enables us to "open the box" and demonstrate how imagination achieves its epistemic relevance.

2. Imagining Under Constraints

Before moving to the framework itself, it is worth mentioning that Kind's project does not depend on any particular theory of imagination. As she writes herself: "(...)I rely only on the assumption that imagining involves a more active effort of mind than does supposition or entertaining a proposition..." (Kind 2016, p. 4). Kendall Walton also suggests that imagination "is doing something with a proposition one has in mind." (Walton 1990, p. 20). Another widely accepted and intuitive way of explaining it is that imagination allows us to behold what is not present.

It is also important to explain more thoroughly what epistemic significance means in the context of Kind's project. Despite the popular denial of imagination's justificatory role among philosophers, referring to this role with respect to people's contingent beliefs about the world, there is some consensus on imagination's ability to enhance/accelerate the memory of humans.[4]. For instance, when someone imagines what things she wants to take with her on a cruise, she suddenly remembers that she imagined her favorite sunglasses were broken, and she needs to buy new ones. But she might also imagine glueing the old glass from broken glass to another one, coming up with a new creative idea through imagination, which also seems like a really normal and usual consequence of imagining – creative outcomes. There seems to be no problem with the idea that imagination might generate different beliefs about the world. What Kind's opponents argue is that imagination cannot justify (and even play a role in justifying) such beliefs. Thus, epistemic significance in the context of these debates means imagination's capacity to justify or play a justificatory role in justifying beliefs, not just generating them.

This allows Kind to argue that there is a possibility to separate epistemically significant imaginings from insignificant ones on the basis of their justificatory capacity, that is directly tied to the constraints.

Furthermore, in her work, Kind presents two examples of significant use of imaginative projects with a high justificatory role and success. Kind writes in her work about the inventor Nicola Tesla, referring to his extraordinary inventions created with the help of the remarkable powers of visualization, allowing him to test his inventions in his imagination, realizing them later in the real world without any problems. Temple Grandin was an animal scientist who also

[4] Contingent in this context refers to the beliefs about some state of affairs being the case or not the case.

created different designs by imagining them and testing them within her imagination in different weather conditions, with varying breeds of animals, and so on. Truthfulness and factual status of these cases might be debatable in fact, and it will be explained further, but they are still important theoretically, as they might be a demonstration of the "Ideal imagination", or, rather, cases that are seemingly really close to it.

The notion of ideal imagination Kind draws from Campbell's sci-fi story "The Last Evolution," where superintelligent machines are taking care of human needs. Imagination exercised by machines is ideal, meaning that conclusions made on the basis of it concern not only metaphysical possibilities but also contingent facts about the world. The key difference from human imagination in this context, as Kind puts it, is in the fact that the imagination that machines are using is not creative (where the imaginative project is disconnected from reality) but "reality-guided".

This means that their imaginings are closely guided by reality, which includes all the relevant objects, events, causations, and so on. Kind provides an example of how „(...) the machines employ imagination to stave off the impending alien attack that threatens Earth and all its occupants" (Kind 2016, p. 8). She points out that the importance is not just in the concern of the metaphysical possibility of the occurrence of such events, but in figuring out what actions or courses of events can and will actually prevent the attack. To do so, machines must imagine alien forces, their own defensive systems, and other relevant aspects as they actually are.

Besides that, the imagined project itself requires machines to imagine all the relevant changes in the world as the imaginators believe them to be. Imagining all the relevant changes thus should govern how the imagined scenario would unfold over time, demanding the imagined project to contain plausible causal relations, which reflect our best understanding of how the events would (at least typically) unfold in the real world. This guarantees the fixation of the logical consequences within the imaginary project, where the world is somehow changed. These two aspects, which Kind calls the *reality constraint* and the *change constraint*, can be seen as constraints imposed upon imagination.

2.1 Reality and Change Constraints

Let us consider the example where Tom imagines meeting with his friend tomorrow at 16:30, even though his workday ends at 16:00, and he must consider the best way to get to his friend

on time. Let us assume that the reality constraint that he applies to his imaginative project is sabotaged for some reason. In that case, Tom might imagine that he takes a suit from his closet at work, puts it on, then heads out from his workplace at 16:05 and goes to his friend's place using the specific route because the usual one is closed due to maintenance. The reality constraint is not fulfilled since the imagined suit is actually not in the closet but was thrown out by him a few weeks ago. Even though the imaginative project is not successfully governed by the reality constraint, there are no clear reasons to assume that the same project violates the change constraint. The latter is satisfied because the imagined sequence unfolds in a coherent and causally plausible way. This suggests that when some relevant aspects of the imagined project are not governed by the reality constraint, it can still exhibit internal coherence. It can still provide epistemic value, which in this case is realized in helping Tom assess time management, route selection, and other preparatory things.

Now, consider another example, but let us assume that the change constraint is not met, while the reality constraint is. In this case, a person is desiring to finish his thesis faster. He knows that he is working on a laptop for 3 hours every day, getting around 1000 words. He might imagine that if he worked on a better high-end laptop for 4 hours a day, then he would get at least 5000 words per day. In this case, the reality is met: the student accurately imagines the situation, regarding his current productivity, realistic access to a better laptop, realistic desire to improve his work results, and other things. However, the change constraint is not violated, since the imagined increase in productivity is disproportionate and clearly lacks a plausible causal grounding. The high-end laptop still might make his work more comfortable and productive, increasing his writing efficiency, but imagining it alone increases his output in five times seems to be stretching the realistic boundaries of the change expectation. Nevertheless, the epistemic relevancy is not entirely lost. The whole imaginative process can still help him to consider the role of motivation and comfort, the relation of productivity and used technology and environment, along with other insights. That might lead him to a justified belief that by changing the used technology or the conditions where he works, he can increase his writing efficiency. Even though the change constraint is not met/fulfilled, there is no reason to assume that the reality constraint would be violated, and the whole imaginative project would be epistemically valueless.

These examples show two important things. Firstly, these constraints are differentiated from one another, and failure to fulfil one doesn't necessarily mean that another one is also violated. Secondly, in fact, imagination does not have to imagine all and only things/situations in reality

and the effects that the changes there would make. In the first case, the fact that reality constraint was not able to fix the world exactly as it is did not in any way restrict the imaginer from getting imaginings with epistemic significance. The second case demonstrates that violation of the change constraints does not mean inability of imagination to lead to some kind of relevant justificatory outcomes. Sometimes, it might be even useful to over-/underestimate some aspects of reality in imagination, as is the case where someone, for instance, imagines what clothes would be more reasonable to take on a hike in the mountains in Norway (imagining it much colder than it is). Despite this imagining not being completely accurate, it still grants justification to the imaginer's beliefs regarding the clothes of choice. If the gear with protection from cold up to -10 °C is imagined and considered to be good, it will be good in the real world, even if real temperatures don't go below -5 °C in that place.

Even though this example might seem as possibly problematic, because the person might feel hot on the hike, the basic idea behind this example should be clear, demonstrating one of the ways people usually justify some decisions through imagination, which leads to the actions according to the outputs of imagination. Another important insight that can be derived from the examples presented earlier is that constraint satisfaction is not an all-or-nothing matter. But the more these constraints are met, the more epistemically powerful the imaginative project becomes.

Kind also presents an analogy to perception, suggesting that: "Though ideal perception requires that our perceptions represent the world exactly as it is—that they meet a reality constraint for perception—we can still learn about reality from many perceptions that fall short of the ideal." (Kind 2016, p.12); and "Likewise, though ideal imagination requires that our imaginings satisfy the reality and change constraint, we can still learn from imaginings that fall short of this ideal." (Kind 2016, p.12-13).

2.2 Constraints as Non-Sequential Processes

The last important thing related to constraints worth mentioning is that these constraints are not operating sequentially, where one is operating prior to another. Kind brings up the tempting intuition to assume that the reality constraint is executed prior to the change constraint. She offers to view ideal imagination as involving three distinct steps, which are: (1) We imagine the world (or some part of it) as it is; (2) we make one or some targeted changes as governed by our overall imaginative project; (3) we adjust our imagining appropriately in light of all and

only the consequences of the changes made (Kind 2016, p. 10). Kind suggests that the difference between these steps is not temporal but conceptual. Even though some of the steps might occur at once, like in the case of (1) and (2), step (2) may also be partly doing step (3) and so on, they all envelope simultaneously revising and enhancing each other during the development of imaginative projects.

Now, all of the important aspects of the constrained imagination framework are presented. The whole framework can be considered as an answer to the question "How is epistemic relevance achieved in imagination?" by proposing a set of constraints to keep the imagination under control. While imagining, one must be fairly concentrated and strongly desiring to get things right, representing everything as correctly as possible. This goes for both of the constraints. If one succeeds in doing so, then it is highly likely that one cashes out epistemically relevant imaginings as justified beliefs, or as a means of justifying them. And again, even though humans are not like Tesla or Temple Grandin, and surely not like Campbell's robot possessing powers of ideal imagination, if in our imaginings we can get as closely as possible in constraining reality and the changes, the more closely to ideal imaginators we become.

The following section will be dedicated to the critical line by Levy and Kinberg. Their critical argument took the form of a dilemma, where the first horn suggests that the presented framework is trivial and the resulting knowledge comes not from imagination but rather from hypothetical reasoning. The second horn suggests that otherwise, the constraints remain mysterious, explaining nothing about the process of creation of epistemic relevance.

3. The Dilemma Threatening Constrained Imagination.

In their work "Epistemic Imagination Revisited", Levy and Kinberg present a few challenges to the positively tuned accounts regarding the epistemic powers of imagination of „Black box“ arguments proponents and Kind's constraint-based framework. In this section, I will present the main lines of arguments against epistemic powers of imagination, namely arguments against the Black box and Constraints, finishing with Levy and Kinberg's argument in the form of a dilemma.

Before moving on, a few things need to be clarified. Firstly, Levy and Kinberg also do not presuppose any theory of imagination. They point out the common distinction between *suppositional* and *immersive*[5] imagination (Levy & Kinberg 2023, p. 4). The former refers to the imagination in a weaker sense, where we imagine whenever we take some proposition under consideration without presuming its truth. The latter refers to the imagination in a richer sense, referring to the cases of imagining involving some mental sensory-like experience or images (or quasi-experience of any other modality) in which we immerse ourselves. After mentioning this distinction, Levy and Kinberg point out that the main kind of imagination under consideration in their work will be an immersive imagination (And also other authors in the context of this debate, including Kind), claiming the suppositional imagination to be „plain old hypothetical reasoning“.

Levy and Kinberg have a similar approach regarding an epistemological position. The authors clearly state that the challenges they present don't require them to take any particular stance[6] because regardless of that, the argument presented by them still poses a challenge to the positions critiqued. What they still do is draw attention to their assumption that „reliability matters for knowledge, at least insofar as lack of reliability can defeat knowledge“ (Levy & Kinberg, 2023). Both of these clarifications regarding their stance on imagination and knowledge are also important for highlighting that the matter in question in their work is not whether the imagination is somehow involved in knowledge acquisition. What is important is the question regarding the „warrant-providing“ role of the imagination. This is a really important point that plays a crucial role in making the dilemma presented to the constrained framework formulated by Kind. If the primary focus is on the capacity for imagination to

[5] This distinction is also often presented using terms propositional (for suppositional) and episodic (for immersive).
[6] The debate between internalism and externalism, to be more precise.

secure knowledge, then the effects of the dilemma can be devastating for the plausibility of Kind's work. But before moving to the dilemma itself more thoroughly, let us inspect briefly the „Black box" arguments and their critique, followed by an analysis of the constrained framework from Levy and Kinberg's perspective.

Levy and Kinberg refer to the "Black box" arguments as suggesting that the imagination is reliable without worrying about how exactly it attains reliability. Examples that are often presented by the proponents of this approach are related to imagining the unfolding of different spatiotemporal events. Levy and Kinberg argue against this by introducing a lot of theoretical and experimental work showing that humans' intuitive physics is prone to errors and biases. Intuitive physics refers to the ability to predict simple physical events. Since these types of arguments are not directly analyzed in my work, mentioning them is important to demonstrate that just appealing to the everyday cases with seemingly plausible examples of epistemically significant imagination is problematic. Existing evidence suggests that the many examples put forward by the proponents of the „Black box" arguments belong to the same group of tasks that are being studied in the intuitive physics research. Levy and Kinberg present some experiments in intuitive physics where the design of the tasks resembles examples provided in the „Black box" style arguments (Levy & Kinberg 2023, p. 7). Skeptical conclusion drawn by Levy and Kinberg can be concluded in the note of Dennis Profitt's work on the related topic: "The wheel is one of the simplest and most commonplace extended body systems encountered in our culture. Be that as it may, common-sense intuitions about its dynamical properties in extended body contexts are terribly muddled (Proffitt et al., 1990, p.371)".

Another example of the „Black box" arguments that are also used by Kind, are the aforementioned cases of extraordinary imaginative capacities documented throughout history, including Tesla and Grandin. Levy and Kinberg focus on the examination of Tesla. As previously noted, Kind presented Tesla as an example of someone with exceptional abilities to mentally simulate his inventions with great precision, which later allowed him to successfully bring his plans to life. Examples like this are intended to support the idea that imagination can produce new knowledge or confirm it. However, upon closer inspection, Tesla's own records reveal certain inconsistencies, and he himself acknowledges various kinds of failures in his early work, as well as in some of his later efforts. Thus, even the "best-case" example put forward by Kind and some other philosophers proves to be problematic. Both types of examples—those of everyday cases and of individuals with extraordinary abilities—lack sufficient plausibility to suggest that imagination in itself truly possesses the epistemic power

that the proponents of these arguments claim. The epistemic outcomes of both examples seem opaque and/or unpredictable, paving the path for skepticism in the reliability of imagination, which remains mysterious. Since imagination by itself is vulnerable to various kinds of problems (as previously discussed), Kind's project, as she suggests, offers a way to rescue the epistemic potential of imagination.

3.1 Levy & Kinbergs Trivialization Horn

According to Kind, her framework of constrained imagination shows when and how imagination can have a justificatory role, revealing imagination with higher epistemic significance than it was historically considered, viewing imagination as a viable source of justification, or having the capacity to play a role in justifying beliefs.

To repeat, there are two constraints that can be taken to suffice for an imaginative process to justify its output. The reality constraint is needed for an imaginative project to „set up the scene" that involves an accurate reflection of the states of affairs essential for the epistemically relevant output. Meanwhile, the reality constraint serves the role of abiding by all the causal relations that ideally should mimic real-world occurrences. These two constraints, while working in tandem, allow imagination to begin in the close-to-reality point, developing then into the scenario that is of the main interest to the one imagining. Thus, if correctly (or, rather, ideally) executed, this process should allow the imaginer to track how events in the real world would unfold.

Kinberdg and Levy also note that „(...)'reality' and 'change' do not name specific principles but function as labels for the sorts of conditions that would be required in order for an imaginative project to be epistemically successful."(Levy & Kinberg 2023, p. 13). While the specifics weren't sufficiently unpacked, as Levy and Kinberg claim, they highlight the main line of thought taken by the proponents of the constraints-based (and not only). Namely, that imagination can lead to knowledge if it stays „truth-preserving". This means that if the inputs of the imaginative project are correct, then the output will also be correct. To put it more generally, this idea suggests that the imagination is capable of providing us with knowledge under some circumstances, denying the opposite claim that can be stated as an „up-to-us challenge. " The challenge suggests that imagination cannot grant any knowledge since the contents of the imaginative project are determined solely and voluntarily by the agent imagining. Constraints-based account denies this challenge by providing the mechanism for

overcoming the problem, showing that imagination does not have to be necessarily of a „creative“ kind, where the one imagining is not guided by any rules (the only rule is to make a new one whenever you need).

But these types of claims are not the ones Levy and Kinberg are objecting to. They clarify that their objections are unrelated to this particular issue. The possibility of the scenario where imagination may grant knowledge is not the thing in question, but the nature of the resultant knowledge is.

This allows Levy and Kinberg's argument, which took the following form: „Our argument takes the form of a dilemma: we suggest that if the constraints underlying our imaginative exercise are followed explicitly (and, we suppose, intentionally), then the resulting knowledge is a product of a familiar process, namely hypothetical reasoning. Otherwise, the constraints remain mysterious, and we seem to be back in black-box argument territory.“(Levy & Kinberg 2023, p.14). In other words, the first horn of the dilemma is trivializing the role of imagination in the process of knowledge acquisition through it.

If we assume that imagination is explicitly guided in a way that reliably leads to truth/knowledge, it is not imagination that does the „epistemic work“. It is rather logic, prior knowledge, and hypothetical reasoning in general. Thus, if constrained imagination is seen as epistemically significant, then it is not distinct from the ordinary forms of hypothetical reasoning. The generated knowledge becomes indistinguishable from simulation and/or hypothetical modeling, which are governed by reasoning and inference. Imagination, in this case, serves a role similar to paper, where someone is solving, or a map, where someone is trying to come up with the fastest route from point A to point B. Imagination, along with offered examples, plays the role of an arena where the epistemically significant processes unfold. However, imagination itself is not significant in this context.

Levy and Kinberg argue that the constraint-based framework confusingly grants epistemic credit to the wrong processes. The constrained setup of the imaginative project just allows us to put forward some propositions of interest and explore whether their interplay leads to some consequences. What is really important is the quality of the inferences applied within the imagination, but not the imagination itself. As Levy and Kinberg suggest, it would be absurd to claim one acquires knowledge of the fastest route through the map itself, as presented in the last example. Instead, the knowledge comes from the reasoning applied using the map. The

same goes for the imagination, where epistemic work is carried out by the inferential processes occurring within the imaginative project, but not by imagination as such. In such cases, imagination just hosts the process, but it does not drive it epistemically.

3.2 The Mystery Horn

On the other hand, the second horn of the dilemma is equally problematic, stating that if the processes remain distinctively imaginative, the constraints do not sufficiently explain or guarantee the outputs' reliability. Kind was trying to implement analogies with computer simulations in her reasoning. Imagination's alignment with the simulation might seem reasonable because imagination's epistemic capacity can easily be akin to computer simulations if the imaginative project is executed under appropriate constraints. As Kind writes herself: "[o]nce we accept that computer simulations can provide us with justification for beliefs, it becomes very hard to deny that imaginative simulations can do so as well."(Kind, 2018). But, shortly speaking, the main line of argumentation against the relevancy of these types of arguments in this discussion might go as follows.

Levy and Kinberg state that there are two ways of grounding the justificatory power of imagination. These are robust empirical validation, meaning running simulations with diverse outputs as many times as possible, and/or a justified code base, referring to having „faith in the code by having good confidence regarding the theoretical background behind it. The problem with the first one is that it leads us back to a black-box type of argument. In this case, as shown earlier, this approach with sealed black boxes lacks any significant reliability. If we follow this analogy, then imagination in this context is even in a worse position. Computer simulations can be tested, replicated, and externally validated. But that can not be said in the case of imagination. If we claim that the processes remain distinctively imaginative, meaning not reduced to inference, hypothetical reasoning, and code, then the reliability of their outputs becomes even more mysterious. Imagination is then viewed even less transparent than simulations because of their private and phenomenologically rich nature, not even speaking about cases of inaccessibility to the one imagining. Lacking the same ways of grounding justificatory powers like simulations, and also any other implicitly stated ones, imagination's epistemic relevance remains too fragile.

Thus, the dilemma seems to be offering Kind's framework an uneasy choice, where both options might seem fatal for the defended claim about imagination's epistemic relevancy. To

conclude, the first horn trivializes the role of imagination. If imagination is explicitly guided in some way leading to truth, the processes responsible for this guiding are the epistemically significant processes, making the imagination a mere arena where they unfold. The second horn, on the other hand, claims that the epistemic power of imagination appears to be a mystery. If we agree with the claim that imagination can have a justificatory role, and the process backing it up is distinctively imaginative, then, without any specific criteria and explanatory mechanism, we are forced to submit to black box arguments, which have proved to be problematic.

Yet this need not be an end for imagination's epistemic potential. Rather than accepting the second horn as a fatal strike to a constraints-based framework, I will argue that the processes underlying epistemically relevant imagination can be pre-reflective, embodied, and have a sensory-motor basis. In the next section, I will introduce the strong embodiment thesis, the notion of body schema, and provide a plausible response to the dilemma, defending the constraints-based framework.

4. Response to the Dilemma

In this section, I will first introduce the strong embodiment thesis and the body schema and make necessary clarifications regarding them. After that, I will show why they are relevant in this discussion, providing support for Kind's claims. The main goal of this section is to demonstrate that the dilemma's second horn fails because imagination's constraints can arise transparently from the body schema, a pre-reflective system of sensorimotor processes. It will show that constraints can naturally and non-mysteriously filter imaginative acts and justify the resulting outputs.

4.1 Strong Embodiment and Body Schema

There are many senses of „embodiment" in the contemporary philosophy of mind, cognitive science, psychology, and other disciplines. Di Paolo and Thompson, in their work „The enactive approach," provide a wide variety of different understandings of embodiment(Di Paolo & Thompson 2014, p.68). Their list includes:

In recent years, the term "embodied" has been used elastically to refer to anything from conservative ideas about how bodily action provides a format for neuronal representations (A. Goldman & de Vignemont, 2009); (Goldman, 2012)) or helps to reduce computational load (Clark, 2008) to a variety of "radical embodiment" (Thompson & Varela, 2001) proposals—for example, that kinesthetic body schemas are a constitutive part of mental skills (Lakoff & Johnson, 1999), that sensorimotor know-how is a constitutive part of perceptual experience (O'Regan & Noë, 2001).

As a foundation for my response to the dilemma, I will use embodiment as it was presented in the work by Rucińska and Gallagher, „Making imagination even more embodied" (Rucińska & Gallagher, 2021). They try to describe embodiment by appealing to a distinction widely accepted by different proponents of embodied cognition (EC from now on). This distinction is between weak and strong EC. According to them, weak EC is based on commitment to bodily-format and motor-related neural simulations as being explanatory for some types of cognition.

Strong EC, on the other hand, stands on the idea that the body itself, along with the processes of attunement that couple the body to the environment, plays a significant role in contributing to(and sometimes constituting) cognitive processes. This alternative view provides an alternative view of how the brain actually functions without appealing to representations.

Body schema is also a term that can be explained using both weak and strong EC approaches, but in this work, I will focus only on the latter. Body schema in strong EC reading can be understood as a system of sensory-motor processes, which is responsible for bodily posture and movement. As Gallagher wrote himself: "On a strong EC interpretation, these same forward processes are part of the online motor control processes that are directly tied to bodily movement and cannot be decoupled from current bodily posture or environmental structure. "(Gallagher, 2008). Body schema, while being a pre-reflective (meaning prior to or independent of conscious reflection and deliberation) and dynamic system, is grounded in real-time sensorimotor interactions. But how is it relevant in the context of this discussion?

The strong EC and the body schema can be used as an explanatory force for specific types of imagination, namely, action-oriented imagination (and also some others, which I will mention later on). Analysis of action-oriented imaginings allows us to show that some imaginative acts are not detached from reality, but are grounded in the embodied capacities of the agent. Action-oriented imaginings are understood here as forms of imagination involving simulations of potential movements of an agent's body in some environmental contexts. Some examples of imaginings were also presented by Kind, with the introduction of her constraints, which can also be seen as action-oriented imaginings. What is different here is that action-oriented imaginings understood in the light of strong EC are not detached and abstract representations, but are rooted in the agent's body schema. The body schema, while being shaped by an agent's physical capabilities, posture, and history of sensory-motor experience, constrains the imaginings by what the agent's body can do. Before moving to a more precise explanation, let us reframe the dilemma first.

4.2 How Body Schema Addresses the Second Horn

As it was demonstated, the dilemma challenges Kind's framework by arguing that either the constraints are applied explicitly, in which case justification comes from the hypothetical reasoning (in the best case), thus trivializing the role of imagination itself, or they are implicit and remain mysterious, making imagination an unreliable basis for justification. Although the first horn can itself be met (as I will briefly demonstrate), I concentrate on dismantling the second horn. Conceding the first horn highlights that imagination often operates via rule-governed inference. However, what really is decisive is whether the constrained imagination can avoid the problem of opacity. I aim to show that grounding constraints in the pre-reflective

transparent processes of the body schema can preserve imagination's distinct epistemic role without collapsing into a mysterious "black box".

Consider an example: Tom is imagining himself climbing a tree because he has to take his cat, who climbed up the tree, and can't get down. This act of imagining can be explained in terms of Kind. Still, then it would be overly intellectualized in this context, not to mention being exposed to the critique mentioned earlier. But if body schema is involved in this process, the imaginative act becomes deeply embodied. Tom is not merely projecting himself, climbing a tree from the third-person perspective, or reasoning by hypothetical propositions, but is simulating the bodily action relevant in this scenario. Tom imagines himself reaching, pulling upward, lifting his legs, etc.. Tom's imagining of grabbing a branch adjusts dynamically if he „feels" that the branch is too slippery. All these simulations are based on Tom's previous sensorimotor history, proprioceptive state[7], and so on. Imagination in this case is limited and shaped by the actual capacities and possibilities of the agent's body, serving as a pre-reflective constraint. Body schema's constraints are not hidden here, but operate in a pre-reflective way, similarly to how someone catches the falling cup without thinking prior action.

Different kinds of action-oriented imaginings can also be grounded in the agent's know-how knowledge for interaction, based on their bodily skills and familiarity with specific environments. This shows that some kinds of imaginings can be constrained and explained in a naturalistic way, avoiding drifting to black-box type arguments. These constraints make action-oriented imaginings epistemically robust because they rely on an agent's well-developed motor patterns along with their bodily familiarity. Such imaginings can reliably track feasible outcomes, which makes the beliefs derived from them justified. However, they do so not through hypothetical reasoning but because the embodied process is informationally rich and sensitive to reality in appropriate aspects.

Let us return to the example with the tree. When Tom imagines pulling himself on a branch or leaping from one branch to another, his imaginings are automatically constrained by proprioception and muscle memory. He does not need to consciously check whether this move is physically possible for him. The body schema is „filtering" the imagined scenario in real time. Constraints can be transparently implemented through Tom's bodily systems. There is no mysterious „black box" mechanism that underlies his imaginings. The applied constraints

[7] Proprioception refers to the body's ability to sense its position, movement, and effort in space without relying on visual of auditory cues.

arise from the embodied nature of these action-oriented imaginings. They are shaped by the history of Tom's body's past interactions, current physical state, given physical affordances, and other things. This shows that action-oriented imagination can be constrained in a transparent way. The second horn of the dilemma is thus undermined, because these constraints are not mysterious or ad hoc, but embodied, pre-reflective, and empirically grounded. Constrained imagination can justify beliefs in a naturalistically respectable manner.

Rucińska and Gallagher also propose that imaginings can be recreative of perception „(...) not because they simulate possibilities for action as 'possible', but because in imagination, we re-use the perceptual motor system in the act of prospecting future actions"(Rucińska & Gallagher 2021, p. 8). This allows us to strengthen the argument even further, allowing us to see imagination as a mechanism of reenacting what was perceived. In the same way as body-schematic processes constrain perception (defining possible actions in specific situations and environments), so does the imagination in the context of (at least) action-oriented imaginings, which construction also involves motoric processes, that are also habitually informed by perception.

The tree example with Tom shares some similarities with the experiences of the expert climber Alex Honnold, that was analysed in Jesús Ilundáin-Agurruza's article(Ilundáin 2017, p. 11). In his book, he writes that a few days before his solo climb on the Moonlight Buttress, he was „sitting and thinking, hour after hour. Visualizing every single move, everything that could possibly happen."(Honnold & Roberts, 2016). Ilundáin proposes a distinction between eidetic imaginings (EIs) and coporeal imaginings (CIs). EIs, according to him, as eidetic, involve mental content and representation. CIs, on the other hand, „(...)involve actual performance, manifesting variously in the distinctive ways sportspeople and performers solve kinetic problems. Vitally, CIs generate and do not merely replicate: they expand performers' kinetic repertoires (PKRs)— patternings of 'owned' movements."(Ilundáin 2017, p. 7). This perspective can be seen as complementary to mine, allowing a stronger response to the dilemma.

We can see that both CIs and action-oriented imaginings are bodily constraints, but not mysterious, meaning that they are explanatorily accessible. Honnold's and Tom's examples can be analysed from both the CI perspective and the perspective of action-oriented imaginings. The free solo climb that Honnold did involved ascending sheer rock faces without ropes and relying on his real-time bodily adjustments. His ability to improvise mid-route (involving rebalance of his weight, adjusting grip, etc.) demonstrates the body schema's role

in action-oriented imagination and CIs. When Tom reaches for the branch, his body schema filters impossibilities (for example, leaping beyond his leg strength) through his proprioceptive awareness. Imagining rescuing the cat is not hypothetical and detached from reality, but a proprioceptive exploration. All of these simulations are filtered by his body schema's „knowledge" of arm lengths, grip strength, balance, and so on, making boundaries of his imaginings not cognitive, but proprioceptive. Similarly, when Honnold adjusts mid-climb, his body schema enacts constraints via his sensorimotor history(muscle memory of different grip techniques, for instance). Imagining a climb for him is not a passive visualization, but action-oriented imagining that is „edited" by body schema, rejecting options that are incompatible with his current physical state or set of skills.

All that allows for reframing action-oriented imagination as sensorimotor prospection, where the body tests possible actions through real-time pre-reflective simulations. These simulations are bodily constrained and arise from the body schema's empirically observable process, namely proprioception and muscle memory, for instance. Because these constraints are grounded in transparent, pre-reflexive mechanisms rather than hidden or inferential processes, they do not qualify as mysterious. These simulations also have epistemic power that lies in embodied „fidelity". By anchoring action-oriented imaginings in the body schema, we can reveal its epistemic significance. Honnold's trust in his extremely dangerous climbing simulations is justified not by some mysterious unobservable mechanism, but by his bodily familiarity, which was gained through years of tactile, kinesthetic, vestibular, and many other feedbacks. When Tom „feels" the strain of reaching in his imagination, this actually mirrors actual climbing demands, in contrast with lacking this embodied grounding, hypothetical reasoning („If I jump, then...", for instance). Their beliefs in the imaginings are justified by proprioceptive fidelity. The history of the body schema's successful actions ensures that imaginings track reality.

The second horn of Levy and Kinberg's dilemma rests on the assumption that if the constraints that guide imagination are not consciously imposed or rule-governed, then they must be mysterious and epistemically unreliable. The whole dilemma follows the logic that either constraints are explicit (i.e, inferential), which leads to the trivialization of imagination's epistemic role, or constraints are implicit, in which case they are drifting in the „black box", which leads to imaginative outputs lacking epistemic power. But if we anchor imagination (or at least action-oriented imagination) in body schema, then the second horn of the dilemma falls short. Imagination's reliability mirrors perception in some ways. They both are constrained by

the body schema. Just as we trust perception's limits, we can trust the proprioceptive limits of imagination.

I believe it is possible to rebut the first horn of the dilemma also, by showing how action-oriented imaginings and CIs can be constrained by body schema explicitly in real time, but this is unnecessary for the purpose of this work. If body schema is a plausible answer on the second horn of the dilemma, then this particular case of the action-oriented imaginings eliminates the absolute claim behind the dilemma, that imagination itself can not have epistemic power. Therefore, constrained imagination – at least in action-oriented form – can serve as a reliable and distinctively imaginative epistemic source.

4.3 Possible Objection: Overextension of Embodied Imaginings?

One possible objection can go as follows: If imagination is constrained by body schema, then how can we explain abstract and/or counterfactual imaginings, like imagining unicorns, alternate laws of physics, and so on? Doesn't it overextend the role of embodiment?

While this is true, this does not deny its significance. Levy and Kinberg's dilemma presumes that imagination operates uniformly. However, at least some cases (action-oriented) demonstrate that some imaginings are reliably constrained by embodied processes. This shows that the constraints-based account holds at least in some cases, refuting Levy and Kinberg's universal skeptical claim about imagination's epistemic powers. For non-action-oriented cases, some different additional constraints may apply. I can assume that for abstract and fantastical cases, some other logical, cultural, linguistic, and other possible constraints likely will play a larger role. But in any case, the burden lies on the skeptics to prove that no imaginings escape the dilemma. By grounding Kind's constraints in the body schema, imagination can have epistemic potential, which opens the door for future work related to more abstract cases.

Conclusion

Levy and Kinberg's dilemma collapses when imagination is understood as embodied and action-oriented. Body schema – a pre-reflective system that is shaped by an agent's sensorimotor engagement – constrains action-oriented imaginings without opacity, resolving the problem of mystery (and, perhaps, escaping trivialization, since there is a possibility for a good claim for constrained action-oriented imaginings without explicit rules). While abstract imaginings may require other constraints, the success of embodied cases allows dismantling of the universal skepticism in the form of Levy and Kinberg's dilemma. Imagination's epistemic power is thus far from inexplicable because of its emergence from an agent's capacity to simulate possibilities through the body. Future work can extend this framework, but the body schema already proves that at least some type of imagination can play a role in justification, being a sensorimotor rehearsal of actionable possibilities.

Bibliography:

Clark, A. (2008). *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195333213.001.0001

Di Paolo, E., & Thompson, E. (2014). The enactive approach. *The Routledge Handbook of Embodied Cognition*, 68–78. https://doi.org/10.4324/9781315775845

Dorsch, F. (2016). Knowledge by imagination—How imaginative experience can ground factual knowledge. *Teorema*, *35*, 87–116.

Gallagher, S. (2008). Are Minimal Representations Still Representations? 1. *International Journal of Philosophical Studies*, *16*(3), 351–369. https://doi.org/10.1080/09672550802113243

Goldman, A., & de Vignemont, F. (2009). Is social cognition embodied? *Trends in Cognitive Sciences*, *13*(4), 154–159. https://doi.org/10.1016/j.tics.2009.01.007

Goldman, A. I. (2012). A Moderate Approach to Embodied Cognitive Science. *Review of Philosophy and Psychology*, *3*(1), 71–88. https://doi.org/10.1007/s13164-012-0089-0

Honnold, A., & Roberts, D. (2016). *Alone on the Wall*. W. W. Norton, Incorporated. https://books.google.ee/books?id=TbZ-jwEACAAJ

Ilundáin, J. (2017). Muscular Imaginings—A Phenomenological and Enactive Model for Imagination. *Sport, Ethics and Philosophy*, *11*(1), 92–108.

Kind, A. (2016). 145Imagining Under Constraints. In A. Kind & P. Kung (Eds.), *Knowledge Through Imagination* (p. 0). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198716808.003.0007

Kind, A. (2018). 227How Imagination Gives Rise to Knowledge. In F. Macpherson & F. Dorsch (Eds.), *Perceptual Imagination and Perceptual Memory* (p. 0). Oxford University Press. https://doi.org/10.1093/oso/9780198717881.003.0011

Lakoff, G., & Johnson, M. (1999). *Philosophy In The Flesh: The Embodied Mind And Its Challenge To Western Thought*. Basic Books. https://books.google.ee/books?id=XPHaAAAAMAAJ

Levy, A., & Kinberg, O. (2023). The epistemic imagination revisited. *Philosophy and Phenomenological Research*, *107*(2), 319–336.

Myers, J. (2021). The Epistemic Status of the Imagination. *Philosophical Studies*, *178*(10), 3251–3270.

O'Regan, J. K., & Noë, A. (2001). A sensorimotor account of vision and visual consciousness. *The Behavioral and Brain Sciences*, *24*(5), 939–973; discussion 973-1031. https://doi.org/10.1017/s0140525x01000115

Paul, L. A. (2014). *Transformative Experience*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198717959.001.0001

Proffitt, D. R., Kaiser, M. K., & Whelan, S. M. (1990). Understanding wheel dynamics. *Cognitive Psychology*, *22*(3), 342–373. https://doi.org/10.1016/0010-0285(90)90007-Q

Rucińska, Z., & Gallagher, S. (2021). Making imagination even more embodied: Imagination, constraint and epistemic relevance. *Synthese*, *199*(3), 8143–8170. https://doi.org/10.1007/s11229-021-03156-x

Sartre, J.-P. (1948). The Psychology of Imagination. *Philosophy*, *25*(92), 89–90.

Thompson, E., & Varela, F. J. (2001). Radical embodiment: Neural dynamics and consciousness. *Trends in Cognitive Sciences*, *5*(10), 418–425. https://doi.org/10.1016/S1364-6613(00)01750-2

Walton, K. L. (1990). *Mimesis as make-believe: On the foundations of the representational arts* (Vol. 102, Issue 3, pp. 440–443). Harvard University Press.

Resümee

Kujutluse võime luua ja/või põhjendada teadmist on üks keskseid teemasid tänapäeva vaimufilosoofias, kujutlusefilosoofias ja epistemoloogias. Ajalooliselt oli eeldatud, et kujutlusvõimel puudub epistemoloogiline jõud - kujutlusvõime ei saa olla usaldusväärse teadmise allikaks ega mängida mitte-triviaalset rolli teadmise põhjendamises. Mitmed kaasaegsed filosoofid, nagu Amy Kind, vaidlustavad aga selle vaate. Töös „Imagination under Constraints“ pakub Kind välja uue raamistiku, väites, et teatud tingimustel (reaalsuse ja muutuse piirangud) saab kujutlusvõime mitte ainult rikastada meie arusaama maailmast, vaid mängida ka rolli uskumuste põhjendamises.

Selle ja sarnaste raamistike kriitikud, Arnon Levy ja Ori Kinberg, esitavad dilemma: kui kujutlusvõimele seatud piirangud rakenduvad selgelt (nt formaalsete reeglitena), taandub selle epistemoloogiline roll triviaalsele hüpoteetilisele arutlusele; kui aga piirangud on implitsiitsed, jääb nende toimimismehhanism selgitamata, mis viib skeptitsismini kujutlusvõime epistemoloogilise potentsiaali osas.

Käesolevas töös väidan, et dilemma teise haru saab ümber lükata, toetudes keha skeemi kontseptsioonile. See prereflektiivne sensoormotoorne süsteem juhib kehalist liikumist ja füüsilist suhtlust keskkonnaga. Ma väidan, et tegevusele orienteeritud kujutlusvõime, mis tugineb keha skeemile (nt kujutledes füüsilisi tegevusi nagu hüppamine või ruumis liikumine), allub automaatselt realistlikele piirangutele, vältides seeläbi vajadust mingi salapärase või seletamatu mehhanismi järele. Seeläbi näitan, et dilemmaga kaasnev absoluutne skeptiline väide kukub kokku, kaitstes Amy Kindi raamistikku ja näidates, et vähemalt tegevusele orienteeritud tüüpi kujutlusvõime võib omada epistemoloogilist jõudu, mängides rolli põhjendamises.

Abstract

This bachelor's thesis investigates the epistemic role of imagination in response to the criticism that imagination cannot justify or play a role in the justification of knowledge. The work is built around the framework proposed by Amy Kind (Imagination under Constraints) and addresses the dilemma posed to her by Arnon Levy and Ori Kinberg. The dilemma presents a skeptical argument against the epistemic power of imagination, claiming that either the epistemic role of imagination is trivialized if the constraints are operating explicitly, or it remains mysterious and unexplained if they are applied implicitly. This thesis proposes the concept of the body schema from the theory of embodied cognition as a response to the dilemma, reinforcing Kind's framework. The body schema links imagination to bodily experience, providing constrained reality-based simulations without collapsing into hypothetical reasoning or a mysterious "black box." Although the response primarily applies to action-oriented imaginings, the argument still rebuts the absolute skeptical claim about the epistemic power of imagination. This also opens the way for further development of the framework and investigation of constraints in other types of imagination.

Keywords: imagination, body schema, constraints, action-oriented imaginings, justification

Lihtlitsents lõputöö reprodutseerimiseks ja üldsusele kättesaadavaks tegemiseks

Mina, Mark Fogel,

1. annan Tartu Ülikoolile tasuta loa (lihtlitsentsi) minu loodud teose„Body Schema: a Solution to the Epistemic Dilemma of Constrained Imagination“, mille juhendaja on Uku Tooming, reprodutseerimiseks eesmärgiga seda säilitada, sealhulgas lisada Tartu Ülikooli digitaalarhiivi kuni autoriõiguse kehtivuse lõppemiseni;

2. annan Tartu Ülikoolile loa teha punktis 1 nimetatud teos üldsusele kättesaadavaks Tartu Ülikooli veebikeskkonna, sealhulgas digitaalarhiivi kaudu Creative Commonsi litsentsiga CC BY NC ND 4.0, mis lubab autorile viidates teost reprodutseerida, levitada ja üldsusele suunata ning keelab luua tuletatud teost ja kasutada teost ärieesmärgil, kuni autoriõiguse kehtivuse lõppemiseni;

3. olen teadlik, et punktides 1 ja 2 nimetatud õigused jäävad alles ka autorile;

4. kinnitan, et lihtlitsentsi andmisega ei riku ma teiste isikute intellektuaalomandi ega isikuandmete kaitse õigusaktidest tulenevaid õigusi.

Mark Fogel

16.05.2025