

Barry Schein, **'And': Conjunction Reduction Redux**. Cambridge, MA: MIT Press. 2017. Pp. xiv + 1019.

On first examination, it appears that there is no simpler word than 'and' – its meaning is nothing more than a binary truth-function. 'Or' and 'if' are trickier: the former has both inclusive and exclusive uses, the latter occurs in indicative as well as subjunctive conditionals. With 'every' and 'some' there is the question of how to handle domains of quantification, 'must' and 'can' even rank possibilities within their associated domains. It remains controversial what to say about the existence and uniqueness implications of 'the' and how exactly its meaning differs from that of 'that'. There are at least three major types of views on 'be' and many more on 'become'. And once we look beyond functional categories, no one really has a clue. You can evidently know what 'elm' and 'beech' mean, know that they mean different things, but fail to know what the difference consists in. We should all celebrate our crisp and clean account of 'and'.

Alas, there is a complication even with that plain word. Like 'or', 'and' can conjoin mere phrases and, unlike 'or', it can yield complexes that cannot be analyzed as conjunctions of complete sentences. For example, in their most natural readings, neither (1) nor (2) entail (3) – (1) could be true if the students and the faculty collectively painted the lounge, and (2) could be true if the students divided the painting and the cleaning amongst themselves.

- (1) The students and the faculty painted the lounge.
- (2) The students painted the lounge and cleaned the windows.
- (3) The students painted the lounge.

Following terminology that has come down to us from medieval logicians, linguists say that the complex subject of (1) makes *collective reference* and that the complex predicate of (2) introduces *divided reference*.

The most natural (and, as of now, near universal) response to the phenomena of collective and divided reference is to posit an ambiguity in 'and'.¹ We might say that the subject in (1) refers to a plurality of individuals made up of the students and the faculty, and that the sentence ascribes painting the lounge to this plurality. Similarly, we might say that the predicate in (2) refers to a plurality of actions made up of painting the lounge and cleaning the widows, and that the sentence ascribes this plurality to the students. This sort of approach – sometimes called *algebraic semantics* because it interprets the recalcitrant occurrences of 'and' as a join operation in a semi-lattice – was initiated in a seminal paper by Godehard Link.² It can be naturally extended to a full-blown theory of plurals and mass nouns, and even further to a theory of the aspectual categories of verbs. Over the last decades, algebraic semantics has grown into a major research program within natural language semantics. The main thesis of Barry

¹ The suggestion that 'and' is ambiguous was already made by Aristotle, who in chapter 4 of the *Sophistical Refutations* mentions the following fallacy: five is two and three, so five is even and odd.

² Godehard Link, 'The logical analysis of plurals and mass terms: A lattice-theoretical approach'. In: *Meaning, use and interpretation of language*. Ed. by Reiner Bäuerle, Christoph Schwarze, and Arnim von Stechow. Berlin, Germany: de Gruyter, 1983, pp. 303–323.

Schein's new book is that this entire program rests on a mistake. Collective and divided reference do not spoil the pristine view of 'and' – this word functions always and everywhere as the truth-conditional connective we all know and love. The consequence is that much of phrasal syntax and semantics must be rethought.³

The key insight goes back to Frege and Tarski. Boolean connectives aren't merely *sentential*: they can combine open formulae as well as closed ones. According to Schein, within the (substantially simplified) logical forms of (1), (2), and (3) 'and' operates under the scope of existential quantifiers:

- (1') For some e_1, e_2, e_3 , the students are the Agents of e_1 , **and** the faculty are the Agents of e_2 , and the lounge is the Theme of e_3 , and those_{1,2} Cause that₃, and e_3 is a painting.
- (2') For some e_1, e_2, e_3 , the students are the Agents of e_1 , and the lounge is the Theme of e_2 , **and** the windows are the Theme of e_3 , and that₁ Causes those_{2,3}, and e_2 is a painting, and e_3 is a cleaning.
- (3') For some e_1, e_2 , the students are the Agents of e_1 , and the lounge is the Theme of e_2 , and that₁ Causes that₂, and e_2 is a painting.

e_1, e_2 , and e_3 are variables whose values are events. I indicated the contribution 'and' makes to the logical forms in bold. As usual, indices mark co-valuation; thus, 'that₁' is a descriptive pronoun designating singularly e_1 and 'those_{1,2}' is a descriptive pronoun designating plurally e_1 as well as e_2 . Capitalized words are semantic primitives: 'Agent' and 'Theme' pick out *thematic relations*, 'Cause' picks out a *bridge relation* often employed in the causative analysis of transitives.

What exactly do these semantic primitives mean? It is tempting to stay neutral on this matter but at least when it comes to 'Cause', this is not a real option for someone who wants to account for the fact that neither (1) nor (2) entail (3). In order for (1') to be true while (3') is false (4) must hold in some context, and in order for (2') to be true while (3') is false (5) must hold in some context:

- (4) Those_i Cause that_k, and these_j are some of those_i, but these_j do not Cause that_k.
- (5) That_k Causes those_i, and this_j is one of those_i, but that_k does not Cause this_j.

There are indeed contexts where (4) holds,⁴ but I have a hard time imagining one where (5) does. A Cause of many, it seems, is *ipso facto* a Cause of each. Admittedly, this appearance might be misleading – 'Cause', after all, is not a word of English and its meaning is only vaguely related to that of 'cause'.⁵ So, Schein may well be within his rights to simply stipulate that (5) is true in some context. But the fact that he needs such a stipulation is a blemish on his account of divided reference. There is also a general concern here. Going in for very fine-grained events in the semantics, as Schein does, inevitably gives

³ The book was a long time in the making. A preview of its major attractions came out as 'Event Semantics' in 2012 in Gillian Russell & Delia Graff Fara, eds., *The Routledge Companion to Philosophy of Language*, pp. 280-94.

⁴ Suppose the bill passes only if A, B, and C all vote yea. These (A, B, and C each voting yea) Cause that (the bill passing), those (A and B each voting yea) are some of these (A, B, and C each voting yea), and yet those (A and B each voting yea) did not Cause that (the bill passing).

⁵ According to the causative analysis of 'kill', to kill is not to cause to die but it is to Cause to die.

rise to worries that we do not have a good grip of how exactly they are supposed to be linked with one another.⁶

Modulo lingering questions about the meaning of 'Cause', Schein's account of collective and distributive reference is a success: it preserves the univocality for 'and' and eschews any appeal to algebraic operations in semantics. And while theoretical advantages alone rarely persuade people to switch from one framework to another, he also shows that his approach has considerable empirical virtues. He can, for example, capture the interaction of collective and divided reference with adverbs:

- (6) The students enthusiastically and the faculty reluctantly painted the lounge.
- (7) The students painted the lounge enthusiastically and cleaned the windows reluctantly.

(6) entails that the students did something enthusiastically and the faculty did something reluctantly and (7) entails that the lounge was painted enthusiastically and that the windows were cleaned reluctantly. It is hard to see how a semantics that interprets 'and' simply as a plurality-building connective can account for these facts.

Schein's book fits into a general pattern of moving semantics further and further from the sort of analyses that might strike a philosopher as natural. Donald Davidson's 1967 paper⁷ took the first step away from the manifest image. 'Jones buttered the toast in the bathroom at midnight' does not *seem* to say that for some event e , e is a buttering of the toast by Jones, and e occurred in the bathroom, and e occurred at midnight. And yet, Davidson insisted, it says just that. (Surely, opponents have protested, someone can believe what this sentence says without believing in events! Surely, proponents responded, someone can also believe that all lightning is dangerous without believing in electrostatic discharge. This does not show that lightning is anything but electrical discharge. Some people may not believe in events even if what they say quantifies over them.) Terence Parsons' 1990 book⁸ made a further step by introducing thematic roles into logical form and analyzing verbs as uniformly *monadic*. For neo-Davidsonians, 'Jones buttered the toast in the bathroom at midnight' says that for some event e , e is Past, e is a buttering, the Agent of e is Jones, the Theme of e is the toast, e occurs in the bathroom, and e occurs at midnight. (Surely, opponents objected, one can understand this sentence without having a clue about what it is to be an agent! Indeed, proponents responded, but 'Agent' needn't be synonymous with the English word 'agent'. It is a semantic primitive – a theoretical entity whose introduction is justified, as always, by the explanatory success of the theory to which it belongs.) Barry Schein's analyses are firmly on the side of the scientific image by making the semantics *supermonadic* – every DP introduces its own event and its own relation to it. For Schein, 'Jones buttered the toast in the bathroom at midnight' says that for some events e_1, e_2, e_3, e_4 , the Agent of e_1 is Jones,

⁶ It is worth noting that intuitions regarding the topological bridge relations Schein often uses in his logical forms are much clearer. For example, if you replace 'Cause' with 'Overlap' in (4) and (5), the resulting claims are both uncontroversially true in some contexts.

⁷ 'The Logical Form of Action Sentences.' Reprinted in *Essays on Actions and Events*. Oxford: Oxford University Press. 1980.

⁸ *Events in the Semantics of English*. Cambridge, MA: MIT Press. 1990.

the Theme of e_2 is the toast, a Participant of e_3 is the bathroom, a Participant of e_4 is midnight, e_1 is Past, e_1 Causes e_2 , e_2 is a buttering, e_2 occurs in e_3 , and e_2 occurs at e_4 .⁹

Schein's logical forms look much like the contorted paraphrases nominalists give to explain away apparent ontological commitment to pluralities. (Here is van Inwagen's paraphrase for 'Some zoological species are cross-fertile': there are two living animals x and y that are not conspecific and which satisfy the following condition: for any two fertile animals of different sexes one of which is conspecific with x and the other of which is conspecific with y , one of those two animals can impregnate the other.¹⁰) Whatever their value as a guide to ontology or conceptual clarification, linguists and philosophers have grown weary of paraphrases when offered as interpretations. (Incidentally, van Inwagen is not guilty of this.) We have come to agree that semantic analyses should be embedded within compositional theories and supported by proper linguistic evidence, preferably drawn from a variety of natural languages. Schein's analyses meet these demands handily. The compositional semantics for *Eventish* – second-order monadic predicate calculus with binary, restricted quantification, definite and indefinite descriptions, and descriptive anaphora, hypothesized to be the language of thought – is sketched in Appendix 2 of the book, and what comes in the more than 800 pages before that (plus the 150 pages of notes that come behind) gives an abundance of linguistic evidence that (barring the vagaries of disambiguation) there is a systematic translation from natural languages to Eventish.

To cover an impressive array of semantic phenomena in dozens of languages, Schein introduces the two innovations to the neo-Davidsonian framework already briefly mentioned (supermonadicity and descriptive event pronouns) and adds another two I don't have the space to discuss (adverbialization and spatiotemporal orientation¹¹). The modifications are modest but their repercussions are vast. Archimedes asked for a firm spot to stand and a lever long enough and offered to move the Earth with those. When it comes to the theory of meaning, the firm point is 'and' and the long lever is "And': Conjunction Reduction Redux.' Philosophers interested in language should all experience the spectacle.¹²

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⁹ Again, I am ignoring further complexities. 'Participant' is a generalized thematic relation. Agents, Themes, Instruments, Goals, etc. are all Participants of events. Schein argues in Chapter 1.4. that to handle collective and divided reference logical forms must sometimes be non-specific about the relation individuals bear to events – hence the need for a generalized thematic relation.

¹⁰ On p. 132 of Peter van Inwagen, 'Quine's 1946 Lecture on Nominalism.' *Oxford Studies in Metaphysics*. 2008, 4: 125-142.

¹¹ Adverbialization and spatiotemporal orientation are introduced in the logical forms primarily to solve various substitution puzzles that arise with conjoined noun phrases conjoined by 'and'.

¹² For those who don't have the time or the will for the whole thing, one can learn much from the introduction (a mere 75 pages) which covers the main attractions.