

Squibs and Discussion

AN ANTINOMY ABOUT ANAPHORA
Mahrad Almotahari
MIT

Standard theories of so-called donkey anaphora (Kamp 1981, Heim 1982, Groenendijk and Stokhof 1991) predict that sentence (1) is truth-conditionally equivalent to (2).¹

- (1) Every farmer who owns a donkey beats it.
- (2) Every farmer who owns a donkey beats *every* donkey that he owns.

I will refer to the proposition expressed by (2) as the *strong reading* of (1). A nonstandard theory, defended by King (1993, 2004), predicts that (1) is equivalent to (3).

- (3) Every farmer who owns a donkey beats *a* donkey that he owns.

The proposition expressed by (3) is the *weak reading* of (1).

Although the authors I have referred to disagree about how best to interpret (1), they agree that (1) is not ambiguous; it semantically expresses no more than one reading. Not everyone shares this opinion, though. Schubert and Pelletier (1989), Kanazawa (1994), and Chierchia (1995) suggested that sentences relevantly like (1) *are* ambiguous.² Consider, for example, sentences (4)–(6).

- (4) Everyone who owns an umbrella leaves it at home on a sunny day.
- (5) Everyone who owns an umbrella uses it on a rainy day.

Thanks to Ephraim Glick, Caspar Hare, Irene Heim, Paul Hovda, Jeff King, Bernhard Nickel, Bob Stalnaker, Steve Yablo, and two anonymous referees.

¹ The primary difference between the Kamp-Heim system and the Groenendijk-Stokhof system—“dynamic predicate logic” (DPL)—is that the latter is fully compositional. There are differences in the syntax, as well, but we needn’t bother with them. The two systems are empirically equivalent in every other respect: they generate the same truth value assignments.

² Kanazawa (1994) thinks that some donkey sentences fronted by *every* are unambiguous and cannot felicitously be embedded in a discourse that elicits the weak reading. He also hypothesizes that the interpretation of donkey sentences is underspecified by the rules of the grammar.

- (6) Every farmer who owns a donkey rides it to and from the market on Saturday.

Sentence (4) naturally elicits the strong reading, on which *every* umbrella is left at home. In contrast, (5) and (6) naturally elicit the weak reading, on which *an* umbrella is used and *at least one* donkey is ridden. Very likely, which reading is favored is determined by our knowledge of how people use umbrellas in rainy and sunny conditions, and of how someone typically uses something as a means of transportation. So (4)–(6) do not conclusively support the idea that the ambiguity is semantic in nature, because (it is standardly assumed that) semantic aspects of meaning can be recovered by speakers/listeners without the aid of “world knowledge” (i.e., knowledge that in some way extends beyond what is needed to be linguistically competent).

Aware of examples such as (4)–(6), King (2004) expressed skepticism about there being an ambiguity. His skepticism was based on two considerations. First, he claimed, it is difficult to construct a single sentence that allows for both a strong and a weak reading. Second, sentences relevantly like (1), but which begin with *some* rather than *every*, seem always to elicit a weak reading. Consider, for example, *Some farmer who owns a donkey beats it*. We naturally take this sentence to mean that some farmer who owns a donkey beats at least one of his donkeys. “This makes the view that the sentences actually possess both readings as a matter of their semantics at least somewhat suspect” (King 2004:110).

I think King and others are wrong to be skeptical. Sentence (1) semantically expresses both strong *and* weak readings. This can be clearly illustrated as follows.

Imagine a world—call it *McWorld*—where there are exactly two farmers, Old McDonald and Young McDonald.³ And let us say OM owns exactly two donkeys, Daisy and Duke. YM owns exactly one, Duchess. OM beats Duke, but not Daisy. YM beats Duchess. Now, unless we acknowledge that (1) is semantically ambiguous between the strong and weak readings, two equally compelling arguments would force us to say that my description of *McWorld* is incoherent.

THESIS

- (7) OM owns Daisy and doesn’t beat her.
 (8) So, OM owns a female donkey and doesn’t beat her.
 (9) So, OM owns a donkey and doesn’t beat it.
 (10) So, a farmer owns a donkey and doesn’t beat it.
 (11) Therefore, not every farmer who owns a donkey beats it.

³ One might be distracted by the use of *Every farmer . . .* when there is only one farmer, because use of *every* Φ may suggest that there are multiple Φ s. That is why my story involves two farmers: to bypass this possible source of distraction. If two are not enough, simply add as many as it takes to bypass the problem.

ANTITHESIS

- (12) OM owns Duke and beats him.
- (13) So, OM owns a male donkey and beats him.
- (14) So, OM owns a donkey and beats it.
- (15) YM owns Duchess and beats her.
- (16) So, YM owns a female donkey and beats her.
- (17) So, YM owns a donkey and beats it.
- (18) OM and YM are the only farmers who own donkeys.
- (19) Therefore, every farmer who owns a donkey beats it. [From (14), (17), and (18).]

Every inference in both *THESIS* and *ANTITHESIS* is valid. One should be far more confident of this than of any existing account of anaphora that may imply that some step in the inference chain is not valid. Indeed, I have yet to encounter a theoretically naive yet competent English speaker who judges one of the inferences in *THESIS* or *ANTITHESIS* to be invalid. The judgments I have gathered have been unanimous and firm: the arguments are obviously sound. But observe that (11) is the negation of (19). So unless one acknowledges that (1) is semantically ambiguous—that it expresses the strong reading in (11) and the weak reading in (19)—one will have to say that *THESIS* and *ANTITHESIS* constitute a real antinomy. But that would be silly. Far better to accept a synthesis: abandon the standard view that (1) is not semantically ambiguous.

It is often observed that semantic intuitions about the truth conditions of donkey sentences are not firm enough to be trusted. Many years ago, Neale (1990) expressed more than a hint of skepticism about whether a systematic, generally appealing theory of donkey sentences could be constructed for this very reason. “Along with others, I have, at times, felt that the absence of firm and consistent intuitions about the truth conditions of donkey sentences is a serious obstacle to the provision of any sort of theory that can achieve general appeal” (p. 254n18). The antinomy we have looked at exemplifies a useful strategy in light of the methodological problem that Neale and others have observed: judgments about what follows from what can be rather strong and uniform, even when direct judgments about the truth conditions of a sentence are infirm and vary from person to person. So when there is persistent disagreement about whether a sentence expresses one set of truth conditions or another, the disagreement can be more effectively resolved by looking at the logical properties of the sentences. One needn’t resort to intuition mongering. The apparent antinomy is, therefore, methodologically preferable to (4)–(6) as a way of showing that (1) is semantically ambiguous.

King (2004) gave two reasons to think that (1) expresses a single reading. The first was that it is hard to find a particular sentence that genuinely elicits both. Schubert and Pelletier, Kanazawa, and Chierchia merely offer different sentences that intuitively favor one rather

than the other. This allows one to account for the different interpretations pragmatically. The apparent antinomy, however, suggests that the canonical relative-clause donkey sentence itself semantically expresses both readings. One cannot accept each step as valid, as competent English speakers do, and then locate the ambiguity in the pragmatics of (1), because that would not eliminate the inconsistency between (11) and (19). But perhaps one can pragmatically explain away the appearance of validity as follows.

One might say that what (14), (17), and (18) really imply is not (19) but (20).

(20) Every farmer owns a donkey *and* beats it.

We feel as though the inference to (19) is valid because we are not clearly distinguishing the proposition semantically expressed by (19) from the proposition semantically expressed by (20)—or so the pragmatic explanation says, anyway.⁴ To see why this explanation distorts what is really going on here, let us slightly complicate our story. Suppose there are two more farmers in McWorld, old farmer Fred and young farmer Frederica. Unlike the McDonalds, however, neither Fred nor Frederica owns donkeys. Now consider the following argument:

ANTITHESIS REDUX

(21) The old farmer who owns Duke beats him.

(22) So, the old farmer who owns a male donkey beats him.

(23) So, the old farmer who owns a donkey beats it.

(24) The young farmer who owns Duchess beats her.

(25) So, the young farmer who owns a female donkey beats her.

(26) So, the young farmer who owns a donkey beats it.

(27) The farmers referred to above are the only farmers who own donkeys.

(19) Therefore, every farmer who owns a donkey beats it. [From (23), (26), and (27)].⁵

By embedding a restrictive relative clause, *who owns . . .*, in each premise, ANTITHESIS REDUX more forcefully elicits the semantic judgment that (19) follows. It is now much harder to resist the inference to (19), because (20) is false in McWorld: not every farmer (e.g., Fred and Frederica) owns a donkey. And yet we judge that (23), (26), and (27) jointly imply (19).

⁴ Caspar Hare and Steve Yablo independently suggested this in conversation.

⁵ One might wonder why I have suddenly switched to definite descriptions (e.g., *the old farmer*) from proper names (e.g., *Old McDonald*). Originally, names appeared in ANTITHESIS REDUX, not definite descriptions. Thus, (21) used to be *OM, who owns Duke, beats him*. But the relative clause in this sentence is not syntactically functioning as a restrictor, whereas in (19) it is. The switch is intended to avoid this problem.

One might want to resist ANTITHESIS and ANTITHESIS REDUX on the following grounds: the arguments are long and distracting. Granted, they are not obviously invalid, but they are not obviously valid either. The appearance of validity may be an illusion stemming from unintended distractions. So let's consider a simpler version of the argument to see whether the appearance of validity persists.⁶

ANTITHESIS SIMPLIFIED

(28) OM beats exactly one of two donkeys he owns.

(29) YM beats the one donkey he owns.

(18) OM and YM are the only farmers who own donkeys.

(19) Therefore, every farmer who owns a donkey beats it.

If (1) semantically expresses the weak reading, ANTITHESIS SIMPLIFIED *should* have a valid interpretation. Why, then, is the inference judged to be invalid?

I want to make three points in response. First, unless one can say what *precisely* the distracting elements of ANTITHESIS and ANTITHESIS REDUX are, and how such distractions generate the appearance of validity, one has not really explained why competent English speakers are disposed to incorrectly judge that they are valid arguments. One has only provided the roughest sketch of a possible explanation. Perhaps the idea here is that ANTITHESIS and ANTITHESIS REDUX are designed in such a way as to mask the fact that OM doesn't beat one of his donkeys. If one were to keep in mind that OM owns Daisy and doesn't beat her, then ANTITHESIS and ANTITHESIS REDUX would no longer appear valid.⁷ I don't find this objection very convincing. If it were correct, then one would expect competent speakers/listeners to judge that (14)/(23) doesn't follow from (12)/(21) once they are reminded of Daisy. But notice that this inference is mediated by (13)/(22). Why should reminding someone of the fact that OM owns Daisy—a *female* donkey that he doesn't beat—undermine her confidence in thinking that (12)/(21) implies (13)/(22), which says that OM owns a *male* donkey that he beats? It shouldn't, and, as a matter of fact, it doesn't. The judgment that (12)/(21) implies (14)/(23) persists in the light of (13)/(22) even after competent speakers/listeners are reminded of Daisy.

The second point is that there is an argument, comparable in simplicity to ANTITHESIS SIMPLIFIED, but which strongly elicits the judgment that (19) follows.

ANTITHESIS SIMPLIFIED REDUX

(30) OM beats a donkey that he owns.

(31) YM beats a donkey that he owns.

⁶ An anonymous referee for *LI* suggested this objection. I thank him/her.

⁷ A different referee for *LI* suggested this. I want to thank him/her, too.

(18) OM and YM are the only farmers who own donkeys.

(19) Therefore, every farmer who owns a donkey beats it.

This argument is no more complex than *ANTITHESIS SIMPLIFIED*, so if there were illusion-inducing distractions present in *ANTITHESIS* and *ANTITHESIS REDUX*, they would not be present here. And interpreters judge this argument to be valid.

One question is left unanswered: why is *ANTITHESIS SIMPLIFIED* judged to be invalid? The third point I want to make addresses this question. The reason why interpreters may be disposed to judge that *ANTITHESIS SIMPLIFIED* is invalid is that the premises do not overcome the interpretive pressures that compel speakers/listeners to assign (1) the strong reading. Those of us who take donkey sentences to be systematically ambiguous acknowledge that the canonical relative-clause donkey sentence overwhelmingly elicits the strong reading (Geurts 2002:129–130). Why the ambiguity is typically resolved in one direction is a question that has been the focus of some attention. One answer is that the interpretive pressure to assign (1) the strong reading stems from latent psychological principles governing how interpreters individuate objects (Geurts 2002); another is that it stems from the predicates occurring in the sentence, whether they are “total” or “partial” (Yoon 1996). Whatever the correct answer is, *ANTITHESIS*, *ANTITHESIS REDUX*, and *ANTITHESIS SIMPLIFIED REDUX* overcome such pressures by highlighting structural similarities between the premises and the conclusion, similarities that license the inference on purely syntactic grounds. Subjects are confident that truth is preserved because logically relevant structure is preserved. Because the premises of *ANTITHESIS SIMPLIFIED* do not exhibit any such similarities, one should expect that the interpretive pressures compelling speakers/listeners to assign (1) the strong reading are not overcome. So one should expect interpreters to judge that *ANTITHESIS SIMPLIFIED* is invalid.

King (2004) offered two reasons for skepticism about the presence of semantic ambiguity in (1). We have discussed the first. Let’s now look at the second: donkey sentences fronted by *some* do not give rise to two readings. King takes this to show that (1) must not be semantically ambiguous. But there is another conclusion that his observation supports equally well: the presence of the ambiguity in (1) is somehow due to the universal quantifier in sentences like (1). The task, then, is to construct a formal theory that implements this idea. Sadly, I do not have one to offer here. But given that (1) *is* semantically ambiguous, as the antinomy above clearly demonstrates, I suggest that this other conclusion is the proper one to draw from King’s observation, not that there mustn’t be any ambiguity in (1).

One might think that there is an easy fix to the problem I have identified: simply posit two lexical entries for *every*—from one we derive the strong reading, from the other the weak. In recent work on donkey anaphora largely in response to sentences like (4) and (5), Geurts and Beaver (2007) implement this strategy within Discourse Representation Theory (DRT)—the framework originally due to

Kamp (1981).⁸ Let me say a little more about DRT and the Geurts-Beaver amendment before drawing attention to its flaws.

Kamp's basic idea, somewhat informally stated, was that an assignment function, α , satisfies the formula (or "discourse representation structure") corresponding to (1) (= 'farmer(x) & donkey(y) & owns(x, y) \rightarrow beats(x, y)') iff *every* assignment function, α' , which extends α and which satisfies the formula corresponding to the determiner phrase of (1) (= 'farmer(x) & donkey(y) & owns(x, y)') is such that there is an assignment function, α'' , which extends α' and which satisfies the formula corresponding to the verb phrase of (1) (= 'beats(x, y)').⁹ The primary motivation for this idea was that indefinite noun phrases deserve a uniform analysis.

The problem with [*Every farmer who owns a donkey beats it*] is that the indefinite description *a donkey* . . . reemerges [in its most straightforward analysis] as a universal quantifier. How does an expression of a type which standardly (or so it always seemed) conveys existence manage to express universality . . . ? . . . As I see the problem a proper solution should provide . . . a general account of the meaning of indefinite descriptions. (Kamp 1981:191)

By design, DRT allows us to systematically predict the quantificational force of an indefinite—whether it occurs in a relative clause or in some other context—simply by looking at the environment in which the term is embedded. It thus offers a uniform theory of indefinites.

Geurts and Beaver (hereafter, G&B) supplement Kamp's basic idea by adding that an assignment function, α , satisfies 'farmer(x) & donkey(y) & owns(x, y) \rightarrow beats(x, y)' iff *some* assignment function, α' , which extends α and which satisfies 'farmer(x) & donkey(y) & owns(x, y)' is such that there is an assignment function, α'' , which extends α' and which satisfies 'beats(x, y)'. This additional principle allows *every* to convey existence, as Kamp would put it, thereby permitting G&B's amended DRT to predict the weak reading of (1). G&B's idea may, therefore, appear as a quick and easy fix to the problem, but there are two reasons to be dissatisfied.

The first is that if *every* is semantically ambiguous, then one would expect there to be a language in which the ambiguity is morphologically resolved. There should be a language, that is, in which distinct words (or perhaps a single word with distinct markings) express the different values. But, as far as we know, there is no such language (Chierchia 1995:112). Why should this ambiguity be so well hidden?

The second reason to be dissatisfied is that G&B's strategy is counterproductive. Recall the original motivation for DRT: it was to

⁸ King (2005) recommends a similar strategy.

⁹ Given two assignment functions, α and α' , α' extends α iff the domain of $\alpha \subseteq$ the domain of α' and for all x in the domain of α , $\alpha(x) = \alpha'(x)$.

give a uniform theory of indefinites. Kamp asked why a term that typically expresses existence can sometimes express universality. By positing two lexical entries for *every*—one of which allows it to convey existence—G&B buy DRT’s uniform analysis of *a* but at an unreasonable price: a nonuniform account of *every*. What recommends the revised DRT framework over a “static” predicate-logic analysis of donkey anaphora that posits two lexical entries for *a*? Following Kamp, we might now ask why a term that typically expresses universality can sometimes express existence. It is no progress to simply trade one difficult question for an equally difficult one. The original motivation for DRT should close the door on the sort of amendment G&B propose. I conclude, therefore, that there is no easy way to fix this broken semantic theory.¹⁰

References

- Chierchia, Gennaro. 1995. *Dynamics of meaning: Anaphora, presupposition, and the theory of grammar*. Chicago: University of Chicago Press.
- Geurts, Bart. 2002. Donkey business. *Linguistics and Philosophy* 25: 129–156.
- Geurts, Bart, and David Beaver. 2007. Discourse Representation Theory. *The Stanford encyclopedia of philosophy*. Available at <http://plato.stanford.edu/entries/discourse-representation-theory/>.
- Groenendijk, Jeroen, and Martin Stokhof. 1991. Dynamic Predicate Logic. *Linguistics and Philosophy* 14:39–100.
- Heim, Irene. 1982. The semantics of definite and indefinite noun phrases. Doctoral dissertation, University of Massachusetts, Amherst.
- Kamp, Hans. 1981. A theory of truth and semantic representation. In *Formal methods in the study of language*, ed. by J. A. G. Groenendijk, T. M. V. Janssen, and M. B. J. Stokhof, 277–322. Amsterdam: Mathematisch Centrum. Reprinted in *Formal semantics: The essential readings*, ed. by Paul Portner and Barbara Partee, 189–222. Oxford: Blackwell. Page references to this edition.
- Kanazawa, Makoto. 1994. Weak vs. strong readings of donkey sentences in a dynamic setting. *Linguistics and Philosophy* 17: 109–158.
- King, Jeffrey. 1993. Intentional identity generalized. *Journal of Philosophical Logic* 22:61–93.
- King, Jeffrey. 2004. Context dependent quantifiers and donkey anaphora. Supplement to *Canadian Journal of Philosophy* 30: 97–127.

¹⁰ Groenendijk and Stokhof’s (1991:41–42) DPL is motivated by the same uniformity considerations as Kamp’s DRT. So a G&B-style response within the framework of DPL is also counterproductive.

- King, Jeffrey. 2005. Anaphora. *The Stanford encyclopedia of philosophy*. Available at <http://plato.stanford.edu/entries/anaphora/>.
- Neale, Stephen. 1990. *Descriptions*. Cambridge, MA: MIT Press.
- Schubert, Lenhart K., and Francis Jeffrey Pelletier. 1989. Generically speaking, or, using Discourse Representation Theory to interpret generics. In *Properties, types, and meaning*. Vol. 2, *Semantic issues*, ed. by Gennaro Chierchia, Barbara Partee, and Raymond Turner, 193–268. Dordrecht: Kluwer.
- Yoon, Youngeun. 1996. Total and partial predicates and the weak and strong interpretations. *Natural Language Semantics* 4:217–236.