No Redundancy Principle and Its Applications

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1. Introduction

Recently, Sauerland (2004, 2005) proposed within the neo-Gricean tradition a computation system that can account for both the clausal and scalar implicatures of a disjunction. He argued that his account of both kinds of implicatures is more satisfactory than Gazdar's (1979), in that it shows in a more clear and uniform way the relation between the two implicatures: while Gazdar posits two distinct computation mechanisms for clausal and scalar implicatures, his own system uniformly derives the two implicatures from Horn scales, and the only difference between clausal and scalar implicatures in his system is just that the latter is epistemically strengthened from the former.

In the present paper, I discuss some aspects of Sauerland's and Gazdar's theory of implicatures that are conceptually and empirically inadequate, and then put forth an alternative analysis of the two implicatures, which is based on what I call "the No Redundancy Principle", instead of the widely accepted the Gricean first submaxim of Quantity (Quantity-1). The NRP says, "Every meaningful expression, which is overtly written or said in a sentence or a text, must not be redundant: Either it must make a contribution to the truth-conditional interpretation, or its occurrence must be pragmatically licensed." The plan of this paper is as follows: Section 2 summarizes the main points of Sauerland's and Gazdar's theory of clausal and scalar implicatures, and then discuss two problematic cases that Sauerland's and Gazdar's theory may have difficulties handling, In section 3, I demonstrate how the NRP can provide plausible explanations for the problematic cases. Finally, in section 4 I present a unified NRP-based analysis of both clausal and scalar implicatures.

2. Sauerland's and Gazdar's Theory of Implicatures

In this section, I summarize the main aspects of Sauerland's and Gazdar's proposals on the clausal implicatures of disjunctions, and then discuss two specific cases they have difficulties explaining.

2.1. Sauerland's and Gazdar's Computation Mechanism of Implicatures

Let's start with Sauerland's theory. First, Sauerland argues that both clausal and scalar implicatures are derived from Horn scales, which are n-tuples of alternatives $<\alpha_1, \alpha_2, ..., \alpha_n>$ ordered by entailment relation. Following Soames (1982) and Horn (1989), Sauerland additionally assumes that implicatures come at two levels of epistemic strength: in the first step, primary implicatures of the form "The speaker is *not certain* whether ψ holds." are computed, where ψ is a scalar alternative that asymmetrically entails the assertion. In the second step, primary implicatures are strengthened to scalar implicatures, which Sauerland calls "secondary implicatures", of the form "The speaker is *certain* that ψ does *not* hold." Sauerland employs the K-operator to represent epistemic certainty, and the P-operator for epistemic possibility (Hintikka 1962). Hence, what is implicated first is the primary implicature $\neg K\psi$ rather than the scalar implicature $K\neg\psi$. Scalar implicature $K\neg\psi$ would follow from primary implicature $\neg K\psi$ if we additionally assume that $K\psi \vee K\neg\psi$, i.e. either the speaker is certain that ψ holds or he is certain that *not*-ψ holds, and $K\neg\psi$ does not contradict the conjunction of the primary implicatures and the assertion. Primary and scalar implicatures are defined as in (1a) and (1b), respectively:

(1) a. If ψ is a scalar alternative of ϕ and ψ asymmetrically entails ϕ, then $\neg K\psi$ is a primary implicature of ϕ.
b. If $\neg K\psi$ is a primary implicature of ϕ and $K\neg\psi$ is consistent with the conjunction of ϕ and all primary implicatures of ϕ, then $K\neg\psi$ is a scalar implicature of ϕ.

Second, Sauerland proposes that the scale of disjunction is the partially ordered scale <A and B, {A, B}, A or B>,[1] instead of the standard scale <*and, or*>.

Now, let's consider how these two assumptions work with the example in (2) below. Abbreviating *Kai saw Aaliyah* as *A*, and *Kai saw Beyonce* as *B*, we can represent the assertion in (4) as *A or B*. Sauerland's proposal predicts that the primary implicatures of (2) are (3a-c):[2]

(2) Kai saw Aaliyah or Beyonce.
(3) a. +> $\neg$KA
b. +> $\neg$KB
c. +> $\neg$K(A and B)
d. +> PA ($\Leftrightarrow \neg K\neg A$)
e. +> PB ($\Leftrightarrow \neg K\neg B$)

In conjunction with the assertion, the primary implicatures entail furthermore (5d) and

1) This scale was independently proposed by Lee (1995).
2) Throughout this paper, "+>" and "*+>" are symbols for "conversationally implicates" and "doesn't conversationally implicate", respectively.

(3e), which state that each disjunct must be possible. From $\neg KB$ in (3b) together with the epistemically modified assertion *K(A or B)*,[3] it follows that $\neg K\neg A$ ($\Leftrightarrow$ PA), i.e. *A* is possible. Similarly, $\neg K\neg B$ ($\Leftrightarrow$ PB) follows from $\neg KA$ in (3a) and *K(A or B)*. The set of these four primary implicatures, i.e. {P$\neg$A ($\Leftrightarrow$ $\neg$KA), PA ($\Leftrightarrow$ $\neg$K$\neg$A), P$\neg$B ($\Leftrightarrow$ $\neg$KB), PB ($\Leftrightarrow$ $\neg$K$\neg$B)}, give rise to the observed inference of epistemic uncertainty that the speaker is not certain whether Kai saw Aaliyah or whether Kai saw Beyonce. As is well known, Sauerland's four primary implicatures were called clausal implicatures by Gazdar (1979).

Let's continue to consider which primary implicatures can turn into scalar implicatures. First, $\neg KA$ cannot give rise to the scalar implicature $K\neg A$ because the derived primary implicature $\neg K\neg A$ ($\Leftrightarrow$ PA) contradicts the potential scalar implicature $K\neg A$. In a similar way, $K\neg B$ is blocked. $K\neg$*(A and B)*, however, is consistent with the assertion and all the primary implicatures. So it is realized as an actual scalar implicature and gives the exclusiveness reading of disjunction. The result is summarized in (4):

(4) scalar implicatures of *A or B*:
  a. *+> K$\neg$A (blocked by (3d))
  b. *+> K$\neg$B (blocked by (3e))
  c. +> K$\neg$(A and B) (exclusivity scalar implicature)

This result nicely conforms to our intuition: from the utterance in (2) above, we can have neither "Kai didn't see Aaliyah." nor "Kai didn't see Beyonce." as scalar implicatures. Only the exclusivity scalar implicature "Kai didn't see both Aaliyah and Beyonce." obtains.

On the other hand, Gazdar (1979) proposes for clausal implicatures a computation mechanism distinct from that of scalar implicatures. It roughly goes as follows: clausal implicatures are derived from the embedded clauses of compound sentences. Given a compound sentence ϕ the mechanism yields for each non-entailed and non-presuppositionally induced embedded sentence ψ a set of clausal implicatures $P\psi$ and $P\neg\psi$. For a disjunction *A or B*, this yields {PA, P$\neg$A, PB, P$\neg$B}. On the other hand, scalar implicatures are derived in a difference fashion: given Horn scale $<\alpha_1, \alpha_2, ..., \alpha_n>$, a sentence ϕ containing a weaker expression will invoke the implicature that the speaker is sure that the corresponding inference containing a stronger expression from the same scale does not hold. So given the scale *<and, or>*, the utterance of (4) will implicate *K(Kai didn't see both Aaliyah and Beyonce)*.

2.2. Flaws of Sauerland's and Gazdar's Theories

3) The epistemic modification of the assertion follows from the maxim of Quality, "Do not say what you believe to be false"; therefore, the speaker is certain that his assertion is true.

Sauerland (2005) notices an interesting difference between clausal and scalar implicatures: In general, it is odd to cancel clausal implicatures, while scalar implicatures arent. For example, the sentence in (5) yields (6a) as a clausal implicature:

(5) Kai saw Aaliyah or Beyonce.
(6) a. Possibly Kai didn't see Aaliyah.
b. #Kai saw Aaliyah or Beyonce, and he definitely saw Aaliyah.

Sauerland (2005) perceives the sequence in (6b) to be odd out of the blue. He assumes the oddness of (6b) out of the blue to be due to the fact that (6a), one of the clausal implicatures of the first clause of (5), contradicts the second sentence, *he definitely saw Aaliyah.* On the other hand, (7a) below, which is the scalar implicature of (5), can be cancelled in the context of (7b) by adding *possibly he saw both*:

(7) a. Certainly Kai didn't see both Aaliyah and Beyonce.
b. Kai saw Aaliyah or Beyonce, and possibly he saw both.

Sauerland, however, provides no explanation for why clausal implicatures are not readily suspended.

Gazdar (1979), on the other hand, stipulates that if a clausal implicature conflicts with a potential scalar implicature, the latter is suspended. Consider the example in (8a):

(8) a. Some of the boys left, or all left.
b. Certainly not all of the boys left.
c. Possibly all of the boys left.

The first disjunct of (8a) yields the potential scalar implicature in (8b), but the whole disjunction (8a) lacks this implicature. The reason is, according to Gazdar, that (8c), one of the clausal implicatures of (9a), suspends the potential scalar implicature (8b). Then, one must ask why it is not possible to cancel the clausal implicature, rather than the scalar implicature if there is a conflict between the two. But he fails to account for why clausal implicatures take priority over scalar implicatures.

Sauerland (2004), on the other hand, claims that this hierarchy follows from his mechanism of implicature computation: To reason that the assertion is true, one only needs to appeal to the assumption that the speaker making an assertion is obeying Grice's quality maxim. To reason that the clausal implicatures arise, one needs the assumption that the speaker making an assertion is additionally obeying Grice's quantity maxim. Finally, to reason for a scalar implicature $K\neg\psi$ one has to assume that the speaker obeys quality and quantity maxims to derive $\neg K\psi$ and furthermore that $K\psi \vee K\neg\psi$ is justified.

However, this account of Sauerland's is not so convincing for the following

reason: As is well known, Gazdar proposes that if a clausal implicature conflicts with a potential presupposition, the latter is suspended. Consider the example in (9a):

(9) a. Either John has no wife or his wife is far away.
b. John has a wife.
c. Possibly John has no wife.

His wife in the second disjunct of (9a) triggers the presupposition in (10b). But (10a) as a whole does not presuppose (9b). Gazdar argues that (9c), a clausal implicature from the first disjunct of (9a), suspends the conflicting potential presupposition (9b). Gazdars account, however, seems a bit mysterious because a conversational implicature, which is characteristically cancelable, defeats a presupposition, which is in general not so easily defeated. More importantly, Sauerland account of clausal implicatures priority over clausal impicature has nothing to say about the defeasibility of presupposition. This suggests that we need a different approach to the hierarchy between implicatures.

3. Explaining the Discrepancy between Clausal and Scalar Implicatures

In this section I provide answers to the two related but obviously different questions: Why do clausal implicatures resist cancellation while scalar implicatures do not, and why do clausal implicatures take priority over scalar implicatures? My accounts are based on the No Redundancy Principle (NRP), so let's begin with a brief overview of the NRP.

3.1. No Redundancy Principle

As a first step to provide solutions to the problems discussed in section 2, I propose the following general condition on interpretation:

(10) No Redundancy Principle (NRP):
Every meaningful expression, which is overtly written or said in a sentence or a text, must not be redundant: Either it must make a contribution to the truth-conditional interpretation, or its occurrence must be pragmatically licensed.

The underlying motivation of the constraint seems quite obvious and uncontroversial: Why should we utter any meaningful expressions at all if they play no roles in conveying information? In that case, they are simply superfluous and uninformative. In this regard, I assume that the NRP is a rule that regulates all the interpretation processes. Consider discourses in (11):

(11) a. #John left. And John and Mary left.

b. #John left. And John doesn't leave or Mary left.

In (11a), *John left* has been asserted twice, and therefore one of the two is truth-conditionally redundant necessarily: The discourse (11a) as a whole is truth-conditionally equivalent to *John and Mary left* (cf. $(p \wedge (p \wedge q)) \Leftrightarrow p \wedge q$). Thus, (11a) violates the NRP, which explains why (11a) is deviant. Also, in the discourse in (11b), the first disjunct *John doesn't leave* is truth-conditionally redundant: (11b) as a whole is equivalent to *John and Mary left* (cf. $(p \wedge (\neg p \vee q)) \Leftrightarrow p \wedge q$), and therefore violates the NRP. Now consider the discourses in (12) below:

(12) a. John and Mary left. Therefore, John left.
b. (Context: *A* asks the same question again.)
A: Who left?
B: John left! John left!
Don't ask me the same question any more!

(12a) as a whole is equivalent to the first sentence *John and Mary left*, which makes the second sentence *Therefore, John left* truth-conditionally redundant. The second sentence is, however, pragmatically non-redundant if we assume that (12a) is uttered, for example, in a logic class to show the entailment relation: The second sentence is *required* in this situation, and hence, it is pragmatically and contextually licensed. Thus (12a) is felicitous. On the other hand, in (12b), *B* repeats *John left* twice, so one of the two is truth-conditionally redundant. However, since the context makes it clear that *B* intends the repetition to express something like *Listen more carefully what I am saying*, the repetition of *John left* is pragmatically licensed. In the next section I will show how the NRP provides a plausible account for the non-defeasibility and defeasibility of clausal and scalar implicatures, respectively.

3.2 Non-defeasibility of Clausal Implicatures

To begin, I will briefly introduce a theoretical tool of my analysis. Instead of Hinttika's two epistemic operators, *K* and *P*, used by Sauerland, I adopt some aspects of the framework of Groenendijk and Stokhof (2001): Groenendijk and Stokhof's theory seems to be a better way to illustrate my points, since in their framework an agent's information/epistemic state is an essential component of linguistic meaning. In addition, the notations used by them seem more accessible than Hintikka's since they adopt explicit quantification of epistemic possibilities instead of *K* and *P*.

Groenendijk and Stokhof define the information state of an agent who is engaged in an informative linguistic exchange as a set of possibilities, where each possibility consists of a possible world and a referent system. A possible world is an alternative way the actual world could be as far as the partial information of the agent goes. On

the other hand, a referent system concerns the knowledge pertaining to discourse referents, which are posited to resolve anaphoric links across utterances. Since the information represented by a referent system is not directly relevant to my current discussion, I will assume for the sake of simplicity that a possibility consists of only a possible world. Hence, an information state is identified with a set of possible worlds, viz. a set of epistemic possibilities which are compatible with an agent's information.

Consider first the disjunction in (13a), which I will abbreviate as *A or B* as before:

(13) a. Kai saw Aaliyah or Beyonce.(=A or B)
b. $\forall i \in s$: $A_i \vee B_i$ (Assertion + Maxim of Quality)

For a speaker to assert *A or B* correctly, it is required that his information state supports it, i.e. that *A or B* is true in every epistemic possibility in his information state, which follows from Grice's Maxim of Quality. This may be represented as (13b) above ("i" and "s" represent a possibility and an information state, respectively.), which is equivalent to Sauerland's *K(A ∨ B)*. As illustrated in section 2, (13a) yields four clausal implicatures, or four primary impicatures in terms of Sauerland, {¬K¬A (=PA), ¬KA (=P¬A), ¬K¬B (=PB), ¬KB (=P¬B)}, which can be equivalently represented as in (14):

(14) a. $\neg\forall i \in s$: $\neg A_i$ ($\Leftrightarrow \exists i \in s$: A_i) (cf. ¬K¬A (=PA))
b. $\neg\forall i \in s$: A_i ($\Leftrightarrow \exists i \in s$ $\neg A_i$) (cf. ¬KA (=P¬A))
c. $\neg\forall i \in s$: $\neg B_i$ ($\Leftrightarrow \exists i \in s$: B_i) (cf. ¬K¬B (=PB))
d. $\neg\forall i \in s$: B_i ($\Leftrightarrow \exists_i \in s$: $\neg B_i$) (cf. ¬KB (=P¬B))

Now, I will show how the NRP provides a proper explanation for why the clausal implicatures are difficult to cancel, while scalar implicatures are not. As noted in section 2, Sauerland points out that in general, it is odd to cancel a primary implicature, while a scalar implicature isn't. For example, the oddness of (15a) below shows that the primary implicature in (15b) is hard to cancel:

(15) a. #Kai saw Aaliyah or Beyonce, and he definitely saw Aaliyah.
b. Possibly Kai didn't see Aaliyah.

However, when the NRP comes on the scene, it is quite obvious why (15a) is deviant: (15a) violates the NRP. To see this, consider (16), which is a translation of (15a), where *definitely* is represented as an epistemic certainty operator:

(16) $(\forall i \in s: A_i \vee B_i) \wedge \forall i \in s: A_i$ (=K(A ∨ B) ∧ KA)
(17) $(\forall i \in s: A_i \vee B_i) \wedge \forall i \in s: A_i \Leftrightarrow$
$\forall i \in s: (A_i \vee B_i) \wedge A_i \Leftrightarrow$

$\forall i \in s$: A_i (=KA)

The logical equivalence relations in (17) above show that (16) as a whole is equivalent to $\forall i \in s$: A_i (=KA) (cf. $((p \vee q) \wedge p) \Leftrightarrow p$), which paraphrases as *Kai definitely saw Aaliyah*, and therefore the first sentence *Kai saw Aaliyah or Beyonce* is rendered truth-conditionally redundant. Also, it plays no evident pragmatic role in (16a) when uttered out of the blue. Hence, the cancellation of the clausal implicature in (15b) by adding *and he definitely saw Aaliyah* necessarily violates the NRP.

In a similar vein, the NRP also explains why (18b), another clausal implicature of (13a), cannot be cancelled in a discourse like (18a):

(18) a. #Kai saw Aaliyah or Beyonce, and he definitely didn't see Aaliyah.
b. Possibly Kai saw Aaliyah.

(19) a. $(\forall i \in s: A_i \vee B_i) \wedge \forall i \in s: \neg A_i$
b. $\forall i \in s: B_i \wedge \neg A_i$ (=K(B $\wedge \neg$A))

(19a), the logical translation of (18a), is logically equivalent to (19b), which shows that the first disjunct *Kai saw Aaliyah* is rendered truth-conditionally redundant by adding *and he definitely didn't see Aaliyah.* Also, it plays no evident pragmatic role in (18a) when uttered out of the blue. Hence, (18a) violates the NRP.

Now let us consider why scalar implicatures, differently from clausal implicatures, can be easily defeated, as shown by the discourse in (20a). As discussed in section 2, Sauerland's computation mechanism yields (20b) as the scalar implicature of *Kai saw Aaliyah or Beyonce*:

(20) a. Kai saw Aaliyah or Beyonce, and possibly both.
b. Certainly Kai didn't see both Aaliyah and Beyonce.

(20a) translates into (21a), where *possibly* is represented as an epistemic possibility operator, and (20b) into (21b):

(21) a. $(\forall i \in s: A_i \vee B_i) \wedge \exists i \in s: (A_i \wedge B_i)$
(=K(A $\vee$ B) $\wedge$ P(A$\wedge$ B))
b. $\forall i \in s: \neg(A_i \wedge B_i)$ (=K$\neg$(A $\wedge$ B))

$\exists i \in s: (A_i \wedge B_i)$ in (21a), i.e. *possibly both*, sure suppresses the scalar implicature in (21b). Note, however, that (21a) as whole is truth-conditionally equivalent to (22a) below, which is the truth-conditional meaning of *Kai saw Aaliyah or Beyonce*, so *$\exists i \in s: (A_i \wedge B_i)$* itself is truth-conditionally redundant though it doesn't make *Kai saw Aaliyah or Beyonce* redundant:

(22) a. $\forall i \in s$: $A_i \vee B_i$

b. $(\forall i \in s$: $A_i \vee B_i) \wedge \forall i \in s$: $\neg(A_i \wedge B_i)$

$(=K(A \vee B) \wedge K\neg(A \wedge B))$

But obviously *possibly both* plays a role in (20a): Without it, (20a) would get, by default, the interpretation in (22b), which is the conjunction of the truth-conditional meaning of *Kai saw Aaliyah or Beyonce* and its scalar implicature in (20b). That is, the role of *possibly both* is to remove the scalar implicature inference out of (22b). Hence, its presence is pragmatically licensed, and therefore respects the NRP.

3.3 Hierarchy between Clausal and Scalar Implicatures

Once the NRP is taken into consideration, we find a plausible explanation for the suspension of presupposition and scalar implicature by clausal implicature. If the presupposition (23b) below were projected to the whole disjunction in (23a), then it would in effect be equivalent to the unacceptable discourse in (24a) below:

(23) a. Either John has no wife or his wife is far away.

b. John has a wife.

(24) a. #John has a wife and
either John has no wife or she is far away.

b. John has a wife and she is far away.

c. $(p \wedge (\neg p \vee q)) \Leftrightarrow (p \wedge q)$

Note that (24a) violates the NRP: (24a) is truth-conditionally equivalent to (24b), as shown by the logical equivalence in (24c). Thus, the projection of the presupposition in (23b) makes the first disjunct of (23a), *John has no wife*, redundant, which is in violation of the NRP. To account for examples like (24a), van der Sandt (1992: 367) proposes a constraint which roughly goes as follows: When a presupposition is projected, it must not entail the negation of any subordinate clauses. Though this constrant makes a descriptively correct prediction, it does not seem to provide any explanation for why it should be so.

Now the suspension of (25b), the scalar implicature of the first disjunct of (25a), can be explained in a similar way. Abbreviating *Some of the boys left* as SOME and *All of the boys left* as ALL, (25a,b) are represented as (26a,b), respectively:

(25) a. Some of the boys left, or all left.

b. Certainly not all of the boys left.

(26) a. $\forall i \in s$: $SOME_i \vee ALL_i$ $(=K(SOME \vee ALL)$

b. $\forall i \in s$: $\neg ALL_i$ $(=K\neg(ALL))$

If the potential scalar implicature (26b) were projected to the whole disjunction (26a), the result would be (27a) below:

(27) a. $(\forall i \in s: \text{SOME}_i \vee \text{ALL}_i) \wedge (\forall i \in s: \neg \text{ALL}_i)$
b. $\forall i \in s: \text{SOME}_i \wedge \neg \text{ALL}_i$
$(=P(\neg \text{ALL}) \Leftrightarrow \neg K(\text{ALL}))$

However, (27a) is logically equivalent to (27b), and therefore the overt meaningful expression *All left* is rendered truth-conditionally redundant. Also, since there is no obvious pragmatic role available for it, the logical configuration (27a) violates the NPR. Therefore, the projection of the scalar implicature (25a) is prohibited.

4. Deriving Clausal and Scalar Implicatures from the NRP

As noted in section 2, Sauerland (2004) proposed a computation system that can account for both the clausal and scalar implicatures of a disjunction: While Gazdar posited two distinct computation mechanisms for clausal and scalar implicatures, Sauerland's system uniformly derived the two implicatures from Horn scales, and the only difference between clausal and scalar implicatures in his system is just that the latter derive from the former with the additional assumption that the speaker is well-informed, i.e. $K\phi \vee K\phi$, where ϕ is a stronger scalar alternative. Sauerland assumed that the underlying principle deriving the clausal and scalar implicatures is Grice's first submaxim of Quantity (Quantity-1), in conjunction with the maxim of Quality. In this subsection, I explore the possibility that the NRP can eventually replace the Quantity-1 in the computation of clausal and scalar implicatures. More specifically, I propose that differently from Sauerland, both clausal and scalar implicatures be calculated from the bare scalar alternatives and disjuncts, which are not epistemically modified, and then the epistemic modifications follow under the assumption that the implicatures are a genuine reflection of the speaker's epistemic state.

Dealing with scalar implicatutures first, (29a) below, which is the scalar implicature of (28), can derive in the following way: If (29b), which is (28)'s scalar alternative, is true, this inference makes the assertion in (28) necessarily redundant, as shown in the equivalence relation in (29c) below:

(28) Kai saw Aaliyah or Beyonce.
(29) a. Kai didn't see both Aaliyah and Beyonce.
b. Kai saw both Aaliyah and Beyonce.
c. (Kai saw Aaliyah or Beyonce) and (Kai saw both Aaliyah and Beyonce) ⇔ Kai saw both Aaliyah and Beyonce
(30) Certainly Kai didn't see both Aaliyah and Beyonce.

Therefore, the scalar alternative in (29b) cannot be true, and hence the SI in (29a) follows. And then, the epistemically modified scalar implicature in (30) is yielded under the assumption that the implicature (29a) is a genuine reflection of the speaker's information state:

Next, let me illustrate how clausal implicatures derive from the NRP. Note first that the NRP disallows us to spell out either the first or the second disjunct of (28) above true. If the first disjunct is true, then we can say that (28) is true based on the first disjunct alone, regardless of the truth-value of the second disjunct. For the same reason, we cannot say the second disjunct is true, either. Hence, if we can tell whether one disjunct is true, the other is necessarily rendered redundant, which is in violation of the NRP. We can pronounce neither the first nor the second disjunct of (28) false, either. If the first disjunct is false, then the second disjunct should be true, and hence (28) can be spelled out true with the second disjunct alone. For the same rationale, we cannot say the second disjunct is false, either. Therefore, assuming that this inference is a genuine reflection of the speaker's information state, we should conclude that the speaker's information state contains both the truth and falsity of each disjunct as his epistemic possibilities; this is equivalent to saying that the speaker is not certain whether or not Kai saw Aaliyah, and whether or not Kai saw Beyonce, which is the very clausal implicatures of (28).

5. Conclusions

In the present paper, I proposed a unified NRP-based analysis of both clausal and scalar implicatures, which is hopefully free from the conceptual and empirical difficulties of the widely accepted Quantity-1-based approaches to the computation of implicatures. My main claims are summarized as below:

First, I show that the NRP-based analysis of implicatures can offer plausible accounts to two specific cases, which the Quantity-1 may have difficulties in handling: the discrepancy between clausal and scalar implicatures in defeasibility and the priority of clausal implicatueres over scalar implicatures.

Second, I explored the possibility that the NRP can also be applied to the computation of clausal and scalar implicatures: Both scalar and clausal implicatures were first calculated with bare scalar alternatives which were not epistemically modified, and then the resulting inferences were epistemically modified.

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