

On Relevance Conditions for Asserting Disjunctions

Hans Lycke*

1 Introduction

Communication is a goal-directed activity. In general, it can serve multiple purposes, e.g. information transfer, expression of emotions, making promises,... According to H.P. Grice (1989), if communication is to be successful, the specific purpose of the communicative act has to be known and accepted by all participants. Hence, for a participant to be cooperative (i.e. willing to make the communication successful), she should tailor her contributions to the specific purpose of the communicative act she is involved in (the *cooperative principle*).

The Cooperative Principle

Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged. (Grice, 1989, p. 26)

Grice proposed his infamous maxims (of quantity, quality, relation, and manner) in order to specify the main characteristics of communicative acts governed by the cooperative principle.

Contrary to appearances, the Gricean maxims should not be interpreted as normative statements directed at speakers. As made clear in the neo-Gricean literature — see e.g. Bach (2006), Horn (2004), and Levinson (2000) —, the maxims should be interpreted more broadly as “presumptions about utterances, presumptions that we as listeners rely on and as speakers exploit.” (Bach, 2006, p. 24) Despite the fact that both listeners and speakers are referred to, neo-Griceans usually focus on listeners, that is on how they rely on the Gricean maxims to retrieve the intended meaning of an utterance. In this paper though, I will focus on speakers. More specifically, on how they efficiently exploit the Gricean maxims to produce utterances that bring the communicative act they are involved in closer to the fulfillment of its purpose. In other words, I will investigate the Gricean behavior of *cooperative speakers*. Moreover, I will do so from a formal point of view.

*The author is a Postdoctoral Fellow of the Special Research Fund of Ghent University.

Relevance Conditions for Asserting Disjunctions. Because of the vastness of the subject, I will only deal with the relevance conditions related to the disjunction, i.e. the conditions that determine whether it is relevant to assert a disjunctive statement. Whether the approach can be extended to other connectives as well (e.g. conjunction, implication,...) is left for further research.

The relevance conditions related to the disjunction are most easily explained for *atomic disjunctions*, i.e. disjunctions for which the disjuncts are atomic formulas or negations of atomic formulas. Hence, before turning to the relevant assertability of disjunctions (resp. formulas) in general, the simpler case of atomic disjunctions will be discussed first.

For an atomic disjunction $A \vee B$ to be relevantly assertable, three conditions have to be fulfilled. First of all, the speaker obviously has to know that $A \vee B$ is the case. Secondly, neither A nor B may be known by the speaker, otherwise she isn't as informative as she could be. Finally, the speaker has to know whether A and B are co-consistent, which means that she has to know whether $A \wedge B$ is consistent. If the latter is not the case, $A \vee B$ is a tautology, so that one can hardly claim that it is relevant to assert it, for it's informational content is empty.

A Relevantly Assertable Atomic Disjunction

A speaker s may assert an atomic disjunction $A \vee B$ in case (1) she knows that $A \vee B$ is the case, (2) she doesn't know that A is the case, (3) she doesn't know that B is the case, and (4) she doesn't know that $A \wedge B$ is inconsistent.

The case for atomic disjunctions is generalized to all disjunctions (resp. formulas) by means of the following demands: condition (1) should apply to the disjunction (resp. formula) as a whole, and conditions (2)–(4) should apply to all “disjunctive subformulas.” Both demands need some explanation. First of all, to see why condition (1) has to apply to the disjunction (resp. formula) in general and not to all its disjunctive subformulas, consider the disjunction $p \vee (q \vee r)$. If the speaker has to know the disjunctive subformula $q \vee r$ in order for $p \vee (q \vee r)$ to be relevantly assertable, then the latter cannot ever be relevantly assertable, for it is impossible to satisfy condition (3).

Secondly, what is meant by the second demand is actually not as simple as it seems to be. Concerning conditions (2)–(3), what is meant is the following: where $A[B \vee C]$ expresses that $B \vee C$ is a (positive) subformula of A , neither $A[B]$ nor $A[C]$ may be known by the speaker in order for A to be relevantly assertable. To see why this should be the case, consider again the formula $p \vee (q \vee r)$. This disjunction isn't relevantly assertable in case either p , $q \vee r$, q or r is known by the speaker (the disjuncts of the disjunctive subformulas of $p \vee (q \vee r)$). However, also in case that either $p \vee q$ or $p \vee r$ is known by the speaker, the formula $p \vee (q \vee r)$ should obviously not be relevantly assertable. Only in case conditions (2)–(3) are interpreted as above, this will be the case. Concerning condition (4), what is meant is the following: for $A[B_1 \vee (C_1[B_2 \vee (C_2[\dots[B_n \vee C_n]\dots)])]$ to be relevantly assertable, B_1, B_2, \dots, B_n , and C_n have to be co-consistent. The reasoning is quite similar to the one for conditions (2)–(3) and is left to the reader.

The Dynamics of Relevant Assertability. In the neo-Gricean literature, conditions (2)–(4) are usually considered to be *implicated* (i.e. derived on non-deductive grounds) by listeners upon hearing the utterance $A \vee B$ — see e.g. Levinson (2000, p. 19). However, speakers obviously will not implicate them from $A \vee B$, for (2)–(4) are *relevance conditions* that determine whether or not $A \vee B$ is relevantly assertable. Hence, knowledge of these statements has to be obtained irrespective of condition (1). Nonetheless, there is a striking correspondence between implicatures and relevance conditions. Both are only derivable *in a defeasible way!* For a discussion of the defeasibility of implicatures, see e.g. Jaszczolt (2008) and Levinson (2000, ch. 1). That relevance conditions are also defeasible is easily verified. First of all, new information may become available, as a consequence of which some disjunctions might not be relevantly assertable anymore (actually, this comes down to *non-monotonicity*). For example, as long as Mary doesn't know that John is at home (and not at work), she may relevantly assert that John is either at home or at work. However, when she comes to know that John is sick and has gone home, she can't relevantly assert anymore that John is either at work or at home. To be relevant, she will now have to assert that John is at home. Secondly, as people are *not logically omniscient* (they do not know all consequences of their knowledge base), people might also gain a better insight in what they already know. This might also result in some disjunctions not being relevantly assertable anymore. For example, suppose that Mary knows that it is Friday as well as that John doesn't work on Fridays. For as long as she hasn't made the connection between both facts, she will consider it relevant to assert that John is either at work or at home. Once she has made the connection though, i.e. once she has derived from both facts that John won't be at work, she will have to assert that John is at home in order to remain relevant (from a formal point of view, this is a strictly proof theoretic feature, and not a metatheoretic one — see e.g. Batens, 2007).

Aim of this Paper. In this paper, I will provide a formal explication of the way speakers make use of the relevance conditions discussed above in order to determine whether it is relevant to assert a particular disjunction (resp. formula). First of all, I will show that the relevance conditions under consideration can be represented adequately by means of the standard bimodal logic **KC**. Secondly, in order to formally explicate the defeasible nature of some of these relevance conditions, I will make use of the *adaptive logics framework* — see e.g. Batens (2007) and Batens et al. (ta). More specifically, I will present the adaptive logic **RIT^s** (based on the logic **KC**) that will treat the relevance conditions (2)–(4) as *defeasible presuppositions*, which means that their truth will be presupposed unless or until this can no longer be done. As a consequence, a particular disjunction (resp. formula) will only be considered as relevantly assertable in a conditional way (for the time being, given the speaker's limited knowledge and limited insight in her knowledge base).

2 Formally Representing Relevance Conditions

In view of the informal discussion above, a formal approach towards the relevance conditions for asserting disjunctions should be able to represent both *knowledge* and *consistency*. In this section, I will present the logic **KC** (Knowledge & Consistency) that is able to do so. The logic **KC** is a standard bimodal logic, obtained by adding two modal operators to (propositional) *classical logic*, viz the *epistemic* operator **K** (capturing knowledge) and the *metatheoretic* operator **C** (capturing consistency).

As in **KC**, the formulas KA and CA are used respectively to express that the formula A is known by the speaker, and to express that the formula A is consistent, the relevance conditions (1)–(4) for asserting atomic disjunctions (see section 1) are represented as follows:

Formal Representation of Relevantly Assertable Atomic Disjunctions

A speaker s may assert an atomic disjunction $A \vee B$ in case the following four conditions are satisfied:

- (1) $K(A \vee B)$,
- (2) $\neg KA$,
- (3) $\neg KB$, and
- (4) $KC(A \wedge B)$.

How the modal operators **K** and **C** are used to express the relevance conditions for asserting disjunctions (resp. formulas) in general will be explained later on (in section 2.2). First, the logic **KC** will be characterized in some more detail (in section 2.1).

2.1 The Bimodal Logic KC

The bimodal logic **KC** is based on the language $\mathcal{L}^{\mathcal{M}}$, obtained by adding the epistemic operator **K**, as well as the metatheoretic operator **C**, to the standard propositional language \mathcal{L} (see also table 1). The set of well-formed formulas (wffs) $\mathcal{W}^{\mathcal{M}}$ of $\mathcal{L}^{\mathcal{M}}$ is defined in the usual way.

Language	Letters	Logical Symbols	Set of Formulas
\mathcal{L}	\mathcal{S}	$\neg, \wedge, \vee, \supset, \equiv$	\mathcal{W}
$\mathcal{L}^{\mathcal{M}}$	\mathcal{S}	$\neg, \wedge, \vee, \supset, \equiv, K, C$	$\mathcal{W}^{\mathcal{M}}$

Table 1: The Languages \mathcal{L} and $\mathcal{L}^{\mathcal{M}}$.

Two remarks are necessary. First of all, in the remaining of this paper, only negation, disjunction, the epistemic operator **K**, and the metatheoretic operator **C** are taken as primitive. The other logical symbols are defined as usual.

Secondly, the epistemic operator \mathbf{K} corresponds to the necessity operator of the normal modal logic $\mathbf{S5}$, while the consistency operator \mathbf{C} corresponds to the possibility operator of the normal modal logic \mathbf{GL} .¹ Hence, given that they correspond to the modal operators of different modal logics, the operators \mathbf{K} and \mathbf{C} are not interdefinable. Obviously, their dual operators can easily be defined in \mathbf{KC} , but since these are of no importance for the remaining of this paper, there is no need to do so.

Proof Theory and Semantics. Syntactically, the logic \mathbf{KC} is fully characterized by the axiom system of (propositional) classical logic, extended by the axiom schemas and inference rules presented in table 2.

MAx1 $\mathbf{K}(A \supset B) \supset (\mathbf{K}A \supset \mathbf{K}B)$ MAx2 $\mathbf{K}A \supset A$ MAx3 $\mathbf{K}A \supset \mathbf{K}\mathbf{K}A$ MAx4 $A \supset \mathbf{K}\neg\mathbf{K}\neg A$ NEC1 $\vdash A \Rightarrow \vdash \mathbf{K}A$	MAx5 $\neg\mathbf{C}\neg(A \supset B) \supset (\neg\mathbf{C}\neg A \supset \neg\mathbf{C}\neg B)$ MAx6 $\neg\mathbf{C}\neg((\neg\mathbf{C}\neg A) \supset A) \supset \neg\mathbf{C}\neg A$ NEC2 $\vdash A \Rightarrow \vdash \neg\mathbf{C}\neg A$
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Table 2: Additional Axiom Schemas and Inference Rules of \mathbf{KC} .

Due to space limitations, I will not provide a semantic characterization of the logic \mathbf{KC} . Nothing fundamental is lost though, for \mathbf{K} and \mathbf{C} are characterized as in $\mathbf{S5}$ and \mathbf{GL} respectively. Hence, the semantics of \mathbf{KC} can easily be obtained by any reader acquainted with these logics.

2.2 Formally Representing Relevantly Assertable Disjunctions

Natural language sentences are taken to be represented by means of \mathcal{L} -wffs (well-formed formulas of the language \mathcal{L} , see table 1). The relevant assertability of these sentences is however expressed by means of $\mathcal{L}^{\mathcal{M}}$ -wffs (well-formed formulas of the language $\mathcal{L}^{\mathcal{M}}$, see table 1). Hence, to formally express that the natural language sentence represented by the \mathcal{L} -wff A (henceforth, the \mathcal{L} -wff A) is relevantly assertable, the \mathcal{L} -wff A is mapped to the appropriate $\mathcal{L}^{\mathcal{M}}$ -wff A' . This mapping is done by the functions g and g^* that will be characterized below. First however, consider the following preliminary definition.

Definition 1. For $\Delta = \{B_1, \dots, B_n\}$, $\bigvee(\Delta) =_{df} B_1 \vee \dots \vee B_n$ and $\bigwedge(\Delta) =_{df} B_1 \wedge \dots \wedge B_n$

Next, where \mathcal{W}° is the set of all subsets of \mathcal{W} (the set of \mathcal{L} -wffs, see table 1), the functions g and g^* are characterized as follows:²

¹The characterization of the modal operators \mathbf{K} and \mathbf{C} as $\mathbf{S5}$ -necessity and \mathbf{GL} -possibility respectively is completely in accordance with the standard literature on *epistemic logic* (see e.g. Hintikka, 2005) and the *logic of provability* (see e.g. Boolos, 1993). For an overview of both, see Garson (2006).

²Remember that conjunction, implication, and equivalence are treated as defined connectives. Hence, they are not considered here.

- G1.0 $g : \mathcal{W} \times \mathcal{W}^\circ \rightarrow \mathcal{W}^{\mathcal{M}}$.
 G1.1 For $A \in \mathcal{S}$, $g(A, \Delta) = A$.
 G1.2 $g(\neg A, \Delta) = \neg g^*(A, \Delta)$.
 G1.3 $g(A \vee B, \Delta) = (g(A, \Delta \cup \{B\}) \vee g(B, \Delta \cup \{A\})) \wedge \neg \mathbf{K} \bigvee (\{A\} \cup \Delta) \wedge \neg \mathbf{K} \bigvee (\{B\} \cup \Delta) \wedge \mathbf{K} \bigwedge (\{A, B\} \cup \Delta)$.
 G2.0 $g^* : \mathcal{W} \times \mathcal{W}^\circ \rightarrow \mathcal{W}^{\mathcal{M}}$.
 G2.1 For $A \in \mathcal{S}$, $g^*(A, \Delta) = A$.
 G2.2 $g^*(\neg A, \Delta) = \neg g(A, \Delta)$.
 G2.3 $g^*(A \vee B, \Delta) = g^*(A, \Delta) \vee g^*(B, \Delta)$.

Finally, definition 2 below lays down when it is relevant for a speaker to assert a particular \mathcal{L} -wff A .

Definition 2 (Formal Representation). *The \mathcal{L} -wff A is relevantly assertable by a speaker s iff s knows the $\mathcal{L}^{\mathcal{M}}$ -wff $g(A, \emptyset)$ iff $\mathbf{K}g(A, \emptyset)$.*

Given the characterization of g and g^* above, it is easily verified that definition 2 nicely incorporates the relevance conditions for asserting disjunctions (as set out in section 1). For, the above characterization (and in particular G1.3) ensures that when the speaker knows the formula $g(A, \emptyset)$, she then knows the formula A , doesn't know any of the disjuncts of the "disjunctive subformulas" of A , and knows the co-consistency of all disjuncts of the "disjunctive subformulas" of A .

Formal Explication of Gricean Behavior. Although the logic \mathbf{KC} is clearly powerful enough to express the relevance conditions for asserting disjunctions, \mathbf{KC} isn't strong enough to determine the formulas that are relevantly assertable by a speaker s in view of her knowledge base $\Gamma^{\mathbf{K}}$. For, in order to be strong enough, the logic \mathbf{KC} should be able to derive all relevantly assertable formulas $\mathbf{K}g(A, \emptyset)$ from $\Gamma^{\mathbf{K}}$. Given that the knowledge base $\Gamma^{\mathbf{K}}$ is defined as the set of all \mathcal{L} -wffs the speaker s knows to be true (see definition 3), \mathbf{KC} obviously isn't able to do so (as none of the relevance conditions (2)–(4) can be derived from a knowledge base by means of \mathbf{KC}).

Definition 3. $\Gamma^{\mathbf{K}}$ is the knowledge base of the speaker s iff $\Gamma^{\mathbf{K}} = \{\mathbf{K}A \mid A \in \mathcal{W} \text{ and } s \text{ knows } A\}$.

Because the logic \mathbf{KC} doesn't enable one to derive enough consequences from the knowledge base of a speaker s , a different logic is used to determine the formulas that are relevantly assertable by s , viz. the logic \mathbf{RIT}^s .

Definition 4 (Gricean Behavior). *The \mathcal{L} -wff A is relevantly assertable by a speaker s with knowledge base $\Gamma^{\mathbf{K}}$ iff $\Gamma^{\mathbf{K}} \vdash_{\mathbf{RIT}^s} \mathbf{K}g(A, \emptyset)$.*

The logic \mathbf{RIT}^s extends the logic \mathbf{KC} by treating the relevance conditions (2)–(4) as *defeasible presuppositions*, which means that the relevance conditions are presupposed to be true *unless* or *until* this can no longer be done. In this way, the logic \mathbf{RIT}^s does not only enable one to determine all formulas that are relevantly

assertable by a speaker in view of her knowledge base, the logic **RIT**^s also captures the specific dynamics related to the Gricean behavior of cooperative speakers (as described in section 1).

3 The Adaptive Logic **RIT**^s

The logic **RIT**^s is a standard adaptive logic. Hence, it is characterized by three elements: a *lower limit logic* (**LLL**), a *set of abnormalities* Ω (a set of formulas characterized by a logical form F), and an *adaptive strategy*. Before I will characterize these elements for the logic **RIT**^s, I will first show how they interact in general. This will be done by presenting a short, rather intuitive characterization of the *standard format* of adaptive logics — for an extensive characterization, see Batens (2007) and Batens et al. (ta).

3.1 The Standard Format

Adaptive logics (**AL**) are a branch of logics that were developed to characterize inference relations that lack a positive test,³ such as e.g. inconsistency–handling, induction, abduction,... (see e.g. Batens, 2007). To capture such inference relations, **AL** display a twofold dynamics, an external and an internal one. The former comes down to non–monotonicity (enlarging a premise set Γ may necessitate the withdrawal of consequences derivable from Γ alone), while the latter is a strictly proof–theoretic feature (deriving new consequences from a premise set Γ may necessitate the withdrawal or rehabilitation of earlier derived or withdrawn consequences of Γ). This twofold dynamics is a result of the specific interplay between the constituting elements of an adaptive logic, viz. its **LLL**, its set of abnormalities, and its adaptive strategy.

The **LLL** is the stable part of an adaptive logic. As theorem 1 clearly shows, this means that all **LLL**–consequences of a premise set are also **AL**–consequences of that premise set.⁴

Theorem 1. $Cn_{\mathbf{LLL}}(\Gamma) \subseteq Cn_{\mathbf{AL}}(\Gamma)$.

An adaptive logic typically enables one to derive more consequences from a premise set than its **LLL**. The supplementary **AL**–consequences are obtained by interpreting a premise set *as normally as possible*. This is done by interpreting as false as much elements of Ω (abnormalities) as possible, which comes down to the fact that some formulas are *conditionally derivable* from a premise set: if $\Gamma \vdash_{\mathbf{LLL}} A \vee Dab(\Delta)$, with $Dab(\Delta)$ a *Dab*–formula (a finite disjunction of abnormalities), then the formula A is an **AL**–consequence of Γ *unless* or *until* there are reasons to consider some elements of Δ as true. Hence, at this point, the formula A might be called a *conditional consequence* of Γ .

³Phenomena for which there are no finite means to determine whether a formula belongs to the consequence set of a particular premise set.

⁴For a proof of theorem 1, see Batens (2007, p. 237).

Definition 5. *A is a conditional consequence of Γ iff $\Gamma \vdash_{\mathbf{LLL}} A \vee Dab(\Delta)$.*

Which of the conditional consequences of a premise set Γ are also *final* consequences of Γ , i.e. **AL**-consequences of Γ , depends on the *Dab*-consequences of Γ as well as on the adaptive strategy of the adaptive logic. The *Dab*-consequences are those *Dab*-formulas that are **LLL**-derivable from Γ .

Definition 6. *$Dab(\Delta)$ is a *Dab*-consequence of Γ iff $\Gamma \vdash_{\mathbf{LLL}} Dab(\Delta)$.*

Not all abnormalities occurring in a *Dab*-consequence can be considered as false. Otherwise, the *Dab*-consequence itself cannot possibly be considered as true (resp. **LLL**-derivable). Hence, if a premise set has *Dab*-consequences, some of the conditional consequences of that premise set have to be rejected (because they were derived by mistakenly interpreting some of the abnormalities in a *Dab*-consequence as false). Which of the conditional consequences will be rejected, is determined by the adaptive strategy. For, the latter provides the guidelines of how to cope with the abnormalities occurring in the *Dab*-consequences of a premise set. Obviously, different adaptive strategies provide different guidelines. Hence, different strategies will yield different consequence sets (for an overview of the most common adaptive strategies, see Batens et al., ta).

It is now easy to see why **AL** display the twofold dynamics mentioned earlier on. First, consider non-monotonicity. Enlarging a premise set Γ may lead to the derivation of *Dab*-consequences that are not derivable from Γ alone. As a consequence, some of the final consequences of Γ may not be final consequences of the enlarged premise set. Secondly, consider the internal (proof theoretic) dynamics. At a certain stage of an **AL**-proof, a formula A may be considered a consequence of a premise set Γ . For, given the formulas derived at that stage, there might be no reason to presuppose otherwise (for example, because no *Dab*-consequences have been derived yet). However, at some later stage this might change, for example in case a *Dab*-consequence has been derived necessitating the withdrawal of A as a consequence of Γ .

3.2 General Characterization of the Logic **RIT**^s

As the adaptive logic **RIT**^s is an extension of the logic **KC**, the latter is the **LLL** of the former. Consequently, all **KC**-consequences of a premise set are also **RIT**^s-consequences of that premise set.

Theorem 2. $Cn_{\mathbf{KC}}(\Gamma) \subseteq Cn_{\mathbf{RIT}^s}(\Gamma)$.

Next, the set of abnormalities Ω of the logic **RIT**^s is defined as the union of the following two sets:

Definition 7. $\Omega_1 = \{KA \mid A \in \mathcal{W}\}$.

Definition 8. $\Omega_2 = \{\neg KC(A \wedge B) \mid A, B \in \mathcal{W}\}$

To interpret a premise set as normally as possible, the logic **RIT^s** will presuppose as many elements of Ω as possible as false. Hence, given the validity in **KC** of the law of excluded middle, $\neg KA$ and $KC(A \wedge B)$ will be conditional consequences of any premise set Γ (for any $A, B \in \mathcal{W}$). This indeed means (as claimed before) that the logic **RIT^s** treats the relevance conditions for asserting disjunctions as defeasible presuppositions.

Finally, the adaptive strategy of **RIT^s** is the *normal selections* strategy. In general, this means that a conditional consequence of a premise set Γ , derived by interpreting the *Dab*-formula $Dab(\Delta)$ as false, is an **AL**-consequence of Γ only in case $Dab(\Delta)$ is not **LLL**-derivable from Γ . In view of definition 5, this implies that **RIT^s**-derivability is defined as follows:

Definition 9. $\Gamma \vdash_{\mathbf{RIT}^s} A$ iff $\Gamma \vdash_{\mathbf{KC}} A \vee Dab(\Delta)$ (A is a conditional consequence of Γ) and $\Gamma \not\vdash_{\mathbf{KC}} Dab(\Delta)$.

Examples. Because of space limitations, no semantic or proof theoretic characterization of the logic **RIT^s** will be provided. Nonetheless, based on the general characterization above, some simple examples will be given to clarify the way in which the logic **RIT^s** captures the Gricean behavior of cooperative speakers. First, consider an example of a disjunction that is not relevantly assertable by the speaker because she knows one of the disjuncts.

Example 1. Let the knowledge base Γ^K of a speaker s be the set $\{K(p \vee q), Kp\}$. For $p \vee q$ to be relevantly assertable by s , $Kg(p \vee q, \emptyset)$ has to be derivable from Γ^K by means of the logic **RIT^s**. As $\Gamma^K \vdash_{\mathbf{KC}} Kg(p \vee q, \emptyset) \vee Kp \vee Kq \vee \neg KC(p \wedge q)$, $Kg(p \vee q, \emptyset)$ is a conditional consequence of Γ^K . However, $\Gamma^K \vdash_{\mathbf{KC}} Kp$, which means that $Kg(p \vee q, \emptyset)$ is not a final consequence of Γ^K . Hence, $p \vee q$ is not relevantly assertable by the speaker s . On the other hand, it is easily verified that p is relevantly assertable by s .

Secondly, consider an example of a disjunction that is not relevantly assertable because the informational content of one of its “disjunctive subformulas” is empty.

Example 2. Let the knowledge base Γ^K of a speaker s be the set $\{Kp\}$. For $(p \wedge q) \vee \neg q$ to be relevantly assertable by s , $Kg((p \wedge q) \vee \neg q, \emptyset)$ has to be derivable from Γ^K by means of the logic **RIT^s**. As $\Gamma^K \vdash_{\mathbf{KC}} Kg((p \wedge q) \vee \neg q, \emptyset) \vee K(p \wedge q) \vee K\neg q \vee \neg KC((p \wedge q) \wedge \neg q)$, $Kg((p \wedge q) \vee \neg q, \emptyset)$ is a conditional consequence of Γ^K . However, $\Gamma^K \vdash_{\mathbf{KC}} \neg KC((p \wedge q) \wedge \neg q)$, which means that $Kg((p \wedge q) \vee \neg q, \emptyset)$ is not a final consequence of Γ^K . Hence, $(p \wedge q) \vee \neg q$ is not relevantly assertable by the speaker s . On the other hand, it is easily verified that p is relevantly assertable by s .

4 Conclusion

In this paper, I have initiated the formal explication of the Gricean behavior of cooperative speakers (i.e. how cooperative speakers treat the conditions that

guarantee the relevant assertability of particular formulas). I have done so by presenting the adaptive logic **RIT**^s that captures the way cooperative speakers handle the relevance conditions related to the assertion of disjunctions.

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Hans Lycke

Centre for Logic and Philosophy of Science, Ghent University
Blandijnberg 2, 9000 Gent, Belgium

Hans.Lycke@UGent.be

<http://logica.ugent.be/hans/>

References

- Bach, K. (2006). The top ten misconceptions about implicature. In B. Birner & G. Ward (Eds.), *Drawing the boundaries of meaning: Neo-Gricean studies in pragmatics and semantics in honor of Laurence R. Horn* (pp. 21–30). Amsterdam: John Benjamins.
- Batens, D. (2007). A universal logic approach to adaptive logics. *Logica Universalis*, 1, 221–242.
- Batens, D., Meheus, J., & Provijn, D. (ta). An adaptive characterization of signed systems for paraconsistent reasoning.
- Boolos, G. (1993). *The logic of provability*. Cambridge (UK): Cambridge University Press.
- Garson, J. (2006). *Modal logic for philosophers*. Cambridge (UK): Cambridge University Press.
- Grice, H. (1989). *Studies in the way of words*. Cambridge (Mass.): Harvard University Press.
- Hintikka, J. (2005). *Knowledge and belief: An introduction to the logic of the two notions*. London: King's College. (*Texts in philosophy*, vol. 1, prepared by V. Hendricks & J. Symons)
- Horn, L. R. (2004). Implicature. In L. R. Horn & G. Ward (Eds.), *Handbook of pragmatics* (pp. 3–28). Oxford: Blackwell Publishing.
- Jaszczolt, K. M. (2008, Fall). Defaults in semantics and pragmatics. In E. N. Zalta (Ed.), *The stanford encyclopedia of philosophy*. Available from <http://plato.stanford.edu/archives/fall2008/entries/defaults-semantics-pragmatics/>
- Levinson, S. C. (2000). *Presumptive meanings. The theory of generalized conversational implicature*. Cambridge (Mass.): MIT Press.