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Margherita Arcangeli

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## NARRATIVES AND THOUGHT EXPERIMENTS: RESTORING THE ROLE OF IMAGINATION

Margherita Arcangeli

Institut Jean Nicod (CNRS-EHESS-ENS), PSL University

**Abstract:** Imagination is typically invoked in accounting for our interaction with narratives. This idea has been recently undermined by Derek Matravers, who argues that consumers of narratives reason through manipulating mental models rather than through imagination. This point finds a nice parallelism in the debate on thought experiments. An influential account of the cognitive mechanisms underlying thought experimentation, the model-based approach, has it that the reasoning employed in thought experiments is closely related to the one used in the consumption of narratives and is based on mental models, which simulate the situations described in thought experimental narratives. Relying on a prominent view of imagination as a simulative attitude, this chapter distinguishes imagination from mental models by arguing that they are different kinds of phenomenon involving different kinds of mental simulation. The twofold aim is to show that Matravers appeals to a questionable definition of imagination and that the model-based approach fails to recognise the important role of imagination in thought experiments. The proposed view restores imagination to its pivotal role in our interactions with (fictional and non-fictional) narratives, including those involved in thought experiments. The resulting account opens the way for an analysis of the epistemic roles that imagination plays in science and the arts.

### 1. INTRODUCTION<sup>1</sup>

According to a common view, fictions are invitations to imagine whereas non-fictions are invitations to believe (*loci classici* are Walton 1990 and Currie 1990, for a recent defence see Stock 2017). In *Fiction and Narrative* Derek Matravers rejects this view, and argues that our cognitive interaction with narratives is the same whether they are fictional or not. He provocatively claims that such interaction does not call for imagination, if the latter is defined, as it typically is, as a distinctive attitude. Rather, Matravers gives pride of place to mental models in accounting for our engagement with narratives.

There is a nice parallel between this idea and another in the debate on thought experiments. An influential account of the cognitive processes underlying thought experimentation, the model-based

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<sup>1</sup> This contribution is partially based on ideas previously published in French in Arcangeli 2018a.

approach, has it that the reasoning employed in thought experiments is closely related to the one used in the consumption of narratives. The most developed version of the model-based approach claims that thought experimenters reason by manipulating a mental model, which simulates the situation described in the thought experimental narrative (Mišćević 1992, 2007; Nersessian 1993, 2007).

The aim of my contribution is to restore imagination to the forefront of our interactions with (fictional and non-fictional) narratives, including those involved in thought experiments. I take this to be a first step towards the clarification of why the latter can be regarded as a source of knowledge. More generally, the resulting account preserves an important epistemic role for the imagination in grasping narratives in science and the arts. In §2 I will go into the details of Matravers' view, specifying the notion of imagination he appeals to, namely propositional imagination (in its belief-like form). I will concede that Matravers might be right in claiming that invoking imagination alone is not sufficient to separate fictional from non-fictional narratives, but I will contest his idea that imagination is not suited to play a key role in our engagement with narratives. I will show that this idea relies on a misinterpretation of the relationship between imagination and belief.

In §3 I will turn to thought experiments and to a rather neglected aspect of them, namely their narrative dimension (i.e., the fact that they are presented through narratives). I will show how such a dimension is tightly connected to their cognitive dimension (i.e., what happens in the mind of a thought experimenter). Although imagination has been identified as a relevant underpinning of thought experimentation, Matravers's worries can be raised also with respect to thought experiments, thus suggesting that we replace the notion of imagination with that of mental model.

Relying on a prominent view of the nature of imagination as a simulative attitude (which is not only belief-like), in §4 I will distinguish imagination from mental models by arguing that they are different kinds of phenomena, involving different kinds of mental simulation. I will thus show that Matravers appeals to a questionable definition of imagination and that the model-based approach fails to recognise the important role of imagination in thought experiments.

## 2. NARRATIVES AND IMAGINATION

Talking about fiction very often implies talking about imagination. Imagination seems to be both the means by which we create a fictional world and how we access that world, in the context of all kinds of fiction (involving images, novels, plays, operas, ballets, films). In other words imagination is the cognitive ability exploited by consumers of fiction. The philosophical literature has gone further and claimed that while works of fiction are invitations (if not prescriptions) to imagine, works of non-fiction instruct their consumers to believe.

This is what Matravers calls the “consensus view” (Matravers 2014, 24), which *cognitively* casts the difference between fiction and non-fiction in terms of the difference between imagination and belief.<sup>2</sup> He rejects this view and argues that, insofar as both fiction and non-fiction are mediated interactions with situations, they call for the same kind of cognitive interaction. According to him, proponents of the consensus view rely on a notion of imagination that itself suggests this conclusion.

The relevant notion seems to be what has been called “propositional imagination” (Kind 2016a). As Walton stresses, propositional imagination “is *doing* something *with* a proposition one has in mind” (Walton 1990, 20). In other words, imagination, like belief, desire, or perception, is a psychological *attitude*, a specific way of presenting (or representing) a mental content. When such mental content takes a propositional form, imagination is a *propositional* attitude. Very often this type of imagination has been taken to bear similarities with belief (e.g., as regards the emotions they can trigger), whence the alternative labels “belief-like imagination” (Currie & Ravenscroft 2002), “make-believe” (Walton 1990; Davies 2007a), or “cognitive imagination” (McGinn 2004; Weinberg & Meskin 2006; Weinberg 2008).<sup>3</sup> A common way to interpret the similarity between belief-like imagination (henceforth

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<sup>2</sup> Besides the cognitive question of what goes on in the mind of a subject engaged with a fiction, one might wonder what makes a proposition (or a work) fictional or not. Such classificatory question can be treated independently from the cognitive one, although, as Matravers underlines, the consensus view seems to consider them together by suggesting that a proposition is fictional if there is an invitation to imagine it (a fictional work is a compound of fictional propositions). Here I will be concerned with the cognitive question only.

<sup>3</sup> The notion of “propositional imagination” is a slippery one, since it is not clear what is supposed to pick out. Not all propositional imaginings seem to be belief-like, they might be desire-like (Currie & Ravenscroft 2002; Doggett & Egan 2007), hope-like (Goldman 2006a), and even perception-like, if one accepts that the imaginative homologue of epistemic perception (Dretske 1969) exists.

imagination) and belief is to say that the former is the *mental simulation* of the latter.<sup>4</sup> Notwithstanding, their affinities with beliefs, imaginings are *sui generis* mental states, distinct and irreducible to beliefs.<sup>5</sup>

What mainly sets imagination and belief apart are their relations to truth and the will (Arcangeli 2018c). Emma can imagine that there are lilacs in the garden, even though she believes, even knows, that this is not true. Moreover, her imagining does not conflict with her belief that there are only geraniums in the garden. By contrast, on the basis of the evidence she possesses, Emma cannot deliberately (and without irrationality) form the belief that there are lilacs in the garden. First, in order to believe we need reliable sources of information and reasons. Second, our beliefs are subject to an ideal of coherence. Therefore, imaginings and beliefs typically differ in the inputs they rely on and the outputs they give rise to. For instance, perception is not epistemically connected to imagination as it is with belief: my seeing *x* justifies my belief about *x*, but not my imagining about *x*. Emma's belief about geraniums is likely to be justified by her perceptual experience of the flowers in the garden, but the same does not hold for her imagining about lilacs. Similarly, Emma's belief, in conjunction with appropriate desires, can lead her to undertake certain actions (e.g., buying some fertiliser), whereas her imagining does not typically have the same motivational power.

When it comes to our engagement with fictions, imagination can be seen as what allows us to reason in the fictional world, that is, to project ourselves into the fictional situation and to simulate what one (not necessarily the imaginer) would believe from that perspective.<sup>6</sup> We do not believe that Remedios, the beautiful woman in *One Hundred Years of Solitude*, ascended to heaven, body and soul, or that Thérèse Desqueyroux coldly tried to poison her husband. It is *as if* these events had occurred, we *make* believe (or imagine) them. This might be an accurate description of what is going on in the

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<sup>4</sup> Not all authors have endorsed a strong version of simulationism, according to which the very same sub-personal mechanisms of belief are recruited “off-line” by the imagination. Still the gist of the simulationist view, which postulates strong similarities (along with important differences) between imagination and belief, is a shared point in the literature (see, e.g., Schroeder & Matheson 2006; Arcangeli 2018c).

<sup>5</sup> For dissenting voices see Langland-Hassan 2012 and Schellenberg 2013.

<sup>6</sup> The projection should be interpreted in a loose way without any commitment to the idea that the imaginer's self is always part of what is imagined. The experiential perspective involved by the projection can remain “virtual” (Dokic & Arcangeli 2015). In §4 I will consider the idea that fiction can involve forms of the imagination other than belief-like imagination (e.g., perception-like imagination).

readers' mind, but what Matravers contends is that this is not specific to our engagement with fictions: imagination seems to be recruited whenever we are not really confronted with a given situation, but we have a mediated access to it through a representation.<sup>7</sup>

Compare the following cases.

Emma is reading *Miss Smilla's Feeling for Snow*. She gets fascinated by the idea that there are different types of snow and imagines that, like Smilla, she masters knowledge of these different types. Such reading elicits her desire to learn more about snow and to plan a trip to Greenland.

Emma is reading a book based on a personal diary of an actual trip to Greenland. She gets fascinated by the idea that there are different types of snow and imagines that, like the writer, she masters knowledge of these different types. Such reading elicits her desire to learn more about snow and to plan a trip to Greenland.

Although Emma is engaged with a literary fiction in the first case and a work of non-fiction in the second case, there is no difference in the kind of mental state she finds herself in. In both cases she exploits her imagination and she is led to entertain the same imagining, which eventually indirectly (by generating a desire) causes the same action.

According to Matravers this comes as no surprise, since fictions and non-fictions typically do not differ in the perceptual inputs and in the behavioural outputs they cause. He then wonders why we should endorse the consensus view.<sup>8</sup> The aforementioned characterisation of imagination is, in fact, neutral with respect to the distinction between fiction and non-fiction. We may agree with Matravers in claiming that it is not by relying *solely* on the notion of imagination that we can demarcate fiction from non-fiction, but we may think that imagination has an important role to play in our interaction with narratives *tout court*. Matravers rejects this idea as well.

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<sup>7</sup> Matravers holds that the relevant distinction is between “confrontations” and “representations”, rather than between fiction and non-fiction. Stock (2017, 167) rightly observes that these are not necessarily rival distinctions and the latter can be a meaningful contrast within the “representations” category.

<sup>8</sup> See Stock 2017 for a critical discussion of Matravers' view and a defence of the consensus view. Although I share most of the worries raised by Stock, I can remain neutral here, since my main focus is on imagination as underpinning our interactions with narratives, whether fictional or not.

Matravers argues that we get a better understanding of the cognitive process at stake in our engagement with narratives by replacing the notion of imagination with that of *mental model* (a notion he owes to research in cognitive sciences; see Johnson-Laird 1983). The latter would have two explanatory advantages over the former. First, mental models are “compartmentalized but not isolated from our pre-existing structures of belief” (Johnson-Laird 1983, 90), thus explaining the fact that (part of) the content of narratives (or “representations” – see fn 6) can be integrated with our beliefs. Second, in talking about mental models we avoid positing a specific attitude (i.e., imagination or belief) proper to either fiction or non-fiction, thus accounting for the intuitive neutrality we have, at least at first, vis-à-vis the contents of the narrative in question (Matravers 2014, 79).

With respect to the first advantage, Matravers starts with the consideration that non-fictions are mainly made up by true propositions, but most fictions are mixtures of true propositions and propositions true only in fiction. According to the proponent of the consensus view, while the former should be believed, the latter should be imagined. Here lies, Matravers argues, a problem for the proponent of the consensus view: “if the imagination is defined in contrast to belief, how is it that they work seamlessly together?” (Matravers 2014, 38). The conclusion, suggested by Matravers, is that we should get rid of the notion of imagination – at least in our account of narratives – and replace it with a notion that refers to a cognitive underpinning that can easily interact with belief, namely mental models.

It is true that imagination is typically defined in contrast with belief, in the sense that it is compared to and distinguished from the latter. But defining imagination as being different from belief does not imply that these mental states cannot smoothly work together. To see this, consider belief and desire. These are two different propositional attitudes, but in our reasoning they often occur together. The same seems to hold for imagination and belief. It has been advanced that in certain fictional contexts a subject must make her imagination and belief interact seamlessly (Currie & Ravenscroft

2002; Weinberg & Meskin 2016). Matravers (2014, 43) argues that by conceding this point, new problems spring up: if most of the time our engagement with fiction implies the involvement of two sorts of mental state (i.e., imagination and belief), but there is no tangible difference (in, e.g., inputs and outputs) between the two, then why should we posit these types of mental state in the first place? This leads to his second reason to prefer mental models over imagination, which we can only assess by means of a careful analysis of what mental models are and how they relate to imagination. Before tackling these issues, I would like to make Matravers' case as strong as possible by turning to the debate about thought experiments. In this debate, mental models are used to explain our cognitive interactions with the fictional narratives of thought experiments.

### 3. THOUGHT EXPERIMENTS AND NARRATIVES

Thought experiments are a much-discussed topic, at the heart of a lively debate among contemporary philosophers. They are commonly used both in philosophical disciplines (e.g., Plato's *Cave* – *Republic* 514b-520a, the brain in the vat – Putnam 1981) and in natural sciences (e.g., Galilei on free-fall – Galilei 1638, Einstein's lift – Einstein & Infeld 1938). Moreover, although an agreed-upon definition is lacking, almost all authors involved in the debate agree in considering thought experiments as epistemic tools aimed at somehow testing a theory or specific hypotheses.<sup>9</sup>

Thought experiments are extremely important because through them we gain, share, and spread knowledge. It is important to highlight that thought experiments are mostly written and publicly presented through narratives, which may have different levels of detail and rhetoric, and which may be accompanied by pictures.<sup>10</sup> This narrative dimension is a rather neglected aspect of thought experiments, but it has led authors to establish a parallelism between them and literary fictions, which are narratives par excellence.<sup>11</sup>

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<sup>9</sup> For an introduction presenting examples of thought experiments and the main issues in the debate see Arcangeli 2017.

<sup>10</sup> In what follows I will be mainly concerned with literary narratives, but I am not ruling out other types of narratives (e.g., oral ones) through which thought experiments can be conveyed.

<sup>11</sup> Quite often the narrative dimension of thought experimentation has been highlighted in order to downplay its value (see, e.g., Norton 1991; Sorensen 1992; Hacking 1993).



A thought experiment tells us a story. This story can be about ordinary objects or beings, such as stones, boats, cows, and beetles, but also about extraordinary objects or beings, such as ropes without mass, a substance that looks like water but is not composed of H<sub>2</sub>O molecules, demons, and human doppelgängers without consciousness.<sup>12</sup> The scenarios depicted by thought experiments are often described as “hypothetical” or “counterfactual”. Thought experiments tell us stories that could have happened or could happen, if certain conditions were met. In this sense, thought experiments display an affinity with fictional narratives: like works of fiction, thought experiments are “typically not, and in any case need not be, representations *of* anything real” (Elgin 2014, 227).

On this view thought experiments can be seen as short novels or fictional tales, and those who put them forward, such as Galilei or Putnam, are novelists or storytellers. The idea that thought experiments are “short fictional narratives” (McAllister 1996, 233) seems to be fairly intuitive and widely accepted.<sup>13</sup> Some authors have taken this idea seriously and explored the potential for the debate on thought experiments, as well as for debates in aesthetics, of a comparative analysis bringing together thought experiments and literature, (see, e.g., Davenport 1983; Carroll 2002; Davies 2007b, 2010, 2013; Elgin 2007, 2014; Swirski 2007; Gaetens 2009; Ichikawa & Jarvis 2009; McComb 2013; Meynell 2014). Some have even suggested considering thought experiments as a genre, like science fiction (see Weinberg 2008; Peterson 2018).

Among the authors who study the relationship between thought experimentation and fictional narratives, David Davies has offered the most sustained argument in favour of their similarities. According to him, thought experiments, whether scientific or philosophical, meet two necessary and sufficient conditions for the fictionality of a narrative.

First, fictional narratives are not subject to what he calls the “fidelity constraint” (Davies 2010, 52). A narrative obeying the fidelity constraint requires the author to include in the narrative only those

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<sup>12</sup> I am here referring to the following thought experiments: Galilei’s on falling bodies, Theseus’ ship (used since antiquity, see, for example, Hobbes 1655 II, Ch. 11, §7), the cow in the field (Cohen 1999), Wittgenstein’s beetle (1953, §293), Twin Earth (Putnam 1973 and 1975), Maxwell’s demon (1871), philosophical zombies (Chalmers 1996).

<sup>13</sup> Stock, for instance, writes: “In another familiar case, a non-fictional philosophy work can contain a fiction in the form of a thought experiment” (Stock 2017, 159).

events that she believes to have occurred and to tell them in the order in which she believes they have occurred. A newspaper article exposing a crime or the chronicle of Marie Antoinette's life both obey the fidelity constraint.

Davies maintains that we cannot say the same for fictional narratives. Gabriel García Márquez in his *One Hundred Years of Solitude* did not intend to describe what really happened in the village of Macondo; the village is imaginary like probably most of the characters who populate it. Although François Mauriac was inspired by the trial of Madame Canaby, the aim of his novel *Thérèse Desqueyroux* was not to write a faithful account of the latter. Davies argues that in the case of fictional narratives, the purpose of the author is more general, "such as entertaining or perhaps instructing readers in certain specific ways" (Davies 2010, 52). This does not prevent novelists from intending, and making explicit to the reader, that the situation might have occurred as described. The idea is that, even though Mauriac intended to describe a potentially real story, *Thérèse Desqueyroux* would not obey the fidelity constraint.

Davies also argues that thought experiments do not obey the fidelity constraint. Their authors are not motivated by the goal of describing a real event and how it happened. Frank Jackson (1982), in his thought experiment of Mary the super-scientist, never intended to tell the true story of a neuroscientist named Mary who grew up in a black-and-white room. With his cow in the field problem, Martin Cohen (1999) did not aim to provide an accurate account of a farmer's concern for his favourite cow, although he may have sought to provide a more plausible example than other Gettier cases (see Gettier 1963). Indeed, a farmer might feel reassured in seeing a black-and-white silhouette in the field and believe that his cow is in the field, when the cow is actually in the field, but what he saw was something else. With his thought experiment about running after a ray of light, Albert Einstein (1949) did not intend to give us an account of what he did one afternoon. Galilei too was not motivated by the presentation of a fact, even though his thought experiment on falling bodies described a situation that was possible and that nowadays can be reproduced: we can see (on the internet), and not just imagine,

a hammer and a feather falling with the same speed when dropped by an astronaut on the Moon (see Strohminger's this volume).

By pointing out that thought experiments, like fictions, can represent situations as possibly real, Davies aims to block a potential objection (see also Davies 2007b). It has been argued that at least scientific thought experiments should not be seen as relying on fictional narratives, because they always describe a situation as potentially real (see Mišćević 1992; Nersessian 1993). Even in scientific thought experiments involving bizarre situations, such as chasing a beam of light or a lift in cosmic space, as Nancy Nersessian puts it: "The assumption is that if the experiment could be performed, the chain of events would unfold according to the way things usually take place in the world" (Nersessian 1993, 295). By contrast fictional narratives do not presuppose any such constraint on the course of the events described in the narrative. As Davies points out, even accepting Nersessian's hypothesis on scientific thought experiments (see Cooper 2005 for a critique), it is not clear why it should differentiate them from fictional narratives. What Davies suggests is that Nersessian's hypothesis is weaker than the fidelity constraint. According to that constraint the author of the non-fictional narrative should not simply present some possible system which unfolds as it would in the real world (as Nersessian demands for scientific thought experiments), but rather must only present how those described facts, which she believes to have actually occurred, unfolded.

Second, according to Davies, the author of a fiction intends to induce the reader to pretend to believe the content of the narrative. In other words, he endorses the consensus view and claims that a fictional narrative, as opposed to a non-fictional narrative, involves make-believing (or imagining) that the described situation occurs.

Davies argues that thought experiments are invitations to imagine too (see also Stock 2017). When we read the thought experiment of Mary the super-scientist, we do not believe that there is a scientist, Mary, who grew up in a black-and-white room. Likewise, we do not believe that there is a cat which is both dead and alive at the same time, when we are confronted with Schrödinger's cat thought

experiment (Schrödinger 1935). The same holds for less fanciful situations: when reading Newton's thought experiment of the bucket (Newton 1687) or the cow in the field (Cohen 1999), we do not believe, respectively, that in front of us there is a bucket with spinning water, or that there is a farmer worried about his cow and then reassured by seeing a black-and-white silhouette in the field. Also in thought experiments we imagine that what is being told really happens or happened.

Given Davies' two points, it would appear reasonable to argue that a thought experiment is presented not only by a narrative, but more precisely by a *fictional* narrative. Moreover, this analysis, which puts thought experimentation at the same level as literary fiction, points at the imagination as a key component of the cognitive process underlying thought experiments.<sup>14</sup> The latter is assimilated to the cognitive process underlying the reception of fiction, for which imagination seems to be essential too.

Although Matravers is not concerned with thought experiments, his worries can be raised against them as well. No matter whether they are conveyed through a fictional or non-fictional narrative, Matravers' view threatens the idea that imagination is the key cognitive process underlying our engagement with thought experiments. Mental models would instead play this role. This is in line with what has been defended by influential proponents of the model-based approach to thought experiments.

The model-based approach analyses thought experiments in terms of their cognitive functioning, more than in terms of their epistemic outputs. Indeed, in studying thought experiments we can ask, on the one hand, about their results and, on the other hand, about the way they produce these results. Given that philosophers largely agree that thought experiments increase our knowledge, the first question leads to issues that are mainly epistemological (e.g., How can a thought experiment produce new empirical knowledge without the input of new data? What kind of knowledge does it really produce?), whereas the second question leads us to examine thought experiments from the point of

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<sup>14</sup> Several analyses of thought experiments dealing with aspects other than the narrative one (e.g., the epistemological aspect) have stressed the prominent role played by imagination in thought experimentation (see, e.g., Mach 1896; Gendler 2004; De Mey 2006; McAllister 2013; Stuart 2017 and 2019; Salis & Frigg 2020).

view of the cognitive functioning of the thought experimenter.<sup>15</sup>

The model-based approach is mainly concerned with the second set of questions. It explores the cognitive dimension of thought experimentation by appealing to research in cognitive science on model-based reasoning. Among the authors who have defended this approach (e.g., Gooding 1993; Bishop 1999; Palmieri 2003; Cooper 2005), two have played a particularly important role in developing it: Nenad Mišćević and Nancy Nersessian.

These authors start from the idea that the narrative aspect of thought experimentation is crucial to the process of performing a thought experiment. They hold that the cognitive process underlying thought experimentation is closely related to the one that is exploited in the consumption of narratives, given that thought experiments are presented in a narrative form. Drawing on the literature in cognitive science on narrative comprehension, Mišćević and Nersessian have argued that it is through the manipulation of a mental model that a thought experimenter acquires new knowledge (Mišćević 1992, 2007; Nersessian 1993, 2007).

Should we really replace the notion of imagination with that of mental model to account for our engagement with all sorts of narratives, including those presenting thought experiments? In order to answer this question, we need to know more about the nature of mental models and how they relate to imagination.

#### **4. MENTAL MODELS AND IMAGINATION**

Let me expand briefly on the notion of mental model. According to Philip Johnson-Laird (1983, 2004), one of the most influential proponents of mental models, a mental model represents a real-world or imaginary situation. It is a structure stored in short- or long-term memory and is defined as a third

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<sup>15</sup> There are two types of thought experimenter: (i) the creator or designer of the thought experiment (e.g., Einstein), (ii) the receiver of it. Both the creator and the receiver of a thought experiment can be said to “perform” it, but it might be that these are two different senses of performance involving different cognitive processes. It is beyond the scope of the present chapter to go into such details. Given the complexity of the creative dimension of thought experiments and how it relates to the performance dimension (see Arcangeli 2018b; Stuart 2020), here by “thought experimenter” I will simply mean (ii).

type of mental representation, intermediary between propositional and pictorial mental representations. Mental models are structurally analogous to what they represent, but not all of them can be visualised. In the case of narrative comprehension, we can say that mental models *simulate* what is described by the given narrative. For this reason, Mišćević and Nersessian, who explicitly rely on Johnson-Laird's notion of mental model, see thought experimentation as a species of simulative reasoning.<sup>16</sup> We have also seen that imagination has been understood as a form of mental simulation, but interesting differences between mental models and imagination can be highlighted.

To do this, we need a useful distinction in philosophy of mind, namely that between psychological attitude and mental content. I have already hinted at it, but something more can be said. This distinction is easily grasped through examples. In a belief that  $p$ ,  $p$  is the content and belief is the attitude; in a desire that  $q$ ,  $q$  is the content and desire is the attitude; in a perception of  $x$ ,  $x$  is the content and perception is the attitude. A psychological attitude contributes to a mental state by dealing with *how* the latter represents, rather than with *what* it represents (i.e., the mental content).

As there are different types of psychological attitudes, there are also different types of mental content. A usual way of typing mental contents is in terms of their format (or vehicle).<sup>17</sup> What a mental state represents can be conveyed in different representational formats. A notable distinction is the one between propositional and non-propositional content: while the former has a propositional format (i.e., it is propositionally organised or carried by propositions), the latter does not (e.g., it has a pictorial or iconic format).

With such a distinction at hand, we can come back to the relationship between imagination and mental models. Recall that imagination is quite unanimously considered as a psychological attitude. In imagining that *there are lilacs in the garden*, “there are lilacs in the garden” is the content and

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<sup>16</sup> This idea has been, more or less explicitly, put forward by other authors (see, for example, Mach 1896; Gendler 2004; Chandrasekharan *et al.* 2013), but not necessarily by invoking the notion of mental model. For a more in-depth analysis of Mišćević's and Nersessian's views, as well as of other model-based approaches (e.g., the one proposed by Rachel Cooper, who criticises Mišćević and Nersessian), see Häggqvist 1996, Arcangeli 2010 and 2017.

<sup>17</sup> I would use the term “format”, because “vehicle” is ambiguous between the type of representation (i.e., the format) and what concretely realises mental contents (i.e., the medium) – which is likely to include (or to coincide with) brain states or processes (see Crane 1995).

imagining is the attitude. What about mental models? The same does not seem to hold for them.<sup>18</sup> Talking of mental models as a structure stored in memory, as a type of mental representation (which is neither fully propositional nor fully pictorial), suggests that they have to do with the notion of mental content, more than that of psychological attitude. Mental models can be taken as a type of format in which mental contents can be conveyed. On this view, mental models may be accessed by means of several attitudes (e.g., belief, imagination).

If this interpretation is correct, in replacing the notion of imagination with that of mental model we are not dealing with the same dimension, we are moving from the attitudinal to the content dimension. This might be precisely what Matravers has in mind in pleading for mental models. Indeed, he puts forward a two-stage model of our cognitive engagement with narratives according to which at a first stage we simply build a mental model of the narrative content without having a specific attitude towards it (Matravers 2014, 90). By contrast, at a second stage (some of) those propositions can be integrated with our pre-existing beliefs and thus believed – this is what happens in response to non-fiction usually and to fiction less frequently. According to Matravers, the neutrality of the first stage is lost by analyses of narratives pivoting on the notion of imagination construed as a distinctive attitude.

However, Matravers's first stage does not seem to capture an explanandum at the same level of interest to proponents of the consensus view. The latter are mainly interested in what goes on at the *personal level* of a subject engaged with a narrative, whereas the former is a description of what goes on at the *sub-personal level*. Matravers' first stage would capture the phase in which some model-building sub-personal processes generate a mental representation of the narrative's content. But what happens at the personal level? Arguably at this level a subject cannot have a floating content without an attitude through which she grasps it. Matravers seems to anticipate this kind of worry in claiming that if any attitude is to be invoked, "it is merely one of them [the given propositions] being part of the content of whatever particular representation [narrative] we are reading or remembering" (Matravers

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<sup>18</sup> The same can be said about mental imagery (Arcangeli 2020). Exploring how the latter relates to the notion of mental models unfortunately goes beyond present purposes.

2014, 78-79). This quote suggests that we take entertaining (or a cognate phenomenon, like apprehending, grasping, considering, understanding) to be the relevant attitude involved in the first stage.

The problem for Matravers is that entertaining does not guarantee that he has a theory that does not appeal to imagination. The relationship between entertainment and imagination is controversial. First, imagination has been associated with entertainment. Sartre, for instance, in his characterisation of imagination as the attitude which “posits its object as a nothingness” (Sartre 1940, 11), puts forward the idea that imagination can be neutral vis-à-vis its content, presenting it under no specific guise. There is indeed a kind of disinterestedness that imagination exhibits towards its content. Quite often imagination is said to be non-committal, contrary to committal attitudes, such as belief or perception. The same can be said for entertaining, which has been seen as a form of imagination, namely propositional imagination (see, e.g., Gaut 2003). Second, treatments of entertainment have aligned it with imagination. Uriah Kriegel has recently offered a detailed analysis of entertaining which casts it as having a distinctive phenomenology (irreducible to other kinds of phenomenology), and he argues that such a phenomenology and imaginative phenomenology “belong together” (Kriegel 2015, 195).

Yet, independently of whether it coincides with entertaining (for sceptical views see, e.g., Doggett & Egan 2007; Kind 2016b; Arcangeli 2018c), imagination fulfils (pace Matravers) his rather undemanding requirement: if any attitude is involved at the first stage of our engagement with narratives it should be a neutral or non-committal attitude, which is separate from, but can mingle with and lead to beliefs.

Therefore, there are no clear reasons to prefer the notion of mental models over that of imagination. Replacing the latter with the former leaves unexplained what happens at the personal level, that is in what attitude a reader (or other consumer of a narrative) finds herself. Given its non-committal nature, imagination is likely to be this attitude. Moreover, the employment of imagination is compatible with mental models being involved as the format through which the imagined content is



conveyed. A plausible alternative description of Matravers' first stage thus sees the recruitment of both imagination and mental models.

By contrast there are good reasons for granting to the imagination a key role in our engagement with narratives (maybe independently from whether fictional or not). But to see this we need to go beyond the narrow notion of imagination Matravers refers to. He focuses only on belief-like imagination, but arguably this is only one form of the imagination. Matravers might reply that he borrows the notion of belief-like imagination from his opponents (i.e., the proponents of the consensus view). Although most of the debate on fiction has focused on belief-like imagination, it has been pointed out that other forms of the imagination are involved in fiction (see, e.g., Goldman 2006b; Currie 2014).<sup>19</sup> These views draw on a heterogeneous understanding of imagination that pictures it as a family comprising different genera and species.

A promising way to account for this complex notion of imagination is in terms of mental simulation (Currie & Ravenscroft 2002; Goldman 2006a, 2006b; Arcangeli 2018b, 2018c). Imagination is thus defined as a complex mental activity that simulates other kinds of mental states (e.g., belief, perception); and imaginings are mental states bearing phenomenological and/or functional similarities with their "counterparts" (i.e., the mental states they simulate). These phenomenological and functional similarities are not captured by mental models, which by encoding spatial configurations (and probably other manifest properties such as shapes and colours) are mental "simulations of [...] external or physical states of affairs" (Goldman 2006a, 51, fn 10), rather than of mental states.

Imagination and mental models capture two different senses of mental simulation: while the former involves *mental* mental simulation, the latter involves *objectual* mental simulation (Arcangeli 2018b, see also Goldman 2006a, Zeimbekis 2011). Objectual mental simulation might encode

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<sup>19</sup> Interestingly, the debate on thought experiments seems to have privileged a perception-like form of imagination (see Arcangeli 2010 and 2017; Salis & Frigg 2020). However, some authors have highlighted the role of non-perceptual forms, such as belief-like imagination, supposition, or conceiving (see, e.g., Weinberg & Meskin 2006; McAllister 2013; Balcerak Jackson 2016).

information concerning the perspective from which the relevant situation is represented, insofar as such perspectival information can be reduced to spatial configurations or information about manifest properties. Mental simulation, however, specifies the type of self “occupying” the given perspective (e.g., the imaginer’s actual self, the self of a friend we imagine being, or even a sort of virtual self – a placeholder for any subject who would have the same experience). In other words, it conveys self-relative information that cannot be explained only in terms of spatial or otherwise perspectival information. This is enough to show that mental simulation cannot be reduced to objectual simulation.

When we engage with a narrative, we are projected into the world described by it and feel as if we “live” in that world, perceiving or believing from that perspective. This aspect can be easily explained using the notion of imagination, conceived as a simulation of mental states (and not restricted to the simulation of belief). An analysis of the interactions with fictions, or narratives in general, based only on the notion of mental models would be unable to account for this mental involvement *in* narratives.

The same holds for narratives presenting thought experiments, which can be seen as “props” inducing the receiver to re-perform, by using different forms of imagination, the thought experiment at issue and thus grasp its conclusion. Imagination is the cognitive ability through which the thought experimenter has access to a scenario that is not directly present to her senses, and enables her to perceive or believe from this new perspective.<sup>20</sup> Thought experimentation is very often described (even by Mišćević and Nersessian themselves) in a language that evokes experiential aspects (on this point see Meynell 2014). The notion of imagination is better adapted than the notion of mental model to grasp and simulate these phenomenological aspects. Therefore, an imagination-based approach to thought experimentation is more promising than the model-based approach: like the latter it is a simulative account – it does justice to the narrative dimension of thought experiments, but it has

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<sup>20</sup> Imagination allows us to clarify the experimental character of thought experimentation: thought experimenters are like observers, like ordinary experimenters (Arcangeli 2018b).

considerable explanatory advantages (Arcangeli 2010, 2018b).

An interesting issue is whether a simulative imagination-based account of thought experiments might help clarify their epistemological valence. The relevant question would then be how we can move from imaginings to knowledge. The simulationist view has the resources to gesture towards some paths to follow. We have seen that via our imagination we can simulate different types of mental state. It has been suggested that some imaginings simulate states of (actual or potential) knowledge. The idea is that imagination can simulate complex mental states which are conducive to knowledge – e.g., “not only the judgement and the experience, *but at the same time the epistemic relation between them that converts the former into knowledge*” (Dokic 2008, 105). This seems to be what is going on when we engage with thought experiments – and possibly when we engage with other narratives too.

## 5. CONCLUSION

What goes on in the mind of a subject engaged with a fiction? A common answer is that fiction calls for imagination. In this contribution I have considered a recent critique against this thesis, which holds that mental models, rather than imagination, are the key underpinnings of our engagement with narratives *tout court* (whether fictional or not). I have pointed out that the analysis of the narrative aspect of thought experimentation can be offered in support of such a critique. Indeed, the fact that thought experiments are presented through narratives has motivated interest on the cognitive processes they require, and mental models have been proposed to fit this role. I have argued that these views are based on a mischaracterisation of imagination. Once we appreciate that imagination is a psychological attitude, which mentally simulates mental states (including states other than beliefs), we see that mental models cannot play a similarly adequate role, not only in thought experiments, but in all kinds of narratives, whether fictional or not.

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