

# Do We Need Virtual Actions and Events? An Ontological Cost-Benefit Analysis

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## Abstract

As the number of people spending their time with computer games or in online communities increases, so does the number of virtual actions they commit. We refer to virtual actions in our talk. This suggests that we are committed to the existence of virtual actions, because otherwise it would be difficult to see what would make our talk about them true. Actions are usually categorized as a subclass of events. It is common to treat talk about actions as being about events. If talk about actions entails a commitment to events, then talk about virtual actions seems to entail a commitment to virtual events. Is a commitment necessary to make sense of talk about what goes on in computer games and online communities? It will be argued that the epistemological benefits gained by admitting virtual actions and virtual events are bought at too high an ontological cost. An alternative account is proposed with an arguably better theoretical cost-benefit ratio.

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## 1 Virtual actions

We are agents. As such, we commit numerous actions on a daily basis. An increasing subset of these are virtual. We can tentatively define ‘virtual action’ as follows:

**Definition 1.1** (Virtual action). A *virtual action* is an action initiated by a user in a virtual environment that involves only persons and objects within that environment.

Lifting a box in a video game is a paradigmatic example of a virtual action. (Brey, 2014, 49, 53) The proposed definition includes undefined concepts like VIRTUAL and VIRTUAL ENVIRONMENT. This is as it should be at present because the concern about virtual actions is at least partly also a concern about virtual entities in general.

We refer to virtual actions in our talk and argue about them. It seems that we are committed to the existence of virtual actions, because otherwise it would be difficult to see what we would be talking about or what would make such talk true. Actions are usually

categorized as a subclass of events, and it is common to treat discourse about actions as being about events. Thus, a commitment to the existence of actions seems to entail a commitment to events. If virtual actions are kinds of actions, then a commitment to virtual actions seems to entail a commitment to virtual events. But do we have to admit virtual actions and virtual events into our ontology in order to talk about what goes on in computer games and online communities? I will argue that we don't by showing that the benefits of admitting them are bought at too high a theoretical cost. I will then propose an alternative account of virtual actions with a better overall cost-benefit ratio.

## 2 Virtual cases

We want an account of virtual actions because we want, among other things, to answer questions about their moral value. A good way to test competing theories is to see how they deal with certain difficult cases. I will evaluate different accounts of virtual actions in light of the following cases:

- Case 1.* In 1992, one player's avatar took control of another player's avatar in the LambdaMOO virtual community and performed various sexual acts with it while the latter could do nothing to intervene. These acts were limited to textual descriptions, seen by all logged-in users, since LambdaMOO was a text-based virtual environment. Was this an instance of virtual rape? Was this morally wrong? (See [Dibbell, 1998](#))
  
- Case 2.* In 2009, Dutch judges convicted three minors of theft for stealing virtual furniture in the virtual world of the online multiplayer game *Habbo* (2000). The game consists of a virtual hotel where players can furnish their own room. The perpetrators obtained the usernames and passwords of other players by deceit, accessed their accounts, and transferred their virtual furniture to their own accounts and rooms. Was this an instance of virtual theft? If yes, then was it morally wrong? ([Strikwerda, 2012, 89](#))

These cases show that we speak of virtual actions and argue over how to evaluate them. Answers to the questions posed by these cases depend on what kinds of entities we take virtual actions to be. This depends on two things: the ontological commitments of our talk about virtual actions, and how we understand categories like VIRTUALITY and REALITY.

## 3 Ontological commitment

[Quine \(1963a\)](#) has taught us that in order to determine our ontological commitments, we must regiment the theory of interest in some first-order language, identify its ontological commitments by looking at the kinds of entities that are the bound variables in the regimented language, and accept the existence of those entities. ([Cowling, 2013, 3891-3892](#)) We can state Quine's criterion of ontological commitment as follows:

(QC) *Quine's Criterion*: a theory is committed to those and only those entities to which the bound variables of the theory must refer to in order for the statements made in that theory to be true. (Quine, 1963a, 12-13)

QC can be summarized with the slogan: to be is to be the value of a variable. (Quine, 1939, 708)

In order to apply QC, I will introduce a fragment of a standard first-order language (i.e. predicate logic),  $\mathcal{L}$ . Its *vocabulary* consists of  $n$ -ary *predicate* symbols,  $P, Q, R, \dots$ , *constants*,  $a, b, c, \dots$ , *connectives*,  $\neg, \wedge, \vee, \rightarrow$ , the *existential quantifier*,  $\exists$ , and *variables*,  $x, y, z, \dots$ . Constants and variables are the *terms* of  $\mathcal{L}$ . *Atomic formulas* have the form  $P^n(t_1, \dots, t_n)$  where  $P^n$  is a predicate of arity  $n$  and  $t_1, \dots, t_n$  are terms. If  $n = 0$ , then  $P$  is a *proposition*; if  $n = 1$ , then  $P$  is a *predicate*; and if  $n \geq 2$ , then  $P$  is an  *$n$ -ary relation*. If  $\varphi$  is a formula, and  $x$  is a variable, then  $\exists x\varphi$  is a formula in  $\mathcal{L}$ .

To understand the difference between *free* and *bound variables*, let ' $P$ ' be "is a plumber" and compare:

(1)  $P(x)$

(2)  $\exists x(P(x))$

(1) says of  $x$  that it is a plumber. Since  $x$  is a placeholder, this is read as "... is a plumber." If we let  $m$  stand for the proper name 'Mario' and substitute  $m$  for  $x$ , then we get a proposition  $P(m)$ , to be read as "Mario is a plumber," which is either true or false. (2) is read as "Something is a plumber," or more specifically "there is at least one  $x$  such that it is a  $P$ ." This is true if there is at least one thing in our universe of discourse that is a plumber. The variable  $x$  is *free* in (1) because it does not fall within the scope of a quantifier. The variable  $x$  is *bound* in (2), because it falls within the scope of the existential quantifier,  $\exists$ . According to QC, (2) also commits us to the existence of plumbers because  $x$  and the predicate  $P$ , which are both referring expressions, fall within the scope of  $\exists$ .

A few remarks on QC. First, it's referential. The connection between quantification and entities outside of language consists in the fact that the truth or falsity of a quantified statement depends, in part, on what the expressions in that statement refer to. (Quine, 1963b, 102-103; Quine, 1963c, 130-131) This connection is implicit in the operation of *existential generalization*—the operation whereby we infer (4) from (3):

(3)  $\exists x(x \text{ is mortal})$

(4) Something is mortal.

The idea behind such an inference is that whatever is true of the object referred to is true of something. This inference is unjustified when the term in question does not refer. For example, we cannot infer (6) from (5):

(5) There is no such thing as Pegasus.

(6)  $\exists x(\text{there is no such thing as } x)$

i. e., “There is something which there is no such thing.” Thus, it is the referential use of a term that commits us to the existence of its referent. (Quine, 1943, 116, 118)

Second, QC determines existence according to a theory. It allows us to determine not what there is *tout court*, but what a given theory says there is. This does not mean that existence is a linguistic matter. What exists is independent of our ways of talking about what there is. (Quine, 1963a, 15-16) Thus, what is at issue is the ontological commitment of a discourse, i. e. what one says there is, and not what there is independently of our theories. (Quine, 1963b, 103)

I adopt QC because it has the following benefits:

- QC allows us to discuss disagreeing ontologies without committing to them. If *A* and *B* disagree about, say, the existence of abstract objects, then *A* cannot let his terms refer to the kinds of objects found in *B*’s ontology. Both can, however, talk about the kinds of statements either one of them affirms.
- QC affords a common ground for disagreements. If *A* and *B* disagree about abstract objects, they can still argue over semantic matters without getting bogged down in intractable metaphysical disagreements.
- QC provides a simple method for comparing the ontological commitments of different theories without forcing us to adopt their respective vocabularies. (Quine, 1963a, 16; Quine, 1963b, 105)

## 4 Ontological cost-benefit analysis

One way of adjudicating between competing theories is to submit them to an ontological cost-benefit analysis (see Lewis, 1986). This requires a set of criteria for assessing the costs and benefits of competing theories and their ontological commitments. I will employ the following:<sup>1</sup>

1. *Ontological Parsimony*: a good ontology should be as parsimonious as possible.
2. *Faithfulness to Ordinary Language*: a good ontology should be centered around categories reflected in ordinary language (in this case, English that has perhaps been extended by particular technical vocabularies).
3. *Epistemic risk*: a good ontology should take the fewest number of necessary epistemic risks.
4. *Explanatory power*: an ontology of a given domain should have broader implications for theory or practice; it should help us solve extra-ontological problems.

A few comments are in order. The first criterion is summarized in

(OC) *Occam’s Razor*: Do not multiply entities without necessity!

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<sup>1</sup>This list is not exhaustive.

OC is generally acknowledged among philosophers as an adequate evaluative criterion for theories and ontologies. However, its precise content can be difficult to specify.<sup>2</sup> When two theories are equally parsimonious, the choice between them should be guided by criteria 2–4.

Criterion 2 is desirable in the context of philosophy, because philosophical theories are couched in ordinary language, and philosophical concepts originate from everyday discourse. Philosophical concepts are *multicriterial* (they contain multiple in-principle separable components), and *fact coordinated* (they are infused with our understanding of the putative facts about the workings of our actual world). For example, the concept of PERSONAL IDENTITY concerns the sameness of persons over time. It is multicriterial because it contains separable components, like bodily continuity and continuity of personality, as well as fact coordinated since these theoretically separable but conceptually joined criterial factors are held together by purported facts about persons, continuity over time, etc. (Rescher, 1985, 45-46) Since philosophy borrows its concepts from ordinary language, which, according to the next criterion, should be supplemented with the best science of the day, its ontological categories should be constrained by everyday language and the sciences. I take this to be the meaning behind criterion 2.

Criterion 3 rests on the idea that in metaphysical theorizing we seek to strike a balance between parsimony and explanatory power. This is summarized in the following thesis:

(FOT) *The Fundamental Ontological Trade-off*: there is a compromise between the explanatory power of a theory and the epistemic risks associated with its acceptance, which is manifest in the choice between an ontologically rich but epistemically risky theory with high explanatory power, and an ontologically parsimonious but epistemically safe theory with limited explanatory power.

On the one hand, a theory with a rich ontology can explain a large number of phenomena, but it's epistemically risky, since it's hard to believe in the existence of all the postulated entities. On the other hand, a theory with a minimal ontology is epistemically safe, since it postulates the existence of a small number of different kinds of things, but this also constrains its explanatory power. I suggest that we should adopt the following principle when weighing the trade-off between explanatory power and epistemic risk:

(LER) *Principle of Least Epistemic Risk*: when competing ontological claims are made, determine the degree of epistemic risk associated with the methods used for establishing or denying the existence of the entity in question, and make an ontological choice based on the method with the lowest risk. (Humphreys, 2013, 70-71)

Criterion 4 states that philosophy is not an end in itself. Rather, it's a problem-solving activity and different philosophical theories can be assessed by how well they solve problems in particular domains. I will assess competing theories by comparing how fruitfully they deal with our problem cases (see §2).

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<sup>2</sup>There are controversies over whether OC should be reformulated or replaced with some other criterion (see Schaffer, 2015).

## 5 Actions and events

Our talk of virtual actions must be regimented in order to determine its ontological commitments. *Prima facie*, virtual actions seem to be kinds of actions. Thus, sentences about virtual actions should be regimented similarly to action sentences.

### 5.1 Davidson's theory of action

Actions can be categorized as a subclass of events: both occur, have relatively clear temporal boundaries, relatively unclear spatial boundaries, both appear to tolerate co-location, and extend in space as well as time by having spatial and temporal parts. (Casati and Varzi, 2015) It is customary in contemporary linguistics and philosophy of language to treat discourse about actions as being about events. (Davidson, 2001a,b; Lasersohn, 1995; Landman, 2000; Link, 1998) This is sometimes called the (Neo-)Davidsonian approach since it originates in the works of Donald Davidson.

According to this view, the traditional analysis of the following sentence is wrong

(7) Mario kicked Bowser.

The traditional view says that (7) should be analyzed as containing an unvoiced singular reference to an action, viz. a *kicking*, at the level of its underlying logical form. We could interpret (7) as having the following logical form

(8)  $kicked(m, b)$

where 'kicked' is a two-place predicate, 'm' stands for 'Mario', and 'b' for 'Bowser'. Davidson (2001a, 118-119) suggests that 'kicked' in (7) should be interpreted as a three-place predicate with a hidden event-place. Thus, the logical form of (7) is actually

(9)  $\exists e(kicked(m, b, e))$

where  $e$  is an event. (9) should be rendered in English as "there is an event  $e$  such that  $e$  is the kicking of Bowser by Mario."

Note that in light of QC, (9) ontologically commits us to the existence of events because  $e$  falls within the existential quantifier's scope. It should also be noted that Davidson (2001c) treats events as particulars with a definite location in space and time.

### 5.2 The costs and benefits of events

But why treat action sentences as being about events? Davidson has given a number of arguments in support of his analysis. We will consider two, since they involve things that a theory of virtual actions should be able to explain for, viz. inferences involving action sentences and alternative descriptions of the same action.

**The entailment argument** We need to admit events into our ontology because without them we cannot account for certain natural and valid inferences. Consider:

- (10) (a) Alice strolled through the streets of Bologna at 2 a.m.  
 (b) Alice strolled through the streets of Bologna.  
 (c) Alice strolled.

It's clear that (10 a) entails (10 b), and (10 b) entails (10 c) due to their logical forms. This seems to require that the entailed sentence is syntactically contained in entailing sentence. This should be reflected in the logical forms of these sentences. The standard way of representing the logical forms of these sentences involves treating 'strolled' in (10 a) as a three-place predicate, ' $x$  strolled through  $y$  at  $t$ ', but as a two-place predicate, ' $x$  strolled through  $y$ ', in (10 b). But these two predicates are unrelated. Thus the syntactic containment is not apparent in the logical form. However, if we admit events into our ontology, then we can represent the entailment in question at the level of logical form (' $a$ ' stands for 'Alice' and ' $sb$ ' for 'streets of Bologna'):

- (11) (a)  $\exists e (strolled(a, e) \wedge through(sb, e) \wedge at(2\ a.m., e))$   
 (b)  $\exists e (strolled(a, e) \wedge through(sb, e))$   
 (c)  $\exists e (strolled(a, e))$

Here the logical entailment is made apparent at the level of logical form, since we see that (11 c) is contained in (11 b), and (11 b) is contained in (11 a). (Davidson, 2001a, 136-137; Davidson, 2001d, 167; Davidson, 2001c, 185-186) Therefore, we need to include events in our ontology in order to systematically account for common patterns of inference involving action sentences.

**The alternative descriptions argument** Another reason for admitting events into our ontology is that a satisfactory theory of action should allow us to talk literally of the same action under different descriptions.

Jones managed to apologize by saying 'I apologize'; but only because, under the circumstances, saying 'I apologize' *was* apologizing. Cedric intentionally burned the scrap of paper; this serves to excuse his burning a valuable document only because he did not know the scrap was the document and because his burning the scrap was (identical with) his burning the document. Explanation, as already hinted, also seems to call for events. ... All this talk of descriptions and re-descriptions makes sense, it would seem, only on the assumption that there are *bona fide* entities to be described and redescribed. (Davidson, 2001d, 164)

Such entities, of course, are events. Thus, we need to admit events into our ontology, and treat actions as kinds of events, in order to make sense of describing and redescribing the same action.

A number of arguments have also been given against admitting events into our ontology. Since I cannot cover the whole debate here, I will only note two relevant arguments here.

**The unclear ontological status of events** The Davidsonian approach has us treat predicates like kicked in (12a) as containing a third event-place and the whole statement as quantifying over events, as is apparent in (12c).

- (12) (a) Alice kicked Bob.  
(b) *kicked*(*a*, *b*)  
(c)  $\exists e$ (*kicked*(*a*, *b*, *e*))

(12b) is true if an ordered pair,  $\langle Alice, Bob \rangle$ , belongs to the extension of '*kicked*'. But this won't do for the reasons already given. (12c) is true if an ordered triple consisting of Alice, Bob, and the event of Alice's kicking of Bob, belong to the extension of '*kicked*'. But when does a reference to an event designate an event? When do two such references designate one and the same event? A simple answer would be that a reference to an event designates an event when our valuation assigns truth to the statement in which that reference occurs. Thus, (12a) refers to an event just in case it is true that Alice kicked Bob. But on the Davidsonian approach, (12a) is true just in case its reference to an event actually designates the event of Alice's kicking Bob. But this leads back to the original question about when references to events designate events. Without an answer to this question, it is unclear what we are admitting into our ontology when we adopt the Davidsonian approach to action sentences. (Clark, 1970, 318-319)

**The problem of the identity criteria for events** If we admit events into our ontology, then we must be able to make sense of identity-sentences, such as  $e_1 = e_2$ , where ' $e_1$ ' and ' $e_2$ ' refer to events. Indeed, it seems that we regularly talk about event-identity:

- (13) The third round of the fight was (identical with) the one in which he took a dive.  
(14) Our worst accident was (identical with) the one where we hit four other cars.  
(15) Falling off the tower was (identical with) the cause of his death.

The problem of the identity criteria for events is the problem giving criteria for saying when such sentences are true. (Davidson, 2001a, 146) Different conceptions of events have led to different identity criteria. Despite decades of debate, no generally acceptable identity criteria for events have been found (see Mackie, 1997). According to Quine's dictum, there's "no entity without identity." This means that we cannot admit into our ontology or even talk about entities that we cannot distinguish from other kinds of entities. (Rescher, 2006, 4-5) Although a lack of identity criteria has generally not stopped philosophers from admitting all kinds of things into their ontologies, the absence of acceptable identity criteria for an entity should nonetheless count as evidence against its existence.

## 6 Virtual actions and virtual events

The (Neo-)Davidsonian approach suggests that virtual actions should be construed as events. Consider an example of a sentence about a virtual action:

- (16) (a) Mario gave Bowser a virtual kick.  
 (b)  $\exists e (kicked(m, b, e) \wedge virtual(e))$

Here (16 b) gives the logical form of (16 a). According to QC, (16 b) commits us to the existence of virtual events.

As it stands, this analysis is unhelpful—the concepts VIRTUAL and VIRTUAL EVENT remain undefined. Hence, we don't yet know what kinds of entities virtual kicks, virtual actions, and virtual events are. This calls for an account of the ontological status of virtual entities. There are two main theories of virtuality that have been applied to information and communication technologies.

## 6.1 The fictional view

Philosophers working in the phenomenological tradition have claimed that virtual entities are fictional and imaginary. According to this *fictional view*, we could define 'virtual' as follows:

**Definition 6.1** (Virtual (phenomenology)).  $x$  is a *virtual F* if and only if (iff) it is not an actual  $F$  but is as if an  $F$  due to its capacities.

Virtual entities are accompanied by make-believe because they are not real and their existence depends on our imagination and shared beliefs. (See Heim, 1993, 1998; Mooradian, 2006; Madary, 2014) This suggests that computer game characters are similar to those found in literature since both are fictional and depend on make-believe.

This view suggests that (16 a) has the following logical form

- (17)  $\exists e (kicked(m, b, e) \wedge fictional(e))$

In light of QC, this view commits us to the existence of fictional events.

### 6.1.1 Costs and benefits of the fictional view

Accepting the fictional view seems to come with more costs than benefits. Granted, it has the following benefit:

- Faithfulness to ordinary language: 'virtual' is commonly understood as referring to unreal or fictional entities.

I take this to be obvious and not in need of supporting arguments. The fictional view comes with the following costs:

- Virtual actions beyond morality: virtual actions qua fictional cannot be morally evaluated because only real actions have moral value.
- Low explanatory power: the fictional view cannot give satisfactory answers to Cases 1 and 2.
- High epistemic risk: admitting fictional entities into one's ontology is epistemically risky.
- The VRO: equating virtual actions with fictional actions upholds the Virtual-Real Opposition (VRO).

I will now proceed to give arguments for each of these claims.

**Virtual actions beyond morality** If we equate virtuality with fiction, then one could argue that virtual actions cannot be morally wrong, because they are fictional and only real actions can have moral value. It follows that virtual theft is not morally wrong, and neither is virtual rape, because both are akin to fictional episodes in literature or film, and we do not condemn real people for fictional acts. So, the fictional view puts virtual actions outside the sphere of morality.

**Low explanatory power** The fictional view cannot provide satisfactory answers to the questions posed by Cases 1 and 2. Take Case 1 first. Unlike fictional actions, virtual actions can have real consequences. For example, consider the aftermath of Case 1:

“Mostly voodoo dolls are amusing,” wrote exu [the victim] on the evening after Bungle’s [the perpetrator] rampage, posting a public statement on the widely read in-MOO mailing list called *\*social-issues*, a forum for debate on matters of import to the entire populace. “And mostly I tend to think that restrictive measures around here cause more trouble than they prevent. But I also think that Mr. Bungle was being a vicious, vile fuckhead, and I . . . want his sorry ass scattered from #17 to the Cinder Pile. I’m not calling for policies, trials, or better jails. I’m not sure what I’m calling for. Virtual castration, if I could manage it. Mostly, [this type of thing] doesn’t happen here. Mostly, perhaps I thought it wouldn’t happen to me. Mostly, I trust people to conduct themselves with some veneer of civility. Mostly, I want his ass.”

Months later, the woman in Seattle would confide to me that as she wrote those words she was surprised, to find herself in tears—a real-life fact that should suffice to prove that the words’ emotional content was no mere fiction. (Dibbell, 1998, 15)

This shows that virtual actions can have real consequences. One could argue that the fictional actions of fictional characters can also have real psychological consequences for the audiences invested in their adventures. But there is a difference. In the case of fictions, one feels genuine emotions, but they do not correspond to the conventional feelings we refer to when we use words like ‘fear’ or ‘hope’. Instead, it is fictional that we feel those conventional emotions in response to fictional actions and events. For example, when someone says that she felt afraid while watching a horror movie, it is true that she was emotionally moved, but fictional that she was moved by fear. (Walton, 1978) Case 1 seems different: it’s debatable whether it’s a case of virtual rape or not, but it is akin to a form of cyberbullying, and there is nothing fictional about one’s emotional responses to that. Now consider Case 2. The fictional view says that virtual theft is fictional, and hence cannot be morally wrong. But some virtual acts are morally wrong. A virtual bank allows us to transfer real money. If I steal someone’s money from a virtual bank, then I’ve done something immoral, because both the theft and the money were real. (Dunn, 2012, 256) Thus, the fictional view cannot provide satisfactory answers to questions posed by our two test cases.

**High epistemic risk** The fictional view commits us to the existence of fictional actions and fictional events. But what kinds of entities are fictions? Are they abstract objects?

Which methods give us information about their existence and properties? The most common methods include abductive reasoning—the best explanation for the truth of a statement in a given domain (say, mathematics) is that the abstract entities referred to exist—and appeals to a priori arguments and intuitions. But even expert intuitions about non-empirical matters can be unreliable. A famous historical example is the Monty Hall problem.<sup>3</sup> Most people arrive at the wrong answer when they approach it intuitively. When the problem was first posed, most experts got it wrong as well, and had to be convinced of the right answer by arguments or simulations. The reliability of intuitions also varies among experts—some philosophers have better logical or moral intuitions than others. It is relatively clear whose intuitions should prevail in empirical matters, such as whether a particular house or mountain is dangerous (the fire department’s and the experienced mountaineer’s, respectively, because they have more empirical, evidence-based experience in such matters.) But there is no similar situation in metaphysics where we could appeal to empirical evidence for determining whose intuitions are more accurate. (Humphreys, 2013, 59-62) LER suggests that we should not take the epistemic risks associated with the admission of fictional actions and fictional events into our ontology since their existence and characteristics are established on the basis of appeals to intuitions. Therefore, the fictional view entails high epistemic risk.

**The VRO** The fictional view is just one way of spelling out a more fundamental ontological thesis:

(VRO) *The Virtual-Real Opposition*: there is an ontological difference in kind between virtual and real entities.

The problem is that the VRO is not a neutral ontological distinction—it’s a normative distinction that a priori equates virtuality with unreality (Boellstorff, 2014, 741). The VRO is rarely supported by evidence because it is assumed that it follows from the meanings of VIRTUAL and REAL. But in light of different interpretations of VIRTUAL and REAL, it is not at all obvious that the VRO somehow captures the actual relationship between the two concepts. Rather, it seems that the relationship between them is usually chosen with a specific conclusion in mind, e.g. for showing that virtual friendships are not genuine friendships or that virtual actions cannot be morally wrong. (See Søraker, 2012, 213, 214) But if this is the case, then the VRO is not an objective ontological thesis; it’s an (often hidden) assumption or premise in an argument that should be defended with evidence or supporting arguments. The identification of virtual with fictional entities should be rejected because it rests on the unsupported VRO. This thesis debars us from finding satisfactory answers to the kinds of questions raised by Cases 1 and 2.

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<sup>3</sup>The Monty Hall problem is a probability puzzle, named after Monty Hall, the original host of the American television game show *Let’s Make a Deal*. The problem goes as follows: Suppose you’re on a game show, and you’re given the choice of three doors: behind door one is a car; behind the others, goats. You pick door No. 1, and the host, who knows what’s behind the doors, opens another door, say No. 3, which has a goat. He then asks, “Do you want to pick door No. 2?” Is it advantageous to switch your choice?

## 6.2 The simulation view

Another definition of VIRTUAL emerged from computer science in the second half of the 20th century. According to this view, all virtual phenomena are created by or related to computers.

**Definition 6.2** (Virtual (computer science)).  $x$  is a *virtual F* iff  $x$  does not exist physically but is as if an  $F$  due to software or it is a computer-simulated  $F$ .

Similar definitions of ‘virtual’ have become ubiquitous in popular discourse. Many philosophers, like Brey (2008) and Søraker (2011), have followed computer scientists in their proposed definitions of ‘virtual’.

**Definition 6.3** (Virtual (Søraker)).  $x$  is a *virtual F* iff it is either an interactive computer-simulated  $F$  or is made possible by an interactive computer simulation. (Søraker, 2011, 64)

This definition states that we can categorize an entity as being virtual only if it is an interactive computer-simulation.

According to this *simulation view*, (16 a) has the following logical form

$$(18) \quad \exists e (kicked(m, b, e) \wedge \text{interactive computer simulated}(e))$$

because all virtual entities, including virtual events, are interactive computer simulations. In light of QC, this view commits us to the existence of interactive computer-simulated events.

### 6.2.1 Costs and benefits of the simulation view

The simulation view has a number of benefits:

- Some virtual actions are wrong: virtual actions with extravirtual consequences have moral value.
- Explanatory power: the simulation view can answer questions posed in Cases 1 and 2.
- Faithfulness to ordinary language: ‘virtual’ is often colloquially used for referring to computer-generated entities.

I will now show that the simulation view has these benefits.

**Some virtual actions are morally wrong** To apply the simulation view to virtual actions, two kinds of virtual actions must be distinguished. Since virtual actions generally take place within a virtual world, first let’s define ‘virtual world’.

**Definition 6.4** (Virtual world). A *virtual world* is an interactive, computer simulated, persistent environment where users can interact with each other.

Søraker (2011, 60-62) adds the requirement that a virtual world must be three-dimensional, because he wants to distinguish virtual worlds from virtual environments. There is no need to adopt this requirement here, since nothing hinges on the distinction between virtual worlds and virtual environments.

There are two kinds of virtual actions: virtual actions with intravirtual consequences and virtual actions with extravirtual consequences.

**Definition 6.5** (Intravirtual consequence). The *intravirtual consequence* of a virtual act is a consequence that does not exceed the boundaries of the virtual world within which the act is performed.

**Definition 6.6** (Extravirtual consequence). The *extravirtual consequence* of a virtual act is a consequence that exceeds the boundaries of the virtual world within which the act is performed and reaches into the real world. (Brey, 2014, 49)

From this distinction it follows that virtual acts with extravirtual consequences are real acts that have moral value. Virtual acts with intravirtual consequences are not real acts, and as such do not have moral value. On the simulation view, then, some virtual acts can be morally wrong because virtual acts with extravirtual consequences can have moral value.

**Explanatory power** The distinction between extravirtual and intravirtual consequences provides the conceptual resources that the simulation view needs to say something about the our test cases. Start with Case 1. The simulation view suggests that the virtual rape in LambdaMOO was morally wrong since it had extravirtual psychological consequences (see §5.2). Likewise, virtual theft is morally wrong if it has extravirtual consequences. Some virtual objects are functionally similar to their real counterparts because they serve the same functions. For example, both virtual and paper money serve the same function—both can be used for buying and selling items. Other virtual entities merely simulate their real counterparts. For instance, a virtual car is not functionally similar to a real car because it merely simulates the real car. (Brey, 2014, 45-46, 51) The value of a virtual object comes from its functional similarity with real objects. This suggests that the virtual theft is morally wrong when the stolen virtual object is functionally similar to some real object. But what about the theft in Case 2? One possible source of a virtual object’s value is the work invested in its acquisition or creation. If the stolen virtual furniture was acquired at the cost or extravirtual work (hours spent playing, money spent on the conditions that enable play etc.), then it might be sufficiently similar to real objects to warrant calling its non-consensual taking a virtual theft. Furthermore, if the virtual theft had extravirtual psychological consequences, e.g. distress, then its moral condemnation and punishment could also be justified. So, the simulation view has the conceptual resources to answers questions posed by our two test cases.

Despite its benefits, the simulation view comes with a number of costs:

- Circularity of the definition of ‘virtual’: the definition of ‘virtual’ employed by the simulation view is circular.

- The VRO supports immoral behavior: the simulation view's adherence to the VRO supports immoral behavior by excluding some virtual actions from the domain of morality on purely conceptual grounds.
- Epistemic risk: admitting simulations as fundamental entities into our ontology is epistemically risky.

I will now argue for each of these claims.

**The definition of 'virtual' is circular** If our definition of 'virtual' says that all virtual things are interactive computer simulations, then such a definition is threatened by circularity because the meaning of 'virtual' is tied to specific technologies. It follows that the identification of virtuality presupposes the identification of certain technologies—interactive computer simulations—while the identification of these technologies presupposes a definition of 'virtual' because it enables us to recognize technologies that sustain virtuality. (Richter, 2011, 37)

**VRO supports immoral behavior** The simulation view endorses VRO, because SIMULATION and REALITY are opposing concepts (Søraker, 2011, 53-55). Although virtual actions with extravirtual consequences may be the objects of moral evaluation, virtual actions with intravirtual consequences fall outside the domain of morality. But this can encourage certain kinds of immoral behavior in virtual environments. Indeed, one could defend obnoxious virtual actions by appealing the fact that their consequences are merely intravirtual. It seems that even the intravirtual consequences of virtual actions may sometimes deserve moral condemnation. Instead of inventing an artificial example to illustrate my point, I will appeal to an analogy with an actual case.

**The football case:** In 2004, one Dutch footballer committed a foul against another, breaking the latter's leg in several places. The offending player was convicted of battery under criminal law because his act exceeded the rules of the game. The judges established that there are two types of situation in which an act performed in the context of a game does not fall under the scope of its rules. First, acts that constitute such grave violations of the game's rules that they do not provide an adequate punishment. Second, acts performed partly outside the game setting. The player was punished because his act was of the first type. (Strikwerda, 2012, 92)

Analogously, a virtual act could have such severe intravirtual consequences that there are no adequate means for redressing them within the virtual world. Punishment and compensation presuppose moral judgment. If the moral judgment, punishment, and reasoning in the football case were justified, then the moral evaluation of virtual actions with severe intravirtual consequences should also be justified. But the simulation view has no resources for dealing with such cases because it has excluded such actions from the sphere of morality by definition.

**High epistemic risk** According to QC, the simulation view is ontologically committed to the existence of interactive computer simulations and computer simulated events. But what are computer simulations? Brey (2008, 363) tells us that a computer simulation is a computer

program that contains a model of a particular system, whether actual or theoretical. But there is no agreement on the ontological status of models: they are treated as abstract objects, fictional objects, set-theoretic structures, descriptions, equations, or gerrymandered objects. (See [Frigg and Hartmann, 2006](#)) Without an account of the ontological status of models, we don't know what kinds of entities interactive computer-simulated events are. This reduces the explanatory power of the simulation view, while increasing its ontological cost. It also increases epistemic risk because we don't know what kinds of entities we're admitting into our ontology when we quantify over interactive computer simulations. Thus, the explanatory power of the simulation view is bought at the price of high epistemic risk.

## 7 Against virtual actions and events

I will now argue that there is a third view of virtual actions that is ontologically parsimonious and not epistemically risky, yet exceeds the alternatives in explanatory power. This is the *similarity* or *linguistic hedge view*. It defines virtual as follows (see [Laas, 2015](#)):

**Definition 7.1** (Virtual (Laas)).  $x$  is a *virtual*  $F$  iff it is almost the same as a  $y$  that is an  $F$ .

The phrase 'almost the same as' is understood here as denoting a contextually changing degree of similarity between  $x$  and the most typical relevant example,  $y$ , of some predicate  $F$  that expresses some linguistic concept. In other words, 'virtual' refers to a certain degree of similarity between a thing and a typical example of the concept under which that thing falls.

This view makes certain empirically founded assumptions about lexical concepts. Such concepts do not have definitional structures, expressed in terms of necessary and sufficient conditions (see [Rosch and Mervis, 1975](#); [Rosch, 1978, 2011](#)); they are structured mental representations that encode the properties that their objects tend to possess. ([Margolis and Laurence, 1999](#), 31) Lexical concepts have paradigmatic or typical examples, the properties of which help us in determining whether to classify a particular thing as falling under a given concept or not. For example, a typical example of the concept BIRD is something that flies, has feathers, a beak, wings, etc. The fewer such properties a given thing has, the less typical it is as an instance of BIRD. Robins are more typical instances of BIRDS than penguins because the latter have no feathers and the do not fly.

According to the similarity view, 'virtual' is neither a predicate referring to a property nor a modal term signaling a mode of existence; it's a *linguistic hedge* or *modifier*, a word "whose job is to make things fuzzier or less fuzzy." ([Lakoff, 1973](#), 471) *Approximators* are hedges that create a semantic effect by enlarging the extension of another linguistic expression. They operate on the propositional content of an expression, and influence their interpretation by indicating that some member of the concept expressed by a given lexical item is non-prototypical. Approximators are subdivided into *adaptors* and *rounders*. *Adaptors* broaden the meanings of nouns, adjectives, and verbs to accommodate referents or concepts that are not usually referred to by the unmodified expression. In other words, they broaden membership in the category expressed by the modified expression. *Rounders* enlarge the extension of numerals and temporal expressions by opening up a zone of imprecision or vagueness around the value of a scale. For example,

(19) Bob almost won the race.

(20) Bob weighs approximately 75kg.

The adverb ‘almost’ in (19) says that the state of affairs referred to by that statement is very similar to the prototypical instance of the concept of WINNING A RACE, viz. coming in first. The adverb ‘approximately’ in (20) indicates that Bob’s weight is in the vague range around 75kg. (See Prince et al., 1982)

Words like ‘almost’, ‘very’, ‘sort of’, and ‘virtually’ are adaptors that are used to hedge the propositional content of statements. (Fraser, 2010, 17) This means that such expressions influence the truth values of statements. They are not about the world; they are about other words. According to the similarity view, ‘virtual’ should be interpreted as functioning semantically like the adverbial modifier ‘virtually’, viz. as a linguistic hedge used to modify the truth values other expressions to convey gradedness, vagueness, approximation, and uncertainty.

One could argue that this approach cannot get off the ground because the colloquial meaning of ‘virtual’ in English as “almost the same as” is too vague to be useful. After all, everything resembles everything else in some respects. SIMULATION is the more precise concept because it spells out the relevant features in terms of which  $x$  and  $y$  resemble each other. This is a mistake, since similarity is more fundamental than simulation. Computer simulations are models, and presuppose similarity because they are imitations of some real-world systems. (Banks, 2009, 3, 5) A model provides information about its target system only if it has counterparts in the world. (Frigg and Hartmann, 2006, 745) The counterpart relation is a similarity relation (see Lewis, 1983, 28-29). Like other kinds models, computer simulations depend on similarity because identifying the target system that a given simulation imitates presupposes that we’ve identified the relevant similarities and differences between system and model. For example,  $x$  is a computer simulations of a soldier only if  $x$  resembles a soldier in relevant respects. Said respects are not determined by simulation; they are determined beforehand by those who create the simulation, and use those similarities to evaluate the simulation’s adequacy. (See Laas, 2015)

## 7.1 The virtually operator

How do we regiment statements like (7) according to the similarity view? This depends on how we approach the semantics of adverbial modification. According to the currently prevalent Neo-Davidsonian approach, (7) has the following logical form:

(21)  $\exists e (kicked(m, b, e) \wedge virtual(e))$

This is unhelpful because it treats ‘virtual’ as a predicate and leaves it unanalyzed. It also commits us to the existence of virtual events, thereby opening the door to all the metaphysical problems that I counted among the costs of the other views.

To eliminate these problems, I propose to resuscitate and out-of-fashion approach to adverbial modification—the operator approach. It treats modifiers as functional unary operators that change the truth values of other expressions. This idea can be developed in

different ways,<sup>4</sup> but I will follow [Lakoff \(1973\)](#) in basing my approach on first-order fuzzy logic.

I must now introduce a fuzzy first-order language (i.e. a fuzzy predicate logic). For the sake of simplicity, let's say that the vocabulary and atomic formulas of the fuzzy language are like those of  $\mathcal{L}$ . The important differences are in the semantics.

First, in classical first-order logic a valuation function,  $V$ ,<sup>5</sup> assigns to each formula  $\varphi$  of  $\mathcal{L}$  one of two truth values, 1 for true or 0 for false. In a first-order fuzzy language,  $V$  assigns to each formula  $\varphi$  of  $\mathcal{L}$  a truth value, i.e. a real number in the interval  $[0, 1]$ , which represents its degree of truth. The endpoints of this interval, 0 and 1, are classical truth values.

Second, classical predicates correspond to crisp sets but fuzzy predicates correspond to fuzzy sets.<sup>6</sup> Thus, the truth value assigned to a formula  $P(t)$  by a classical valuation says that the entity denoted by the term  $t$  is a member of the set corresponding to the predicate  $P$  if  $V(P(t)) = 1$ , or that the entity referred to by  $t$  does not belong to the set referred to by  $P$ , if  $V(P(t)) = 0$ . The truth value assigned to formula  $P(t)$  by the fuzzy valuation function is the degree to which the entity denoted by the term  $t$  is a member of the fuzzy set corresponding to the fuzzy predicate  $P$ . ([Belohlavek and Klir, 2011](#), 73)

Finally, the valuation of existentially quantified formulas is different in fuzzy logic. In the classical framework I've been using so far  $V(\exists x\varphi) = 1$  iff there is at least one  $d \in D$  such that  $\exists x\varphi$  comes out true if  $d$  is assigned to  $x$ . In fuzzy predicate logic, the rule for evaluating existentially quantified formulas is as follows:

$$V(\exists x\varphi) = \max \{V(\varphi) \mid d \in D\}$$

Note that 'max' stands for maximum. If infinite domains are admitted, we must use 'sup' for supremum instead. The formula  $\varphi$  can be read as a complex fuzzy set. For each  $d \in D$ , the degree of membership that  $d$  has in this set (how true it is that  $d$  is a member) is equal to  $V(\varphi)$ . The maximum of these numbers is the truth value of the claim that at least one thing in the domain is in the fuzzy set. For example, suppose we have three individuals in our domain—Mario, Luigi, and Toad—viz.  $D = \{m, l, t\}$ , and the following statements are

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<sup>4</sup>For variations of the operator approach, see [Clark \(1970\)](#); [Thomson \(1971\)](#); [Parsons \(1972\)](#); [Thomason and Stalnaker \(1973\)](#).

<sup>5</sup>The (formula) *valuation function*  $V_{\mathfrak{M},g}$  of a model  $\mathfrak{M}$  with assignment function  $g$ , if we're precise. A *model* for language  $\mathcal{L}$  is an ordered tuple  $\mathfrak{M} = \langle D, I \rangle$  such that  $D$  is a non-empty set or *domain* and  $I$  is an *interpretation function* that assigns different values to different kinds of terms in  $\mathcal{L}$ . An *assignment function*  $g$ , for a model  $\mathfrak{M}$  is a function that assigns to each variable of  $\mathcal{L}$  an element of  $D$ . For quantified formulas, an assignment function  $g[x/d]$  (where  $d \in D$ ) is the assignment that assigns  $d$  to  $x$  but otherwise behaves like  $g$ , is added to the model, since we need to consider assignments to the variables of  $\mathcal{L}$  that are similar to  $g$  but may assign a different element to  $x$ . Since all valuation functions for first-order languages are relative to a model an assignment function, I will omit the subscripts for the sake of clarity and simplicity.

<sup>6</sup>A fuzzy set is defined by a *membership function*,  $\mu$ , that maps each individual  $x$  in the domain  $D$  to the unit interval of real numbers representing  $x$ 's degree of membership in the fuzzy subset  $P \subseteq D$ :

$$\mu_P(x) : D \mapsto [0, 1].$$

If  $\mu_P(x) = 0$ , then  $x \notin P$ . If  $\mu_P(x) = 1$ , then  $x$  is in the *core* of  $P$ . All  $x \in D$  such that  $\mu_P(x) > 0$  constitute the *support* of  $P$ . The core gathers the *paradigms* or *typical exemplars* of  $P$ . A fuzzy set is normal if, for some  $x$ ,  $\mu_P(x) = 1$ , and subnormal otherwise. For simplicity, I will assume that all fuzzy sets discussed here are normal.

made about them

(22) Luigi is tall.

(23) Mario is tall.

(24) Toad is tall.

Let the fuzzy valuations for (22)–(24) be

$$\begin{aligned} V(\text{tall}(l)) &= 1 \\ V(\text{tall}(m)) &= 0.6 \\ V(\text{tall}(t)) &= 0 \end{aligned}$$

Then,

$$V(\exists x(\text{tall}(x))) = \max\{1, 0.6, 0\} = 1$$

that is, the truth degree of “Someone is tall” is 1 in our domain of three individuals.

I will treat linguistic hedges as operators. A modifier,  $m$ , combined with an expression,  $\varphi$ , yields a modified expression  $m(\varphi) = \varphi^m$ . Hedges like ‘almost’ and ‘virtually’ are *weak modifiers* that lower the threshold for membership in the fuzzy set, and increase the membership degrees of individuals in the set. *Strong modifiers*, like ‘very’, increase the threshold of set membership, and lower the membership degrees of individuals in the set. ‘Virtual’ and ‘virtually’ are *weak modifiers* that fuzzify other expressions. I will define a new unary operator, *virtually* ( $\cdot$ ), (read as “It is virtually true that...”) to represent the semantic value of ‘virtual’:

**Definition 7.2** (*virtually* ( $\varphi$ )). For every formula  $\varphi$  of  $\mathcal{L}$ , the unary operator *virtually* ( $\varphi$ ) is defined by the following valuation function:

$$V(\text{virtually}(\varphi)) \triangleq \begin{cases} 1, & \text{if } 0.9 \leq V(\varphi) < 1 \\ V(\varphi)^{0.5}, & \text{if } 0 \leq V(\varphi) < 0.9 \\ 0, & \text{if } V(\varphi) = 1 \end{cases}$$

In other words, the semantic value of the word ‘virtual’ is represented by the unary operator *virtually* ( $\cdot$ ), that modifies the truth values of the expressions hedged by the word ‘virtual’ in accordance with the following three rules:

- If the truth degree of an unhedged expression  $\varphi$  is close to absolute truth,  $0.9 \leq V(\varphi) < 1$ , then the hedged expression ‘virtual  $\varphi$ ’ is absolutely true,  $V(\text{virtually}(\varphi)) = 1$ .
- If the truth degree of an unhedged expression  $\varphi$  is not close to absolute truth,  $0 \leq V(\varphi) < 0.9$ , then the hedged expression ‘virtual  $\varphi$ ’ indicates that the unhedged expression’s truth degree has been modified via exponentiation by 0.5,  $V(\text{virtually}(\varphi)) = V(\varphi)^{0.5}$ .

- If the truth degree of an unhedged expression  $\varphi$  is absolutely true,  $V(\varphi) = 1$ , then the hedged expression ‘virtual  $\varphi$ ’ is absolutely false,  $V(\text{virtually}(\varphi)) = 0$ .

These rules capture three ideas about the meaning of statements involving terms like ‘virtual’ and ‘virtually’.

First, modifying an absolutely true statement should yield a falsehood. Suppose  $D = \{b, l, m, t\}$ , and

$$\begin{aligned} V(\text{tall}(b)) &= 1 \\ V(\text{tall}(l)) &= 0.9 \\ V(\text{tall}(m)) &= 0.6 \\ V(\text{tall}(t)) &= 0 \end{aligned}$$

In light of this,

- (25) (a) Bowser is tall.  
 (b) Bowser is virtually tall.

(25 b) should be false since (25 a) is true without qualifications.

Second, some hedged statements should come out absolutely true. For instance,

- (26) (a) Luigi is tall.  
 (b) Luigi is virtually tall.

(26 b) should be true with qualifications because (26 a) is false without qualifications. (26 b) should also be true because the paradigm of tallness in our context is Bowser and Luigi is shorter than he is, but is nonetheless more similar to Bowser with respect to height than all the other members of our domain.

Third, hedging statements that are neither absolutely true nor absolutely false should make them more true than they were prior to hedging. This is captured by the idea that their truth values are modified via exponentiation by 0.5. Thus, in the case of these statements

- (27) (a) Bowser is virtually tall.  
 (b) Luigi is virtually tall.  
 (c) Mario is virtually tall.  
 (d) Toad is virtually tall.

we see that

$$\begin{aligned} V(\text{virtually}(\text{tall}(b))) &= 0 \\ V(\text{virtually}(\text{tall}(l))) &= 1 \\ V(\text{virtually}(\text{tall}(m))) &= 0.6^{0.5} \approx 0.8 \\ V(\text{virtually}(\text{tall}(t))) &= 0^{0.5} = 0 \end{aligned}$$

viz. (27 a) is false, (27 b) is absolutely true, (27 c) is true to degree 0.8 (i. e. virtually true), and (27 d) is absolutely false.

## 7.2 Costs and benefits of the similarity view

The similarity view has a number of benefits:

- **Ontological parsimony:** the similarity view does not commit us to the existence of virtual events and virtual entities.
- **Faithfulness to ordinary language:** the similarity view’s interpretation of ‘virtual’ is in conformity with ordinary language use (at least with ordinary English).
- **Low epistemic risk:** the similarity view is epistemically low-risk due to its ontological parsimony.
- **Denial of VRO:** the similarity view denies VRO, thus undercutting potentially intractable metaphysical disagreements in favor of tractable disagreements over degrees of (dis)similarity between cases and typical examples of the concepts under which they fall.
- **High explanatory power:** the similarity view provides a framework for answering questions about the actions and events that occur in computer games, computer simulations, etc. as well or better than rival accounts of virtual actions.

I will now proceed to argue for these claims.

**Ontological parsimony** The similarity view is ontologically parsimonious because it does not commit us to the existence of virtual actions, virtual events, or other kinds of virtual entities. According to this view, the logical form of (7) is

(28)  $\text{virtually}(kicked(m, b))$

which is read as “Mario virtually kicked Bowser” or “it is virtually true that Mario kicked Bowser.” This is true if the kicking in question is almost the same as our paradigmatic examples of KICKING, which it is since our typical examples involve contact between two concrete entities but neither Mario nor Bowser are concrete, thus their action is not identical to a typical example of KICKING. Note that there is no need to quantify over events to uncover the logical form of this sentence. This seems like an added benefit for this view since it frees us from having to deal with thorny issues like the identity criteria or ontological status of events (see §5.2). And even if we cannot eliminate reference to events, because without them we cannot account for the kinds of inferences that originally motivated Davidson to introduce them, the similarity view is still better off than the competition because it won’t have the added burden of dealing with *virtual* events. Consider

- (29) (a) Mario virtually kicked Bowser at 2 a.m.  
(b) Mario virtually kicked Bowser.  
(c) Mario kicked Bowser.

Here ‘kicked’ in (29 a) still seems to require either a third time-place or an event-place. If we take the easy way out and admit events into our ontology after all, then we still won’t have to worry about quantifying over virtual events because on this view the logical forms of (29 a)–(29 c) are:

- (30) (a)  $\exists e (\text{virtually} (kicked(m, b, e) \wedge \text{at}(2 \text{ a.m.})))$   
 (b)  $\exists e (\text{virtually} (kicked(m, b, e)))$   
 (c)  $\exists e (kicked(m, b, e))$

Although we must quantify over events, we are not quantifying over *virtual* events, and are therefore not admitting anything above and beyond events into our ontology; virtual, fictional, or computer-simulated actions and events can be kept at bay even if events themselves cannot.<sup>7</sup> Even though the *virtually* operator falls within the scope of  $\exists$ , this does not entail any ontological commitments on QC because neither ‘virtual’ qua linguistic hedge nor the operator are referring expressions. An operator is a function that maps the truth values of expressions to truth values. The referents of expressions like ‘virtual kick’ or ‘virtually kicked’ are determined by the context in which the words ‘kick’ and ‘kicked’ are used. They are not determined by the word ‘virtual’, since it doesn’t refer to anything, but merely modifies other words that do. In a context where ‘Mario’ refers to the famous videogame plumber, ‘virtual kick’ refers to an in-game representation which is almost the same as a kick relative to our paradigmatic examples of the concept KICK. In another context, the ‘kick’ in ‘virtual kick’ may refer to the action of one person toward another, an action that resembles a kick but fell short of being a one in some way. Thus, the similarity view is ontologically parsimonious since it does not admit virtual entities into our ontology.

**Faithfulness to ordinary language** The similarity view is faithful to ordinary language. In English, one meaning of the word ‘virtual’ is derived from the 14th century French *virtuel*, by which ‘virtual’ came to mean something implicit but not formally recognized. (Heim, 2014, 111) This use is common in sentences like

- (31) Virtually everyone knows that philosophy is a waste of time.  
 (32) Bob virtually won the race.  
 (33) It was virtually certain that Alice would leave the country.

Thus, the similarity view is faithful to the everyday use of ‘virtual’.

**Low epistemic risk** The similarity view comes with low epistemic risk because it is ontologically parsimonious. Its ontological parsimony comes from the fact that, in light of QC, it is not committed to the existence of virtual events, virtual actions, or virtual entities of any kind. Hence it is not subject to the risks of postulating entities the existence of which is uncertain or difficult to ascertain. The epistemic risk associated with admitting virtual entities into one’s ontology stems from their *ontological uncertainty*, viz. from the fact that

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<sup>7</sup>Ordinarily, from “Mario virtually kicked Bowser” one cannot infer “Mario kicked Bowser” because one cannot infer from “Mario almost kicked Bowser” that “Mario kicked Bowser.” Rather, one would have to infer “Mario did not kick Bowser” since ‘almost’ negates that the action in question fully qualifies as a kick. (See Clark, 1970, 329-330) However, whether we could infer “Mario kicked Bowser” from “Mario virtually kicked Bowser” or not in a fuzzy framework depends on the system of fuzzy logic one adopts and the argument forms one employs, since in fuzzy logical systems, formulas have degrees of truth and arguments can have degrees of validity.

their mode of existence as well as their relation to reality is uncertain. (Brey, 2014, 51) The situation is exacerbated by the fact that there are no reliable methods for determining the existence and characteristic features of putative virtual entities. Hitherto, philosophers have mainly relied on conceptual analysis and a priori intuitions. LER suggests that the accounts of virtuality arrived at by applying such methods should be rejected in favor of those resting on more reliable methods. Since we currently have no accounts that employ more reliable methods, the rational thing to do is not to commit ourselves to the existence of virtual entities, and not to treat VIRTUAL as a fundamental ontological category.

**Denial of VRO** The similarity view denies VRO because it denies that the term virtual draws an ontological distinction between kinds of entities. Denial of the VRO allows the similarity view to avoid potentially intractable metaphysical disagreements about the “real essence” or “nature” of virtuality and reality in favor of potentially tractable disagreements about classification, analogies, and degrees of relevant (dis)similarity between relevant cases. The upshot is that we can discuss and morally evaluate actions, regardless of whether their consequences extend beyond games or not.

**Explanatory power** The similarity view has the conceptual resources for dealing with the questions posed by our two test cases. It says that whatever ‘virtual rape’ refers to is morally wrong if it is sufficiently similar to our paradigmatic examples of RAPE. In Case 1, this means that the parties involved should determine by rational argumentation whether what happened in LambdaMOO is sufficiently (dis)similar to typical instances of rape to warrant the same kind reaction as would be warranted by typical cases of rape. Regarding Case 2, virtual theft is morally wrong if it is sufficiently similar to our typical examples of THEFT. Again, it does not matter whether the stolen goods were tangible or intangible. Whether a particular action should be treated as an instance of theft or not is to be determined by rational argumentation about typical instances of theft. Although the similarity view does not proscribe the correct answer in these cases, it does provide guidelines for potentially resolvable rational argumentation about these matters. A focus on (dis)similarities, typical cases, concepts, and analogies—these suggestions facilitate rational argumentation because questions about (dis)similarities and other such matters can be answered empirically, whereas metaphysical questions about the natures of virtual entities cannot. Moreover, by not drawing a distinction between intravirtual and extravirtual consequences, the similarity view does not exclude actions with severe in-game consequences from moral consideration. Thus, the explanatory power of the similarity view is at least as great, if not greater, than that of its rivals.

Finally, the similarity view has at least two notable costs:

- Flaunting Russell’s razor: if the similarity view is combined with a fuzzy framework, then it flaunts *Russell’s razor*—the injunction not to needlessly complicate one’s formal theoretical machinery—because it adds an infinity of truth values to our logic and, depending on the fuzzy logic one adopts, does away with some classical logical laws, such as the law of excluded middle.
- Moral particularism: the upshot of the similarity view’s treatment of virtual actions and their moral evaluation is that the formulating general rules for morally evaluating

virtual actions seems to go by the board because the emphasis on (dis)similarities requires that issues be resolved on an individual, case-by-case basis.

I will try to show that these costs are not as high as might initially seem.

**Flaunting Russell’s razor** I would justify the first cost by saying that Occam’s razor should take precedence over Russell’s razor in our metaphysical theorizing. Occam’s razor is valued because we believe that we are more likely to arrive at the truth about non-linguistic reality if we avoid postulating theoretically-superfluous entities. Russell’s razor, however, is concerned solely with linguistic matters. While neat theories are preferable to messy ones, the admission of additional linguistic entities does not necessarily entail commitments about non-linguistic reality. But the postulation of additional entities does. (Horgan, 1982, 51) Thus, if the price of parsimony is bought by flaunting Russell’s razor, then this is a price that I, for one, am willing to pay.

**Moral particularism** The second cost is also not as great as it seems. The similarity view foregrounds rational argumentation as a requirement of moral decision-making, and emphasizes the need to include those involved in deliberations about the issue. Even though it might be harder to formulate general rules for moral evaluation, it might still be possible to formulate principles for reasoning well with vague information. Such principles could mitigate some of the difficulties of making decisions in the absence of clear-cut general rules. They might even aid in the formulation of defeasible general principles for moral reasoning in particular contexts.

## 8 Conclusion

We talk about and evaluate virtual actions. Such talk seems to make sense only if we admit virtual actions into our ontology. Actions are generally treated as kinds of events. If this is right, then a commitment to virtual actions entails a commitment to virtual events. What virtual actions are depends on one’s theory about virtual entities in general. In this paper, I have compared different theories of virtual actions in light of their ontological and epistemic costs and benefits. I argued that we don’t have to admit virtual actions and virtual events into our ontology in order to make sense of our talk about actions in computer games and online communities. The theory that allows us to have our cake and eat it too comes ahead of the competition in terms of theoretical costs and benefits. Its implications for moral reasoning about virtual actions, however, remain to be worked out in detail.

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