**If models were fictions, then what would they be?**

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 Models have come to play an increasingly important role in the sciences, from physics to economics to biology and the earth sciences. But talk of models raises the metaphysical question: what are these models?

We must first distinguish between model *descriptions*—the kinds of descriptions appearing in scientific papers, textbooks, and diagrams—and the model *systems* described: ideal pendulums, systems of purely rational self-interested agents, or infinite populations of animals. The metaphysical puzzles arise for the model systems, given that there are no (concrete) frictionless pendulums, systems of perfectly rational purely self-interested agents, or infinite populations of animals. Recently, there has been an increasing interest in the idea that model descriptions should be thought of as similar to stories, and model systems should be thought of as akin to fictional characters—as Nancy Cartwright puts it “A model is a work of fiction” (1983, 153). I will not argue for this idea—though others have done so.[[1]](#footnote-1) There are certainly good *prima facie* reasons for thinking of models this way (see Frigg 2010b, 102-3). First, although there is typically nothing (concrete) that matches the descriptions in fictional stories or scientific model-descriptions, there are things we can apparently say truly (and falsely) about the characters or model systems. Moreover, as Peter Godfrey-Smith has emphasized “scientific modelers often treat model systems in a ‘concrete’ way that suggests a strong analogy with ordinary fictions” (2006, 739). That is, scientists often think of themselves as describing “imaginary biological populations, imaginary neural networks, or imaginary economies” where an “imaginary population is something that, if it was real, would be a flesh-and-blood population, not a mathematical object” (2006, 735). And as in the literary case, we are concerned not just with what is explicitly attributed to the objects in the model description, but also (and to a greater extent) with what can be inferred from that basis, using the relevant rules at issue.

But if model systems were (like) fictional characters—what would they be? One might hope to make some progress by looking at the various philosophical theories of fiction on the market. Traditionally, there were two dominant approaches to understanding fictional discourse. Neo-Meinongians (Parsons 1980, Zalta 1983, Rapaport 1978, Wolterstorff 1980) hold that there is something that the stories correctly describe—since there is no real, concrete object, they conclude that it must be a nonexistent or abstract object that (in some sense) has properties that fit the descriptions in the story. Their opponents, anti-realists, deny that there are fictional characters at all. Any discourse that appears to refer to them, the anti-realists holds, can be either paraphrased in a way that avoids the apparent reference, or be taken as in the context of a game of pretense—so that we needn’t posit fictional objects.

Some early approaches to scientific models parallel the neo-Meinongian views of fiction—taking model systems to be abstract objects that (in some sense) fit the model descriptions. But the idea that stories or models describe ‘description-fitting’ objects runs into complications and difficulties that have dimmed the initial appeal of such views, in the case of both fictions and models. In reaction against this, recent work on understanding scientific models as fiction has taken an anti-realist turn, influenced by Kendall Walton’s pretense theory of fiction (1990). Indeed both Roman Frigg (2010a, 2010b, 2010c) and Adam Toon (2010, 2012) adopt Walton’s theory wholesale, arguing that the pretense approach provides the basis for a good account of scientific modeling that avoids “ontological costs” (Frigg 2010c, 274; cf. Toon 2012).

But while the pretense view does a great deal to advance our understanding of talk and thought about fictional characters and models alike, there are also problems with a pure pretense theory that are well known to those working in the philosophy of fiction. Walton treats not only discourse about what goes on within the content of a story, but *all* discourse—including ‘external’ critical and historical claims—as implicitly involving games of pretense. As a result, he gives us an unnecessarily convoluted and implausible reading of external discourse about fictional characters, with only dubious ‘ontological benefits’ to show for it.

I will argue that these problems for a pure pretense theory of fiction carry over as problems for a pure pretense theory of models. While the pretense approach provides a persuasive account of the ‘internal’ discourse about what goes on in a model, there are also many critical, historical, and theoretical contexts in which we seem to refer, without pretense, to model systems themselves. Indeed scientific discourse itself requires these ‘external’ ways of speaking about models.

In the fiction literature, the problems with neo-Meinongian realist views on the one hand, and anti-realist views of fictional characters on the other, have led to the development of an increasingly popular alternative. That alternative is what I have elsewhere called an “artifactualist” view of fiction. Artifactualist approaches of various forms have been suggested or developed, e.g., by Saul Kripke (2013), John Searle (1979, 71-2) Nathan Salmon (1998), Stephen Schiffer (1996), and myself (1999, 2003a, 2003b, 2010).

On the artifactualist view one can allow, with the pretense theorist, that talk about the content of a story is within the context of a pretense, and also allow that there are (typically) no objects that fit the descriptions in stories. Nonetheless, one can also allow that, in writing such stories and introducing such games of pretense, authors thereby create fictional characters, understood as a kind of abstract cultural artifact. Artifactualist views thus preserve the advantages of pretense views without the costs that come from treating all talk about fictional characters as implicitly in the context of a pretense.

But strangely, despite their popularity in fiction circles, artifactualist approaches to fiction have largely been overlooked by those aiming to understand scientific models on analogy with fiction.[[2]](#footnote-2) I will argue, however, that those who hope to treat scientific models as fictions would do better to abandon the pure pretense approach in favor of an artifactualist view. For models as for fiction, an artifactualist approach can retain the advantages of the pretense view while giving a far more straightforward account of external historical, theoretical, and critical discourse about models. The main perceived drawback to artifactualist views is their supposed ‘ontological costs’. In closing I will all too briefly suggest why ontological qualms of this sort should be discounted.[[3]](#footnote-3)

**1. Troubles for Description-Fitting Objects**

The literary works we read seem to refer to people, places and activities and say things about them. Call the discourse within works of literature ‘fictionalizing discourse’. In discussing works of fiction, we often—perhaps most often—speak of fictional characters *as they appear in the content of the story, or as they are described in the story.* Call this ‘internal’ fictional discourse.[[4]](#footnote-4) In such contexts, we will speak of Hamlet as a man—a prince, born to Queen Gertrude and the now deceased King Hamlet. But we don’t just speak of the properties the character is directly ascribed in the story; we also speak of and discuss features of the character that are not directly mentioned. Although it’s never mentioned, it seems true to say that Hamlet has two legs, and literary critics might also make other inferences, say, that he suffers from depression or an Oedipal complex.[[5]](#footnote-5)

In giving an analysis of this sort of (internal) fictional discourse, we need some way to distinguish those attributions that seem true (Hamlet is a prince, Hamlet is Danish) from those that are false (Hamlet is a plum pudding, Hamlet is Italian). A natural move is to take fictionalizing and internal discourse literally, as descriptions of objects of a certain kind. And in the first phase of philosophical theories of fiction, the dominant approach was to think of attributions like these as literal descriptions of objects that (in some sense) fit the descriptions (Parsons 1980, Zalta 1983, Wolterstorff 1980). Yet in most cases no such (concrete) objects that possess the properties ascribed in the stories really exist. Thus, those who take such statements descriptively tend to take them to describe not real, concrete objects, but rather Meinongian nonexistent objects or abstract objects.

Even if we accept that there are objects described in such attributions, however, problems arise.[[6]](#footnote-6) For a non-existent object cannot be thought to literally have all of the properties it is ascribed in the work of literature: Hamlet (in contrast with the ghost of old Hamlet) is ascribed the property of being a *real* or *existent* man. But the nonexistent man Hamlet can’t have the property of existing.[[7]](#footnote-7) If one thinks of fictional characters as abstract entities rather than as nonexistent objects, other problems arise. For abstract objects can’t be thought to literally have properties like walking down the street or breaking a leg. Indeed, for most of the properties commonly ascribed to the characters of a story, it would seem to be a category mistake to think abstracta could have those properties.

In response to the first difficulty, Meinongian realists about fictional characters have taken one of two routes. Some, with Terence Parsons (1980), distinguish different types of properties: nonexistent objects may really possess the *nuclear* properties they are ascribed in the story (like being a man and being a prince), but not ‘extra-nuclear’ properties (like existence, completeness (in the sense of, for every property P, either having or lacking P), etc.)—although they may have ‘watered-down nuclear’ simulacra of these properties. Others, such as Edward Zalta (1983), treat fictional characters as abstract objects and distinguish two modes of predication. On Zalta’s view, fictional characters *encode* the properties they are ascribed in the story, but do not *exemplify* those properties as regular things do—Hamlet, on this view, encodes but does not exemplify existence. This distinction also resolves the second problem: while abstracta can’t exemplify the property of walking down the street, they can encode it. The moral here is not that such views cannot be made coherent—they can, as Parsons and Zalta have both shown. Instead, the moral is that difficulties in unraveling ways we think and talk about fictions are not easily resolved just by holding that there are description-fitting objects.

In work on models, as in work on fiction, one historically prominent approach was to take the model-descriptions literally as about description-fitting objects. Ronald Giere, for example, proposes taking the objects described in model-descriptions, such as the simple harmonic oscillator as “*abstract entities* having all and only the properties ascribed to them in the standard texts” (1988, 78). Martin Thomson-Jones (2010) argues at length, however, that various attempts at treating models as abstract objects that have the properties they are described as having run into trouble. One problem is that the theories describe the objects of the model system as having properties that abstract entities cannot have. The simple pendulum described in a model, say, is said to have a certain length and to move through space over time in a certain way, but abstracta of course cannot do that (2010, 13?). One could (analogously to Zalta’s move) take the relevant abstracta to bear some other relation to their properties (encoding them, or having them as parts). But that would undermine the original attractions of the view, which lay in the idea that models can be straightforwardly compared for similarity with the real-world target systems (2010, 15?).[[8]](#footnote-8) Thomson-Jones concludes, “we should learn to do without description-fitting entities corresponding to descriptions of missing systems” (2010, end?).

The above is not meant as a refutation or even original argumentation against views that take stories or model descriptions to be about description-fitting objects. Instead, it is intended just to serve as a reminder of difficulties that are known to arise if we take that route. Such difficulties have motivated looking at fictional discourse—and similarly, scientific discourse about model systems—differently. Perhaps we were wrong to take these kinds of internal statements about fictional characters or model systems literally, as accurate descriptions of a certain (kind of) object. Perhaps instead we should see the statements in works of fiction not as descriptions of abstract, nonexistent, or other sorts of objects at all—but rather as props in games of make-believe. This reaction against traditional forms of realism has led, in turn, to the popularity of anti-realist views of fictional characters and models.

**2. The Promise of Pretense**

In recent years, the most popular anti-realist alternative to traditional realism about fictional characters has been to adopt a pretense view.[[9]](#footnote-9) On the pretense view, the text of *Hamlet* should not be taken literally, as describing a (nonexistent or abstract) prince. Instead, it should be seen as enjoining us to make-believe that there was such a prince. On the pretense view, works of literature are taken as ‘props’ in games of make-believe, which make certain things fictional-in-the-game. Whatever is directly stated (and not retracted or undermined) in the story is something we are instructed to imagine by the official game of make-believe. But that’s not all. ‘Principles of generation’ may also license us to infer what else we are to imagine, even when it is not explicitly stated. So, for example, for realistic works of fiction, we are entitled to infer (unless indicated otherwise) that the people described have the usual number of limbs and are psychologically similar to real people. Internal claims about the play’s content are counted as true if (given the principles of generation and the features of the ‘prop’—in this case, what the play says) someone who utters them pretensefully makes it fictional of herself that she speaks truly, in the make-believe game authorized for the work (Walton 1990, 400).

The pretense view offers a marked improvement over Neo-Meinongian views in treating discourse within and about the content of works of fiction. It is intuitively plausible that we are engaged in something like imagining or pretending when we write works of literature and discuss their content. Acknowledging that pretense means that we needn’t think of internal discourse descriptively, and so needn’t accept that there are non-existent or abstract objects that (in some sense) have the properties described. This in turn saves us from other tangles: we needn’t distinguish nuclear from extra-nuclear properties or distinguish two different modes of predication to capture the sense in which statements like ‘Hamlet is a prince’ are true: it is true not if there is a nonexistent or abstract object that is (or encodes) being a prince, but rather if someone who says “Hamlet is a prince” makes it fictional of herself that she speaks truly, in the game authorized by *Hamlet.*

Frigg (2010a, 2010b, 2010c) and Toon (2010, 2012) develop views of scientific models based on Walton’s treatment of fiction. Frigg argues that model descriptions should be understood (parallel to stories) as props in games of make-believe (2010a, 260). So, to say that the simple pendulum has no frictional forces at the point of suspension is not to (falsely) report that there is a concrete object like that, nor is it to describe an abstract object as having properties it could not have (a location of suspension). Nor do we need to consider some alternative way in which an abstract object may have a property (or alternative, perhaps mathematical properties, we can attribute to it). Instead, according to the pretense view, the model-description of the simple pendulum serves as a prop in a game in which we are to imagine that there is a concrete object suspended in a frictionless way from a given point (and so on…). Attributing concrete properties to models in internal discourse “is explained as it being fictional that the model system possesses these properties” (Frigg 2010a, 261). It is fictional that the model system has these properties, roughly, if the model-description, together with the appropriate rules of generation, enjoins us to imagine that there is a system that has these properties (Frigg 2010c, 268). Generally, for a statement p about what is the case within a model system to be true, is for the model-description together with the relevant principles of generation to prescribe p as to be imagined (Frigg 2010c, 262).

 **3. Problems for Pure Pretense for Fiction**

But while the pretense view brings certain clear advantages in handling fictionalizing and internal discourse,[[10]](#footnote-10) it also faces well-known problems. For we have more ways of talking about fictional characters than just participating in the pretense licensed by the story. Historical and literary critical discussions, in particular, often speak of fictional characters in what I have called ‘external’ contexts (2003b, 207): speaking of them not as people but *as* fictional characters, discussing the circumstances of their creation, the sources for them and their further influences on literary history, their appearance in various stories or other media, their development or novelty, and so on. So for example, we might explain to a puzzled child that Gregor Samsa is just a fictional character, and that no real person could turn into an insect. Works of literary history may say things like “Hamlet is one of Shakespeare’s most famous creations”; “Hamlet also appears in Stoppard’s *Rosencrantz and Guildenstern are Dead”,* or“The earliest portrayal of Hamlet on stage was by Richard Burbage”. Or we might speak of Jane Austen’s character Emma Woodhouse as drawn with a wealth of detail hitherto unseen in the English novel, or as being a core source drawn on for the character Cher in the movie ‘Clueless’, and so on.

Intuitively, all of these are cases in which we step outside the pretense we participate in when reading the story or discussing its content. In these contexts we speak not of a person but of a *character,* a literary figure created by an author, in a given historical context (typically not the same as the circumstances of creation attributed to the person in the story), with distinctively literary attributes, sources and influences.

Walton, however, takes *all* discourse apparently involving reference to fictional characters to be best understood as (at least implicitly) in the context of a game of make-believe. Having uncovered the role of make-believe in internal statements about fiction, Walton goes on to see it everywhere. “…[W]hen realists claim with a straight face that people refer to and talk about fictional entities”, he writes, “…they are overlooking or underemphasizing the element of make-believe that lies at the heart of the institution. They mistake the *pretense* of referring to fictions, combined with a serious interest in this pretense, for genuine ontological commitment” (1990, 390). As a result he gives us an anti-realist view of fictional characters: on his view there are no such things, and so there is no ontology of them to give. We just pretend that there are. I will call this a ‘pure pretense’ view, since it holds that pretense plays a prominent role in understanding both internal and external fictional discourse.

But how can we give a pretense-based reading of external discourse about fiction? Clearly we cannot understand external statements like those cited above as things that the text authorizes us to pretend. The text of *The Metamorphosis* does not authorize us to pretend that Gregor Samsa is a creation of Kafka’s, but rather that he is a man of woman born. The text of *Hamlet* certainly does not authorize us to pretend that Hamlet appears in *Rosencrantz and Guildenstern are Dead.* Nor does the text of *Emma* authorize us to pretend that Emma Woodhouse is drawn with an unusual wealth of detail and psychological insight, or that she is the source for a later character in “Clueless”.

In order to hold that all such external statements are nonetheless in the context of a pretense, Walton suggests that those who utter them are involved in *unofficial* or *ad hoc* games of make-believe (1990, 406). For example, where statements like “Gregor Samsa is a fictional character” are concerned, Walton writes:

There may be an unofficial game in which one who says [“Gregor Samsa is a (purely fictional) character”] fictionally speaks the truth, a game in which it is fictional that there are two kinds of people: ‘real’ people and ‘fictional characters’ (1990, 423)

Walton similarly treats claims about characters being created by authors as implicitly invoking an unofficial game “in which to author a fiction about people and things of certain kinds is fictionally to create such” (1990, 410). What should we do with talk about characters appearing in other works—treat them as invoking unofficial games in which we pretend that works are places and characters are people who go there? I am not even sure how to start thinking of claims about characters being drawn with an unusual wealth of detail in the terms that a pure pretense view would require. Certainly these seem to be straightforward claims about literary figures rather than pretenseful claims about imagined people.[[11]](#footnote-11)

In short, while it seems right that pretense is involved in our internal claims about fictional characters (in the context of discussing the content of works of literature), it is far more of a stretch to think that *all* talk about fictional characters should be understood as in the context of a pretense. First, it is psychologically implausible—those who are engaged in literary historical discussions about the number of stories a character appeared in, about its historical sources and influence, about the techniques the author uses in developing the character, etc. seem to be involved in a straightforward literary-historical discussion that involves stepping outside of the pretense.

Even if the psychological plausibility point can be discounted, treating both internal and external fictional discourse as implicitly in the context of a pretense leads to an *ad hoc* theory. The analyses of apparently true external sentences must each be concocted by supposing there is some new *ad hoc* game of make-believe implicitly invoked, according to which one who makes the relevant utterance speaks truly. There are no rules for detecting the presence of games, their presence is often not intuitively plausible, and they are a disparate lot. So it seems more of an idle hope of pretense theorists to analyze all fictional discourse in this way, in order to avoid accepting that there are fictional characters, rather than a principled solution driven by linguistic or psychological evidence.

Moreover (as I have argued elsewhere (2003b)) treating all apparent reference to fictional characters as pretenseful does double the revisionary work needed to offer an account of fictional discourse. Some revisions to a face-value understanding of fictional discourse are essential—for there are apparent contradictions that arise, for example, between saying ‘Hamlet was a man’ and ‘Hamlet is a fictional character’, or ‘Frankenstein’s monster was created by Dr. Frankenstein’ and ‘Frankenstein’s monster was created by Mary Shelley’, and so on (2003b, 205). We can avoid the contradictions by treating the first statement in each case as implicitly in the context of a pretense—even if we take the second to be literally true. But the pretense theorist proposes that we understand *both* as in the context of a pretense (two different pretenses) and thereby does double the revisionary work needed to make sense of fictional discourse. It seems a reasonable principle that we need justification for interpreting discourse in a revisionary way—but what is the justification here for doing double the revisionary work needed?

Pure pretense views of fiction have been well received and popular largely because they are thought to offer the key to avoiding ‘postulating’ fictional characters, offering a sparer and less ‘mysterious’ ontology. This is not prominent among Walton’s own explicit goals, however, and he denies being motivated by a goal of avoiding abstract entities in general (1990, 390). He does, however, think that there are “grounds for being wary of fictional entities that are not readily applicable to abstractions generally”, particularly, that in many ordinary contexts we naturally claim that fictions do not exist (1990, 390).[[12]](#footnote-12) Walton also takes pride in giving paraphrases that don’t threaten “to force fictional entities on us” (1990, 416) and excoriates some sorts of fictional realists for engaging in “voodoo metaphysics” (1990, 385). I will return to discuss the alleged ontological advantages of avoiding fictional characters below. But if we take Walton at his word, that his primary interests lie not in parsimony but simply in giving a better account of the discourse, we might begin to question the grounds for thinking that pretense is *always* involved in talk apparently about fictional characters.

**4. Problems with Pure Pretense for Models**

Anti-realist accounts of models have been developed by Roman Frigg (2010a, 2010b, 2010c), Adam Toon (2012), and Arnon Levy (forthcoming), in ways inspired by Walton’s pure pretense account of fiction.[[13]](#footnote-13) As in the fiction case, this approach appeals to many as a way of accounting for the discourse while avoiding ontological commitments. As Frigg puts it:

 What metaphysical commitments do we incur by understanding models in this way? The answer is: none. Walton’s theory is antirealist in that it renounces the postulation of fictional or abstract entities, and hence a theory of scientific modeling based on this account is also free of ontological commitments (2010a, 264).

Elsewhere Frigg again emphasizes the fact that “this account is ontologically parsimonious; we have not incurred ontological commitments to fictional entities” (2010c, 274).[[14]](#footnote-14) Toon writes “if we were to understand model-systems in the same way that Walton understands fictional characters then it seems that we would conclude that there are no model systems” (2012, 58), and Levy notes that on his view “models need not be seen as genuine objects” (forthcoming, 5?).

At points Frigg seems to embrace this anti-realism and even present it as an advantage, urging that ‘we need to know what kind of commitments we incur when we understand model-systems along the lines of fiction, and how these commitments, if any, can be justified”; (2010b, 113) and giving voice to worries that “fictional entities are beset with philosophical problems so severe that avoiding fictional entities altogether would appear to be a better strategy” (2010b, 101). Toon similarly presents his anti-realism as an advantage, writing “the make-believe view has an advantage over existing accounts of scientific representation, since it is able to accommodate models without objects” (2012, 82).

Yet, like Walton, Frigg does not present ontological parsimony as his primary motivation.[[15]](#footnote-15) Indeed at certain points he suggests that parsimony is not really important to him:

…it is not, in my view, a condition of adequacy that the account we propose be metaphysically parsimonious. As a matter of fact, the account I develop below eschews commitment to fictional entities, but this is accidental, as it were. To say it a different way, it just so happens that the theory that provides the most convincing answers [to five questions about models] is also metaphysically parsimonious; but if it had turned out that a metaphysically substantial theory (i.e. one that is committed to fictional entities) had provided the best answers, then we should have chosen that theory. (2010b, 113).

Instead of taking his view to give a knockdown case against realism about models (or fictional characters) he puts it more moderately:

The point to emphasize here is just that whatever these reasons may be [for preferring a realist view], the needs of science are not one among them. (2010a, 264)

I will argue, however, that we have reason to think that the ‘needs of science’ do give us reason to accept that there are models, and that our scientific discourse sometimes refers to them—that our talk of models is not always in the context of a pretense.

The well-known problems with pure pretense views of fiction carry over to the parallel views of models. While the pretense approach gives us a good way of understanding internal talk of model systems as prescriptions to imagine,[[16]](#footnote-16) just as in the case of literary fictional characters, this is not the *only* way we talk about model systems.[[17]](#footnote-17) Nor is it the only way we need to talk about them in the practice and study of science. Attending to external discourse about models raises problems for a pure pretense theory of discourse about models that parallel the problems for pure pretense approaches to fictional discourse.

In their primary use, we use models to learn about the world—the target systems described. But we also, as Godfrey-Smith points out, come to talk about models themselves, as objects of study (indeed objects of study that can themselves be further represented in toy models). Thus Godfrey-Smith writes:

It may then happen that this fictionalizing becomes more systematic, giving rise to a tradition in which fictional objects are studied as topics in their own right. Scientists in the field get used to discussing how such systems behave, get used to talking of what is true or false of them—get used to treating a fictional model system as an object in itself. (2009, 19).

The parallels with literary fiction are again striking. For just as we engage in ‘external’ historical and critical discussion about fictional characters—where that discourse cannot be taken to be in the context of pretending what the story authorizes—so is there a great deal of historical, theoretical, and critical talk about models that cannot be understood as implicitly in the context of a pretense authorized by the model description.

So, for example, we speak historically when we discuss the sources and influence of a model, saying that the quantized shell model of the atom was proposed by Niels Bohr in 1913, on the basis of modifying the Rutherford model, and was in turn modified and enhanced on the Sommerfeld model. But the imagined atoms themselves are not pretended to have been proposed or created by Bohr or to have influenced the Sommerfeld model. Moreover, the truth of such external sentences, as Contessa (2010, 223) points out, is settled largely by empirical (in this case historical and archival) evidence—not by working out what follows from a model-description.

Theoretical discourse about models—including philosophical discourse—also frequently requires us to say things about models systems that cannot be construed as implicitly in the context of what the model-description instructs us to pretend. Thus, for example, Frigg himself (with Stephan Hartmann) describes model systems as capable of yielding results where theories remain silent (Frigg and Hartmann 2012, section 4.2), and as capable of being good models even if they are false (Frigg and Hartmann 2012), and so on. But the model descriptions certainly don’t authorize us to imagine that infinite populations of rabbits are capable of yielding results or of being good even if false (how do you imagine a false rabbit?). Another key theoretical claim about models is that model systems represent a worldly target system (Frigg 2010b, 121). But this claim is also problematic on a pure pretense view that eschews all reference to models, and treats all talk of models as implicitly in a pretense. For again, this is not something the model description instructs us to pretend—and it seems like a straightforward theoretical claim about the model system. Frigg engages in a long discussion of how we can represent nonexistent objects (2010b, 123). But the more difficult question is: how can we truly say that model systems represent target systems in the world if, as he apparently holds, *there are no model systems?* Frigg accepts a denotationist view according to which X represents Y iff X denotes Y and X comes with a key that specifies how facts about X are to be translated into facts about Y (2010b, 126). But how can we then attribute representation where X does not exist? As Toon puts it, “If there are no model-systems then there can be no facts about them and we cannot establish an object-to-object [representation] relation between model-systems and the world” (2012, 58; cf. Levy forthcoming, 14?). Toon (2012, 58-9) argues that Frigg thus must either provide a different account of the way model-systems represent target systems (one which does not make reference to model-systems) or become a realist after all.[[18]](#footnote-18)

Moreover, scientists themselves do not only develop and use models—it is also essential to the work of science itself that they critically examine models, discuss their relation to the real-world target phenomena and their usefulness as providing a means of knowledge of the target phenomena. Thus arguably for scientific models, even more so than literary fictions, the ability to make sense of external discourse about such models is crucial.[[19]](#footnote-19) Such critical discourse might include claims that certain economic models that treat agents as fully rational and self-interested are based on faulty psychological assumptions, or incapable of giving the desired information about real-world target systems. We also comparatively evaluate models, saying, e.g. that one model of hurricane development has higher resolution or greater historical accuracy than competing models. But again it would be a category mistake to think we are instructed to imagine that the interacting *agents* are based on faulty assumptions; or that the *hurricanes* represented in the model are *to be imagined* as high resolution or historically accurate (while *models* might be high resolution or accurate, giant windstorms are not the right sort of thing to be).

In short, the history, theory, and even internal critical work of science itself seem to require us to talk about models in external ways, quite distinct from the ways we talk of models while engaged in pretending what they authorize us to pretend. But it is far from obvious how to understand this external talk on a pretense model.

Could we, following Walton, suggest that we are involved in some *ad hoc* game of pretense when we say that Bohr developed the quantized shell model of the atom, or that traditional economic models involve psychologically unrealistic assumptions?

Toon (2010, 2012) explicitly suggests adopting Walton’s *unofficial game* strategy, writing: “When scientists appear to talk about theoretical models as objects… we should not take this talk too seriously” (2012, 131-2). So suppose we say that Lopez developed a model of the bouncing bob as a simple harmonic oscillator that enabled better predictions of the movements of the actual bob. How can a pure pretense view understand this? Toon suggests:

Walton’s notion of unofficial games allows us to understand theoretical hypotheses as acts of pretence. Our theoretical hypothesis invokes an unofficial game in which it is fictional that there exists both the bob and an entity called ‘the model bob’ which, fictionally, has all the properties attributed to the bob by the model (2010, 314)

Yet it seems even more implausible here than in the fiction case to think that we are engaging in some unofficial game of pretense. If we say Lopez developed a model of the bob as a simple harmonic oscillator, are we really pretending that Lopez created a point mass subject to a uniform gravitational field..? It seems far more plausible to think of it as straightforward reporting on scientific work. It is even less clear how to use the ‘unofficial games’ strategy to understand claims that an economic model is based on faulty psychological assumptions, or that one model of hurricane development is higher resolution than another.

One could of course try using various paraphrase techniques to avoid reference to model systems. We might try to paraphrase some external statements into talk about model *descriptions* rather than model-systems: we might, say, aim to paraphrase talk about creation in terms of talk of the relevant scientists writing certain model-descriptions. But this itself is not straightforward: a Nobel-prize winning scientist might develop a model, while the relevant model-description is written by a graduate student; or a new model-description may be written without a new model being created—since the same model may be described in many different ways. As Frigg and Hartmann argue (2012) we can’t on the whole replace objectual talk about model-systems with talk of model-descriptions: the same model-system may be described in many different ways (even in different media—e.g. verbally, diagrammatically). Moreover, much is true of the model description that is not true of the model system (e.g. that it consists of 5,325 words, is in French, is written by a graduate student) that is not true of the model system itself—and vice versa.

Those who are committed to avoiding all reference to model systems might succeed at devising, for each external sentence, a way in which we can understand it as pretenseful or paraphraseable. But as in the case of fiction, there is risk of this becoming a very *ad hoc* procedure driven solely by ontological worries (worries which, on my view, are misplaced and misguided).[[20]](#footnote-20) Moreover, as in the case of fiction, it will involve giving revisionary interpretations of what seem like straightforward historical, critical and theoretical statements. While some revisionism may be necessary to interpret model talk, the revisions that are needed can be handled by treating internal discourse pretensefully. As in the case of fiction, those who aim to treat internal and external discourse about models pretensefully do double the revisionary work necessary, and attribute pretense even where we appear to have straightforward historical, theoretical or critical claims. Those who aren’t antecedently committed to finding a way to avoid reference to model systems might find these increasingly *ad hoc* moves both unconvincing and unnecessary. The question to press on those who aim to paraphrase *all* apparent reference to model systems is this: what is the linguistic and psychological evidence (in each case) that the statement should not be interpreted literally? If the motivation comes (in any case) not from linguistic or psychological evidence relevant to interpreting the discourse, but rather from ‘ontological concerns’—and we can give grounds for dismissing those ontological concerns—then the paraphrases should be rejected and the simpler view of the discourse adopted.

**5. An Overlooked Option: Artifactualism**

While neo-Meinongian realism and anti-realism were once the main contenders among views of fiction, those are not the only options. The problems arising for both of those traditional approaches have made an alternative view popular. That alternative is an artifactual theory of fictional characters—an approach that is well known in the fiction literature, but which seems to have been largely overlooked in the literature on scientific models (with the important exception of work by Thomson-Jones (this volume)).[[21]](#footnote-21)

 The basic idea is this. It makes sense to think of authors, in writing works of fiction, as engaging in a certain kind of pretense: that there were such and such people, that certain events happened, etc. So it may well be, as the pretense theorist has it, that the primary use of fictional names like “Emma Woodhouse” is a pretending use. Nonetheless, as Stephen Schiffer has put it, on the basis of these pretending uses, we may become *entitled* to introduce a ‘hypostatizing’ use of fictional names that refer (in *external* contexts)to fictional characters. As Schiffer puts it: “…whenever one of us uses a name in the fictional way … then that use automatically enables any of us to use the name in the hypostatizing way, in which case we are referring to an actually existing fictional entity” (1996, 156; see also Searle 1979, 71-2). Just as we normally assume in our literary discussions, all it takes for a fictional character (like Emma Woodhouse) to be created is for an author in the right context to write in a way that pretends to be about real individuals (but using a name that doesn’t refer back to any extant individual). When Austen *pretended* to assert various things about the young woman, Emma Woodhouse, she thereby *created* a fictional character—an abstract literary creation that we can go on to seriously refer to in the context of critical and historical discussions (see my 2003a, 147-53).

The artifactual approach has the advantage of enabling us to take external discourse about fictional characters at face value.[[22]](#footnote-22) We can take it to be a straightforward truth that Austen created the character Emma Woodhouse, that the character was a source for Cher of ‘Clueless’. Such characters are understood not as special kinds of (imaginary or nonexistent) people, but rather as abstract artifacts—cultural creations similar in kind to stories, theories, and laws. Thus when we talk about the history and development of a character we can take names for the character to refer—not to an object that matches the descriptions in the story, but rather to an abstract artifact (see my 2009 for an overview of the literature).[[23]](#footnote-23)

There are various choice points about how to develop this basic idea. The key point of the artifactualist approach is to allow that singular terms for fictional characters do really refer (to abstract artifacts) in *external* discourse. But a great deal is left open about how to treat internal and fictionalizing discourse. One thing is clear: it is not to be read straightforwardly as about abstract or nonexistent objects. (The abstract artifacts do not have properties like being a woman or being handsome, clever, or rich.) But internal discourse might be paraphrased (as discussing what is true according to the story (see my 1999)) or treated along the lines suggested by pretense theorists—as participating in the game authorized by the story.

As Thomson-Jones suggests, there is room to develop an abstract artifacts view of models, paralleling the artifactualist view of fiction: “missing systems like simple pendula are abstract artifacts, created by physicists at a certain point (or over a certain period) in the history of classical mechanics” (this volume, 10?). As Godfrey-Smith observes, scientific papers often begin with phrases such as “’imagine a population of self-replicating molecules…’, ‘assume a three-layer neural network learning by back-propagation’, or ‘consider a collection of agents playing one-shot prisoner’s dilemmas at random…’” (2009, 2). Such sentences we may take to enjoin us to imagine certain scenarios, and may legitimate us in counting certain further claims as true, if they involve or follow appropriately from what we are prescribed to imagine. But utterances or inscriptions of sentences like these, made in the appropriate theoretic context, in a way that enables us to follow implicit rules for determining further features of the model system with the aim of aiding in acquiring knowledge of a target system, may also *entitle* us to introduce reference to the model-system itself. For that, according to ordinary and scientific standards, is all it *takes* to develop a model.[[24]](#footnote-24) We may then refer to it without pretense as a model, developed by a certain group of scientists with certain theoretical goals, intended to represent a certain target system, influenced in its design by prior models and improved by later models, and so on.[[25]](#footnote-25)

Accepting that external discourse may refer to model systems brings significant advantages for the artifactualist theory over a pure pretense approach. For historical, theoretical and critical discourse about model systems can then be read straightforwardly, outside of any pretense operators, as claims about the relevant model system, considered as an abstract artifact. Discussions about how it was developed, what its sources and influence have been, what techniques and assumptions were used in its development, what uses and failings it has turned out to have, about what it represents etc., can all be understood straightforwardly, without appeal to unofficial games of make-believe or *ad hoc* paraphrases. This enables the artifactualist to give a much more straightforward, plausible, and less revisionary approach to external discourse than pure pretense views can.

But how should an artifactualist read fictionalizing discourse and internal discourse about what goes on in the model-system? Even if we accept with the pretense theorist that scientists are engaged in a kind of pretense when they write a model description, options remain open for the artifactualist. Do we take scientists to be engaged in a *de re* pretense, about that very abstract artifact (created performatively in the initial description)—and so to be referring back to the abstract artifact and pretending things of it (that it moves sinusoidally)?[[26]](#footnote-26) Or do we take the scientists to be merely engaged in a *de dicto* pretence that there is such a pendulum, which moves sinusoidally, and simply take that to entitle others, in external contexts, to refer to the abstract artifact?[[27]](#footnote-27)

Similar questions arise about how the artifactualist should interpret internal (‘metafictive’) discourse about the objects as described in the models. When we say, ‘The simple pendulum moves sinusiodally’, should this be understood (in *de re* mode) as referring to the abstract artifact, and saying, of it, that it is fictional that that abstract artifact moves sinusiodally; or should we take this (in *de dicto* mode) as saying that it is fictional that there is a pendulum that moves sinusoidally?[[28]](#footnote-28)

There is no need to settle these issues here. I would rather leave it to those who know better the particular challenges of understanding scientific modeling, to see which options would serve best. But it’s worth noting that the artifactualist has options (treating discourse of either of these sorts as a *de re* pretense) that pure pretense theorists lack. Either that option is better than the *de dicto* pretense option or it is not. If it is, then the artifactualist has an advantage in handling internal and fictionalizing discourse—as well as in handling external discourse. If it is not, then she should simply adopt the *de dicto* pretense strategy.

Admittedly, accepting that there are abstract artifacts (and identifying these with the fictional characters or model systems) is not a panacea to solve all the puzzles of discourse about fictions or models. One sort of discourse remains tricky for both the artifactualist and the pure pretense view: discourse that compares features of the fiction/model system with features of the real world/target system. If we comparatively say: “Letoya is as smart as Holmes”, we cannot take this to be literally true on either view: on the pretense view, there is no Holmes to compare; on the artifactualist view Holmes is an abstract artifact that cannot literally be smart. Similarly, if we say that the sun in the model system is more perfectly spherical than the real sun, we again cannot be taken to utter a literal truth about the sun of the model system on either a pure pretense or artifactualist approach. Pure pretense theorists have tended to handle these difficulties by appealing to properties in a paraphrase (Frigg 2010a, 263): we can paraphrase such comparative sentences as saying, of a certain degree of smartness, that the degree of smartness we are enjoined to imagine Holmes has is the same as that degree of smartness Letoya has. Or we can say, of sphericality, that it is approximated to a certain degree by the sun, and that the model system enjoins us to imagine that it is approximated to a closer degree by the model sun. Godfrey-Smith criticizes Frigg on this score, suggesting that those who have qualms about accepting the existence of non-existent objects should be similarly hesitant to appeal to uninstantiated properties (as one must to apply this strategy across the board) (2009, 113-114). As he puts it “It is not clear that giving an explanation of modeling in terms of uninstantiated properties is more down-to-earth than giving one in terms of non-existent objects” (2009, 114). In my view, however, these cautions about uninstantiated properties are unnecessary. As I have argued elsewhere (2015, following Schiffer 1994, 2003), we can get easy arguments for the existence of properties, by making pleonastic inferences from ‘the shirt is red’ to ‘the shirt has the property of redness’, to ‘the property of redness is possessed by the shirt’. Similar arguments can lead us to accept uninstantiated properties, as we can move from “The wand is not magical” to “the property of magicalness is not possessed by the wand” to infer that there is a property of magicalness that the wand (indeed everything) lacks. But there is no analogously compelling easy inference to claims that there are non-existent objects: moving from ‘There is no round square’ to ‘There is a nonexistent round square’ is not licensed by our ways of introducing object talk. So, for somewhat independent reasons, I think neither the pure pretense theorist nor the artifactualist need have any qualms about appealing to properties in their analyses of comparative statements—even where these are uninstatiated. Their common analyses of comparative statements might raise eyebrows simply for their cumbersomeness, but in my view they should not be thought to raise ontological worries. [[29]](#footnote-29)

So where do we stand in comparing the artifactual view and the pure pretense view? Neither is perfect, and the difficulties of giving a smooth analysis of these areas of discourse are well known. Nonetheless, there is no reason that the artifactualist can’t take over *everything* the pretense theorist says about fictionalizing and internal discourse, and preserve *all* of the advantages a pretense theory brings in handling discourse of these kinds. The artifactualist also, as I have noted above, can take on board the pretense theorist’s approach to handling comparative statements. In that case, the two views end up on a par for internal and fictionalizing discourse, as well as for comparative discourse. However, as I have argued above, the artifactualist view has advantages over pure pretense views in handling external discourse. Looked at from the point of view of understanding the discourse alone, then, the artifactualist approach looks likely to be preferable overall.[[30]](#footnote-30) At the very least, those interested in a fiction view of models would do well to consider an artifactual view as an option, instead of remaining confined by the old options of anti-realism or neo-Meinongian realism.

**6. Ontological Qualms**

Despite its considerable attractions in understanding the discourse, some may be inclined to resist an artifactual approach on ontological grounds. For the artifactual approach apparently has ontological commitments a pure pretense approach lacks: it accepts that there are fictional characters/models, and that we sometimes (in external contexts) refer to them and say true things about them.[[31]](#footnote-31) The idea that ‘problematic ontological commitments can be avoided’ is undoubtedly behind the attraction pure pretense views hold for many metaphysicians (though it ostensibly is not a primary motivation for Walton or Frigg themselves). So it may be worth saying something in closing about these qualms.

Questions of how seriously we should take these alleged problems of ‘ontological commitment’ and how much weight we should give to parsimony in choosing a metaphysical theory are themselves major issues in metametaphysics and cannot be resolved here. I have addressed these issues extensively elsewhere, and refer interested readers there for fuller discussion (2003a, 2007 Chapter 9, 2015). Nonetheless, it is worth making a few closing remarks about three different types of ontological concern that might arise.

First, some might resist accepting that there are model systems on grounds of worries that they would be somehow problematic entities—involving us in contradictions, implausible empirical commitments, difficulties with identity conditions, etc. But as soon as we stop thinking of model systems as imaginary or abstract objects that (in some sense) have the properties attributed to them by the model description, many of these worries melt away. In any case, I have addressed worries of these kinds elsewhere for fictional characters (1999; 2003b, 219-222). There is every hope that parallel solutions would carry over to model systems understood as abstract artifacts.

Second are concerns about admitting a ‘strange kind’ of object to our ontology: an abstract artifact. But again, as I have argued extensively elsewhere (1999; 2003b, 220-222) abstract artifacts are extremely commonplace. Entities such as theories, stories, laws of state, symphonies, etc. all seem best understood as abstract artifacts. If you are prepared to accept that we refer to any of these, then there should be no barrier to accepting fictional characters and model systems—considered as abstract artifacts.

Finally, there are vague neo-Quinean qualms about really ‘accepting such objects into our ontology’, about being unparsimonious, and the like. The neo-Quinean approach to existence questions is one I have argued against extensively elsewhere (2007 Chapter 9, and 2015), and there isn’t space to repeat those arguments here. But think of it this way. On the version of artifactualism developed here, when scientists write a certain description, beginning with a phrase like “consider a collection of agents playing one-shot prisoner’s dilemmas at random” (Godfrey-Smith 2009, 2) or “consider a frictionless plane…” and go on to describe what would be the case in such a scenario, following certain implicit rules for generating further information about the imagined system (that then is supposed to help us gain knowledge of a real-world target system), that is *what it is* to create a model. (Not just a model-description, but also a model-system—just as authors who engage in the proper pretense in writing a text not only create a story but also fictional characters.) This seems entirely in accord with how we treat scientists and their productions, and with how we speak of the development of models in talking about science and its history.[[32]](#footnote-32) As a result, it seems that we can get ‘easy’ arguments for the existence of models, so understood, by starting with premises about the relevant modeling activities of scientists.[[33]](#footnote-33)

Why deny this face-value view—and accept that all of the relevant activities take place, descriptions are written, predictions made, and yet deny that there are model-systems? What more should one think it would take for a model-system to be created, than for scientists to engage in certain kinds of modeling activities and to provide certain model descriptions?[[34]](#footnote-34) (Not for there to really be a world with frictionless planes or an isolated population of rabbits!). Once the relevant qualms are put to the side, there seems no reason at all.

**6. Conclusion**

The idea that the model-systems (and discourse about them) can be understood on analogy with fictional characters (and discourse about them) has been increasingly popular, with good reason. But if we take the analogy seriously, we should bear in mind not only the ways we have of speaking of fictional characters and model systems ‘internally’ as imaginary people, populations or economies, but also the ways we have of speaking of them from an *external* perspective. The analogies again hold up well. But considering the full range of fictional discourse gives reason for accepting that there are fictional characters we sometimes refer to—and that these are a kind of abstract artifact. So similarly, bearing in mind the full range of discourse about models gives us reason to accept that there are model systems, where these too are a kind of abstract artifact. Perhaps surprisingly, taking seriously the idea that models are fictions also gives us good reason to take models themselves seriously—and to think that when we speak of them, we are not always pretending.

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1. A fiction approach to models is defended in various forms by Godfrey-Smith (2006), Frigg (2010a, 2010b, 2010c), Thomson-Jones (2010 and this volume), Contessa (2010), and Toon (2010 and 2012). [↑](#footnote-ref-1)
2. An important exception is Martin Thomson-Jones (this volume) who argues in favor of a view of scientific models based on my (1999) view of fictional characters. Contessa (2010) suggests a somewhat similar view, without citing the parallel fiction literature. [↑](#footnote-ref-2)
3. I have, however, discussed these issues at great length elsewhere, e.g. in my (2007) and (2015). [↑](#footnote-ref-3)
4. Frigg refers to this as ‘metafictional’ discourse: discourse not within the work of fiction, but about the content of the work of fiction (2010c, 272). [↑](#footnote-ref-4)
5. Frigg labels these ‘primary’ and ‘inferred’ (fictional) truths, respectively (2010c, 267). [↑](#footnote-ref-5)
6. See my (1999, 56-62 and 100-105) for discussion of some of these difficulties for neo-Meinongian views of fictional characters. [↑](#footnote-ref-6)
7. For more thorough discussion of difficulties along these lines see my (1999, 93-114). [↑](#footnote-ref-7)
8. Thomson-Jones also worries about the ontological costs of accepting uninstantiated properties. This is not a worry I share, for reasons that will become clear later (and are discussed at greater length in my (2015)). [↑](#footnote-ref-8)
9. Walton (1990) provides the canonical and most developed pretense approach. Other anti-realist views are available, including paraphrase views (e.g. Russell, 1905 and Ryle, 1966) and negative free logic views (e.g. Sainsbury 2005). For simplicity, I will leave these aside here, though I have discussed them elsewhere (1999 and 2010). [↑](#footnote-ref-9)
10. Though it is worth noting that, for those who doubt that appeals to pretense or make-believe are psychologically plausible (for one case or the other), many of the same advantages can be had by taking internal claims as to be paraphrased as talking about what is true ‘according to the story’ or ‘according to the model description’—at least, given a suitable understanding of truth according to a story. [↑](#footnote-ref-10)
11. Of course, rather than appealing to unofficial games of pretense, anti-realists might aim to paraphrase problematic sentences. Some might be paraphrased into talk about the activities of an author, or talk about the stories themselves, or… and in at least some cases the relevant paraphrases may give a better analysis than the appeal to *ad hoc* games. Nonetheless, as I argue elsewhere (1999, 94-100), while inventive paraphrases may be devised for each type of problematic discourse, the risk is that the procedure here is *ad hoc,* and driven merely by ontological (not linguistic) concerns*.* As I argue there (and in 2003b), we can offer a smoother and more uniform overall analysis of fictional discourse if we allow that we sometimes do refer straightforwardly to fictional characters. [↑](#footnote-ref-11)
12. For a response to this, and details about handling nonexistence claims, see my (2010). [↑](#footnote-ref-12)
13. Toon’s view differs from Frigg’s, however, in taking scientific model-descriptions to represent the world *directly,* asking us to imagine things about the system modeled, not *indirectly* by asking us to imagine that there are certain fictional entities (the model systems), which then represent the target system. He is thus more upfront and thoroughgoing about his anti-realism about fictional entities/model systems than Frigg. [↑](#footnote-ref-13)
14. Not all of those inclined to treating model systems as fictions are committed to a pure pretense view, however. Godfrey-Smith is far more cautious, emphasizing that it’s just ‘much of the time’ that models are spoken of as imaginary things (2009, 5), and also pointing out ways in which we come to speak of model systems as objects (2009, 19). Thomson-Jones (this volume) develops an artifactual realist approach, and Contessa (2010) suggests a realist approach of his own. [↑](#footnote-ref-14)
15. Instead, his motivations lie centrally in the superior ability of the pretense account to address six questions about model systems (2010a, 259). But these are motivations for his approach over traditional neo-Meinongian realism (2010b, 113n21). Frigg does not cite or discuss any artifactualist approaches. [↑](#footnote-ref-15)
16. Some take these as prescriptions to imagine *that there are* certain objects with the relevant properties; others take them as prescription to imagine things *of the real-world ‘target’ systems* instead (Levy forthcoming). These differences in pure pretense theories of models will not play a crucial role below. [↑](#footnote-ref-16)
17. An important exception to this is Gabriele Contessa (2010, 223), who distinguishes internal and external discourse about models, along the lines given in the fiction literature. [↑](#footnote-ref-17)
18. One such account is developed in Levy (forthcoming, 21?), who aims to account for the representation undertaken in modeling as a way of *directly* representing the target system—typically by enjoining us to imagine the target in a simplified way, that may give us partial truths about the target system. This gives a way for the pure pretense theorist to avoid the need for employing model-target comparisons, and so avoids the above problem. The other difficulties discussed above, however, of accounting for various sorts of external, critical, theoretical and historical talk of models, remain. [↑](#footnote-ref-18)
19. Thanks to Arnon Levy for emphasizing this point. [↑](#footnote-ref-19)
20. I return in Section 6 below to address these worries, and argue against that sort of worry at much greater length in my (2015). [↑](#footnote-ref-20)
21. Frigg, for example, dismisses realist accounts ‘not merely on the grounds of being metaphysically ‘thick’ but rather for their alleged ‘failure to answer’ certain questions in a satisfactory way. But the only realist view of fiction he considers is the neo-Meinongian view developed by Parsons. Toon likewise neither discusses nor cites any artifactualists in his (2012). Toon, for example, says that “Fictional entities… are objects proposed by realists in order to make sense of works involving fictional characters”, where “realists believe we must posit some kind of object that those [fictional] works represent” (2012, 17), apparently assuming that realists about fictional characters must take them to be represented by the works of fiction and to have the properties descried in the fiction (Toon 2010, 311-12). [↑](#footnote-ref-21)
22. Broadly artifactualist views of fiction are suggested or defended by Searle (1979, 71-2), Schiffer (1996), Salmon (1998), myself (1999, 2003a, 2003b, 2010), and Kripke (2013). [↑](#footnote-ref-22)
23. Contessa (2010) develops a somewhat similar view of scientific models from the ground up (without reference to the parallel literature on fictions), arguing that “a fictional model is an abstract object created by a scientist that stands for one or other of a set of possible concrete systems” (224). On Contessa’s view, external statements may be literally true of the relevant abstracta, while internal statements, though literally false, can be treated as ‘in some sense’ true given that the abstracta can be ‘stand-ins’ for the possible systems represented. [↑](#footnote-ref-23)
24. Roughly at least—the precise specification of application conditions for ‘model system’ might vary without undermining the metaontological point in question: That, given the rules of use for ‘scientific model’, we are entitled to accept that there are such models when the relevant application conditions for the term are fulfilled. For methodological justification of ‘easy’ ontological arguments like this one, see my (2015). [↑](#footnote-ref-24)
25. This is not to suggest that model systems *just are* fictional characters (there may be, e.g., differences in their identity conditions—see below). The crucial point here is just that those who think of scientific models as fictions might do far better to follow the artifactualist model than the pure pretense model. [↑](#footnote-ref-25)
26. I developed this version of the view for fiction in my (1999) and Thomson-Jones (this volume) defends a version of this view for models. [↑](#footnote-ref-26)
27. This version of the view for fiction is suggested by Schiffer (1996) and is one I later defend (2003b). For an assessment of the plusses and minuses of different ways of developing the idea, see my (2003b, 210-214). [↑](#footnote-ref-27)
28. Another option: any of these of course could be treated with paraphrases, about what is true according to the model-description, rather than appealing to pretense. To avoid unnecessary complications and retain as much consistency with the work on modeling by Frigg and Toon, however, I will speak in pretense terms. (I also think the pretense view has a lot of plausibility for this sort of discourse). [↑](#footnote-ref-28)
29. Nonetheless, there is a nice parallelism on the artifactualist view, as she holds that similar trivial inferences can entitle us to move from talk about the writing activities of authors, or modeling activities of scientists, to introduce reference to the relevant fictional characters or model systems. Even talk of the round square is acceptable if understood as referring to the relevant abstract artifact, which, while neither round nor square, is ascribed those properties by Meinong’s ‘story’. [↑](#footnote-ref-29)
30. Another area of discourse to be considered is nonexistence claims. I discuss the issue of nonexistence claims thoroughly in my (2010) and do not have space to do so again here. [↑](#footnote-ref-30)
31. I say ‘apparently’ here since I have argued elsewhere that even those who officially reject certain ontological commitments may nonetheless accept truths that commit them to the questioned entities (see my 2007, Chapter 9). However, there is not space to make that case here. [↑](#footnote-ref-31)
32. See my 2003a, 147-53, for parallel and more developed arguments for the case of fictional characters. [↑](#footnote-ref-32)
33. Such easy arguments parallel those noted above for properties, giving the artifactualist who accepts both quite a coherent position. For further discussion and defense of easy ontological arguments, see my (2015). [↑](#footnote-ref-33)
34. For further development of this line of thought, see my (2013). [↑](#footnote-ref-34)