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RAFAŁ PALCZEWSKI

TOWARDS THE RELATING PRAGMATICS: THE CASE OF CONJUNCTION

INTRODUCTION

Relating semantics is the semantics of relating logic, so it is semantics for the language of that logic. The general idea behind relating semantics is based on the fact that the truth conditions of sentences built with classical propositional connectives are enriched with the condition of some relation between them.[1]

So, let's assume that for the language L of classical propositional logic we deal with models $\langle v, R\rangle$, where v is a valuation of variables in L and R is a binary relation defined on a set of formulas of L. The truth condition of the conjunction in such relating models is as follows (where A and B belong to the set of formulas of L):[2]

$$\langle v, R\rangle \vDash \mathrm{A} \wedge \mathrm{B} \text{ iff } \langle v, R\rangle \vDash \mathrm{A} \text{ and } \langle v, R\rangle \vDash \mathrm{B}, \text{ and } R(\mathrm{A}, \mathrm{B}).$$

RAFAŁ PALCZEWSKI, PhD, Habil., Associate Professor at Nicolas Copernicus University in Toruń, Institute of Philosophy; correspondence address: Instytut Filozofii UMK, ul. Fosa Staromiejska 1a, 87-100 Toruń, Poland; e-mail: rpalcz@umk.pl; ORCID: https://orcid.org/0000-0001-7368-8094.

[1] For an introduction to relating logic see, e.g., JARMUŻEK (2021), JARMUŻEK and KLONOWSKI (2021), JARMUŻEK and PAOLI (2021), KLONOWSKI (2021). For papers devoted to the application of relating logic, see, e.g., JARMUŻEK and KLONOWSKI 2020 (deontic logic), JARMUŻEK and MALINOWSKI (2019), MALINOWSKI and PALCZEWSKI (2021) (connexive logic). The main idea was derived from relatedness logic and concerned primarily implications (see, e.g., EPSTEIN 1979; WALTON 1979) and was later extended to other operators (see JARMUŻEK and KACZKOWSKI 2014).

[2] The other connectives are interpreted analogously: the classical (extensional) truth conditions are combined with the condition for being in the relation R (which can be understood intensionally). Of course, properties can be imposed on the relation R, e.g., symmetric would fit the classical interpretation, and non-symmetry would fit the interpretation intended to reflect a causal or temporal relationship. I omit formal details here, which are not relevant to the argument that follows.

How we understand this relationship is a question beyond logic: it can be temporal order, causal relationship, etc. Moreover, the generality of this idea allows it to be extended to other logics, including nonclassical propositional logic (e.g., multi-valued, connexive) or philosophical logics (e.g., deontic, epistemic).

We can look at such semantics from two perspectives—one narrower and one broader. From the more limited perspective, it is a very general metalogical theory that allows the construction of many interesting logical systems. From a broader perspective, it is a particular case of relating semantics that concerns natural language and propositional connectives. Various applications of relating semantics in propositional logic have been developed in the literature. The paper aims to show that introducing a relating relation to pragmatic considerations also provides a general and valuable analysis tool.

At the outset, it should be made clear that the distinction between semantics and pragmatics has long been a subject of dispute (see, e.g., LEVINSON 1983, chap. 1; BIANCHI 2004). Therefore, the title of this paper can be understood differently, depending on how we set the boundaries of pragmatics. I assume that pragmatics deals with the meaning of utterances that cannot be captured by semantics.[3]

In the first section, I discuss with many examples the known problems with rendering the multiplicity of meanings of the conjunction in classical logic. In the next two sections, I outline the semantic and pragmatic interpretation of these sentences, respectively. In both cases, I point out the problems of these interpretations. These considerations constitute the background for further analysis. In the fourth section, I discuss the idea of relating pragmatics, pointing to its various forms and different attitudes to relating semantics. In the next two sections, I present two examples that illustrate the use of relating pragmatics. First, I present the projection problem for presuppositions. Then, basing of the trivalent approach to presupposition, I argue that introducing the relating relation into this approach sheds light on this problem. Second, I focus on the scalar implicature, which is based on the connective scale. Such a scale

[3] Cf. e.g., GAZDAR (1979). This assumption is very general and can be understood differently depending on how the boundaries of semantics are defined. Therefore, some may view all further considerations as an extension of relating semantics (from logic to natural language) rather than belonging to relating pragmatics. Nevertheless, considerations devoted to disputed notions (like presupposition or generalized implicature) can at least be understood as a move towards pragmatics, hence the paper's title.

is based on the entailment relation, but propositional connectives are understood truth-conditionally. I show, for instance, that a relating relation can hold between values from different scales.

1. MANY FACES OF CONJUNCTION

There are many examples illustrating the well-known fact that the meanings of conjunctive sentences do not always come down to classical truth conditions for the conjunction operator assumed in classical propositional logic. Below are some examples (cf. FILLENBAUM 1977, 64; HUANG 2014, 58–59). In discussing them, and also later, I adopt the following convention: I use parentheses to refer to the sentences and square brackets to refer to what the sentences express, i.e., propositions (see DAVIS 2019). Under that convention, (1b) is the sentence "John came home and then made dinner", and [1b] is the proposition that John came home and then made dinner. In these examples, (1a) expresses [1b], (2a) expresses [2b], etc.[4]

(1) (a) John came home and made dinner.
(b) John came home and then made dinner. (temporal sequence)

(2) (a) It's summer in Auckland and it's winter in New York.
(b) It's summer in Auckland and in contrast it's winter in New York. (contrast)

(3) (a) John sang a folk song and accompanied himself on the piano.
(b) John sang a folk song and simultaneously accompanied himself on the piano. (simultaneity)

[4] Does sentence (1a) also express [1a], and (2a) express [2a], etc.? I will answer that later; for now, I only need such a simple picture outlining the problem. I assume that sentence (1b) expresses [1b], (2b) expresses [2b], etc.

Someone might point out that the following examples do not have all equally possible semantic/pragmatic readings. For instance, in the case of (6), instead of "and only then", it may be more relevant to read "and" as "and because of that", i.e. the causal reading. Indeed, examples (1)–(6), as well as the following, differ in what may be called the pragmatic force, and this is a normal phenomenon; e.g. case (2) is different; cf. sec. 4. In the case of (6) there is a conditional threat/promise that is not expressed solely by pointing to a causal relationshipwhich can be treat as a component of the meaning of (6), cf. (8) and (9) but above all (omitting other conditions for speech acts) to indicate that it will be the only reason for the speaker to take some action. The causal interpretation is too narrow.

(4) (a) We spent a week in Boston and I visited Harvard University.
(b) We spent a week in Boston and during that week I visited Harvard University. (containment)

(5) (a) This house is too big and too expensive.
(b) This house is too big and, moreover, too expensive. (convergent argument)

(6) (a) Do that and I'll shoot you/I'll give you $100.
(b) Do that and then and only then I'll shoot you/I'll give you $100. (conditional threat/promise)

In some contexts, uttering conjunction may carry more than one meaning or complex meaning. In example (1), we are dealing with events that are only temporally ordered, but the events can also be causally related, as in (7) or additionally related intentionally, if they are events resulting from our actions, as in (8). So, we get the following examples of complex meanings:

(7) (a) It was raining and it was wet.
(b) It was raining and this was the cause that after that it was wet. (temporal sequence, causal connectedness)

(8) (a) John pressed the spring and the drawer opened.
(b) John pressed the spring and this was the intentional cause that, after that, the drawer opened. (temporal sequence, causal connectedness, intentionality)

However, the situation is even more complex. Suppose, to the question "What have you been doing for the last three hours?", someone answers (9a). Then, knowing that the two activities usually do not occur together, we conclude that [9b], but at the same time, we obtain that we are not dealing with other meanings of conjunction sentences, e.g. [9c–f]:

(9) (a) I was jogging and reading a book.
(b) I was jogging and then I read a book.
(c) It is not the case that I was jogging and reading a book at the same time.
(d) It is not the case that during jogging I was reading a book.
(e) It is not the case that my jogging causes me to read a book.
(f) It is not the case that I was jogging in order to read a book.

Moreover, instead of [9b], sentence (9a) may have other meanings or combined meanings. For example, it is possible—although the reasons would probably be quite unusual—that someone is jogging (e.g., on a treadmill) such that the jogger can read at the same time, either throughout or for some of the time spent jogging. So, a pragmatic problem arises: what about a given context leads us to arrive at this meaning and not another (assuming that correct communication takes place)? I will come back to this in section 7.

These examples seem to lead to the conclusion that the conjunction "is not a creature of a constant hue, but chameleon-like, takes on the color of its surroundings: *its meaning is determined to some extent by the very propositions it connects*".[5] The conjunction "and" is therefore very universal, as it allows you to express many propositional semantic relations.[6]

However, the above examples do not exhaust what the conjunction operator is supposed to symbolise in propositional logic. First, let us deal with more complex forms of "and", as in (10). Second, the propositional logic conjunction operator is also assumed to correspond to the use of other propositional connectives. For example, (10)–(15) depict selected meanings correlated with "but" (most of these meanings are a kind of objection expressed in the second segment in relation to the first segment).[7]

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[5] See WASON and JOHNSON-LAIRD (1972, 92). The authors used these words to refer to the conditional when comparing it with the material implication. I believe that these words, also in accordance with the authors' intentions, can be generalised to all classical connectives.

There are crosslinguistic differences in this respect, which may be relevant to some settlements concerning conjunction. I will not go into details but only illustrate this problem (see also fn. 13). English "and" translates into Polish as *i* or *oraz*, which have a meaning similar to the conjunction and are allowed in some of the examples indicated in this section. However, "and" (also "but"!) is sometimes translated into Polish as *a*, which better fits the examples of contrast or conditional threat/promise. This does not significantly change the problem outlined here but shows that what in some languages is considered to be a conversational implicature, in others, for lexical reasons, may be considered as a conventional long as we accept these categories of implicating/inferring meaning.

[6] Syntactically speaking, the conjunction "and" is also used to couple nouns, adjectives or adverbs, see, e.g., STRAWSON (1952, 79). And also, in such combinations, we can expect many meanings. Moreover, conjunction combines not only declarative sentences but also interrogative and imperative sentences (but not with each other), or starts a sentence to combine parts of discourse, see HUMBERSTONE (2011, 638). Finally, the function of the conjunction operator can be compared to the full stop or the period function, see STRAWSON (1952, 80). The above list is not exhaustive, of course. Note that different meanings of conjunction sentences (i.e., connected with "and" and "but") can be presented on a semantic map, see MALCHUKOV (2004, figure 1), JASINSKAJA and KARAGJOSOVA (2020, figure 2).

[7] Cf. ZEEVAT (2012, 1891); HUANG (2014, 74, fn. 25). In these examples, the context of the utterance is essential, e.g., the words used earlier. Such a context can be partially determined from

(10) (a) The Queen is English and therefore brave.
(b) Being brave follows from being English. (consequence)

(11) (a) John promised to come but he did not come.
(b) John was expected to come, but did not come. (denial of expectation)

(12) (a) John is poor but he is honest.
(b) Being poor contrast with being honest. (contrast)

(13) (a) The ring is expensive but it is beautiful.
(b) The ring is expensive but a decisive argument in favor of buying it is that it is beautiful. (argumentative)

(14) (a) John is not in Berlin but in Paris.
(b) John is not in Berlin but, and this is correction, John is in Paris. (correction)

(15) (a) Everybody is coming, but John is staying home.
(b) Everybody except John are coming. (exception)

The meaning that points to contrast is best known and widely discussed—for a good outline of the history of this discussion see HUMBERSTONE (2011, 674–76). In the case of the sentence (10a), the fact that it has the meaning [10b] corresponds to "therefore" appended to "and", i.e., (10a) without "therefore" does not lead to [10b] (see DAVIS 2019).

This list is certainly not complete; we also have other propositional connectives considered by logicians to be represented by the conjunction operator; one should also bear in mind the many possible added meanings (implied/inferred in a pragmatic sense). The question then arises: since we have so many meanings of conjunction, are we dealing with a *pure* conjunction at all in natural language, i.e., the meaning of which is reduced only to the propositional logic truth conditions? Examples of conjunctive sentences in which the content of both conjuncts are not related to each other in any way would be the most suitable. The problem, however, is that such sentences do not usually appear in everyday conversational contexts. Thus, it can be argued that

the meaning described in point (b); e.g., in case (13a), the purchase of a ring is considered (it may be one or more people), and its high price is the main argument not to buy it. At the same time, this argument seems to be undermined by the beauty of this ring. We also notice asymmetry, i.e., the opposite sentence would be an argument against buying the ring; cf., e.g., JASINSKAJA and ZEEVAT (2009, 241–42).

we do not use such a conjunction and that propositional logic embraces only the common core of some of the meanings mentioned.

Examples (1)–(15) show the semantic diversity of conjunction in natural language. This fact affects the soundness of the reasoning of classical logic carried out on the basis of the conjunction operator. Simplifying the law of commutation, which holds for symmetric meanings and not for non-symmetric meanings, is particularly problematic.[8] Among [1b]–[15b], the meanings [2b], [5b], [12b] and [14b] are symmetric, and [1b], [6b]–[11b], [13b] and [15b] are non-symmetric, while [3b] and [4b] probably allow both interpretations.[9]

Although the symmetrical meanings of "and" are consistent with the truth-conditional interpretation of the conjunction operator in propositional logic, there are still differences in meaning between them. This is not surprising, because propositional logic ignores meanings, so, on the one hand, we can use a conjunction to join sentences that are significantly distant from each other in terms of meaning, and, on the other hand, we can join sentences to whose combination the natural language connective "and" (and its cognates) adds content. Moreover, we have non-symmetric meanings. Let us see, then, in broad outline, how to deal with them in the area of semantics and how in the area of pragmatics—being aware of the vagueness of this division.[10]

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[8] Instead of non-symmetric conjunction(s), some authors have used the term "asymmetric conjunction(s)" (see, e.g., VON WRIGHT 1965 or LAKOFF 1971). As Humberstone has rightly pointed out, this is not appropriate terminology (see HUMBERSTONE 2011, 640, sec. 3.34). To avoid misunderstanding, it is better to indicate that it is non-commutative conjunction(s).

Not only can the commutation be problematic, but so too can, e.g., ∧-elimination (in a natural deduction); for extensive discussion see HUMBERSTONE (2011), sec. 5.14 and 5.15. One has to be careful, however, in making overly hasty conclusions. The fact is that saying "You can't expect him to be here yet. The traffic is so heavy," we give a reason in the second sentence with the acceptance of the first one. This is missing in the sentence "You can't expect him to be here yet and the traffic is so heavy." However, this does not contradict the ∧-introduction rule because we have no transition from a pair of true premises to a false conclusionthe—the conclusion is true but has a richer meaning; cf. HUMBERSTONE (2011, 651). It is easy to see the difference when we convert the above utterances: "The traffic is so heavy. You can't expect him to be here yet" and "The traffic is so heavy and you can't expect him to be here yet". We have the same interpretation in both cases: the first sentence, whether spoken separately or in conjunction, gives a reason to accept the second. Cf. ZEEVAT and JASINSKAJA (2007, 315).

[9] In their case, a lot depends on semantic and pragmatic solutions, e.g., whether redundancy is important for meanings: in (4a), in the converse of conjunction, the first presupposes the second, see sec. 6.

[10] The semantic and pragmatic approach to the connective "I" in Polish is discussed in MAGNER (2005). Furthermore, we find a test for the conjunctive connective "I" in MAGNER (2019, 357–58). It boils down to the substitutability of "I" with expressions indicating temporal succession, causation, etc. Indeed, I have used a similar method in many of the above pairs of example sentences

2. SEMANTIC INTERPRETATION AND ITS PROBLEMS

From the semantic point of view, it is best to assume that we deal with many meanings of "and" (and its cognates), and logic captures only one of them, which is perhaps distinguished in some unique way. The problem, however, is—and it was mentioned in the previous section—that only conjunction sentences whose terms are semantically unrelated are likely to have a meaning limited to truth conditions. Such sentences rarely appear in everyday contexts. If they do occur, the purpose of their expression is usually the implied/inferring meaning, e.g., conversational implicature (cf. A: Sue bought champagne and… ~ B: And? ~ A: And the weather is nice today.)

Simple tools to enhance the possibilities of presenting in logic the different meanings of conjunction sentences are provided by relating semantics. In the papers concerning that the main reasons for its construction include the differences between sentence conjunctions in natural language and their formal representation. This also applies to the conjunction operator.

As mentioned at the beginning, the general idea of the relating semantics is that, besides the standard truth conditions for the classical binary operator, there is an additional condition stating that the arguments of a given functor are in some relation. Concerning conjunction sentences, we can input into the relating logic as many relating relations as we want to distinguish meanings, i.e., a relation with a contrastive meaning of the conjunction "and", with a contrastive meaning of the conjunction "but" (as long as these meanings are different), or the other mentioned meanings of "and": temporal sequence, simultaneity, containment, convergent argument, conditional threat/promise, causal connectedness, intentionality, as well as the other mentioned meanings of "but": consequence, denial of expectation, argumentative, correction, exception. Of course, the story of what lies behind a given relating relation is an appendix to relating logic. Within its framework, we can only try to ensure that the conjunction functors associated with these meanings apply to the logical laws that define their meaning in natural language, i.e., for example, that the commutative law holds for symmetric meanings, but not for non-symmetric.

The simplicity of the idea and its generality make it very attractive and afford it many advantages. Undoubtedly, however, it faces a problem that also

(but concerning English). I omit here, however, the problems discussed in the latter paper, as these are detailed issues and also force cross-linguistic comparisons.

concerns other semantic approaches to examples (1)–(15) that are not necessarily logical or formal. This problem consists of multiplying the meanings of linguistic expressions, i.e., breaking the Gricean regulative principle that he called Modified Ockham's Razor (and that is now known as Grice's Razor): "Senses should not be multiplied beyond necessity" (see GRICE 1989, 47; cf. DAVIS 1998, 19; 2019; RECANATI 2004, 157).

Such an objection is very general and, at the same time, Modified Ockham's Razor is not universally accepted.[11] Much depends on what we mean by ambiguity and on a clear separation of ambiguity from similar phenomena such as indexicality or vagueness.[12] Despite this, the general idea seems right: the postulate of ambiguity should be well-founded and should be the last option.

It is certainly difficult to address this objection directly to the relating logic, as it only provides a valuable tool, while the decision to recognise a given conjunction as indicating a separate meaning is made by the researcher. Such a decision should be made based on good criteria, which, unfortunately, are difficult to identify. The ambiguity tests proposed by Zwicky and Sadock (1975) are well known. However, their decisive nature is rightly called into question (see SENNET 2021 for discussion), and their application to conjunctions and other connectives is problematic (e.g., the conjunction reduction test).

The semantics, however, are not limited to truth conditions of sentences: their meanings may be inferred or presupposed. Therefore, another doubt arises: perhaps the meanings hidden behind examples (1)–(15) are indeed semantic but cannot be reduced to truth conditions. Already Grice (1989) approached some examples (1)–(9) in a different way, that is, with "and" (mainly with meaning related to time sequence), and differently to examples (10)–(15), that is, with "therefore" added to "and" as well as "but" (or more precisely, to one of them, indicating the occurrence of a contrast). Grice would probably consider most of the first meanings to be conversational implicatures, and most of the second to be conventional implicatures, which cannot be reduced to truth conditions but which are semantic at the same time (cf. GAZDAR 1979,

[11] Let the following words of Milikan serve as an example: "Ockham's razor employed to prohibit proliferation of semantic meanings can be as useless as it is for prohibiting the proliferation of living species" (MILLIKAN 2005, 196).

[12] Moreover, it can be concluded that in the case of the discussed conjunctive sentences, we are dealing with "pragmatic ambiguity" in the sense of RECANATI (1993, 286–87). The key here is how the line between semantics and pragmatics is drawn, butas I mentioned beforethere is no room for discussion here. What is essential in this paper is to point out the specific path rather than its proper location in the relation to this division.

38). But does the "but" have many different conventional implicatures? Before answering this question, let us briefly look at the pragmatic explanation.

3. PRAGMATIC INTERPRETATION AND ITS PROBLEMS

Grice quite often used the example of conjunction in the sense of time sequence to illustrate the concept of conversational implicature. As is well known, the concept of conversational implicature is related to the Cooperative Principle and maxims: implicature appears, depending on the context of the utterance, if the speaker is observing the maxims or if the speaker deliberately and ostentatiously breaches (or routs) the maxims (see, e.g., LEVINSON 1983, 104). Therefore, the general conversational mechanism is responsible for the pragmatic meaning, and it is implicating/inferring, not spoken (or asserted).[13] In the neo-Gricean tradition (e.g., HORN 2006; LEVINSON 2000) and post-Gricean tradition (e.g., CARSTON 2002; SPERBER and WILSON 1995), the set of these principles was modified in various ways, leading to differences in the details of the mechanism of inferring conversational implicatures, but the general idea and the concept have been retained. As Humberstone aptly put it (2011, 633), especially with reference to propositional connectives, "The general moral is that not every feature of *use* is an aspect of [truth-conditional] *meaning*."

Are the meanings [1b]–[15b] conversational implicatures, or perhaps some of them are conventional implicatures? The general pragmatic idea is that by saying, e.g., (7a), I assert—"what is said" in Grice's words—[7a], but that at the same time I implicate, conversationally or conventionally, [7b]. Without going into details, for which there is no room here, let us apply the cancellability test to examples (1)–(15): if the sentence with the cancellation phrase is not contradictory, it indicates that, in fact, it can be cancelled, and therefore it is pragmatic in nature—i.e., it is a conversational implicature; below [b] are consequently the meanings of the sentences (a) after the cancellation of the pragmatic meanings.[14]

[13] Of course, "it is a category mistake to attribute implicatures either to hearers or to sentences (e.g., *P and Q*) and subsentential expressions (e.g., *some*). But we can systematically (at least for generalised implicatures) correlate the speaker's intention to implicate q (in uttering p in context C), the expression p that carries the implicature in C, and the inference of q induced by the speaker's utterance of p in C" (HORN 2006, 3; cf. HORN 2012).

[14] I omit example (9), which in principle is similar to (1). Note that there are also other features of conversational implicatures; see GRICE (1989, 39–40); SADOCK (1978, 294); KROEGER (2018, 152); PUCZYŁOWSKI (2024, § 4.1). Applying them all to the examples discussed would significantly

(1') (a) John came home and made dinner (but not in that order).
(b) John made dinner and then came home.

(2') (a) *It's summer in Auckland and it's winter in New York (but it is not a contrast).
(b) *It's summer in Auckland and it is not a contrast that it's winter in New York.

(3') (a) John sang a folk song and accompanied himself on the piano (but it was not simultaneous).
(b) John sang a folk song and later/before (with, e.g., another song) accompanied himself on the piano.

(4') (a) We spent a week in Boston and I visited Harvard University (but not in that week).
(b) We spent a week in Boston and I also, at another time, visited Harvard University.

(5') (a) This house is too big and too expensive (but the two sentences do not lead separately to the same conclusion).
(b) This house is too big, which leads to one conclusion, and moreover this house is too expensive, which leads to another conclusion.

(6') (a) Do that and I'll shoot you/I'll give you $100 (I'll do it anyway).
(b) You do this or not and I'll shoot you/I'll give you $100 anyway.

(7') (a) It was raining and it was wet (but the rain was not the cause of it being wet).
(b) It was raining and independently it was wet.

(8') (a) John pressed the spring and the drawer opened (but it was not intentional).
(b) John pressed the spring and unintentionally caused the drawer to then open.

expand the paper, diverging from its primary purpose. Hence, the choice fell on cancellability, which is usually understood as a distinguishing feature for conversational implicatures. However, it should be noted that it is sometimes questioned (e.g., WEINER 2006), and the embedded presuppositions are also cancellable. Furthermore, cancellability takes a contextual form: in certain situations/contexts, due to common knowledge, a pressing yes-or-no question, previous statements, circumstances, etc., (generalised) implicature does not appear. I am not using this kind of cancellability here.

The vast majority of the first sentences in these examples can be consistently pronounced, and therefore the meanings of [b] are pragmatic in nature; they are conversational implicatures. The sentence (3a') has the meaning [3a] without the cancellation phrase, while, with the cancellation phrase, it has the meaning [3b'] and similarly in other cases. However, not all of them: case (2') is different; therefore, it was preceded by an asterisk. The utterance of the sentence (2a') is unacceptable because both [2a'] and (in fact identical) [2b'] are semantically contradictory.

So, instead of putting conjunct sentence meanings like temporal sequence, causal connection, etc., in the truth conditions of these propositions (or, more broadly, in semantics), they can be put in the condition of warranted assertability. Thus, the converses of sentences (1a)–(9a) are true according to the classical truth-conditional interpretation but are not (usually) warrantedly asserted. Grice's Razor is not violated.[15]

Let us now consider the cancellation applied to cases (10)–(15).

(10') (a) *The Queen is English and therefore brave (but being brave does not follow from being English).
(b) *Being brave follows and does not follow from being English.

(11') (a) *John promised to come but he did not come (though John's coming was not expected).
(b) *John was expected and wasn't expected to come.

(12') (a) *John is poor but he is honest (though being poor does not contrast with being honest).
(b) *Being poor contrasts and does not contrast with being honest.

(13') (a) The ring is expensive but it is beautiful (though the latter is not a decisive argument in favor of buying it).
(b) The ring is expensive and it is beautiful, and the latter is not a decisive argument in favor of buying it.

[15] The presented strategy can also be applied to conjunction sentences with repeated terms or with their logical equivalence, e.g., "No human is a computer, and no computer is human." The second part is redundant, so it violates the rules of conversation (e.g., Grice's Maxim of Quantity), which means that the utterance of such conjunction must have a different meaning, e.g. "humans and computers cannot have the same rights". Such added content can, of course, be cancelled. The utterances of conjunctive tautologies are similarly explained. The pragmatic explanation is therefore broadly applicable, and not limited to the cases considered here.

(14') (a) *John is not in Berlin but in Paris (though the latter is not a correction).
(b) *John is not in Berlin but, and this is a correction and isn't a correction, John is in Paris.

(15') (a) *Everybody is coming, but John is staying home (though John is not an exception).
(b) *Everybody except and not except John is coming.

In most cases, we get a contradiction when we want to cancel the implied/inferred meaning, which means that it is semantic in nature, that it is a conventional implicature. But, again, we have one exception—case (13'). The presence of the conjunction "but" in (13a) and the order of the sentence, and perhaps also other factors in speech, such as an appropriate emphasis on the second sentence, make an implicature appear, [13a]. However, it can be canceled without contradicting it, indicating that the "but" should be treated as "and", and this has an implicature similar to [5b], i.e., that we have two arguments not to buy a ring. But this is not the end, because we can—and even it seems that most of the contexts enforce such a procedure—also cancel the latter implicature, as in example (5'), and all this in one utterance: "The ring is expensive, and it is beautiful, and the latter is not a decisive argument in favor of buying it; in fact, this also is not an argument for not buying it." Similarly, case (2') can be interpreted: the connective "and" is used in the sense of the connective "but", which indicates a contrast; therefore, case (2') is similar to case (12'), and (2) to (12).

The above shows the usefulness of the cancellability test: it allows to distinguish between implied/inferring pragmatically and semantically meanings. It also shows no need to multiply the meanings of conjunctive sentences beyond need, as they find their explanation in general pragmatic mechanisms.

However, the pragmatic approach is not without problems. One of the more well-known, classic problems concerns the cancellability of embedded implicature (see COHEN 1971, 54, 57–59). According to Grice's (and neo-Griceans') theory, the sentence "The old king has died of a heart attack, and a republic has been declared" has the same truth conditions as its converse. Their different meanings are a matter of implicatures pointing to the temporal sequence. Let us now consider the following sentences in which these conjunctions are embedded (see HUANG 2014, 70):

(16) (a) If the old king has died of a heart attack and a republic has been declared, then Tom will be quite content.

(b) If a republic has been declared and the old king has died of a heart attack, then Tom will not be content at all.

Temporal sequence, which is supposed to be an implicature of antecedents in these implications, turns out in (16a) and (16b) to be part of their semantic meaning: in the first sentence, the sequence of events indicated in antecedent causes that Tom will be quite content, and in the second that Tom will not be content at all. This contradicts the pragmatic interpretation and leads back to the semantic one, e.g., given under relating semantics.[16]

The above discussion only outlines the problem; one can find many semantic and pragmatic proposals for the theoretical description of conjunction sentences. It is not my aim to analyse the whole discussion; conjunctive sentences are here only a point of reference, in order, on the one hand, to show the problems with a uniformly semantic and uniformly pragmatic analysis of them and, on the other hand, to show in the following sections the usefulness of the relating approach to the analysis of presuppositions and scalar implicatures. However, at the end of this outline, I will briefly mention two other approaches. These are important insofar as they are similar to the relating approach.[17]

The first approach is a discourse-based approach proposed by Txurruka (2003). On this approach, a discourse is understood as a sequence of sentences or speech acts. Two incompatible classes of Discourse Relations play a crucial role: Coordinators and Subordinators. The first class includes relations such as Narration, Result, Parallel, List, and Contrast, and the second class includes Reformulation, Explanation, Justification, Elaboration, and Generalization. Txurruk's central postulate is that clauses linked by "and" can only be connected by relations belonging to coordinators, subordinating discourse relations are ruled out.[18] I omit the details of this position and its application to sentences (1)–(15).

The second approach is the additive erotetic approach proposed by Jasinskaya and Zeevat (2007, 2009). It should be emphasised that this approach was based on cross-linguistic observations, as the authors studied conjunction

[16] For more on a contemporary discussion on this topic, see HUANG (2014, sec. 2.4).

[17] I thank one of the anonymous reviewers for raising this point.

[18] Txurruka (2003, 266) described it as follows: "[I]f the interpreter is looking for a Discourse Relation (DR) to attach two representations π and π', ⟨π, π'⟩, and the particle *and* is linking the clauses from which representations π and π' have been built, *and*(π, π'), then the DR linking π' to π must be Coordinator. This axiom is expressed as follows:

(*and*) ⟨π, π'⟩ and *and*(π, π') → Coordinator(π, π')".

connectives in English, German, and Russian. In short, the basic assumption is that conjunctions belong to the class of additive markers, like "too" and "also". However, the erotetic part of this approach is that additivity is understood as the property of giving an answer that is distinct on each dimension corresponding to a *wh*-element x_j of a question $?x_1 \ldots x_n\varphi$.[19] I omit the details of this position and its application to sentences (1)–(15).

The interpretation of conjunction on both approaches uses a relation understood discursively or erotetically (answering the same question), which is combined with classical truth conditions for conjunction. These approaches are thus close to the relating approach or are examples of concretisations of the relating approach. I leave the discussion on this topic for another occasion.

4. FROM RELATING SEMANTICS TO RELATING PRAGMATICS

Relating semantics was developed as semantics for classical propositional logic and is also used in other logics. As I mentioned earlier, however, the general idea can be understood more broadly. That is, we can say that relating relation also impacts nontruth-conditional semantics meanings, or, more precisely, that it extends classical truth conditions with semantic meanings previously not included in them. In this way, we can explain the examples considered in the previous section for which the pragmatic explanation did not fit. Instead of introducing the concept of conventional implicature, which implicates/inferring is related to semantics in a somewhat mysterious way and in the case of conjunction was usually limited to a meaning based on contrast, we can introduce a relating relation, which is then understood differently. For example, for sentence (14a) to be true, both conjuncts must be true, and there must be a relevant relationship: the second conjunct is a correction of the first conjunct. The justification for using relating semantics in logic can therefore be found in other examples than initially indicated.

Doubts may be related to the fact that Grice and other advocates of distinguishing conventional implicatures have argued that the implied/inferred mean-

[19] This approach can be presented differently, depending on the formal representation of the questions. In their second paper (2009, p. 236), Jasinskaya and Zeevat propose the following definition: $\varphi(a_1 \ldots a_n)$ and $\varphi(b_1 \ldots b_n)$ are additive to each other with respect to $?x_1 \ldots x_n\varphi$ in w iff (1) both are true in w and answers to $?x_1 \ldots x_n\varphi$, (2) for all $1 \leq j \leq n$ there is no c such that $c \leq a_j$ and $c \leq b_j$.

ing cannot be reduced to truth conditions. However, these conditions are understood classically by them, and in relating logic the classical extensional truth conditions are combined with the intensional element (cf. JARMUŻEK 2021).

Nonetheless, there are still cases of sentences (1)–(9) that find a good pragmatic explanation. Since, in the case of propositional connectives, the relating relation has a meaning that cannot be reduced to classical truth conditions, there is a temptation for adherents of relating semantics to transfer the idea of relating relation beyond its area towards the relating pragmatics. Is such a stretch sufficiently justified? Would relating pragmatics be a useful tool in analysing the above sentences or any other natural language area?

Further consideration will show that there is much to be said for answering these questions in the affirmative. However, I will begin by pointing out the main paths for the emergence of relating pragmatics that lead to its various forms. It can be tentatively assumed that relating pragmatics should be accompanied by generality, which accompanies relating semantics: it is essential to point to the pivotal role of relating relation, not to its particular interpretation.

In general, relating pragmatics can be developed in opposition to relating semantics, i.e., to *replace* it, or be a specific extension of relating semantics, i.e., to be *a complement*. If we take into account the findings previously made, the second option is promising. However, the choice in this matter is based on a more fundamental decision. There are three basic (non-exclusive) possibilities: (I) to interpret the relating relation pragmatically, i.e., as expressing a specific, pragmatic relationship, (II) to interpret arguments of the relating relation pragmatically or (III) to shift what is influenced by the relating relation on the ground of pragmatics. Choosing one of them often has an impact on the choice of the others.

The first-way approaches would connect pragmatic relations directly with relating relation. Thus, the relation R could express a presupposition or conversational implicature.[20] However, difficulties arise almost immediately. First, presupposition and conversational implicature concepts are also understood to refer to propositions and not to (implicating/inferring) relations. The problem is due to the ambiguity behind the use of these concepts. Still, it is not serious: we can say that we are talking about a relationship of presupposition or conversational implicature. However, I will continue to use the initial concepts, and it will be clear from the context in what sense.

[20] In this paper, I base my considerations on the two most famous concepts in the field of pragmatics. Different theories may mention other concepts (and often redefine the two already mentioned), e.g., explicature (SPERBER and WILSON 1995) or impliciture (BACH 1994).

The second difficulty is that these relations do not occur between two sentences: presupposition is a relation between a sentence and a proposition (in a semantic interpretation) or utterance and a proposition (in a pragmatic interpretation), while conversational implicature is a relation between a sentence/utterance and a proposition. Solving it leads us to the approaches related to point (II): the arguments of the relation *R* can be propositions, sentences or utterances,[21] or other truth-bearer.[22] In this way, we are not only able to render presupposition and conversational implicature understood as relations but also to assume that a relating relation holds between two propositions, which are presuppositions or implicatures.

Of course, not every possible combination of the first two approaches finds support in actual theories, for it is difficult to imagine a relating relation that would express a presupposition and connect the two utterances simultaneously. However, another problem arises here that leads to the (III) approaches: the fulfillment or not of the *R* relation may impact truth conditions or nontruth-conditional semantical meaning but on warranted assertability conditions. I will illustrate this with a pragmatic interpretation of non-symmetric conjunction (1) or (8). As I wrote earlier, it is based on the thesis that [1b] and [8b] are conversational implicatures. We can present it more generally: the truth conditions of such conjunctions are classical, and the overlap of the *R* relation, e.g., temporal sequence, has an impact on warranted assertability conditions. Let us assume that it is as stated in sentences (1a) and (8a). According to truth conditions, they are true, and since the corresponding relating relation is satisfied, they are also warrantedly asserted. On the other hand, their converses are not warrantedly asserted because there is no corresponding relating relation, but they are true because they satisfy the classical truth conditions. The problem is, therefore, not the converse of these sentences and their classical interpretation, but the uttering of these sentences because it is their utterance that introduces a relationship that is non-symmetric.

In short, the conditions known to us in relating semantics are divided into two kinds: the classical ones are for truth conditions, and the relating relation

[21] By utterance I mean "sentence in context", where context is understood broadly, not only as circumstances of utterance but also, e.g., the common knowledge of interlocutors and their intentions.

[22] This limitation is not necessary but results from the described path: we move from relating semantics, in which the relation took place between sentences and has an impact on the truth conditions. If we establish relating relation between other linguistic expressions in semantics, we can move to those similar in pragmatics.

is for warranted assertability conditions.[23] The path to relating pragmatics can also lead through indirect approaches, e.g., introducing a pragmatic relation to semantics (e.g., pragmatically understood presupposition) and making truth conditions dependent on it. Instead, a typically pragmatic approach would focus on utterances and warranted conditions (given also for non-assertoric speech acts).

The three (as we have often seen related) paths from relating semantics to relating pragmatics outlined above open up many ways that cannot be discussed here, and not all of them deserve attention. Now I will discuss two examples in which a content relation is essential and how the relating relation can be used in them.

Let us consider the following example of conjunction in which the concept of presupposition is essential.

(17) (a) John stopped drinking and Anne is no longer complaining.
(b) John drank and Anne complained.
(c) John drank and that's why Anne was complaining.
(d) Anne is no longer complaining and John stopped drinking.
(e) Anne complained and John drank.
(f) Anne complained and that's why John drank.

Pretheoretically, i.e., not deciding on the presupposition theory, in particular regarding presupposition projection (or taking into account the simple Langendoen and Savin's cumulative principle: "the presupposition of subordinate clauses stands as part of the presupposition of the complex sentence containing them," [LANGENDOEN and SAVIN 1971, 58]), sentence (17a) has the presupposition [17b]. This presupposition is related to the occurrence of "stopped" (in the first conjunct) and "no longer" (in the second conjunct) phrases in (17a). However, utterance (17a) would be quite confusing if both conjuncts were not content-related. Pragmatics teaches us that the meanings

[23] Going back to the previous considerations, the arguments of the relation *R* can now be, let us say, "the warrantbearers", or entities that are said to be either warranted or unwarranted (though we can admit many warrant-values). This concept is most often associated with the utterance. Still, one can also talk about a proposition or a sentence whose appearance in the context, e.g., by presupposition, could be warranted or unwarranted. In addition, the term "assertability" is linked with acts of assertions (so, *de facto*, I limited utterances to assertions), and these are usually associated mainly with declarative sentences. Of course, the term "warranted" can be extended to cover other acts of speech and then it can be assumed that the relating relation is between them. The compelling possibility is that there is one relating relation in truth conditions and, in warranted assertability, another. Again, there is no room for a closer examination of these possibilities.

of component sentences are most often linked together (and if not, another meaning appears). So, it can be assumed that there is a connection between John's drinking and Anne's complaining, i.e., Anne complained that John was drinking. Then, however, the presupposition of the sentence (17a) is the proposition [17c].[24] The application of the relating relation idea can be seen here: the truth of a judgment [17b] in which there is "and" does not come down to classical truth conditions, but requires that the causal relation (and time sequence) be taken into account. The converse of this conjunction illustrates this well, i.e., the sentence (17d), which has a presupposition [17e], but after taking the causal relationship into account has a presupposition [17f].[25] So, we can see that the relating relation may be useful in the analysis of presuppositions because also, in their case, when they are complex, something more than the classical truth conditions is assumed. It now remains to be decided whether the presupposition is understood semantically or pragmatically.

Let us now consider an example of conjunction in which the notion of conversational (scalar) implicature is essential.

(18) (a) The coffee is warm and good.
(b) The coffee is not hot and not great.
(c) The coffee is not hot and that's why it is not great.
(d) The coffee is good and warm.
(e) The coffee is not great and not hot.
(f) #The coffee is not great and that's why it is not hot.

Pretheoretically, i.e., not deciding on scalar theory implicatures and choosing their nonepistemic description, uttering sentence (18a) points to a scalar implicature [18b]. Such implicature is related to using weaker phrases from

[24] In the interpretation, we can go further. Let us assume that John's drinking activities were at least in part intended to annoy Anne (e.g., he was not hiding from drinkinghe— was drinking ostentatiously), i.e. John was intentionally influencing Anne's complaints. In this case, the presupposition of the sentence (17a) would be that by drinking alcohol, John intentionally influenced Anne's complaints. Similar remarks apply to (17d).

[25] It should be emphasised that, although these are pretheoretical findings, all the presuppositions indicated above pass the presupposition test, i.e., they are licensed when their triggers are embedded in some constructions (Karttunen's holes) such as negation, questions, modal or epistemic operator, antecedents of conditionals, etc. If there is no relationship between the conjuncts in (17a) and (17d), then the test indicates presuppositions [17b] and [17e], and, if there is a (causal) relationship, it indicates presuppositions [17c] and [17f]. For example, it seems that the sentence "It is possible that John stopped drinking and Anne no longer complains", in which the conjunction's conjuncts express the causal relation, also has a presupposition [17c].

different scales in (18a), "warm" in the first conjunct and "good" in the second. However, this kind of inferred complex meaning, may not be complete. Suppose that this sentence is spoken when the interlocutors are standing in the snow in freezing temperatures and the speaker expects hot coffee. Then the assessment of coffee as good depends, among others, on the fact that it is warm, not hot: if it were hot, it would be excellent. Thus, sentence (18a) has implicature [18c]. One can see here the application of the idea relating relation: truth, or the warrant of the proposition [18b], in which "and" appears not to be reduced to the classical truth conditions, but requires that the relation that the first conjunct is a premise in argument for the proposition from the second conjunct to be taken into account. This is well illustrated by the converse of the conjunction with (18a), i.e. (18d), the utterance of which carries the implicature [18e]. Still, at the same time, it seems to have no additional meaning because it would be strange to consider the assessment "not great" as a premise in the argument for the coffee not being hot. Therefore, we will not consider [18f] as a scalar implicature of (18d), but as pragmatically, if not semantically, anomalous or infelicitous (hence the notation "#").[26]

I will develop the two examples discussed above in the following two sections. In the first one, I will show that the relating relation can be used for the trivalent approach to presupposition projection. I have described such an approach earlier as indirect because it is semantics with elements of pragmatics: relating relation can be interpreted pragmatically, but it impacts truth conditions. The second example will show that the relating relation can find application with scalar implicatures.

5. RELATING RELATION AND PRESUPPOSITION

One of the most important problems of the presupposition theory is the so-called projection problem, which, following Kripke, can be expressed with the question: "if we have a logically complex sentence whose clauses bear certain presuppositions how do we compute the presuppositions of the whole?" (KRIPKE 2009, 367). Each theory of semantic or pragmatic presupposition faces this

[26] As was in the case of presupposition, so too now—although the above findings are pretheoretical, the (explicit) cancellability test applies here. The implicature [18b] can be cancelled by adding to (18a), e.g., "in fact the coffee is hot and great". In the case of [18c], however, the relation itself can be canceled, while maintaining the implicature [18b]; it is possible to add to (18a), e.g., "but these ratings are not related" or, "but the former does not lead to the latter".

problem to a greater or lesser extent.[27] My aim is not to argue for one theory or another of presupposition and the related solution to the projection problem one way or another, but to point out the usefulness of an introduction to relating relation considerations. The trivalent approach is very well suited to this task. First, the projection problem concerns the "logically complex sentence", i.e., one composed of propositional connectives considered in propositional logic. Second, trivalent logic captures the basic Fregean-Strawsonian presupposition intuitions expressed in truth values. Third, the relating semantics was developed as the semantics of propositional logic, so transposing its ideas to new ground should not raise objections.[28]

Moreover, as before, I will limit the examples to conjunction sentences/utterances. According to Karttunen's division (KARTTUNEN 1973), the conjunction (as well as other binary classical propositional connectives) belongs to the filters; hence the problem of presupposition projection in its case is sometimes referred to as the filtering problem.

Let's start with general observations. Despite the differences, the following theses are adopted in many presupposition theories: (i) presupposition does not project, if the presupposition of the second conjunct contradicts what is asserted in the first one (and *vice versa*), (ii) presupposition does not project if the presupposition of the second conjunct is asserted in the first one (but

[27] The term "presupposition" comes from LANGENDOEN and SAVIN (1971). Increasingly, in contemporary literature, the so-called Triggering Problem is coming to the fore: "given some information that a linguistic expression conveys about the world, can we predict which part is at-issue and which part is presupposed?"; SCHLENKER (2021, 2). So, before we move on to the question "How does presupposition project?", the more basic question should be answered, "How are presuppositions generated?"

[28] An anonymous reviewer pointed out the following problem concerning the trivalent approach (in its formulation, it referred to a conditional; here, I have changed it to a conjunction). According to this approach, we cannot infer a presupposition in contexts where the speaker declares that they do not know if *p*, where *p* is the presupposed proposition in the subsequent utterance. Example: (i) I do not know if John is married. John's wife loves him, and he/John must be happy. If we want to link John's happiness to the fact that John is married, the relational approach will prove helpful hereI will write about it further. The above problem can be compared to so-called Moorean sentences of the form: "*p* but I don't believe/know that/whether *p*". It is difficult to describe the whole discussion of such sentences here. However, according to the dominant approach to assertion, the so-called epistemic account to assertion (assert only what you know), such a sentence cannot warrantedly be asserted because the first conjunct is pragmatically contradictory to the second conjunct: by asserting *p*, I make it clear that I believe/know that *p*, and then directly reject this. Diagnosing the problem with the sentence (i) would thus be similar to interpreting Moorean sentences according to the epistemic account: it is true, but at the same time, it cannot warrantedly be asserted. Therefore, it is not a problem for the trivalent account to presupposition (enriched or not by relating relation).

not vice versa), (iii) presupposition does not project if the presupposition of the second conjunct is entailed by the first one, and (iv) presupposition does project if two conjuncts are semantically unrelated. Thesis (i) is illustrated below in sentences (19a) and (19b), thesis (ii) in sentences (19c) and (19d), thesis (iii) in sentences (19e) and (19f), and finally thesis (iv) in sentences (19g) and (19h):[29]

(19) (a) #Fred has no children and Fred's children are bronies.
(b) #Fred's children are bronies and Fred has no children.
(c) Fred has children and Fred's children are bronies.
(d) #Fred's children are bronies and Fred has children.
(e) Fred has two sons and Fred's children are bronies.
(f) Fred's children are bronies and Fred has two sons.
(g) Bronies love *My Little Pony* and Fred's children are bronies.
(h) Fred's children are bronies and bronies love *My Little Pony*.

Thesis (i) is beyond doubt: since in one conjunct the presupposition of the other conjunct is undermined, the presupposition does not project in this sentence, and moreover, it is pragmatically infelicitous. Most trivalent approaches (19a) and (19b) are neither true nor false; see below.

Thesis (ii) is less obvious, all the more so as it assumes asymmetry: presupposition is filtered (fail to project) left-to-right but not right-to-left. In (19c), we have a kind of expansion of the information given in the first conjunct; the second conjunct, therefore, does not presuppose this basic information, and the sentence is not infelicitous.[30] On the other hand, in (19d) the second conjunct contains an echo of the presupposition indicated in the first, which makes the sentence pragmatically infelicitous; at the same time, this also shows that the presupposition is projected.

Thesis (iii) is based on the distinction of meanings that are (semantically) entailed from those that are presupposed. In (19e), presupposition of the second conjunct, "Fred has children", is entailed by the first conjunct and therefore is not projected by the whole conjunction. This can be seen when we apply the test with projection through holes, especially modals (see, e.g.,

[29] All sentences were based on two sentences from LEVINSON (1983, 7), but the example with children (bald) was also analysed in-depth in KARTTUNEN (1973) and many subsequent works.

[30] To prove that (19c) does not carry the presupposition *that Fred has children* (related to the second conjunct), the projection through holes test can be used here. Consider, for example, the conditional: "If Fred has children and Fred's children are bronies, then Fred likes *The Little Pony.*" This sentence does not presuppose that Fred has children; it also gives this information in a more literal way.

KARTTUNEN 1973, 179), e.g. "It is possible that Fred has two sons and Fred's children are bronies" does not have the presupposition *that Fred has children*. In the case of (19f) we have a similar mechanism, although there is a noticeable difference: the presupposition of the first conjunct is present until there is a second conjunct that entails it. Then the whole sentence entails (rather than presupposes) that Fred has children (for more on the differences, see MANDELKERN ET AL. 2020, 477–79). Also interesting is the difference between (19f) and (19d), which seems small yet impacts different consequences to projection and pragmatic felicity.

Thesis (iv) reflects the intuition that presuppositions of component sentences are preserved in a complex sentence. In the case of a conjunction, this is when its conjuncts are semantically independent, or, more precisely, there is no entailment between them. Among the many presuppositions, the key is, of course, the one that was in the previous sentences—that is, *that Fred has children*: it is projected in both (19g) and (19h).[31]

As mentioned, the most widely discussed is thesis (ii), which significantly impacts presuppositional projection theories. It turns out that the cases of such sentences as (19c) and (19d) resemble other conjunctions, e.g., those in which we deal with an (asymmetric) entailment. Consider the following sentences (see MANDELKERN ET AL. 2020, 477):

(20) (a) John is a college student, and he is majoring in English.
(b) #John is majoring in English, and he is a college student.

In sentence (20a), the first conjunct entails (and is not entailed by) the second conjunct; in (20b), the opposite is true. It may be stated that, as in the case of (19c), so too in the case of (20a), the second conjunct carries a new content and that the utterance of (20a) is therefore pragmatically felicitous. In (20b), like in (19d), the second conjunct repeats what has already appeared (as entailed meaning) in the first conjunct. This makes the sentence pragmatically infelicitous. So, we are faced with a similar asymmetry, although it is not related to presupposition.

Accordingly, it is possible to point to a wider mechanism responsible for asymmetry, e.g., redundancy associated with the second conjuncts of conjunctions. Sentences (19d) and (20b) are left-redundant, i.e., they violate the prin-

[31] Both conjuncts of these conjunctions carry other presuppositions, including one shared: *that there are bronies*. It is also projected. All of these presuppositions pass the test from projection through holes.

ciple that after Rothschild (2008, 478) can be called "asymmetric anti-redundancy". Why asymmetric? The converses of (19d) and (20a), i.e., (19c) and (20b), are right-redundant, but their pragmatic felicity is not affected.[32]

Recent studies (MANDELKERN ET AL. 2020) show, however, that although broader mechanisms are in place, cases (19c) and (19d) do indeed indicate that the presupposition is filtered left-to-right and not right-to-left. So now, let's move on to the outline of the trivalent account to presupposition.

Propositional bivalent logic cannot convey Fregean–Strawsonian's intuition about presuppositions: ϕ presupposes ψ iff whenever ψ is not true, ϕ is neither true nor false. One solution is to enter the third truth value. And although the creators of three-valued logics interpreted the third truth value differently, e.g. Łukasiewicz (possible), Bochvar (nonsense), Kleene (Strong Kleene: neither true nor false), and with van Fraassen's supervaluation it can be assumed that the asterisk means "unknown" (BEAVER 1997, 953), then when presuppositions are taken into account this value is referred to as "indetermined" (e.g., KARTTUNEN 1973), "undefined" (e.g., BEAVER ET AL. 2021) or "failure" (e.g., WINTER 2019).[33]

[32] The redundancy can be explained as follows: "Let us say that some clause in a complex sentence is *redundant* relative to some context of utterance if you can replace that clause by a tautology without affecting the amount of factual information conveyed by the sentence in that context" (BEAVER ET AL. 2021). In (19c), the first conjunct is redundant because this sentence is truth conditionally equivalent to "Fred is Fred and Fred's children are bronies." And in the same way, we establish redundancy in the case of (19d). These findings are of a semantic nature because, from a pragmatic point of view, the assertion of tautology carries non-literal content, e.g., "Fred is Fred" may imply conversationally that "he has such-and-such distinguishing features that constitute the interlocutors' common knowledge." Cf. also here fn. 13.

[33] See ŁUKASIEWICZ (1920), BOCHVAR (1938), KLEENE (1938), VAN FRAASSEN (1969), PETERS (1979). For more about three-valued logic, including a comparison of basic logics, see, e.g., BERGMANN (2008, sec. 5.4), and in connection with the presupposition projection see, e.g., BEAVER and KRAHMER (2001, sec. 2). It should be emphasised that three-valued logics raise various doubts, but I am interested in these logics here only as a tool for describing the problem of presupposition projection. Order can also be imposed on truth values, which was not done in classical systems. By default, of course, I assume that the distinguished value is T. In addition to the trivalent approach, logic approaches with more truth values, in particular four-valued ones, have also been proposed. However, as Beaver notes (1997, 956): "There are no obvious empirical reasons for using more than three truth values in the treatment of presupposition, and thus Occam's razor commonly makes trivalent semantics the preferred basis for a multivalent treatment of presupposition." In turn, see BEAVER and KRAHMER (2001) about presupposition projection approaches as part of partial (mainly trivalent) logics.

Interpretations of conjunction in basic trivalent logics are presented in the tables below.[34]

Kleene

∧	T	F	*
T	T	F	*
F	F	F	*
*	*	*	*

Peters

∧	T	F	*
T	T	F	*
F	F	F	F
*	*	F	Ḟ

Łukasiewicz

∧	T	F	*
T	T	F	*
F	F	F	F
*	*	F	*

van Fraassen

∧	T	F	*
T	T	F	*
F	F	F	F
*	*	*	*

Bochvar

∧	T	F	*
T	T	F	F
F	F	F	F
*	F	F	F

In the above tables, the cases for only classical truth values are invariable; key are the interpretations presented in the outer columns, i.e., when at least one conjunct has the third truth value, it is supposed to correspond to the situation where conjunct suffers from a failure of presupposition.

Two interpretations—Kleene's and Bochvar's—are the simplest, as they are uniform all along the border. According to Kleene's approach, if at least one conjunct has the indeterminate truth value, then so too does the entire

[34] Each table defines a different type of conjunction, but in order not to multiply the notation, I left one notation for the conjunction in the tables (cf. e.g., KARTTUNEN 1973, BEAVER ET AL. 2021). Kleene's conjunction is also known as Weak Kleene's conjunction or Bochvar's "internal" conjunction or Halldén's conjunction, while Łukasiewicz's conjunction is also known as Strong Kleene's conjunction. These logics, however, differ in the interpretation of at least one other connective, e.g., Strong Kleene and Łukasiewicz trivalent logics differ in the interpretation of implication and equivalence: in a situation where antecedent and consequent have the truth value *, then implication and equivalence take the truth value * in the first logic, and in the second, the truth value T. In most works devoted to presuppositional projection, Strong Kleene is the point of reference, as binary connectives are interpreted in a uniform way. However, the analyses here are limited to conjunction, so, following historical precedence, I am writing about the Łukasiewicz conjunction, cf. KARTTUNEN (1973). The table describing van Fraassen's approaches (method of supervaluations) goes beyond simple truth—functionally Ḟ stands for nontrue, see HERZBERGER (1970, 28–29); KARTTUNEN (1973, 186), BEAVER (1997, 955).

conjunction. Kleene's conjunction is, therefore, the hole in Karttunen's terminology (see KARTTUNEN 1973, 187). Such an interpretation corresponds to the aforementioned cumulative approach (LANGENDOEN and SAVIN 1971) but does not represent the projection of a presupposition in conjunction (and other conjunctions) because—as some sentences from (19) have shown—presuppositions do not project uniformly. For similar reasons, the Bochvar approach must be excluded. Moreover, this approach does not reflect the failure of presupposition for conjunction since its value is in no case equal to *. Bochvar's conjunction is, therefore, the plug in Karttunen's terminology. If we want to omit van Fraassen's supervaluation, which introduces additional theoretical assumptions and differs from Łukasiewicz's approach only in one situation (i.e., when both conjuncts are undefined) we have two approaches to choose: Łukasiewicz and Peters.

The trivalent interpretations of Łukasiewicz and Peters agree in one case: if one conjunct is true and the other is undefined (i.e., has a false presupposition, failure), then the conjunction is undefined, i.e., presupposition is projected. The difference is when one conjunct is false and the other is undefined. In such a situation, Łukasiewicz's interpretation gives us a symmetrical result that the conjunction is false. In contrast, Peters' interpretation gives us a non-symmetric result that the conjunction is false if it is false in the first conjunct and undefined when the second conjunct is false (i.e., only the left conjunct projects uniformly). Taking into account the previous findings—i.e., thesis (ii) and contrast between (19c) and (19d)—Peter's interpretation should be considered more accurate.

Nowadays, there is a renaissance of trivalent approaches to presupposition projection (see, e.g., FOX 2008; SCHLENKER 2008; WINTER 2019), which uses an incremental approach based on Łukasiewicz's or Peters' trivalent interpretation. The main idea behind these ideas can be represented by the following algorithm for the conjunction of the form $A \wedge B$ (adapted and restricted to the conjunction from WINTER 2019, 588; cf. e.g., BEAVER ET AL. 2021):

1. Evaluate the truth value of A,
2. If A has truth value *, then $A \wedge B$ has truth value *, else:
3. If A has truth value F, then $A \wedge B$ has truth value F, else:

i. Evaluate the truth value B.
ii. If B has truth value *, then $A \wedge B$ has truth value *, else:
iii. $A \wedge B$ has binary truth value according to the classical truth table.

Applying the above algorithm to the sentences from (19), we mostly get the expected result (I omit the details). However, the sentences (19g) and (19h)

in which there is no semantic relationship between the conjuncts (i.e., entailment) turn out to be problematic.

However, the concept of presupposition under the trivalent approach can also be approached more directly by introducing to the language of trivalent logic a presupposition operator: unary or binary (which are interdefinable in Łukasiewicz and Strong Kleene logics, see, e.g., BEAVER and KRAHMER 2001, 150–51; $P\phi$ means "the presupposition that ϕ holds", and ϕ_{ψ} means "a sentence in which ψ is an elementary presupposition associated with ϕ"):

ϕ	$P\phi$
T	T
F	F
*	*

ϕ_{ψ}	T	F	*
T	T	*	*
F	F	*	*
*	*	*	*

Before I introduce the relation *R* to the trivalent account to presupposition projection, it should be noted at the very beginning that also, concerning this relation, one can postulate three, not two cases, i.e., the situation that the relation holds between two sentences/propositions, the relation does not hold and the situation in which the relation is undetermined or unknown.[35]

How would the indeterminacy of the *R* relation affect the truth conditions of propositions built using propositional connectives, particularly the conjunction we are interested in? The impact would mainly concern situations in which such sentences are classically true, i.e., in the case of conjunction when both its conjuncts are true. If the relation *R* is not determined, the value of such a sentence would assume the truth value *. In other cases, truth values of conjuncts would have a key influence.[36]

[35] For a general, formal approach, see JARMUŻEK (2021, sec. 2). I limit my considerations to one relating relation, but they are generalised for a set of such relations, including a set of relating relations concerning conjunction. It is possible also to introduce many forms of indeterminacy of the relation *R*, e.g., based on the thesis that such indeterminacy is gradual.

[36] Possibly, that the indeterminacy of *R* leads in consequence from Łukasiewicz's or Peters' approach to the Kleene (Weak) approach, requires more profound analysis. As an example of a sentence in which the relation *R* can be considered indeterminate, consider the sentence "John met Sue and bought a bicycle." Without additional knowledge, it is difficult to assess whether there is a relationship between conjuncts, e.g., causality (although it can be assumed that there is a sequence or a temporal containment relationship), i.e., John met Sue because he had bought a bicycle (he bought from Sue, wanted to tell her about buying, he made a bet with Sue that he would buy a bike, etc.).

However, let's assume that we have a classically understood relation *R*. Its implementation in the trivalent account of presupposition projection can be made in at least three ways.[37] First, *R* may be an additional (intensional) component of the truth conditions of propositional connectives (cf. JARMUŻEK 2021), in particular of a conjunction: it is true iff the conjuncts are true and they are in relation *R*. Note that for the incremental approach discussed above, the algorithm would have to take into account the *R* relation in the appropriate place, mainly in 3iii. Second, *R* can be used when defining presuppositions: ϕ presupposes ψ iff whenever ψ is not true or is not in relation *R* (i.e., in the bivalent approach to *R*, is in the converse relation to *R*) with ϕ, ϕ is neither true nor false. Third, *R* can be the basis for the projection of some presuppositions in complex sentences, e.g., it can be assumed that the conjunction $A_{p1} \wedge B_{p2}$ (where *p1* and *p2* are presuppositions of sentences with which they occur) does project both presuppositions, i.e., takes truth value * iff *p1* or *p2* is not true and *p1*, *p2* are in the relation *R*. We can even claim that $A_{p1} \wedge B_{p2}$ is true iff *A*, *B* are true (only if *p1*, *p2* are true) and *p1*, *p2* are in the relation *R*, changing the truth condition from the first way above.

According to the first approach to the relating trivalent logic, it could be a valuable tool for presupposition projection analysis, similar to Łukasiewicz/Peters' trivalent logic. On this approach, apart from truth values, the relation between its conjunct would be important for the truth value of conjunction. However, we have already seen from the example of sentences (19g) and (19h) that the lack of a semantic relationship affected the presupposition projection.[38] Moreover, the lack of recognition of semantic relations within the trivalent approach has long been considered to be its fundamental disadvantage. As Winter (2019, 583) put it recently: "Whether presuppositions are filtered or projected in propositional constructions depends on semantic and pragmatic relations between the operands, and not only on their truth values

[37] In fact, mixed approaches are also possible: within a distinguished framework, e.g., claiming that the relation *R* holds between one conjunct of conjunction and a presupposition the second or between them, e.g., by choosing both a second and a third approach. They would be important when considering some sentences from (19) and the like. I leave detailed analyses for another occasion.

[38] In sentences (19e) and (19f) we were not dealing with a semantic relationship in the sense of entailment, i.e., neither conjunct entails the second nor its presupposition. However, there was some connection between the conjuncts, both related to the show *My Little Pony*. The relation *R* can also represent such relationships. This would make the occurrence of, e.g., conditional presupposition from the appropriately understood relation *R* between conjuncts.

in specific models."[39] The introduction of the relation R seems to answer this problem directly.

In this paper, I have presented several examples of conjunction sentences, the meaning of which cannot be reduced to the classical truth conditions. Unfortunately, most examples in the discussion of presuppositional projection regarding conjunction do not consider its ambiguity (in a semantic or pragmatic sense). The relating trivalent approach allows this gap to be filled.

The second approach relates directly to the concept of presupposition. It is based on the simple observation that the meaning of a presupposition and the meaning of the sentence/utterance are always connected (usually by triggers), and therefore it eludes trivalent logic. If we want the binary operator of a presupposition to represent it, it must somehow account for the relationship mentioned above. In the table for the binary presupposition operator, any two sentences ϕ and ψ are connected; to change it, the R relation should be taken into account: only if it holds can the ϕ sentence be true. Of course, what is understood by the relation R depends on the theory of presupposition being adopted.

The third approach follows example (17). Based on that, I showed that to fully understand the presuppositions of a compound sentence, it is important to understand the relationship between the presuppositions of the component sentences if such a relation exists. This approach is similar to the first but shifts the R relation from the level of sentences to the level of their presuppositions. In this way, it allows the situations we deal with in sentences such as (17) to be captured.

The approaches outlined above can be combined by introducing, for example, one relation for the relation between sentences and the other one for relations between presuppositions, e.g., conjunction would have a binary truth value iff between true presuppositions there was the relation R_1, while it would be true if the relation R_2 additionally took place between its conjuncts.

The relating trivalent approach to presupposition is, of course, a semantic approach, focusing on truth conditions. Why would such an approach be an example of relating pragmatics? Indeed, this is not a complete passage to relating pragmatics but only a step in that direction. I have already indicated the

[39] This is an echo of Karttunen's words: "In general, whether or not a presupposition of a particular constituent gets filtered out … depends on the truth value of the other constituent, not on the semantic relation between them as the case seems to be in ordinary language" (KARTTUNEN 1973, 188).

reasons for choosing the trivalent approach; the ideas presented can be transferred to pragmatic presupposition theories. But it is also possible that we will pragmatically interpret the *R* relation in the approach outlined above, e.g., that it says that two propositions belong to common knowledge, global context, etc. Moreover, one can try to transfer relating relation from semantics to pragmatics, i.e., from truth conditions to warrant conditions. Then, for example, a sentence like (17a) is true when both its parts are true, and those when their presuppositions are true, but for such a sentence to be warrantedly asserted, i.e., to convey the proposition [17c], there must be a proper relation.

6. RELATING RELATION AND SCALAR IMPLICATURES

The concept of scalar implicature is one of the better-known examples of generalised conversational implicatures in Grice's sense. This concept is connected in particular with the works of Horn, who in his dissertation indicated the number of tests for the presence of a scalar implicature (see HORN 1972; here, I will stay only with the cancellability test). The conversational phenomenon behind the concept of scalar implicature is explained in various ways in neo-Gricean theories.[40] It depends mainly on the endorsed conversational mechanisms: maxims, rules, principles, etc. For further considerations, it is enough to take the scales from Horn's account—the so-called positive and negative Horn scales (or entailment scales) (see, e.g., LEVINSON 2000, 82; HUANG 2014, 45–47).

> *Positive Horn scales*
> A set of linguistic alternates $<x_1, x_2, \ldots, x_n>$ such that $S(x_i)$ unilaterally entails $S(x_j)$, where S is an arbitrary simplex sentence-frame, and $x_i > x_j$ and where $x_1, x_2, \ldots, x_n$ are (i) equally lexicalized items, of the same word class, from the same register; and (ii) "about" the same semantic relation or from the same semantic field.

> *Negative Horn scales*
> For each well-formed positive Horn scale of the form $<x_1, x_2, \ldots, x_n>$, there will be a corresponding negative Horn scale of the form $<\sim x_n, \ldots, \sim x_2, \sim x_1>$, regardless of

[40] Note that scalar implicatures are sometimes theorised in different ways; for instance, Chierchia et al. (2012) point out that sentences with scalar terms are ambiguous and take the meaning excluding the upper bound when a silent syntactic operator whose meaning is similar to that of overt 'only' is present.

> the relative lexicalization of the negation ["~" and "not" are used here to denote negation uniformly; the context will follow to which expression it relates].

Among the positive Horn scales we find, for example, a scale related to quantifiers: <all, most, many, some>, a scale related to adverbs: <always, usually, often, sometimes>, or a scale related to connectives: <and, or>. Among the negative Horn scales, we find, for example, the following scale related to the positive above: <none, not many, not most, not all>, <never, rarely, not always>, <not-or, not-and>. In the following, I focus on the positive and negative connective scale: <and, or> and <not-or, not-and>.[41]

The scalar mechanism is that, by saying $S(x_2)$, one conversationally implicates that $\sim S(x_1)$; for instance, (21a) implies conversationally [21b].[42]

(21) (a) John was jogging or reading a book.
(b) It is not the case that John was jogging and reading a book.

Can relating pragmatics be useful for the scalar implicatures theory? First, I will outline the main ways of introducing relating relation to the discussed issues, and then I will illustrate the fruitfulness of such an approach using examples.

Note at the beginning that in the definition of positive Horn scales, condition (ii) reads: "about" the same semantic relation or from the same semantic field. Here, "semantic relation" means entailment, but a second disjunct speaks of the "semantic field". Horn used, in this case, the term "rank" as a

[41] There is an interesting empirical study that seems to show that children do not see scalar implicatures about conjunctions and disjunctions or quantifiers. As described by Singh et al., previous research results were interpreted as "children pass through a stage of development at which they know the meanings of logical operators but do not compute scalar implicaturesthey behave as if they are 'logicians'" (2016, 307). These authors, however, came to different results with more serious consequences: "our crucial finding … is that a child will *reject* $A \vee B$ when only one of the disjuncts is true. This is consistent with neither logician nor adult behavior [i.e., those who compute scalar implicatures based on disjunctions] but instead suggest a conjunctive interpretation.… The divergence here is quite striking, for it leads children and adults to strengthen in opposite ways: adults conclude that $A \wedge B$ is false, while children conclude that $A \wedge B$ is true" (SINGH ET AL. 2016, 308–11). The authors hypothesise that children understand logical operators as adults and possess the adult capacity to infer/compute scalar implicatures, but do not possess the adult disjunctions (i.e., sentences whose main operator is a stronger element from the same scale). So surely, the full story of scalar implicatures, in this case, is much longer than the standard outline presented here.

[42] This is not the complete story: the details of why we have a scalar implicature are related to accepted conversational rules, e.g., Horn's Q-principle. Moreover, there is a class of related implicatures concerning propositional connectives: clausal implicatures. So, (21a) has not only one kind of generalised conversational implicature. The details are not relevant for further findings.

related class of partially ordered set, e.g., <general, major, … lieutenant, sergeant, corporal, private>. The fundamental difference between scale and rank is that ranked values are mutually incompatible (see HORN 1989, 546). So, we can simplify (ii) to: "about" the same relating relation, while relating relation may be entailment, but also others, e.g., belonging to the same set mutually incompatible elements (i.e., that the corresponding sentences are inconsistent). It is not only a reformulation and a more general view, as other relationships are not excluded (see, e.g., in the context of connective scale, the scale of disjunction proposed in SAUERLAND 2004, 382).

However, there are more detailed ways to employ relating relation to scalar implicatures, especially to the connectives scale. First, next to the entailment condition, it can be required that the scale's values are in the relating relation. Second, there may be a requirement that there is a relating relation between the scales or between the scales' values.

In the case of the connective scale, the first approach leads to the meanings of conjunctions pointed out in section 1. Some of them are treated as semantic (conventional implicatures), others as pragmatic (conversational implicatures). *Prima facie* scales should therefore be related to the latter if similar meanings can be found for disjunction and be related to the first if we find that the scales are, in fact, more complex. I focus only on the latter cases.

Regarding examples (1) and (3)–(9), I have argued from the cancellability test that the meanings in part (b) are conversational implicatures. However, if someone asserts any of the sentences (b) from these examples, the appropriate sentence (a)—treated merely truth-conditionally—is entailed. It must be assumed that connective scale has different faces depending on what content is conversationally implied by *pure* conjunction.

In the example below (22a) has the scalar implicature [22b]. However, the negation of the conjunction in [22b] entails the negation of the conjunction about simultaneity [22c], so the scalar implicature of (22a) is also [22c].

(22) (a) John sang a folk song or played on the piano.
(b) It is not the case that John sang a folk song and played on the piano.
(c) It is not the case that John sang a folk song and simultaneously accompanied himself on the piano.

Therefore, it seems that, in addition to the <and, or> scale, we also deal with the <and_{sa}, or> scale, where "and_{sa}" means "and simultaneously accompanied". Also, the meaning of "and_{sa}" can be connected with pragmatically interpreted relating relation (e.g., conversational principles plus context).[43]

Now suppose we have a scale in which there are conjunctions of [1b], [7b], and [8b]—that is, complete propositions expressed by sentences (1a), (7a) and (8a). Between these propositions, there are the following entailments: intentionality entails temporal sequence and causal connectedness (but not *vice versa*), and causal connectedness entails temporal sequence (but not *vice versa*). At the end of the scale, there would be disjunction. Marking the conjunctions with the first letters of their meaning, we get the scale <and_i, and_c, and_t, or>. Based on this scale, the scalar implicatures utterances of sentences (21a) are determined in a different way:

(23) (a) It is not the case that John was jogging and then reading a book.
(b) It is not the case that John's jogging caused him to read a book.
(c) It is not the case that John was jogging in order to read a book.

The scalar mechanism also shows uttering sentence (24a) conversationally implies [23b] and [23c], and that saying sentence (24b) conversationally implies [23c].

(24) (a) John was jogging and that caused him to read a book.
(b) John was jogging and that was the intentional cause that after that he was reading a book.

The consequence of this approach is that there are few scales related to disjunction. But how does this compare to the inferences described in (9)? Above, we have scalar implicatures related to disjunction, while in (9) we deal with inferences that are based on noticing other meanings of the conjunction and accepting that they do not hold.

The second approach introduces the relating relation between scales or scales' values. It is related to example (18) discussed in section 5 and translates to a projection problem for scalar implicatures.[44] This example was about

[43] Note, firstly, that there is no scale <and_{sa}, and, or>, because, by assertion, the sentence with *pure* "and" sometimes (as I argued in sections 2 and 4) conversationally implied that "and_{sa}"; see (3) and (3'). Secondly, as I already pointed out, I'm leaving open the possibility that disjunction has other meanings, especially related to the sentences (1)–(15).

[44] The problem is more complex as we have cases where one scalar implicature is within the scope of another. This concerns, in particular, the connectives scale and scalar implicatures in the scope of disjunction operator; see, e.g., SAUERLAND (2004).

the second possibility: a semantic connection between values from two different scales: "warm" and "good". The scalar implicature [18c] only appears (i.e., is warrantedly asserted) when these values are related, for instance, based on the circumstances of the utterance of (18a).

In general, the following mechanism can be introduced.[45] Let us assume that we have two two-element scales: $scale_a$: $\langle x_1, x_2\rangle$, where $x_1 > x_2$, and $scale_b$: $\langle y_1, y_2\rangle$, where $y_1 > y_2$. Thus, the sentence $S(x_1)$ entails $S(x_2)$, and $S(y_1)$ entails $S(y_2)$. Additionally, suppose we have relating relation R such that $x_1 R y_1$ and $x_2 R y_2$. In this case, utterances of conjunction $S(x_2) \wedge S(y_2)$ have the scalar-relating implicature $\sim S(x_1) \wedge_R \sim S(y_1)$.

In the case of (18a), we have two scales: <hot, warm> and <great, good>, and context determines the following relating relation: hot*R*great, warm-*R*good. Therefore, an utterance of the sentence (18a) in the context has scalar-relating implicature: $\sim S(\text{hot}) \wedge_R \sim S(\text{great})$. So, it can be said that, by projecting two scalar implicatures in conjunction, the new kind of conjunction's meaning is obtained.[46]

Findings from contemporary empirical research on scalar implicatures point to what is known as scalar diversity: the rate at which scalar inference is drawn varies across scalar words (see, e.g. VAN TIEL ET AL. 2014, VAN TIEL and SCHAEKEN 2017; VAN TIEL ET AL. 2019; and for a review article, see KHORSHEED ET AL. 2022). Most authors writing on scalar implicatures have focused on the inference "not all" from "some" and made generalisations to the other scales. And such a generalisation may be too hasty.[47] The relating approach, however, does not force that: one can similarly consider logics of which we have a relating interpretation of the conjunction and retain the classical interpretation for the remaining functors. Different theoretical explanations can be postulated for various scales. Suppose we introduce relating relation as concerning expressions on scales, not between scales. For some scales, we can interpret it as semantic relatedness (see LANDAUER and DUMAIS 1997), for others, as the question under discussion (VAN KUPPEVELT 1996), and for others, otherwise. The relating approach thus gives a tool for a general, uniform account of scalar diversity but does not force it.[48]

[45] It can easily be extended to any finite scales, more than two scales and to negative Horn scales.

[46] Such implicature is cancellable: "The coffee is warm and good, but I do not mean that the coffee is not great because it is not hot." This shows that sentence (18a) cannot be taken as an example of conventional implicature related with "and therefore".

[47] I thank one of anonymous reviewers for bringing this issue to my attention.

[48] The discussion of the theoretical relevance of the results of research conducted within the framework of experimental pragmatics can be compared to a similar debate regarding the role of

Both approaches outlined above are now «fully» pragmatic, unlike the relating trivalent account outlined in the last section. Relating relation has an influence on warranted assertability conditions, not on truth conditions.

CONCLUSION

The paper aimed to outline a new research perspective related to relating semantics. Relating pragmatics is a unifying approach, i.e., many semantic or pragmatic relations can be treated as kinds of relating relation. For advocates of relating semantics, there are many paths to relating pragmatics, some introducing pragmatically interpreted relating relation to semantics and others shifting it to warranted assertability conditions.

I have shown the efficiency of relating pragmatics in interpreting presuppositions and implicatures (conversational and conventional). On the basis of relating trivalent logic, we can get for the presupposition that which in relating classical logic is obtained for propositional connectives: an intensional connection. When we consider the presupposition projection in conjunction, we have to consider its different meanings, and the relating relation also helps. In turn, in the case of a scalar implicature, relating relation can combine both values on one scale and between two scales. This seems to affect the existence of certain scalar implicatures and for the projection of scalar implicatures.

Finally, there are approaches where presuppositions and scalar implicatures are based on a similar mechanism (see, e.g., CHEMLA 2010), or that some of the presuppositions, the so-called soft presuppositions, are in fact scalar implicatures (see ROMOLI 2015), and even that you can combine the theory of scalar implicatures with a trivalent approach to presuppositions (see SPECTOR and SUDO 2017). Behind some of these theories is the observation that presuppositions involve sets of alternatives similar to scalar implicatures. Such a unifying approach could also benefit from relating semantics or pragmatics—but I leave that for another occasion.

experimental philosophy. Undoubtedly, there is a need for a balanced position that specifies the research methodology and possible theoretical implications. However, this goes far beyond the scope of this article.

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TOWARDS THE RELATING PRAGMATICS: THE CASE OF CONJUNCTION

Summary

The paper presents the prospects and potential of a new pragmatic approach to natural language — the relating pragmatics. The relating pragmatics grows out of relating semantics developed for relating logic. I propose various ways to build relating pragmatics and illustrate the general ideas with two areas of application: the interpretation and projection of presuppositions and the interpretation and projection of scalar implicatures. I chose the issue of the semantic and pragmatic understanding of conjunction as the main background for the discussion.

Keywords: relating semantics/pragmatics; conjunction; presupposition; trivalent logics; scalar implicature; projection

W STRONĘ PRAGMATYKI RELACYJNEJ: PRZYKŁAD KONIUNKCJI

Streszczenie

Artykuł przedstawia perspektywy i potencjał nowego pragmatycznego podejścia do języka naturalnego – pragmatyki wiążącej. Pragmatyka wiążąca wyrasta z semantyki wiążącej opracowanej dla logiki wiążącej. Proponuję różne sposoby budowania pragmatyki wiążącej i ilustruję ogólne idee dwoma obszarami zastosowań: interpretacją i projekcją presupozycji oraz interpretacją i projekcją implikatur skalarnych. Jako główne tło dyskusji wybrałem kwestię semantycznego i pragmatycznego rozumienia koniunkcji.

Słowa kluczowe: semantyka/pragmatyka wiążąca; koniunkcja; presupozycja; logika trójwartościowa; implikatura skalarna; projekcja