Weak Speech Reports

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Indirect speech reports can be true even if they attribute to the speaker the saying of something weaker than what she in fact expressed, yet not all weakenings of what the speaker expressed yield true reports. For example, if Anna utters 'Bob and Carla passed the exam', we can accurately report her as having said that Carla passed the exam, but we can not accurately report her as having said that either it rains or it does not, or that either Carla passed the exam or pandas are cute.

Though this phenomenon is well known, no current account of speech reports explains it. Some authors, such as Brasoveanu and Farkas (2007) and Saebo (2013), take for granted that a certain relation must hold between what a speech report attributes to the speaker and what the speaker in fact expressed, but they do not attempt to define that relation.[1] Others, like Richard (1998), make programmatic remarks about the nature of such a relation which, as I will argue, fail to account for the phenomenon at hand.

Using insights from alternative semantics (Hamblin 1973), this paper offers an analysis of speech reports that distinguishes weakenings of what the speaker expressed that yield true reports from weakenings that do not. According to this view, speech reports are sensitive no only to the informational content of what the speaker expressed, but also to the possibilities a speaker raises in making an utterance. For example, 'Anna said that Carla passed the exam or pandas are cute' is

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[1] For example, Brasoveanu and Farkas (2007) state that "speech act reporting verbs in general assert the existence of a speech act whose author is the referent of the subject of the reporting verb, and whose linguistic content has to 'match' the content of the complement of the report" (p. 11), but they do not cash out the "matching" relation they appeal to. Saebo (2013), who thinks the phenomenon should somehow be accounted for by appeal to background knowledge, acknowledges the state of the discussion when he says "it appears to be still an open question how much and what kind of impllicit information is admissible to bridge a gap in strength between a speech report and its source" (p. 286).

not an accurate report of what Anna said by uttering 'Bob and Carla passed the exam' because it characterizes Anna as having raised the possibility that pandas are cute, yet Anna did not raise that possibility through her utterance.

The structure of the paper is as follows. Section 1 presents the data. There, I call the kind of reports I will be concerned with *weak* and distinguish them from *de re* speech reports, what Saebo (2013) calls reports of specific indefinites, and what I call information-sensitive reports. Section 2 examines three potential analyses of speech reports: one appealing to situation semantics (Barwise and Perry 1981, 1983), one appealing to the notion of content parthood recently examined by Fine (2016) and Yablo (2014), and one proposed by Richard (1998) appealing to structured propositions. I argue that those views do not account for the phenomenon at hand. Section 3 presents my positive view. Section 4 discusses some of the view's limitations and outlines ways of addressing them. Section 5 concludes.

1   Data

Suppose Anna utters (1), and consider the reports of her utterance (1a)–(1d).

(1) Bob and Carla passed the exam.

    a. Anna said that Carla passed the exam.

    b. **#** Anna said that Carla passed the exam or pandas are cute.

    c. **#** Anna said that Carla passed the exam *and* either it rains or it does not.

    d. **#** Anna said that Carla passed the exam *or* it both rains and it does not.

I take (1a) to be true, and (1b)–(1d) to be false (hence the '**#**' preceding them). Evidence of the *truth* of (1a) is the fact that (2), uttered by Anna, would strike us as unreasonable, and even contradictory:

(2) **#** Wait a moment! I said that Bob and Carla passed the exam, I didn't say anything about whether Carla passed the exam!

On the other hand, evidence of the *falsity* of (1b) is the fact that it would not seem unreasonable or contradictory for Anna to utter

(3) Wait a moment! I said that Bob and Carla passed the exam, I didn't say anything about whether pandas are cute!

Finally, the fact that it would be perfectly reasonable for Anna to utter (4) is evidence of the *falsity* of both (1c) and (1d).

(4) Wait a moment! I said that Bob and Carla passed the exam, I didn't say anything about whether it rains!

When in doubt about the truth of a report, we can consider whether the reportee (the person whose speech is reported) could reasonably say something of the form *wait a moment! I said that* p*, I didn't say anything about whether* q, where 'p' is to be replaced by the sentence the reported speaker in fact uttered, and 'q' is to be replaced by a sentential fragment of the sentence embedded in the report we are assessing—e.g. a disjunct, a conjunct, or the whole sentence itself—or a suitable reconstruction thereof.[2] If, assuming that the speaker has all the relevant information, the resulting sentence would be unreasonable for the speaker to assert or it sounds contradictory, that is good (though defeasible) evidence that the report is true. If, on the other hand, the resulting sentence does *not* strike us as unreasonable or contradictory, that is good (though defeasible) evidence that the report is false. The resulting test is not infallible, but it can be useful if we find we are unable to tell whether a report is true by intuition alone.

True speech reports are not always felicitously assertible. For example, though (1a) is true, it can be *infelicitous* or *misleading* to assert it as a response to the question whether *Bob* passed the exam. In such a context, uttering (1a) may suggest that Anna *only* said that Carla passed the exam,

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[2] I say a "suitable reconstruction" for two reasons. The first is that the embedded sentence may involve the use of indexicals that were not used in the original sentence. In such cases, it should suffice that the indexicals as they occur in the embedded sentence be replaced by indexicals that refer to the same objects, but whose use would sound natural when uttered by the person whose speech is being reported. The second reason is that 'and' and 'or' can coordinate subsentential components, such as nouns, predicates, and verbs, as in 'Anna *and* John sing *or* dance'. In those cases, there is no fragment of the sentence that is itself a sentence which we could replace for 'q' in the schema from the main text. In some of those cases, we can distribute the coordinated material through the rest of the material in the sentence, as in 'Anna sings or dances, and John sings or dances', or 'Anna sings or Anna dances and John sings or John dances'. Each of the sentences 'Anna sings', 'Anna dances', 'John sings', and 'John dances', would be a suitable reconstruction of a fragment of 'Anna and John sing or dance' to replace 'q' in the schema from the main text. Note that 'and' and 'or' coordination of subsentential components can't always be eliminated in the way I just described. For example, it does not make sense to reconstruct 'Anna and John are a team' as 'Anna is a team and John is a team'.

but that she said nothing about Bob. The fact that uttering (1a) in such circumstances would be misleading, however, does not make it false.

After this brief excursus, let us consider more data. As before, I mark reports I take to be *false* with '#', and leave unmarked reports I take to be *true*. Assume Anna utters all of (5)–(7).

(5) Carla punched Bob hard in the face.[3]

   a. Anna said that Carla punched Bob.

   b. Anna said that somebody punched Bob in the face.

   c. # Anna said that Carla punched Bob in the face or in the ribs.

   d. # Anna said that Carla punched or kicked Bob.[4]

(6) Cardinals are crimson.

   a. Anna said that cardinals are red.

   b. Anna said that cardinals are some color.

   c. # Anna said that cardinals are crimson or cerulean.

   d. # Anna said that cardinals are crimson or scarlet.

(7) I'll be there at 3pm.

   (Each report below is uttered at 2:55pm from the location Anna was referring to.)

   a. Anna said she will be here soon.

   b. Anna said she will be here within ten minutes.

   c. Anna said she will be here before 6pm.

   d. # Anna said that she will be here at 3pm or at 6pm.

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[3] Based on Cappelen and Lepore's (1997) example 9.

[4] Certain readings of sentences like (5c) and (5d) may ring true. Those readings express the reporter's ignorance as to what the reportee said. For example, (5d) may be read as saying that Anna said that Carla punched Bob or Anna said that Carla kicked Bob (though the reporter may not know which one). Call this kind of reading an *ignorance reading*. I will not be concerned with ignorance readings throughout this paper. The readings I am interested in are those in which the reporter attributes to the reportee a saying of the semantic content of the report's complement clause.

With the exception of (1c) and (1d), all of the reports above are what I will call *weak* speech reports, since they attribute to the speaker the saying of something weaker than what she in fact expressed. As such, they constitute the basic data I will be concerned with throughout this paper. (1c) and (1d) are not weak because they attribute to Anna the saying of something logically equivalent to what she expressed (rather than the saying of something weaker), but we should expect an adequate account to explain their falsity nevertheless.

It is important to distinguish weak reports from *de re* reports, reports of *specific indefinites*, and reports that are sensitive to information that goes over and above what the speaker literally expressed. We can illustrate the difference between those other kinds of reports and weak reports through the following example. Suppose that Anna utters (8), that Carla is the richest woman in the world, that Anna has John in mind as she utters 'a new lover from LA' and had no other way of conveying the information she conveyed through (8) to her interlocutor, and that Anna and everybody involved in the conversation in which she uttered (8) know that LA is part of California. Then, uttered by someone in the know who overhears Anna's utterance, (8a) is an example of a weak report of Anna's utterance, the true reading of (8b) is an example of a *de re* report, (8c) is what we may call an 'indefinite-specifying' report, and (8d) is what we may call an 'information-sensitive' report:

(8) Carla has been seeing a new lover from LA.

    a. Anna said that someone has been seing a new lover.

    b. Anna said that the richest woman in the world has been seeing a new lover.

    c. Anna said that Carla has been seeing John.

    d. Anna said that Carla has been seeing a new lover from California.[5]

De re reports, indefinite-specifying reports, and information sensitive reports are like weak reports in that they can be true even though the sentences they embed do not have the same content as the sentence the speaker uttered. They differ in that only in the case of weak reports, the truth

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[5] Keep in mind that being in LA does not entail being in California. This is why the clause embedded in (8d) is not, strictly speaking, a weakening of (8), and, in turn, why (8d) is information-sensitive rather than weak.

of a report is guaranteed in virtue of a *necessary* relation between the content of the sentence they embed and the content of the speaker's utterance. I will not be concerned with *de re*, indefinite-specifying, or information sensitive reports for the rest of this paper.[6,7] Nor will I be concerned with problems arising from differences in cognitive significance between the sentence embedded in a report's complement clause and the sentence the speaker in fact uttered. For example, I will not be concerned with cases in which Anna is reported as having said that *Hesperus* is pretty if she utters '*Phosphorus* is pretty'.

2   Potential accounts of weak speech reports

This section examines three potential accounts of weak speech reports. The first appeals to a notion of entailment defined using situation semantics. The second uses the notion of content parthood recently developed by Fine (2016) and Yablo (2014). The third, proposed by Richard (1998), appeals to a special relation between structured propositions. As I argue in this section, none of these views fully accounts for the data.

2.1   Situation semantics

Situation semantics defines the semantic contents of expressions from natural language in terms of possible situations rather than in terms of possible worlds. Generally speaking, situations are akin to particular states of affairs or parts of possible worlds in that they settle the truth-values of propositions. However, unlike possible worlds, which settle the truth-value of absolutely every proposition, most situations settle the truth-value of only *some* propositions. For instance, were a situation in which it rains in Nepal to obtain, that alone would make the proposition `it rains in`

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[6] Thanks to an anonymous reviewer for bringing the following case to my attention. If, in the context of a conversation in which everybody knows that exactly one of Bob and Carla will come to the party, Anna utters 'Bob won't come to the party', it may not sound too odd to report Anna as having said that Carla will come to the party. Such a report would count as an information-sensitive report, just as (8d). I hope to discuss information-sensitive reports in future work.

[7] An anonymous reviewer is skeptical that the distinction between information-sensitive and weak reports cuts a joint in semantic and psychological theorizing. Readers who share this worry may think of the distinction as a methodological assumption. Even if there is no fundamental difference between weak and information-sensitive reports, making the distinction will allow us to make progress in the study of these kinds of reports.

`Nepal` true,[8] but it would not settle the truth-value of `it snows in Mexico City`; in fact, that situation's obtaining would be completely irrelevant to the truth of the latter. Because the situation in which it rains in Nepal does not settle the truth-value of `it snows in Mexico City`, it also does not settle the truth-value of `it either snows in Mexico City or it does not`; to do so, it would have to settle the truth-value of at least one of its disjuncts. Also unlike possible worlds, situations can stand in parthood relationships to one another—where parthood is understood as a reflexive, transitive, and antisymmetric relation; for example, a situation in which it rains in Nepal is part of a situation in which it rains in Nepal *and* it snows in Mexico City.

There are many different implementations of this general approach, including those by Barwise and Perry (1981, 1983), Barwise and Etchemendy (1987), and Kratzer (2012b,c), but the differences between them do not matter for our purposes. For our purposes, and much in the style of Fine (2012, 2016), it will suffice to think of possible situations merely as points partially-ordered by the parthood relation; each of those points determines a truth-value for some (but not necessarily all) of the sentences in a given language.[9]

In possible-worlds semantics, a proposition entails another just in case every world in which the former is true is a world in which the latter is true. In situation semantics, a proposition entails another just in case every possible *situation* in which the former is true is a situation in which the latter is true. Call this entailment relation *situationist entailment*.[10]

Situationist entailment is finer-grained than classical entailment. This may suggest that we can use situationist entailment to account for the data at hand. According to this analysis,

(9) $[\![$A said that $\phi]\!]^{c,s} = T$ if and only if, in s, A semantically expressed a proposition which situationally entails $[\![\phi]\!]^c$,

where A is a speaker, c is a context of utterance, and s is a situation.[11]

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[8] Sentences written in `this` font stand for propositions.

[9] Another way to think of situations is as partial models for the sentences in a given language; i.e. as partial functions from the sentences of that language to truth-values.

[10] The availability of this finer-grained notion of entailment and a similarly fine-grained notion of equivalence is one of the advantages Barwise and Perry (1981, p.676-7) originally claimed for situationist semantics over possible-worlds semantics.

[11] Following Kaplan (1989), throughout this paper I take contexts to be sequences of indices which, in conjunction with the character of a context-dependent expression, determine that expression's content.

(9) goes some ways to explain the basic data from the previous section. For example, every situation in which Bob and Carla passed the exam is a situation in which Carla passed the exam, so (9) accurately predicts that (1a) is true. On the other hand, not every situation in which Bob and Carla passed the exam is a situation in which it either rains or it does not—since, as I hinted above, a situation in which Bob and Carla passed the exam need not settle the truth-value of the proposition that it rains or of its negation—so the view accurately predicts that (1c) is false.

Because it accurately predicts that (1c) is false, (9) is an improvement over an analysis according to which a speech report is true just in case it attributes to the reportee the saying of a proposition classically entailed by a proposition the speaker semantically expressed—an analysis which would predict (1c) to be true.[12] However, (9) does not account for all the data. Since every situation in which Bob and Carla passed the exam is a situation in which either Carla passed the exam or pandas are cute, and a situation in which either Carla passed the exam or it both rains and it does not, (9) incorrectly predicts (1b) and (1d) (among others) to be true.

2.2   Content parthood

Fine (2016) and Yablo (2014) have recently examined the logical notion of content parthood. According to them, where P and Q are propositions, the content of P and the content of Q are each part of the content of P∧Q, but it is not true in general that the content of P∨Q is part of the content of P or of the content of Q. For example, according to Fine, if Anna said that Bob and Carla passed the exam, part of what Anna said is that Bob passed the exam, and part of what she said is that Carla passed the exam; but it is not part of what Anna said that either Carla passed the exam or pandas are cute.

It's easy to see how the notion of content parthood may look promising. Since the content of a conjunction's conjuncts is part of the conjunction's content, but the content of a disjunction is not in general part of the content of its disjuncts, one may hope to account for the data through the

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[12] I take a Hintikka-style semantics for speech reports fo be an example of such a semantics. According to a Hintikka-style semantics, a report is true just in attributes to the speaker the saying of a proposition which is true in every world compatible with what the speaker semantically expressed. See Hintikka (1969) for an application to the semantics of belief reports.

following definition:

(10) $[\![\text{A said that } \phi]\!]^{c,w} = T$ if and only if, in w, A semantically expressed a proposition whose content has the content of $[\![\phi]\!]^c$ as a part.

I will now argue that (10) does not account for all the data.

Fine and Yablo define the notion of content parthood in terms of the notions of *truth* and *falsity*makers. Abstracting away from the details of their respective implementations, we can define content parthood as follows:[13]

(11) The content of Q is part of the content of P if and only if:

    (i) Every possible truthmaker for P contains a possible truthmaker for Q.

    (ii) Every possible truthmaker for Q is contained in a possible truthmaker for P.

    (iii) Every possible falsitymaker for Q is contained in a possible falsitymaker for P.

Fine and Yablo implement this definition using different frameworks. Fine takes a proposition's truth(falsity)makers to be situations (or what I have called situations in the previous subsection) that are *fully relevant* to the proposition's truth (falsity)—i.e. situations that have no parts that fail to play a role in making the proposition true (false). Yablo, on the other hand, takes truth and falsitymakers to be sets of possible worlds—i.e. standard possible-worlds propositions. Within Fine's framework, the notion of *containment* used in (11) is to be understood in terms of the parthood relation between situations: where s, s' are situations, s contains s' just in case s' is part of s. Within Yablo's framework, the notion of *containment* used in (11) corresponds to the standard notion of entailment in possible-worlds semantics: where s, s' are sets of possible worlds, s contains s' just in case every world in s is a world in s'; in other words, if we think of truth and falsitymakers as propositions, s contains s' just in case s entails s'.[14]

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[13] Cf. Yablo (2014, p. 46). Yablo states the first of the requirements in terms of entailment, but his requirement is entailed by (i) as stated in the main text. My objection does not depend on this difference. Fine (2016, pp.206-7) omits the third of these requirements, but my objection does not depend on that requirement.

[14] Note that this notion of containment goes the other way around from the standard set-theoretical notion of inclusion: where s, s' are sets, s includes s' iff s' is a subset of s, whereas, in the sense relevant to (11), s *contains* s' iff s is a subset of s'.

The differences between Fine's and Yablo's respective implementations of (11) do not matter for our purposes. For present purposes, it suffices to note that, according to both Fine and Yablo, the truthmakers for a disjunction are just the truthmakers for its disjuncts. Given this and the definition of content parthood in (11), (10) accurately predicts that reports like (1a) are true and reports like (1b)–(1d) are false. However, the view mistakenly predicts that reports like (6a), (6b), and (7a)–(7c) are false.

Take for instance (6a), which reports Anna as having said that cardinals are red given that Anna uttered (6)—'cardinals are crimson'. Given the definition of content parthood above, the content of

(12) `Cardinals are red`

is not part of the content of

(13) `Cardinals are crimson.`

To see this, assume for concreteness that truth and falsitymakers are situations, and for simplicity that the only possible truthmakers for (12) are situations in which cardinals are crimson and situations in which cardinals are scarlet. Then there are possible truthmakers for (12) which are not part of any possible truthmaker for (13), namely, the situations in which cardinals are scarlet. Thus, the content of (12) is not part of the content of (13), so (10) mistakenly predicts that (6a) is false. Similar considerations apply to (6b) and (7a)–(7c).

(10) is on the right track in trying to block certain inferences from non-disjunctive premises to disjunctive ones, but it does not get at the bottom of the issue. I will come back to the idea that disjunction is the source of all our present troubles in section 3. Before that, I will examine one more potential account that does not yield the right results.

2.3 Structured propositions

Richard (1998) makes some programmatic remarks on how to account for the kind of reports we are interested in by appealing to structured propositions. According to Richard, if we assume that the semantic content of a declarative sentence (in a given context) is a *structured proposition*, we can define a DET relation between propositions such that someone says P if and only if there is a

proposition Q she expressed such that Q DETs P. That relation DET between propositions is meant to distinguish between good and bad weakenings for the purposes of reporting somebody's speech. I will consider various ways of cashing out DET in what follows.

Friends of structured propositions (e.g. Richard 1998, 1990, King 2007) tend to claim that the structured proposition a sentence expresses is determined by the sentence's phrase structure and the semantic contents of its subsentential components. For example, following King (2007), since the phrase structure of (1)—'Bob and Carla passed the exam'—is

(14) $[_S[_{NP}[_NBob]][[_{Conj}and][_NCarla]]] [_{VP}[_Vpassed][_{DP}[_Dthe][_Nexam]]]]$,[15]

(1) expresses the structured proposition

(15) $\langle Bob, \langle and, Carla \rangle \rangle, \langle passed, \langle the, exam \rangle \rangle \rangle$

whose atomic constituents are the semantic contents of 'Bob', 'and', 'Carla', 'passed', 'the', and 'exam' as they occur in (1).[16] Since I take King's to be the most developed treatment of structured propositions, I will continue to use it throughout my discussion.

According to Richard, anyone who asserts (15) is thereby committed to

(16) $\langle Bob, \langle passed, \langle the, exam \rangle \rangle \rangle$, and

(17) $\langle Carla, \langle passed, \langle the, exam \rangle \rangle \rangle$,

and in that sense (15) DETs (16) and (17). Examples of propositions that are *not* DETed by (15) are:

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[15] I'm assuming binary branching for simplicity. 'Conj' stands for the syntactic category that includes words like 'and', 'or', 'but', and so on.

[16] There is an extensive literature on the semantic content of 'and'. One possibility is that the semantic content of 'and' is just set intersection, in which case the semantic contents of 'Anna' and 'Bob' could be treated as sets of properties (following Montague 1974). Another possibility, which Champollion (2016) attributes to Winter (1995, 1998), is to treat the semantic content of 'and' as a function that forms an ordered pair with its arguments as elements (e.g. $\lambda yx.\langle x,y \rangle$); as Champollion puts it, according to this view, "when such a pair combines with other items in the tree, it is first propagated upwards in a style reminiscent of alternative semantics [...] At any point in the derivation, this ordered pair can be collapsed back into a single denotation by covert application of Intersection on its two members." (p. 36). For example, in a sentence like (1) the semantic content of 'Bob and Carla' would be the ordered pair $\langle Bob, Carla \rangle$. That semantic content combines with the semantic content of 'passed the exam' to form the ordered pair $\langle \{w : Bob$ passed the exam in $w\}, \{w : Carla$ passed the exam in $w\} \rangle$. Applying intersection to the members of that pair, we get the set of possible worlds in which Bob and Carla passed the exam. See Champollion (2016) for further discussion and a positive proposal on a univocal semantic content for 'and'.

(18) $\langle\langle Carla, \langle passed, \langle the, exam\rangle\rangle\rangle, \langle or, \langle pandas, \langle are, cute\rangle\rangle\rangle\rangle$.

(19) $\langle\langle Carla, \langle passed, \langle the, exam\rangle\rangle\rangle, \langle and, \langle\langle pandas, \langle are, cute\rangle\rangle, \langle or, \langle not, \langle pandas, \langle are, cute\rangle\rangle\rangle\rangle\rangle\rangle\rangle$

Richard does not cash out the relevant notion of commitment or the DET relation, but the general idea is that the truth-conditions of speech reports should be defined as follows:

(20) $[\![A \text{ said that } \phi]\!]^{c,w} = T$ if and only if, in w, A semantically expressed a proposition which DETs $[\![\phi]\!]^c$

This view will make different predictions depending on how DET is cashed out. What follows are some ideas on how to cash out that relation.

One way to cash out DET goes as follows. From (15)'s constituents and structure we can construct other propositions whose constituents are all constituents of (15) and whose structure is "inherited" from (15)'s structure—e.g. by "pruning" the branches of (15). The propositions we can construct in that way are the propositions (15) DETs.[17] According to this view, (15) DETs (16) because all of (16)'s constituents are constituents of (15), and (16)'s structure can be obtained from (15)'s structure merely by eliminating some of the latter's constituents. The same is true of (17). On the other hand, (15) does not DET (18) or (19) because some of the latter's constituents are not constituents of (15).

With this way of cashing out DET in place, (20) makes the right predictions with respect to a significant number of reports. For example, it correctly predicts that (1a) and (5a) are *true*, and that (1c), (1d), (5c), and (5d) are false. However, given how the DET relation has been characterized, (20) *incorrectly* predicts that (6a), (6b), and (7a)–(7c), among others, are false.[18]

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[17] Richard (1990) attributes something like this way of cashing out DET to Cresswell (1985) and criticizes him on that basis, so this way of understanding DET is probably not what Richard had in mind. Another way of cashing out DET is presented below which may fit Richard's intentions better.

[18] Repeated here:

(6a) Anna said that cardinals are red.

(6b) Anna said that cardinals are some color.

(7a) Anna said she will be here soon.

(7b) Anna said she will be here within ten minutes.

(7c) Anna said she will be here before 6pm.

Take for instance (6a), which truly reports Anna's utterance of (6). The proposition expressed by (6) is

(21) ⟨*cardinals*, ⟨*are*, *crimson*⟩⟩

and the proposition Anna said according to (6a) is

(22) ⟨*cardinals*, ⟨*are*, *red*⟩⟩

Given our characterization of DET, (21) does not DET (22), since the latter has a constituent that is not present in the former, namely, *red*, the semantic content of the word 'red'. Thus, according to (20), (6a) is false.

Similar observations apply to (7a)–(7c). For example, (7b) will attribute to Anna the saying of a proposition that has as constituents the semantic contents of 'ten' and 'minutes', but such semantic contents are not constituents of the proposition expressed by (7)—i.e. the proposition that Anna will be at a certain location at 3pm. Hence, the proposition Anna said according to (7b) is not DETed by the proposition Anna expressed through her original utterance.

One could try to avoid these problems by weakening DET so as to allow a proposition to DET another even if the latter has constituents that are not present in the former.[19] Such a weakening could go along the following lines. Take again (21) and (22). Presumably, the semantic content of 'are red' is the property of being red, and the semantic content of 'are crimson' is the property of being crimson; thus, (21) has the property of being crimson as a constituent, whereas (22) has the property of being red as a constituent. There is a non-accidental relationship between these two properties: if an object has the property of being crimson, then it has the property of being red as a matter of necessity. Guided by this thought, one may think that a proposition DETs another if, in addition to satisfying certain conditions on their respective structures and non-property constituents, every property in the DETed proposition is necessitated by some property in the DETing proposition. So, for example, (21) DETs (22) because, though the property of being some shade of red is a constituent of (22) but not of (21), the property of being crimson necessitates the property of being red. With this modification to the DET relation, (20) accurately predicts that (6a) is true.

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[19] This is closer to Richard's (1990, 1998) position.

However, the proposed weakening of DET is too weak. Just as the property of being crimson necessitates the property of being red, it necessitates the property of being either crimson or cerulean. So (21) DETs

(23) ⟨*cardinals*, ⟨*are*, ⟨*crimson*, ⟨*or*, *cerulean*⟩⟩⟩⟩

which is a proposition Anna said according to (6c)—'Anna said that cardinals are crimson or cerulean'. Thus, if DET is understood in this new, weaker way, (20) incorrectly predicts that (6c) is true.[20]

A more radical modification will claim that, contrary to what a sentence's phrase structure may suggest, disjunctive properties are never constituents of structured propositions. According to this view, for instance, (23) misrepresents the proposition expressed by 'cardinals are crimson or cerulean'. According to this view, that proposition should be represented as:

(24) ⟨⟨*cardinals*, ⟨*are*, *crimson*⟩⟩, ⟨*or*, ⟨*cardinals*, ⟨*are*, *cerulean*⟩⟩⟩⟩

If (6c) attributes to Anna a saying of (24) rather than one of (23), and DET is defined in the second of the ways we examined, (20) seems to yield the right results.

Though this modification is likely to yield the right predictions, it comes at a great cost for defenders of structured propositions. I mentioned earlier that those theorists claim that the structure of the proposition expressed by a given sentence is determined by that sentence's phrase structure and the semantic contents of that sentence's syntactic constituents. As I explain below, if the present strategy is to succeed, we must reject that claim. This raises the question of how to determine which structured proposition a sentence expresses.

In addition to coordinating sentences, words like 'or' and 'and' also coordinate nouns and predicates, and noun coordination does not always translate well to sentence coordination in the way it would have to for the present view to succeed. For example,

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[20] Note that, on pain of making the wrong prediction with respect to sentences like (7b), it won't help to claim that the required necessitation relation must hold between the semantic values of individual words—i.e. that in order for a proposition to DET another, the semantic value of every unstructured constituent (e.g. *red*, *crimson*, *cerulean*) of the DETed proposition must be necessitated by the semantic value of an unstructured constituent in the DETing proposition. Above we saw that (7b), the report 'Anna will be here within ten minutes' uttered at 2:55pm truly reports Anna's utterance of (7)—'I'll be there at 3pm'. Yet there is no sense in which any of the unstructured constituents of the structured content of the expression 'within ten minutes' is necessitated by any of the unstructured constituents of the structured content of 'at 3pm'.

(25) Anna and Bob met

can't be accurately translated as

(26) Anna met and Bob met

Thus, it seems, the proposition expressed by (25) must be (27) rather than (28)

(27) $\langle\langle Anna, \langle and, Bob\rangle\rangle, met\rangle$

(28) $\langle\langle Anna, met\rangle, \langle and, \langle Bob, met\rangle\rangle\rangle$

More generally, and unless we posit an ambiguity in the word 'and', we should think that the proposition expressed by '... α and β ...' is $\langle\ldots\langle[\![\alpha]\!], \langle and, [\![\beta]\!]\rangle\rangle\ldots\rangle$ (where α and β are expressions of the kind 'and' can coordinate).[21] So, for example, the structured proposition expressed by 'cardinals are crimson *and* cerulean' should be

(29) $\langle cardinals, \langle are, \langle crimson, \langle and, cerulean\rangle\rangle\rangle\rangle$

rather than

(30) $\langle\langle cardinals, \langle are, crimson\rangle\rangle, \langle and, \langle cardinals, \langle are, cerulean\rangle\rangle\rangle\rangle$

Now, since 'and' and 'or' are words of the same syntactic type, if a grammatical sentence results from substituting one for the other, the resulting sentence's phrase structure should be the same as that of the original sentence except for the substitution of 'and' for 'or' or the other way around.[22] In turn, if a sentence's phrase structure determines the structure of the proposition the sentence expresses, this means that if the proposition expressed by 'cardinals are crimson *and* cerulean' is (29), the proposition expressed by 'cardinals are crimson *or* cerulean' should be (23).

The problem is not minor. The most developed accounts of structured propositions (e.g. King 2007) appeal to phrase structures to determine the structured proposition expressed by a given sentence. If, as the present strategy requires, the structured proposition a sentence expresses is divorced

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[21] See Champollion (2016) for a brief summary of the empirical evidence against the ambiguity of 'and'.

[22] E.g. if the phrase structure of 'Bob is tall and fat' is [$_S$[$_{NP}$[$_N$Bob]] [$_{VP}$ [$_V$ is] [$_{AP}$[$_A$tall] [[$_{Conj}$and] [$_A$fat]]]]], the phrase structure of 'Bob is tall *or* fat' should be [$_S$[$_{NP}$[$_N$Bob]] [$_{VP}$ [$_V$ is] [$_{AP}$[$_A$tall] [[$_{Conj}$or] [$_A$fat]]]]].

from that sentence's phrase structure, it is not clear how to determine the proposition a sentence expresses, or whether there is a principled way of doing so. This is enough motivation to explore a different approach.

3   Making possibilities salient

My analysis relies on two ideas. First, in addition to conveying information about the world, assertoric utterances can also make various possibilities salient. Second, ordinary speech reports are sensitive not only to the information an utterance conveys, but also to the possibilities said utterance makes salient. For example, consider (6) and its corresponding reports (6a) and (6d), repeated here:

(6)   Cardinals are crimson;

(6a)   Anna said that cardinals are red;

(6d)   #Anna said that cardinals are crimson or scarlet.

According to the present view, reports like (6d) are false because, through the use of a disjunction in the embedded clause, they characterize the speaker as having raised possibilities the speaker did not in fact raise. In particular, (6d) is false because it characterizes Anna as having raised the possibility that cardinals are scarlet, even though Anna did not in fact raise that possibility through her utterance of (6). This difference in the possibilities (6a) and (6d) characterize Anna as having raised is independent of the truth-conditional content (i.e. the possible-worlds proposition) those reports characterize Anna as having expressed. For example, even if, as a matter of necessity, cardinals are crimson if and only if cardinals are crimson or scarlet, (6d) would characterize Anna as having explicitly raised the possibility that cardinals are scarlet, but (6a) would not.

We can capture the idea that two truth-conditionally equivalent sentences (i.e. two sentences which are true in exactly the same possible worlds) may raise different possibilities by taking a sentence's semantic content to be a set of *sets* of possible worlds (as opposed to a mere set of possible worlds). In particular, following Hamblin (1973), what I want to propose is that the semantic content of sentences of the form P∨Q is best represented as a set containing at least two sets of possible

worlds: the set of worlds in which P is true, and the set of worlds in which Q is true. In contrast, the semantic content of atomic sentences is best represented as a set containing only the set of possible worlds in which that sentence is true. Intuitively, each set of possible worlds in a sentence's semantic content corresponds to a possibility an assertoric utterance of that sentence would make salient.

Formally, we can refine these ideas through the following semantics for sentential logic. Where p is an atomic sentence, ϕ and ψ are compounds formed with the standard connectives in the usual way, and $[\![\cdot]\!]$ is a function from sentences to semantic contents (I'll be taking for granted that truth at a world has already been defined),

(31) $[\![p]\!] = \{\{w : p \text{ is true in w}\}\}$

(32) $[\![\neg\phi]\!] = \{\{w : \text{for no } \alpha \in [\![\phi]\!] \text{ is it the case that } w \in \alpha\}\}$

(33) $[\![\phi \wedge \psi]\!] = \{\alpha \cap \beta : \alpha \in [\![\phi]\!] \text{ and } \beta \in [\![\psi]\!]\}$

(34) $[\![\phi \vee \psi]\!] = [\![\phi]\!] \cup [\![\psi]\!]$[23, 24]

The main difference with standard possible-worlds semantics is that the semantic contents of sentences are sets of sets of possible worlds, rather than just sets of possible worlds. As I stated above, each of the sets in a sentence's semantic content corresponds to a possibility raised by an utterance of that sentence. Atomic sentences correspond to singleton sets of sets of worlds, since they only raise the possibility that they are true. Disjunctions, on the other hand, raise possibilities corresponding to each of their disjuncts, so their semantic contents are usually sets with more than one

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[23] (33) is due to Hamblin (1973), and the clause for conjunction is adapted from Groenendijk and Roelofsen (2009) so as to fit Hamblin's clause for disjunction. The clause for negation is adapted from Kratzer and Shimoyama (2002). See Alonso-Ovalle (2006) for extensive discussion of disjunction in a Hamblin-style semantics. There are subtle differences between Hamblin's approach (adopted here) and a similar approach recently developed by inquisitive semanticists. I discuss those differences in footnote 26.

[24] I'm restricting my attention to the language of sentential logic, but we can use the composition rule proposed by Hamblin (1973) to develop a fully compositional system for natural language. The composition rule Hamblin proposed is:

If $[\![\alpha]\!] \subseteq D_{\langle\sigma,\tau\rangle}$ and $[\![\beta]\!] \subseteq D_\sigma$, then $[\![\alpha(\beta)]\!] = \{c \in D_\tau : \exists a \in [\![\alpha]\!].\exists b \in [\![\beta]\!].c = a(b)\}$

In a Hamblin semantics, expressions denote sets of objects of the type they standardly denote in a standard Montagovian semantics, and the English word 'or' denotes the operation of set union. For example, take the sentence 'Anna or Bob run'. In a Hamblin semantics, he semantic content of 'Anna or Bob' will be the set whose members are the singleton of Anna and the singleton of Bob; that semantic content will combine with the semantic content of 'run'—presumably, the property of running—to form a set with two sets of possible worlds as its members: the set of possible worlds in which Anna runs, and the set of possible worlds in which Bob runs.

member (the exceptions being sentences of the form P∨P). A sentence's truth-conditional content corresponds to the union of the sets in that sentence's semantic content—i.e. the set of possible worlds in which at least one of the possibilities an utterance of that sentence raises is true.

For example, the semantic content of

(35) Cardinals are crimson or scarlet

is the set containing: the set of possible worlds in which cardinals are crimson, and the set of possible worlds in which cardinals are scarlet. On the other hand, the semantic content of

(36) Cardinals are red

is the singleton set containing only the set of possible worlds in which cardinals are a shade of red. Given the assumption that crimson and scarlet are the only shades of red, (35) and (36) have the same *truth-conditional content*: the set of possible worlds in which at least one of the possibilities one raises obtains is the same as the set of worlds in which at least one of the possibilities the other raises obtains. But despite having the same truth-conditional content, (35) and (36) raise different possibilities: (35) raises the possibility that cardinals are scarlet and the possibility that cardinals are crimson, but (36) does not raise either of those possibilities individually.

Let's call sets of *sets* of possible worlds *alternative propositions* and, where Γ is a set of alternative propositions, let's denote the conjunction of all of its members (determined by (33)) $\bigwedge \Gamma$. So, for example, if Γ is the set containing the alternative proposition that cardinals are crimson or scarlet and the alternative proposition that Bob passed the exam, $\bigwedge \Gamma$ is the alternative proposition containing: the set of possible worlds in which cardinals are crimson and Bob passed the exam, and the set of worlds in which cardinals are scarlet and Bob passed the exam. With this in mind, here is my proposed analysis:

(37) $[\![A \text{ said that } \phi]\!]^{c,w} = T$ if and only if, for some set Γ of alternative propositions each of which A semantically expressed in w,

   (i) For every $\alpha \in \bigwedge \Gamma$, there is $\beta \in [\![\phi]\!]^c$ such that $\alpha \subseteq \beta$, and

   (ii) For every $\beta \in [\![\phi]\!]^c$, there is $\alpha \in \bigwedge \Gamma$ such that $\alpha \subseteq \beta$.

In (37), (i) corresponds to the requirement that every possibility raised by what the speaker semantically expressed entails some possibility the report characterizes her as having raised. This kind of entailment is finer-grained than classical entailment. Where P and Q are logically independent, P classically entails Q∨¬Q. That is not so in the sense of entailment characterized by (i): if P and Q are logically independent, the set of possible worlds in which P is true is neither a subset of the set of worlds in which Q is true, nor of the set of worlds in which ¬Q is true. However, in the sense of entailment characterized by (i), P entails P∨Q.

The second constraint corresponds to the condition that the report does not characterize the speaker as having raised possibilities she did not in fact raise. It is the requirement that every possibility raised by the sentence embedded in the report be a superset of some possibility raised by what the speaker semantically expressed. This second requirement is what allows (37) to make the right predictions about reports like (6a)–(6d).

To see this, let's go back to Anna's utterance of (6) and the corresponding reports (6a) and (6d). (6) has the content we would characterize as:

(38) $\{\{w : \text{cardinals are crimson in } w\}\}$

It raises only the possibility that cardinals are crimson. On the other hand, the semantic contents of the clauses embedded in the that-clauses of (6a) and (6d), respectively, can be represented as:

(39) $\{\{w : \text{cardinals are red in } w\}\}$

(40) $\{\{w : \text{cardinals are crimson in } w\}, \{w : \text{cardinals are scarlet in } w\}\}$

We can now see that (6a) satisfies the conditions imposed by (37). First, in accordance with (i), every possibility raised by (38) is included in a possibility raised by (39), since every world in which cardinals are crimson is a world in which cardinals are red. Second, in accordance with (ii), every possibility raised by (39) includes a possibility raised by (38), since the set of worlds in which cardinals are red includes the set of worlds in which cardinals are crimson. Thus, (37) predicts that (6a) is true. On the other hand, (37) predicts (6d) to be false. Though (6d) satisfies (i), it does not satisfy (ii): contrary to (ii), the set of worlds in which cardinals are scarlet (one of the possibilities

raised by (40)) does not include the set of worlds in which cardinals are crimson (the only possibility raised by (38)).[25],[26]

I will leave it to the reader to see that (37) makes the right predictions about the rest of the reports from section 1. What I want to do instead is show how the present view applies to two examples we have not yet considered.[27] For instance, suppose Anna utters (41) and, after a pause, she utters (42):

(41) Carla passed the exam.

(42) Bob didn't pass the exam.

In such a scenario, (43) seems to be an accurate characterization of what Anna said:

(43) Anna said that Carla passed the exam and Bob didn't.

The present view predicts the truth of (43) as follows. By uttering (41) and (42), Anna asserted (44) and (45), respectively:

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[25] It is worth noting the formal connections between this approach and the approach using the notion of content parthood I discussed in the previous section. If we eliminate the clause on falsitymakers in (11), adopt a treatment on which truthmakers are sets of possible worlds, and assume that an atomic sentence's only truthmaker is the set of possible worlds in which that proposition is true (e.g. that the only truthmaker for 'cardinals are red' is the set of possible worlds in which cardinals are red), then (37) is equivalent to (10). I take the main advantages of the present approach to be philosophical, rather than formal: whereas it might be difficult to justify the claim that the only truthmaker for a sentence like 'cardinals are red' is the set of possible worlds in which cardinals are red (as opposed to the set of possible worlds in which cardinals are crimsoon, the set of worlds in which cardinals are scarlet, and so on), there is no analogous difficulty in claiming that an utterance of 'cardinals are red' makes salient the possibility that cardinals are red without making salient the more specific possibilities that cardinals are crimson or that cardinals are scarlet.

[26] We can get the clauses for conjunction, negation, and disjunction used in inquisitive semantics simply by applying the function $ALT(\Gamma) = \{\alpha \in \Gamma : \text{for no } \beta \in \Gamma, \alpha \subset \beta\}$ to clauses (31)–(34)(see e.g. Groenendijk and Roelofsen 2009). So, for example, the inquisitive clause for disjunction is $[\![\phi \vee \psi]\!]_{INQ} = ALT[\![\phi \vee \psi]\!]$, where $[\![\phi \vee \psi]\!]$ is defined as in (33). In certain cases, the difference between the two clauses makes a difference in (37)'s predictions. For example, suppose Anna utters 'cardinals are red', and consider the report 'Anna said that cardinals are crimson or red'. Using the clause for disjunction from the main text—i.e. (33)—we predict this report is false. For, according to that clause, the content of 'cardinals are crimson or red' is the set containing the set of worlds in which cardinals are crimson and the set in which they are red. Since the set of worlds in which cardinals are red is not included in the set of worlds in which cardinals are crimson, (37) predicts the report to be false. In contrast, using the inquisitive clause for disjunction, we get the prediction that the same report is true. Since the set of worlds in which cardinals are crimson is a proper subset of the set of worlds in which they are red, according to the inquisitive clause for disjunction the content of 'cardinals are crimson or red' is the singleton set of the set of worlds in which cardinals are red. Thus, according to the inquisitive clause, the content of 'cardinals are crimson or red' is exactly the same as that of 'cardinals are red', which yields the prediction that 'Anna said that cardinals are crimson or red' accurately reports Anna's utterance of 'cardinals are red'. I take this to be the wrong result, which speaks in favor of the clauses used in the main text—i.e. (31)-(34)—as opposed to the clauses from inquisitive semantics.

[27] Thanks to an anonymous reviewer for bringing the following two cases to my attention. Consideration of those cases led to revision of a previous proposal.

(44) $\{\{w : \text{Carla passed the exam in } w\}\}$;

(45) $\{\{w : \text{Bob didn't pass the exam in } w\}\}$.

The conjunction of (44) and (45) is

(46) $\{\alpha \cap \beta : \alpha \in (44), \beta \in (45)\} = \{\{w : \text{Carla passed the exam and Bob didn't pass the exam in } w\}\}$,

which is identical to the semantic content of the sentence embedded in (43)'s that-clause:

(47) $\{\{w : \text{Anna passed the exam and Bob didn't pass the exam in } w\}\}$.

And since (47) and (46) are identical, every possibility raised by (46) is included in a possibility raised by (46), and every possibility raised by (47) includes a possibility raised by (46). Hence, there is a set of alternative propositions Anna semantically expressed—namely, the set containing (44) and (45)—which satisfies the conditions imposed by (37).

The second case I want to discuss concerns cases in which the speaker expresses an alternative proposition without uttering a declarative sentence. For example, suppose Anna is asked whether John passed the exam, to which she replies by uttering 'yes'. In such a case, it seems fair to report Anna's utterance as follows:

(48) Anna said that John passed the exam.

Assuming that, through her utterance of 'yes', Anna semantically expressed

(49) $\{\{w : \text{John passed the exam}\}\}$,

the present view predicts that (48) is true.[28]

This ends my presentation of the core elements of my proposal. The next section discusses potential counterexamples, as well as some of the proposal's limitations. In particular, I will discuss potential counterexamples arising from necessary atomic truths, potential counterexamples involving disjunctions, reports of conditional statements, and potential counterexamples arising from presuppositions.

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[28] Note that, if Anna did not *semantically* express (49) by uttering 'yes', we can modify the present account so as to define the truth of a report in terms of what the speaker *asserted*. In such a case, assuming that Anna asserted (49) through her utterance of 'yes', the modified view would predict that (48) is true.

4 Further issues

4.1 Necessary atomic truths

Because the framework I have been using is formulated in terms of possible worlds, (37) makes the mistaken prediction that (6), say, could be correctly reported by uttering

 (50) # Anna said that 2+2=4

This is so because every possible world in which cardinals are crimson is a world in which 2+2=4. Thus, every possibility raised by Anna's original utterance is included in a possibility raised by '2+2=4' (i.e. the singleton set of the set of all possible worlds), and every possibility raised by '2+2=4' includes a possibility raised by Anna's original utterance.

   We can tackle this problem by defining a sentence's semantic content in terms of sets of sets of possible *situations* rather than in terms of sets of sets of possible worlds. So, for example, (31) would look as follows:

 (51) $\llbracket p \rrbracket = \{\{s : \text{p is true in } s\}\}$

In words, the possibility raised by an atomic sentence is the singleton set containing the set of possible situations in which *p* is true. Assuming that not every possible situation in which cardinals are crimson settles whether 2+2=4, the resulting view predicts (50) to be false. Something similar goes for

 (52) Anna said that cardinals are crimson and 2+2=4.

 (53) Anna said that cardinals are crimson or 2+2=4.

Assuming that not every possible situation in which cardinals are crimson settles whether 2+2=4, the present view predicts that these reports are false. For instance, if we use situations instead of possible worlds, the content of 'cardinals are crimson or 2+2=4' is the set containing: the set of possible situations in which cardinals are crimson, and the set of possible situations in which 2+2=4; since not every situation in which cardinals are crimson settles whether 2+2=4, the present view predicts that (53) is false. In this way, the use of situation semantics in conjunction with (37) and suitably modified versions of (31)–(34) improves the present account's predictions.

4.2   Interaction with Hurford's constraint

An objector may point out that (54) and (55) below are both infelicitous when uttered as reports of
(6) ('cardinals are crimson'), yet my proposal predicts them both to be true.

(54) Anna said that cardinals are crimson or red.

(55) Anna said that cardinals are crimson or not scarlet.[29]

The fact that these reports are infelicitous, the objection goes, suggests that they are false, in which
case they are counterexamples to my view. As I will explain now, this objection ultimately fails.
First, using the test I introduced in section 1, I will make a case that (54) and (55) are true despite
being infelicitous. Second, I will show that there is an independently motivated explanation of (54)
and (55)'s infelicity which has nothing to do with their truth-value.

In section 1 I said that true reports may sometimes be infelicitous. For instance, I said that
while the report 'Anna said that Bob passed the exam' truly reports Anna's utterance of 'Bob and
Carla passed the exam', it may be infelicitous insofar as it suggests Anna didn't say anything about
whether Carla passed the exam. Since linguistic intuitions alone are often not fine-grained enough
to distinguish between reports that are merely infelicitous from reports that are false, I proposed the
following test (see above, p. 3): consider whether the reportee (the person whose speech is being
reported) could reasonably say something of the form *wait a moment! I said that* p*, I didn't say
anything about whether* q, where 'p' is to be replaced by the sentence the reported speaker in fact
uttered, and 'q' is to be replaced by a sentential fragment of the sentence embedded in the report we
are assessing—e.g. a disjunct, a conjunct, or the whole sentence itself—or a suitable reconstruction
thereof.[30] If, assuming that the speaker has all the relevant information, the resulting sentence would
be unreasonable for the speaker to assert or it sounds contradictory, that is good (though defeasible)

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[29] Thanks to an anonymous reviewer for bringing these cases to my attention. According to my account, (54) is true
because Anna's utterance of (6) makes salient the possibility that cardinals are crimson, which entails both that cardinals
are crimson and that cardinals are red. Thus, every possibility made salient by Anna's utterance entails a possibility
(54)'s that-clause makes salient, and every possibility made salient by (54) is entailed by a possibility Anna's utterance
makes salient. The same goes, *mutatis mutandis*, for (54), since the possibility that cardinals are crimson entails both
that cardinals are crimson and that cardinals are not scarlet. Note that, as observed in footnote 26, my view predicts that
(54) is false when taken as a report of 'cardinals are red'. Intuitively, this corresponds to the idea that Anna did not make
salient the possibility that cardinals are crimson by uttering 'cardinals are red'.

[30] See footnote 2 for elaboration on what a suitable reconstruction is.

evidence that the report is true. If, on the other hand, the resulting sentence does *not* strike us as unreasonable or contradictory, that is good (though defeasible) evidence that the report is false.

An application of this test to (54) and (55) gives us evidence of their truth. For instance, (56) and (57) seem contradictory when uttered by Anna in response to (54), whereas (58) and (59) sound contradictory when uttered in response to (55):

(56) **#**Wait a moment! I said that cardinals are crimson, I didn't say anything about whether they are red!

(57) **#**Wait a moment! I said that cardinals are crimson, I didn't say anything about whether they are crimson or red!

(58) **#**Wait a moment! I said that cardinals are crimson, I didn't say anything about whether they are not scarlet!

(59) **#**Wait a moment! I said that cardinals are crimson, I didn't say anything about whether they are crimson or not scarlet!

Given this evidence, we have reason to believe that (54) and (55) are true. However, we still have to explain why those reports are infelicitous, and to do so in a way that is independent of their truth-value.

We can produce such an explanation by appealing to *Hurford's constraint*, the observation that "[a] sentence that contains a disjunctive phrase of the form 'S or T' is infelicitous if S entails T or T entails S" (Chierchia et al. 2009, p.48), where the entailment relation is to be understood as the relation *is included in*, "so as to be applicable to pairs of non-propositional constituents" (Chierchia et al. 2009, p. 48, fn.3). Sentences that fall under this generalization include, in addition to (54) and (55),

(60) *****Cardinals are crimson or red.

(61) *****Cardinals are crimson or not scarlet.

(62) *****That painting is of a man or a bachelor. (Hurford 1974)

(63) *The value of x is greater than or not equal to 6. (Hurford 1974)

Given Hurford's constraint, we can explain (54) and (55)'s infelicity independently of their truth-value: those reports are infelicitous because they both embed a disjunctive clause in which one of the disjuncts entails the other.[31] As such, Hurford's constraint plus the case in favor of (54) and (55)'s truth are enough to defuse the present objection.

To conclude my discussion of the present cases, I want to point out that my account of weak reports coheres with the most popular explanations of Hurford's constraint. According to those accounts, disjunctions in which one of the disjuncts entails the other are infelicitous because they are redundant. Within the present framework, and adapting proposals by Katzir and Singh (2014) and Ciardelli and Roelofsen (2017), we can make this idea more perspicuous through the following principle:

Redundancy: A sentence is redundant if its logical form contains a node $O(A,B)$ which is obtained by application of a binary operator O to two arguments A, B such that, if S is the smallest sentential constituent containing $O(A,B)$, then the truth-conditional content of $S[O(A,B)]$ is equivalent to the truth-conditional content of either $S[A]$ or $S[B]$.

So, for example, 'cardinals are crimson or red' is redundant because its truth-conditional content (i.e. the set of possible worlds in which at least one of the possibilities it makes salient is true) is equivalent to the truth-conditional content of 'cardinals are red'. In other words, $\bigcup [\![$cardinals are crimson or red$]\!] = \bigcup [\![$cardinals are red$]\!]$. The same principle also explains the infelicity of *conjunctions* which are equivalent to one of their conjuncts, such as 'cardinals are crimson and red'; accordingly, it explains the infelicity of reports like 'Anna said that cardinals are crimson and red'. Finally, note that the present observations can be combined with the treatment of necessary atomic truths in the previous subsection to achieve greater empirical coverage.

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[31] As Chierchia et. al. report, Gazdar proposed for a weakening of Hurford's constraint so as to account for apparent failures of Hurford's original observation involving scalar implicatures. According to Gazdar's weakening, "a sentence containing a disjunctive phrase 'S or T' is infelicitous if S entails T or if T entails S, *unless* T contradicts the conjunction of S and the implicatures of S." Chierchia et al. (2009, p. 49, my emphasis). See Chierchia et al. (2009) for compelling arguments in favor of the stronger formulation of Hurford's constraint, and Katzir and Singh (2014), Ciardelli and Roelofsen (2017) for further implementations of Chierchia et al. (2009)'s approach to Hurford's constraint. Here I will follow Chierchia et al. (2009), Katzir and Singh (2014), and Ciardelli and Roelofsen (2017) in thinking that scalar implicatures should receive a grammatical implementation, and that Hurford's constraint holds in its strongest formulation.

4.3 Reports of conditionals

So far I have omitted any discussion of conditionals. There are two reasons for this. First, there are many different types of conditionals, and it is not clear that they should all receive the same semantic analysis. Second, even when focusing on a single kind of conditional (e.g. indicative conditionals) there is still wide disagreement as to what the right semantics for that kind of conditional is. As such, any proposal involving reports of conditionals can only be tentative. That said, I want to propose a tentative extension of the present approach so as to account for reports of conditionals.[32]

Let's start with some data:

(64) [Anna:] If Bob or Carla come to the party, Dan will come to the party.

     a. Anna said that if Bob comes to the party, Dan will come to the party.

     b. # Anna said that if Bob or Carla come to the party, Dan or Eve will come to the party.

     c. # Anna said that if Bob comes to the party, then either Dan will come to the party, or it will either rain or not.

     d. # Anna said that if either Bob comes to the party or either it rains or it doesn't, Dan will come to the party.

(64a) may be misleading as a report of (64), since it may suggest that Anna didn't say anything about whether Dan would come to the party if Carla did. Evidence of its truth, however, is the fact that it passes the test from section 1; that is, it would seem unreasonable for Anna to utter (65) as a response to (64):

(65) #Wait a moment! I said that if Bob or Carla come to the party, Dan will come to the party; I didn't say anything about whether Dan will come to the party if Bob comes to the party!

On the other hand, it would seem perfectly reasonable for Anna to utter any of the following, which is evidence of the falsity of (64b)–(64d), respectively:

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[32] Thanks to an anonymous reviewer for pressing me on these issues and for bringing cases like (64c) and (64d) to my attention.

(66) Wait a moment! I said that if Bob or Carla come to the party, Dan will come to the party; I

didn't say anything about whether Eve will come to the party if Bob comes to the party!

(67) Wait a moment! I said that if Bob or Carla come to the party, Dan will come to the party; I

didn't say anything about whether it will rain or not if Bob comes to the party!

(68) Wait a moment! I said that if Bob or Carla come to the party, Dan will come to the party; I

didn't say anything about whether Dan will come to the party if it rains!

This data is in accordance with the known observation that conditionals of the form *if P or Q, then R* seem to entail *if P, then R* and *if Q, then R*.[33] It is also in accordance with the observation that conditionals of the form *if P, then Q* do not generally entail conditionals of the forms *if P, then Q or R* or *if P or R, then Q*.

In order to account for this data, I want to propose a semantic clause for conditionals to be used together with the account of weak reports developed in section 3. The caveat, as I mentioned above, is that there are many kinds of conditionals and there is no agreement as to the correct semantics for each kind. With that in mind, the following clause should be taken as extremely tentative:

(69) $[\![\phi > \psi]\!] = \{\gamma : \text{for some } \beta \in [\![\psi]\!], \gamma = \bigcup\{\gamma' : \text{for all } \alpha \in [\![\phi]\!], \gamma' \subseteq \alpha \to \beta\}\}$

where '$\to$' stands for whatever conditional (e.g. the strict conditional, Stalnaker's conditional, the material conditional, etc.) best accounts for the semantics of a given kind of conditional found in English (e.g. indicative conditionals, counterfactual conditionals, etc.).[34] For example, take the conditional $p \to_S q$, which is true at a world w just in case: in every possible world minimally different from w in which p is true, q is true as well.[35] If this conditional best accounts for the semantics of indicative conditionals, then in order to account for weak reports of indicative conditionals, we will have to substitute '$\to_S$' for '$\to$' in the definition above. If, on the other hand, the material conditional turns out to best account for the semantics of indicative conditionals, then we should replace

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[33] See Alonso-Ovalle (2009), von Fintel (2011) for discussion.

[34] The clause is adapted from Alonso-Ovalle (2009, pp. 216–18)'s work on counterfactuals. See also Champollion et al. (2016), Fine (2012) for alternative clauses that implement the same general idea. See Groenendijk and Roelofsen (2009) for a clause for conditionals in an inquisitive framework.

[35] See Lewis (1973), Stalnaker (1999), Kratzer (2012a) for discussion. According to Stalnaker, the difference between indicative and counterfactual conditionals is only that the antecedent of a counterfactual conditional is presupposed to be false, while the antecedent of an indicative conditional is not.

'→' with '⊃' instead. In what follows, and merely for the sake of illustration, I will suppose that →$_S$ best accounts for indicative conditionals in English, but we should keep in mind that the present account's predictions will ultimately depend on what conditional we substitute for →.

Given our present assumptions, the semantic content of a conditional like

(70) If Bob or Carla come to the party, Dan will come to the party

is determined as follows. First, the antecedent raises two possibilities: that Bob comes to the party (abbreviated 'B'), and that Carla comes to the party (abbreviated 'C'); the consequent, on the other hand, raises only the possibility that Dan will come to the party (abbreviated 'D'). According to the present account, since (70)'s consequent raises only one possibility, (70) itself raises only one possibility as well: the union of all the sets which are subsets of both the set of worlds in which $B \rightarrow D$ is true and the set of worlds in which $C \rightarrow D$ is true—i.e. the set of worlds in which $B \rightarrow D$ and $C \rightarrow D$ are both true.[36] In other words, (70) is equivalent to

(71) If Bob comes to the party, Dan will come to the party, and if Carla comes to the party, Dan will come to the party.

Compare (70) with

(72) If Bob or Carla come to the party, Dan or Eve will come to the party.

Though the antecedents of (70) and (72) raise the same possibilities, their consequents do not. (70)'s consequent raises only the possibility that Dan will come to the party, whereas (72)'s consequent raises two possibilities: that Dan will come to the party, and that Eve will come to the party. Because (72)'s consequent raises two possibilities, (69) predicts that (72) itself raises two possibilities: (i)

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[36] Here is the derivation. A letter in bold denotes the set of possible worlds in which the sentence the letter represents is true. So, for example, **B** stands for the set $\{w : B \text{ is true in } w\}$.

$$\llbracket(B \vee C) > D\rrbracket = \{\gamma : \text{for some } \beta \in \llbracket D\rrbracket, \gamma = \bigcup\{\gamma' : \text{for all } \alpha \in \llbracket B \vee C\rrbracket, \gamma' \subseteq (\alpha \rightarrow \beta)\}\}$$
$$= \{\gamma : \text{for some } \beta \in \{\mathbf{D}\}, \gamma = \bigcup\{\gamma' : \text{for all } \alpha \in \llbracket B\rrbracket \cup \llbracket C\rrbracket, \gamma' \subseteq (\alpha \rightarrow \beta)\}\}$$
$$= \{\gamma : \text{for some } \beta \in \{\mathbf{D}\}, \gamma = \bigcup\{\gamma' : \text{for all } \alpha \in \{\mathbf{B}, \mathbf{C}\}, \gamma' :\subseteq (\alpha \rightarrow \beta)\}\}$$
$$= \bigcup\{\gamma : \gamma \subseteq (\mathbf{B} \rightarrow \mathbf{D}) \text{ and } \gamma \subseteq (\mathbf{C} \rightarrow \mathbf{D})\}$$
$$= (\mathbf{B} \rightarrow \mathbf{D}) \cap (\mathbf{C} \rightarrow \mathbf{D})$$

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that if Bob comes to the party, Dan will come to the party, and if Carla comes to the party, Dan will come to the party, and (ii) that if Bob comes to the party, *Eve* will come to the party, and if Carla comes to the party, *Eve* will come to the party.[37]

With this in mind, we can explain the data I presented above. I just said that (70) raises only one possibility, corresponding to the conjunction of $B \rightarrow D$ and $C \rightarrow D$. That possibility entails the only possibility raised by the conditional embedded in (64a)'s that clause, namely, the possibility corresponding to the set of worlds in which $B \rightarrow D$. Accordingly, (64a) satisfies both clauses in (37).[38] On the other hand, (37) predicts that (64b)–(64d) are all false. Let's start with (64b). I said in the previous paragraph that the clause embedded in that report makes two possibilities salient: the possibility that $B \rightarrow D$ and $C \rightarrow D$ are both true, and the possibility that $B \rightarrow E$ and $C \rightarrow E$ are both true. The second of these possibilities is not entailed by any possibility Anna made salient through her utterance of (64), so (37) predicts (64b) to be false. (64c) is false for similar reasons. The clause embedded in that report makes three possibilities salient: that if Bob comes to the party, Dan will come to the party; that if Bob comes to the party, it will rain; and that if Bob comes to the party, it will not rain. (64c) is false because the latter two possibilities are not entailed by any possibility Anna made salient through her utterance of (64). Finally, the clause embedded in (64d) raises only one possibility, corresponding to the set of possible worlds in which $B \rightarrow D$, $R \rightarrow D$, and $\neg R \rightarrow D$ are all true (where 'R' abbreviates 'it rains'). This possibility is not entailed by the possibility Anna

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[37] Here is the derivation:

$$
\begin{aligned}
[\![(B \vee C) > (D \vee E)]\!] &= \{\gamma : \text{for some } \beta \in [\![D \vee E]\!], \gamma = \bigcup\{\gamma' : \text{for all } \alpha \in [\![B \vee C]\!], \gamma' \subseteq (\alpha \rightarrow \beta)\}\} \\
&= \{\gamma : \text{for some } \beta \in [\![D]\!] \cup [\![E]\!], \gamma = \bigcup\{\gamma' : \text{for all } \alpha \in [\![B]\!] \cup [\![C]\!], \gamma' \subseteq (\alpha \rightarrow \beta)\}\} \\
&= \{\gamma : \text{for some } \beta \in \{\mathbf{D}, \mathbf{E}\}, \gamma = \bigcup\{\gamma' : \text{for all } \alpha \in \{\mathbf{B}, \mathbf{C}\}, \gamma' \subseteq (\alpha \rightarrow \beta)\}\} \\
&= \{\bigcup\{\gamma' : \text{for all } \alpha \in \{\mathbf{B}, \mathbf{C}\}, \gamma' \subseteq (\alpha \rightarrow \mathbf{D})\}, \bigcup\{\gamma' : \text{for all } \alpha \in \{\mathbf{B}, \mathbf{C}\}, \gamma' \subseteq (\alpha \rightarrow \mathbf{E})\}\} \\
&= \{(\mathbf{B} \rightarrow \mathbf{D}) \cap (\mathbf{C} \rightarrow \mathbf{D}), (\mathbf{B} \rightarrow \mathbf{E}) \cap (\mathbf{C} \rightarrow \mathbf{E})\}
\end{aligned}
$$

[38] Repeated here:

(37) $[\![A \text{ said that } \phi]\!]^{c,w} = T$ if and only if, for some set Γ of alternative propositions each of which A semantically expressed in w,

   (i) For every $\alpha \in \bigwedge \Gamma$, there is $\beta \in [\![\phi]\!]^c$ such that $\alpha \subseteq \beta$, and

   (ii) For every $\beta \in [\![\phi]\!]^c$, there is $\alpha \in \bigwedge \Gamma$ such that $\alpha \subseteq \beta$.

made salient by uttering (64), so (37) predicts that (64d) is false.[39]

This concludes my discussion of reports of conditionals. As I claimed, my view's predictions depend on what conditional we replace for $\rightarrow$ in (69). As I have shown, on the assumption that $\rightarrow_S$ adequately accounts for the semantics of indicative conditionals in English, the present account makes the right predictions in a great number of cases.

4.4   Presupposition

Brasoveanu and Farkas (2007) observe that reports which attribute to the speaker the saying of something the latter merely presupposed are false. For example, if Anna utters

(73) My wardrobe is spacious,

her speech can not be truly reported by uttering one of:

(74) #Anna said that she has a wardrobe;

(75) #Anna said that she has something.

Yet the present account predicts both (74) and (75) to be true.

Presuppositions are a difficult subject, and I will not try to say anything about how to determine an utterance's presuppositions, or how presupposition works under embedding. What I want to address instead is the issue of how to account for the falsity of reports like (74) and (75) while

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[39] An anonymous reviewer has kindly called my attention to the following case. Suppose Anna utters 'if Bob comes to the party, Dan will come to the party'. The report 'Anna said that if Bob comes to the party, then Dan will come to the party or 2+2=4' seems inaccurate. However, the present view predicts it to be true. A full discussion of the present case falls out of the scope of this paper, but I would like to point out that the use of possible *situations*, as opposed to possible worlds, can be of help with this case. In particular, one could adopt a view of conditionals similar to the one adopted by Fine (2012). According to Fine, the counterfactual 'if P had been the case, then Q would have been the case' is true at a given possible world just in case every possible outcome of a situation that makes P true (i.e. every possible situation that results from adding to the world a situation that makes P true) contains a situation that makes Q true. Now, at least in principle, we can define the truth of a conditional at a possible situation (as opposed to at a possible world) as follows: P$\rightarrow_F$Q is true in a situation s just in case every possible situation that results from adding a situation in which P is true to s contains a situation that makes Q true. This, together with a reformulation of semantic contents in terms of situations rather than in terms of possible worlds (see above, section 4.1), would allow the present view to make the right prediction in this case. That is, on the assumption that there is at least one situation s such that adding a situation in which Bob comes to the party to s contains a situation in which Dan comes to the party, but not a situation in which 2+2=4, the set of situations in which the conditional 'Bob comes to the party $\rightarrow_F$ Dan comes to the party' is true is not a subset of the set of situations in which the conditional 'Bob comes to the party $\rightarrow_F$ 2+2=4' is true. I hope to explore this approach in future work.

taking for granted that there is some way of determining (73)'s presuppositions. In particular, I want to add to (37) the requirement that the semantic content of the that-clause embedded in a speech report is not a presupposition of what the speaker in fact expressed. In other words, my proposal is to reformulate (37) as follows:

(76) $[\![A \text{ said that } \phi]\!]^{c,w} = T$ if and only if, where Γ is a set of alternative propositions each of which A semantically expressed in w, and U is the set of presuppositions (each taken to be a set of possible worlds) A made when expressing the alternative propositions in Γ,

    (i) For every $\alpha \in \bigwedge \Gamma$, there is $\beta \in [\![\phi]\!]^c$ such that $\alpha \subseteq \beta$,

    (ii) For every $\beta \in [\![\phi]\!]^c$, there is $\alpha \in \bigwedge \Gamma$ such that $\alpha \subseteq \beta$, and

    (iii) For no $\beta \in [\![\phi]\!]^c$, is there $u \in U$ such that $u \subseteq \beta$.

The new clause, (iii), corresponds to the requirement that none of the possibilities a report characterizes the speaker as having said is entailed by what the speaker merely presupposed in making her original utterance(s). For example, if in uttering (73) Anna presupposed that she has a wardrobe and that she has something, the present view predicts that (74) and (75) are false.[40] In this way, the resulting view yields even better predictions than the original (37).

5   Conclusion

This paper discussed some well-known data concerning speech reports, and introduced some new pieces of data concerning embeddings of disjunctive sentences under speech reports—(6c), (6d), (7d). I argued that views appealing to situation semantics alone, to the logical notion of content

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[40] Note that presuppositions here can be thought of either as semantic or as pragmatic presuppositions. An utterance's *semantic* presuppositions (see e.g. van Fraassen 1968) are the propositions that are true whenever the utterance is true or false. Given this definition, (74) and (75) are presumably reports which attribute to Anna the saying of things she *semantically* presupposed. An utterance's *pragmatic* presuppositions, on the other hand, are the propositions the speaker assumed, and assumed that the other participants in the conversation assumed, in the context of the conversation in which the utterance was produced (see e.g Stalnaker 1974). For example, if, in the context of the conversation in which Anna utters 'John is a bachelor' Anna assumes (and assumes that her interlocutors assume) that John is a man, then Anna pragmatically presupposes that John is a man when making her utterance. Accordingly, the present view predicts that the report 'Anna said that John is a man' is false, since it attributes to Anna the saying of something entailed by something she merely presupposed in expressing the alternative proposition that John is a bachelor.

parthood, or to structured propositions, do not account for all the data. I also offered a view of the truth-conditions of speech reports that accounts for the data.

According to the view I propose, the truth of a speech report requires that the report accurately characterizes both the information the speaker expressed and the possibilities the speaker raised or made salient through the reported utterance. I have shown that this account explains the data, and illustrated the ways in which it can be modified so as to address its limitations.

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