Implicatures in Agreement

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1. Introduction

The purpose of this paper is to account for a puzzling agreement behavior of disjunctions, namely the fact that in certain environments plural agreement with a subject-disjunction is possible, even though both disjuncts are singular. I argue that such behavior is driven by the theory of implicatures. Specifically, the proposed analysis has three basic ingredients in it: first, disjunction is a predicate and it can have plural feature, which syntactically triggers plural agreement on the verb and semantically closes the predicate under sum formation; second, this plural feature triggers a multiplicity implicature along the lines of Zweig 2009; third, the disjunction itself triggers an exclusivity implicature. When these two implicatures are in conflict with the assertion, the plural feature is blocked, hence no possibility of plural agreement. In environments where such conflict does not arise, plural agreement is possible. I also show that the proposed analysis has interesting implications for the theory of scalar implicatures, namely it raises a more general question: is it the case that scalar implicatures of a sentence can ever lead to ungrammaticality? I argue that it happens in a limited number of cases, namely when a scalar implicature of a given sentence must be *obligatorily* calculated but potentially leads to a contradiction if conjoined with another scalar implicature of the sentence.

2. The puzzle

In Russian, when the subject is a disjunction and both disjuncts are singular, plural agreement on the verb is normally ruled out, as shown in (1):

(1)	Petja	ili	Vasja	prišel-Ø /*prišl-i**.**
	Petja.SG	or	Vasja.SG	came-SG/came-PL
	‘Petja or Vasja came.’			

However, in some environments (under frequency adverbs, modals and possibly some others) in addition to singular agreement, plural agreement becomes possible, as shown in (2):

(2)	Každyj	vtornik	Petja	ili	Vasja	prixodil-Ø/-i	k	Kole.
	every	Tuesday	Petja	or	Vasja	came-SG/-PL	to	Kolja
	‘Every Tuesday Petja or Vasja came to Kolja.’							

Interestingly, in cases like (2), there is a difference between singular and plural agreement with respect to possible interpretations. Whereas the sentence with singular agreement on the verb can have two interpretations – either the wide scope or the narrow scope interpretation of disjunction, the wide scope interpretation of disjunction is ruled out in the sentence with plural agreement, namely in a scenario where every day the same person came to Kolja, but the speaker is unsure which one, only singular agreement is possible, as demonstrated by (3):

(3) Každyj vtornik Petja ili Vasja prixodil$_{SG}$/*prixodili$_{PL}$ k Kole, ja ne pomnju kto imenno.
‘Every Tuesday Petja or Vasja came to Kolja, I don’t remember who exactly.’

* Many thanks to Danny Fox, Irene Heim and the audience of WCCFL 29 for very helpful and insightful comments. All errors are mine.

The question that I am going to address in this paper is the following: where does the possibility of plural agreement come from when both disjuncts are singular, in particular what licenses plural agreement in cases like (2) and blocks it in cases like (1)?

In the next sections, I am going to discuss Zweig's analysis of dependent plurality, then I will show that the investigated phenomenon is a case of dependent plurality and will present an analysis based on this idea.

3. Semantics of Plural: Zweig 2009

There is a well-known puzzle in the literature concerning the behavior of bare plurals (Sauerland et al. 2005, Zweig 2009 etc.). The puzzle can be described in the following way. In sentences like (4), bare plurals have 'more than one' component in their meaning, namely (4) entails that John owns *more than one* dog:

(4) John owns dogs.

However, there are certain environments in which this multiplicity component disappears or gets modified. Specifically, in negative contexts, it simply goes away as shown in (5):

(5) John doesn't own dogs $\neq$ *John doesn't own more than one dog.*
$=$ *John doesn't own a dog*.

Second, in the scope of plural nouns, the multiplicity component is not distributed over as shown in (6):

(6) My friends attend good schools $\neq$ *Each of my friends attend more than one good school*.

(6) requires that each of my friends attend one good school; but at the same time it is required that more than one school were referred to overall. This is a so-called *dependent plural meaning*.

If all of my friends attend the same school, (6') must be used:

(6') My friends attend a good school.

Zweig in his paper (Zweig 2009) argues that both of these phenomena have the same origin. Specifically, his proposal is that bare plurals do not have the 'more than one' component in their denotation, that is they are number neutral predicates truth-conditionally (cf. Sauerland et al. 2005, Spector 2007), but the 'more than one' component arises as a scalar implicature, relying on the scalar relationship between the bare plural and its singular alternative (cf. Spector 2007). Zweig proposes the mechanism for deriving this implicature. One of the main ingredients of the analysis is the idea that implicature calculation takes place at the level of an event predicate, namely before event closure is applied. The event predicate with a plural variable is weaker than its singular counterpart (Zweig takes singular NPs to denote atomic individuals), giving rise to a scalar implicature[1]. Let's see briefly how the dependent meaning of (7) is accounted for.

(7) My friends attend good schools.

Before existential closure is applied, the sentence in (7) denotes a predicate of events given below:

(8) $\lambda e.\exists X \exists Y[{*}My\_Friend(X) \& {*}Good\_School(Y) \& {*}Attend(e) \& {*}AG(e)(X) \& {*}Th(e)(Y)]$

[1] Zweig shows that after event closure applies, plural and singular alternatives become equivalent, so the multiplicity implicature cannot be generated at this point.

And this is exactly the level at which implicature calculation takes place, according to Zweig. The singular alternative of (8) is given in (9):

(9) $\lambda e.\exists X\exists Y$[*My_Friend(X)&*Good_School(Y) &Y is atomic & *Attend(e) & &*AG(e)(X) & *Th(e)(Y)]

As Zweig demonstrates in the paper, (9) is stronger than (8), so we get the following meaning adding to (8) the negation of (9):

(10) $\lambda e.\exists X\exists Y$[*My_Friend(X) &*Good_School(Y)&|Y|>1 & *Attend(e) & & *AG(e)(X) & *Th(e)(Y)][2]

After existential closure is applied, we get the following:

(11) $\exists e\exists X\exists Y$ [*My_Friend(X) & *Good_School(Y)&|Y|>1 & *Attend(e) & & *AG(e)(X) & *Th(e)(Y)]

As it seems, (11) correctly captures the dependent plural reading of (7).

4. Proposal

4.1 Preliminary Assumptions and Analysis in a Nutshell

If we look again at the interpretations available to sentence (2) depending on the agreement pattern (singular vs. plural), a correlation with singular noun vs. bare plural behavior demonstrated by (6-6') becomes obvious. Specifically, the sentence with plural agreement with disjunction in (2) requires that each Tuesday one of the guys came to me, while at the same time it is inappropriate if each Tuesday it is the same person who came. In other words, plural agreement makes *dependent plural* reading obligatory. If it is the same person who came, the sentence with singular agreement must be used (cf. singular noun in (6')).

As we just saw, disjunctions behave similar to indefinite NPs (either singular or plural). To capture this correlation, I will make the following assumptions:

1. Disjunction is a GQ consisting of a covert existential quantifier and a predicate [a or b]. The semantics of the predicate is given in (12)[3]:

(12) $[\![\text{a or b}]\!] = \lambda x.\ x=a \vee x=b$

2. Predicate [a or b] can be singular or plural, triggering singular or plural agreement on the verb respectively.

3. The plural feature denotes the closure of the predicate under sum formation. The predicate [a or b] with a plural feature will have the following denotation:

(13) $[\![(\text{a or b})\text{-}PL]\!] = {}^*(\lambda x.\ x=a \vee x=b) = \lambda x.\ x=a \vee x= b \vee x=a\oplus b$

How can this help us in explaining the contrast in (1)-(2)?

Here is an idea in a nutshell. Sentences like (1) or (2) have two implicatures: *Multiplicity Implicature* (MI) generated by plural feature (following Zweig's logic) and *Exclusivity Implicature* (EI) generated by a scalar item *or*.

In case of (1) repeated below as (14) the two implicatures look as shown in (15):

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[2] For space reasons, I omit some intermediate steps of the calculation.

[3] In (12) and (13), as well as in (20) type e expressions *a* and *b* on the left-hand side must be understood as shifted to the type <e,t> by means of Partee's IDENT.

(14) [Petja or Vasja]$_{PL}$ came.

(15) a. Petja or Vasja came and it's not true that only one of them came =
=Petja *and* Vasja came (*Multiplicity Implicature*)

b. Petja or Vasja came and it's not true that both Petja and Vasja came
(*Exclusivity Implicature*)

It is obvious that these two implicatures contradict each other, which I take to explain why the plural feature on disjunction and hence the plural agreement on the verb is blocked**.**

However, in cases like (16) the situation is different:

(16) Every Tuesday [Petja or Vasja]$_{PL}$ came.

The two implicatures we get in this case are given below:

(17) a. Every Tuesday Petja or Vasja came and it's not true that every Tuesday Petja came and it's not true that every Tuesday Vasja came (*MI*)
b. Every Tuesday P. or V. came and it's not true that every Tuesday Petja and Vasja came (*EI*)

In this case, the two implicatures are consistent with each other, giving rise exactly to the *dependent plural* reading: both boys have to come overall, but on no Tuesday, both boys have to come.

4.2 Formal Analysis

In this section, I am going to offer a formalization of the informal intuition sketched in the previous section. In order to do that, I need to explicitly lay out my assumptions on the implicature calculation process. First, I assume that scalar implicatures are brought about by a covert exhaustivity operator *EXH* akin to 'only' (see Krifka 1995, for example):

(18) $[\![\text{EXH}_{\text{ALT}}]\!] = \lambda P_{<s,t>}.\lambda e.\ P(e)\ \&\ \forall Q \in \text{ALT}\ \&\ Q \subset P: [\neg Q(e)]$

Second, I assume, following Sauerland (2004), that the set of alternatives for a sentence with two occurrences of a scalar item $\varphi(X, Y)$, where X is an element of the scale Q_X and Y an element of the scale Q_Y, is defined as follows:

(19) $\text{Alt}(\varphi(X, Y)) = \{\varphi(X', Y') | X' \textit{ an element of } Q_X,\ Y' \textit{ an element of } Q_Y\}$

Third, I follow Zweig in assuming that *implicature calculation* happens before the event closure.

Also, I adopt the idea that plural and singular are scalar alternatives with singular being the strongest element of the scale.

On top of these assumptions, I would like to add a new assumption, namely the predicative OR ([a OR b]) has non-Boolean conjunction [a⊕b] defined in (20) as its stronger alternative:

(20) $[\![a \oplus b]\!] = \lambda x.\ x = a \oplus b$ (cf. Krifka 1990)

Below I give some examples from Krifka's (1990) paper which serve as an evidence for the existence of non-Boolean conjunction which applies to <e,t> predicates (for the details I refer the reader to Krifka's paper):

(21) John and Mary are husband and wife.
(22) The flag is green and white.

Now let's see how these assumptions taken together allow us to explain for the data in (1)-(2). First, let's examine a "non-quantificational" case repeated below:

(23) [Petja or Vasja]$_{PL}$ came.

The LF for (23) is given in below:

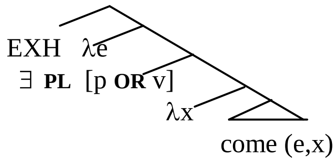

fig. 1

Before existential closure applies, our sentence denotes the following:

(24) $\lambda e.\exists x\ [x=p \text{ or } x=v \text{ or } x=p\oplus v\ \&{}^*came(e, x)]$

As shown in the LF, we are dealing with two scalar items: predicative OR and PL associated with two scales <OR,⊕> and <PL, SG> respectively.

Based on the assumption in (19), the set of scalar alternatives for (24) consists of (25) and (26):

(25) $\lambda e.\exists x\ [x=p \text{ or } x=v\ \&{}^*came(e, x)]$ [SG, OR]

(26) $\lambda e.\exists x\ [x=p\oplus v\ \&{}^*came\ (e, x)]$ [PL, ⊕]

The result of exhaustification of (24) with respect to the alternatives given above is shown in (27):

(27) $\lambda e.\ [\exists x\ [x=p \text{ or } x=v \text{ or } x=p\oplus v\ \&{}^*came(e, x)]\ \&$
$\&\neg\exists x[x=p \text{ or } x=v\ \&{}^*came(e, x)]\ \&$
$\&\neg\exists x\ [x=p\oplus v\ \&{}^*came(e, x)]]$

(27) is obviously contradictory, which I take to be the reason of the ungrammaticality of (1)/(23).

Now let's turn to the "quantificational" case repeated below:

(28) Every Tuesday [Petja or Vasja]$_{PL}$ come.

The LF for (28) is given below:

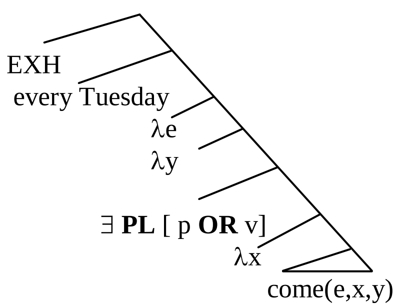

fig. 2

In order to make our analysis work, we will need to adopt the following denotation for the adverbial universal quantifier:

(29) [[every Tuesday]] =
$= \lambda P.\lambda e.\exists Y\ [{*}Tuesday(Y) \& {*}P(e)(Y) \& \forall y\ [Tuesday\ (y) \rightarrow \exists e'\!: e' \subset e\ \& P(e')(y)]]$

The denotation in (29) consists of two parts – besides universal quantification over events, it also introduces a plural event which is the sum of smaller events we quantify over. This will be crucial in the analysis of (28).

Kratzer (in prep), building on Schein 1993, argues that a denotation along the lines of (29) is needed in order to account for cumulative readings of sentences containing universal quantifiers. For example, to account for the cumulative reading of (30), which can be informally stated as "between them, three copy editors found all the mistakes in the manuscript", we need to make reference to the bigger event in order to be able to state that this event is not just an event in which every mistake was caught but, crucially, an event of catching mistakes. This will guarantee that nothing irrelevant gets included in that event.

(30) Three copy editors found every mistake in the manuscript.

Let's come back to (28). Before existential closure the sentence will denote the following:

(31) $\lambda e.\exists Y[{*}Tuesday(Y) \& \exists x\ [x{=}p \text{ or } x{=}v \text{ or } x{=}p{\oplus}v\ \& {*}come(e, x, Y)] \&$
$\& \forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}p \text{ or } x{=}v \text{ or } x{=}\ p{\oplus}v\ \& {*}come\ (e', x, y)]]]]$

The set of alternatives for (31) is shown below:

(32) $\lambda e.\exists Y[{*}Tuesday(Y) \& \exists x\ [x{=}p \text{ or } x{=}v\ \& {*}come\ (e, x, Y)] \&$
$\& \forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}v \text{ or } x{=}p\ \& {*}come(e', x, y)]]]]$

(33) $\lambda e.\exists Y[{*}Tuesday(Y) \& \exists x\ [x{=}p{\oplus}v\ \& {*}come\ (e, x, Y)]\ \&$
$\& \forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}p{\oplus}v\ \& {*}come(e', x, y)]]]]$

The result of exhaustification of (31) with respect to the alternatives given above is shown in (34):

(34) $\lambda e.\ [\exists Y\ [{*}Tuesday(Y) \& \exists x\ [x{=}p \text{ or } x{=}v \text{ or } x{=}p{\oplus}v\ \& {*}come(e, x, Y)]\ \&$
$\& \forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}p \text{ or } x{=}v \text{ or } x{=}\ p{\oplus}v\ \& {*}come\ (e', x, y)]]]]\ \&$

$\& \neg[\exists Y[{*}Tuesday(Y) \& \exists x\ [x{=}p \text{ or } x{=}v\ \& {*}come\ (e, x, Y)]\ \&$
$\& \forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}v \text{ or } x{=}p\ \& come(e', x, y)]]]]]\ \&$

$\& \neg[\exists Y\ [{*}Tuesday(Y) \& \exists x\ [x{=}p{\oplus}v\ \& {*}come\ (e, x, Y)]\ \&$
$\& \forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}p{\oplus}v\ \& {*}come(e', x, y)]]]]]] =$

(a) $\lambda e.\ [\exists Y\ [{*}Tuesday(Y) \&\ \exists x[x{=}p \text{ or } x{=}v \text{ or } x{=}p{\oplus}v\ \& {*}come(e, x, Y)]\ \&$
$\& \forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}p \text{ or } x{=}v \text{ or } x{=}\ p{\oplus}v\ \& {*}come\ (e', x, y)]]]] \&$

(b) $\boldsymbol{\neg\exists Y[{*}Tuesday(Y) \& \exists x[x{=}p \text{ or } x{=}v\ \& {*}come\ (e, x, Y)]]}\ \vee$
$\vee \neg[\forall y\ [Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}v \text{ or } x{=}p\ \& {*}come(e', x, y)]]]]$ *MI*

(c) $\neg\exists Y[{*}Tuesday(Y) \& \exists x[x{=}p{\oplus}v\ \& {*}come\ (e, x, Y)]]\ \vee$
$\vee\ \boldsymbol{\neg[\forall y[Tuesday\ (y) \rightarrow \exists e'[e' \subset e\ \& \exists x\ [x{=}p{\oplus}v\ \& {*}come(e', x, y)]]]]}$ *EI*

What we get in (34) is equivalent to the conjunction of the assertion with the bold-faced disjuncts in (b) and (c). The second disjunct in (b) says that there is a Tuesday on which neither Petja came nor Vasja came, which contradicts the assertion and must therefore be false, and the first disjunct in (b) says that neither Petja nor Vasja is the complete agent of the big coming event. Thus, the conjunction of the assertion and the first disjunct in (b) guarantees that the agent of the big event is the sum of Petja and Vasja, which accounts for the multiplicity implicature, presented informally in (17a).

The first disjunct in (c) says that Petja and Vasja are not the agent of the big coming event, thus it is incompatible with the conjunction of (a) and (b) and hence should be false, making the second disjunct, which says that 'There is a Tuesday for which it's not the case that both Petja and Vasja came', true. This is exactly the exclusivity implicature we presented informally in (17b).

5. Implications for the theory of Scalar Implicatures

One of the most obvious questions the proposed analysis raises is the following: Why should the implicature clash lead to ungrammaticality rather than to implicature cancellation? I am going to discuss two phenomena which show that usually it is not the case. First, the well-known fact about implicatures is that they can be cancelled, as illustrated below:

(35) Peter or John came. In fact, both Peter and John came.

In (35), the use of disjunction triggers the exclusivity implicature that it's not true that both Peter and John came. However, the next sentence cancels this implicature, as it contradicts it, which is usually considered to show that the process of implicature calculation is not obligatory.

The second piece of evidence has to do with implicatures associated with disjunction. It has been argued in several works (Fox 2007, Sauerland 2004) that alternatives to disjunctions must include not only conjunction but also both disjuncts[4]. However, if one adopts this assumption, the following problem immediately arises: as p and q are both stronger than $p \vee q$, we must get $\neg p$ and $\neg q$ as implicatures to $p \vee q$, but they obviously contradict the assertion. So here we have another case of implicatures contradicting the assertion. However, in that case the contradiction does not lead to ungrammaticality, rather it leads to the non-generation of these implicatures.

Based on that fact, Fox (2007) argues that the exhaustivity operator (EXH) takes into account only "innocently excludable" alternatives which guarantees that implicature calculation is contradiction-free. Fox proposes that an alternative to an assertion can be innocently excluded only if it is included in every maximal set of propositions in A such that its exclusion is consistent with the prejacent. Fox's definitions of innocently excludable (IE) alternatives and IE-based EXH operator are given below:

(36) $[[\text{EXH}]]\,(A_{<st,t>})(p_{st})(w) = p(w)\ \&\ \forall q \in \text{I-E}(p,A) \rightarrow \neg q(w)$
$\text{I-E}(p,A) = \cap\{A' \subseteq A\text{: } A' \text{ is a maximal set in A, s.t., } A'^{\neg} \cup \{p\} \text{ is consistent}\}$
$A^{\neg} = \{\neg p\text{: } p \in A\}$

In the case of disjunction, there are two such maximal sets: $\{\neg p, \neg(p\&q)\}$ and $\{\neg q, \neg(p\&q)\}$. The alternative which is included in both sets is p&q, thus it is the only alternative which is innocently excludable. That accounts for the absence of the implicatures $\neg p$ and $\neg q$.

But now if we come back to our analysis of the agreement cases and try to adopt Fox's idea that EXH must be defined using Innocent Exclusion, we will be faced with the following problem: as EXH is contradiction-free, we will never be able to get a contradiction - specifically, in case of (1) no alternative will be negated, as neither can be innocently excluded.

Is there a way to reformulate our analysis in terms of Fox's IE-based EXH operator? We think that the answer is yes. A relevant fact we would like to pay attention to is that unlike many other instances of scalar implicatures, the implicature associated with plural is obligatory, i.e. non-cancellable, cf. oddness of the sequence in (37) (cf. Chierchia, Fox & Spector (to appear)).

[4] This assumption is needed, for example, to explain why the sentence *Every student talked to Mary or Sue* has the following implicatures: a) It's not true that every student talked to Mary; b) It's not true that every student talked to Sue.

(37) I saw boys. # In fact, I saw only one boy.

We can try to encode the fact that an implicature associated with plural is obligatory in the following way: alternatives of plural must be associated with EXH and, moreover, **must** be innocently excluded.

If we adopt this assumption, the explanation of our disjunction facts will follow out automatically. In case of (1), we will need to add two more alternatives to the set consisting of (25)-(26):

(38) $\lambda e.\exists x\, [x{=}p\, \&{*}came(e, x)]$

(39) $\lambda e.\exists x\, [x{=}v\, \&\, {*}came\, (e, x)]$

Obviously, neither alternative can be innocently excluded, which leads to the ungrammaticality.

Let's see what will happen in the "quantificational" case. We will have to add two more alternatives to the alternatives shown in (32)-(33):

(40) $\lambda e.\exists Y[{*}Tuesday(Y) \& \exists x\, [x{=}p\, \&{*}come\, (e, x, Y)] \&$
$\& \forall y\, [Tuesday\, (y) \rightarrow \exists e'[e' \subset e\, \& \exists x\, [x{=}p\, \&{*}come(e', x, y)]]]]$

(41) $\lambda e.\exists Y[{*}Tuesday(Y) \& \exists x\, [x{=}v\, \&{*}come\, (e, x, Y)]\, \&$
$\& \forall y\, [Tuesday\, (y) \rightarrow \exists e'[e' \subset e\, \& \exists x\, [x{=}v\, \&{*}come(e', x, y)]]]]$

Every alternative in this new set can be innocently excluded, giving rise to the meaning in (42) (the last two pieces (42d) and (42e) don't add any new information, as they are entailed by (42b)):

(42) a. $\lambda e.[\exists Y\, [{*}Tuesday(Y) \&\, \exists x\, [x{=}p \text{ or } x{=}v \text{ or } x{=}p{\oplus}v\, \&{*}come(e, x, Y)]\, \&$
$\& \forall y[Tuesday\, (y) \rightarrow \exists e'[e' \subset e\, \& \exists x\, [x{=}p \text{ or } x{=}v \text{ or } x{=}p{\oplus}v\, \&{*}come\, (e', x, y)]]]]\, \&$

b. $\boldsymbol{\neg \exists Y[{*}Tuesday(Y) \& \exists x\, [x{=}p \text{ or } x{=}v\, \&{*}come\, (e, x, Y)]]} \vee$
$\vee \neg[\forall y\, [Tuesday\, (y) \rightarrow \exists e'[e' \subset e\, \& \exists x\, [x{=}v \text{ or } x{=}p\, \&{*}come(e', x, y)]]]]\, \&$

c. $\neg \exists Y[{*}Tuesday(Y) \& \exists x\, [x{=}p{\oplus}v\, \&{*}come\, (e, x, Y)]] \vee$
$\vee \boldsymbol{\neg[\forall y[Tuesday\, (y) \rightarrow \exists e'[e' \subset e\, \& \exists x\, [x{=}p{\oplus}v\, \&\, {*}come(e', x, y)]]]]}\, \&$

d. $\neg \exists Y[{*}Tuesday(Y) \& \exists x\, [x{=}p\, \&{*}come\, (e, x, Y)]] \vee$
$\vee \neg[\forall y\, [Tuesday\, (y) \rightarrow \exists e'[e' \subset e\, \& \exists x\, [x{=}p\, \&{*}come(e', x, y)]]]]\, \&$

e. $\neg \exists Y[{*}Tuesday(Y) \& \exists x\, [x{=}v\, \&{*}come\, (e, x, Y)]] \vee$
$\vee \neg[\forall y\, [Tuesday\, (y) \rightarrow \exists e'[e' \subset e\, \& \exists x\, [x{=}v\, \&{*}come(e', x, y)]]]]]$

6. Conclusion

In this paper, I showed that the puzzling agreement behavior of disjunctions can be explained by the theory of scalar implicatures. Also, I tried to raise a more general question, namely in which cases implicatures of a sentence can lead to ungrammaticality. It is conceivable that it happens when a certain scalar item (plural, in our case) requires its alternative to be "innocently excluded" but, for some reason, it cannot be. Needless to say, this hypothesis needs further investigation.

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