
Givenness and Maximize Presupposition *

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Abstract

Based on word order patterns in Czech, I argue that a cross-linguistically common partitioning of a sentence between given and new material is a result of an interplay of independently needed pragmatic notions: the Maximize Presupposition principle of Heim (1991) and presupposition failure. I formalize the intuition by introducing presuppositions by a freely insertable recursive operator which applies upwards and which adds to each successive argument an existential presupposition (cf. Sauerland 2005). Movement in this approach is free but dispreferred and it is licensed only if it leads to an interpretation which would not be available otherwise (along the lines of Fox (2000, 1995); Reinhart (1995)). The resulting structure is licensed by the interfaces only if it satisfies Maximize presupposition and does not lead to presupposition failure.

1 Introduction

Czech is in general SVO language but other orders are attested as well. In principle, any word order combination may result in a grammatical structure. There is, however, a direct correlation between the word order of an utterance and its information structure. More precisely, in a given context and with a particular interpretation, there is *only one* felicitous order.

Consider (1) where (1-a) is the basic word order, i.e., the order which is felicitous in the out of blue context, and (1-b) is a derived order.

- (1) a. SVO: Chlapec našel lízátko.
 boy.Nom found lollipop.Acc
 b. OVS: Lízátko našel chlapec.
 lollipop.Acc found boy.Nom

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(2) lists interpretations that may be available to the word orders from (1).¹ The examples illustrate that there is an asymmetry in the range of interpretations available for the basic word order and a derived order. The first empirical generalization we need to account for is that while a basic word order is felicitous in multiple contexts, a derived word order disambiguates.

- (2) Possible interpretations:
- a. **SV0**: Chlapec našel lízátko.
 boy.Nom found lollipop.Acc
 (i) ‘A boy found a lollipop.’ ← **new** > **new**
 (ii) ‘The boy found a lollipop.’ ← **given** > **new**
 (iii) ‘The boy found the lollipop.’ ← **given** > **given**
 (iv) #‘A boy found the lollipop.’ ← # **new** > **given**
 - b. **OVS**: Lízátko našel chlapec. ← **given** > **new**
 lollipop.Acc found boy.Nom
 ‘A boy found the lollipop.’

Another property of the Czech word orders that we learn from (1) and (2) is that there is a relation between given and new parts of the utterance (where *given* stands for items introduced in the previous discourse and *new* refers to new information). As we can see if there are any given elements, they must linearly precede all new elements. We can understand this generalization in terms of a linear partition between the given and the new part of an utterance. As we will see in more details shortly, such a partition may in principle fall at any point of the structure. For now, we capture the second empirical generalization about word orders in Czech as in (3).

- (3) a. # **new** > **given**
 b. ✓ **given** > **new**

The fact that complicates the matters and makes the account of the Czech word order patterns a nontrivial task is that not every word order is possible with a particular interpretation. Thus even though the given-before-new condition is a necessary condition, it is not a sufficient one. For example, if the verb and the object are given and the only new material is the subject, the only felicitous order is OVS.²

- (4) a. ✓ **O V S**
 b. # **V O S**

Before we proceed to the actual proposal, there is one more empirical observation that needs to be accounted for: in Czech, utterances are internally divided into *domains*.

¹In this paper, I consider only examples without contrastive focus or topic intonation and interpretation. All the examples under discussion are realized with a neutral intonation contour, i.e., the utterance begins with a slight rise followed by a steady decline. The main sentential prominence falls on the first syllable of the linearly rightmost prosodic word.

²Given elements are throughout the paper typeset in boldface.

There may be a partition between given and new within any domain. Thus, there can be more than one partition within an utterance (or a finite clause). Domains correspond to chunks that have been independently argued to be propositional. Some examples are given in (5) and (6).³

- (5) a. Do you know anything about Petr and Marie?
 b. Náhodou jsem slyšel, že **Petrovi** || říkala nějaká paní, že
 accidentally Aux.1sg heard that Petr.Dat told some lady that
Marii || zaměstnali v ABB.
 Marie.Acc employed.1pl in ABB
 ‘I accidentally heard that some lady told Petr that Marie got employed in the ABB.’
- (6) a. Do you know what Mary did with her famous boat?
 b. **Marie** || se pokusila **loď** || prodat.
 Marie REFL tried boat to-sell
 ‘Marie tried to sell the boat (but no one wanted to buy it).’
 c. **Marii** || nařídil soud **loď** || prodat.
 Marie.Dat ordered court.Nom boat.Acc to-sell
 ‘(You won’t believe it but) a court ordered Marie to sell the boat.’

To summarize, there are three basic empirical generalizations that need to be accounted for:

- (7) a. While a basic word order is felicitous in multiple contexts, a derived word order disambiguates.
 b. If there is a given element, it must precede all new elements.
 c. An utterance may be divided into domains. Within any domain there can be a partition between given and new.

The goal of this paper is (i) to characterize the word order restrictions and their relation to information structure, and (ii) to explain it.

The paper is structured as follows. I will spell out the proposal in section 2. Section 3 looks at further predictions the account makes. In section 4 I will address the question of what constitutes the domains. Finally, section 5 discusses comparison of structures which is needed in order to choose the best alternative.

2 The proposal

The basic intuition I follow here has been around at least since Mathesius’ Prague lectures in 1908. The intuition is that structures are divided into domains and any domain can be partitioned at any position within the domain. This is what we learn from the basic word

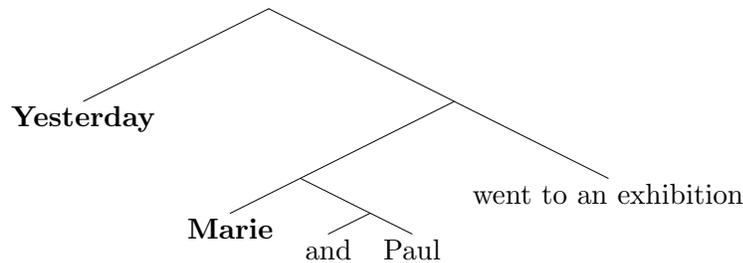
³Partitions are throughout the text marked by || sign.

order patterns. I shift the intuition here a bit and instead of thinking about the partition as two separate domains, I will assume that there is a point in the structure from which everything up is given. As we will see, this move results in different predictions.

Consider the structure in (8). As we can see, even if the partition is off the main sentential spine, the spine is affected upwards.

In structural terms, the partition point is asymmetrically c-commanded by all given elements, but the non-given elements do not need to be asymmetrically c-commanded by the partition point.

- (8) (Context: Did Mary do anything yesterday?)
Yesterday Marie || and Paul went to an exhibition.



In other words, it is more natural to define the structural relation between the partition and the given elements and not the relation between the partition and the new elements. The relation to the new elements is easier to define as an elsewhere condition.

I will formalize this observation in the following way. I propose to capture the structural relation by a syncategorematic operator which marks elements in its scope as given. For concreteness, I follow Sauerland (2005) in assuming that givenness gives rise to an existential presupposition (cf. Schwarzschild 1999). My interest, however, lies in how givenness applies compositionally, the actual lexical entry is not crucial. The proposal may be modified in this respect if the need arises.

Crucially, the operator recursively propagates upwards and terminates on an atomic semantic type.⁴ The operator which I will call G-operator, where G stands for Given, is defined in (9).^{5,6} A schematic illustration of how the operator works is given in (10).

⁴Throughout the paper I will work with a simplifying assumption that the relevant atomic type is propositional, i.e., t or $\langle s, t \rangle$. The reader should keep in mind that it may be discovered that other semantic types function as terminating points as well. The argument goes through as long as we can define the terminating condition in compositional terms.

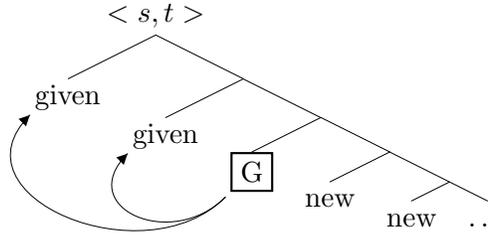
⁵This particular formalization of the G-operator has been suggested by Roni Katzir.

⁶The operator may seem to be unusual because it operates upwards. This is not so exceptional though, see for example Partee and Rooth (1983) and Beck and Sauerland (2000) for recursive upwards oriented operators for coordination and cumulativity.

(9) **G-operator:**

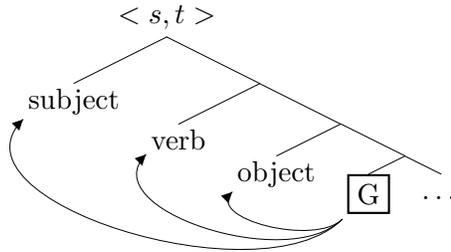
$$G(B) = \begin{cases} \lambda A_\alpha : \text{Given}(A).G(\llbracket B \ A \rrbracket) & B \text{ is of type } \langle \alpha, \beta \rangle \text{ where } \alpha, \beta \\ & \text{is not an atomic semantic type} \\ B & \text{otherwise} \end{cases}$$

(10)



Let's have a look at what the operator does for us. First of all, once the operator starts propagating upwards it does not stop unless it reaches the edge of a domain. This results in structures being divided into domains in which given precedes new. Furthermore, the operator can be inserted at any place of the structure, therefore, we expect the partition between given and new to fall at any point of the structure as well.

Now we can account for basic word order structures and their interpretation. The question is whether the proposal can account for structures in which a given element is base generated below a new element. To see this, let's look at what happens if only the object is given and the subject and the verb are new. The relevant structure is given in (11).

(11) Only object is given (S V || O):
Option I: G operator inserted on O:

There is no way we can insert the G-operator without adding a presupposition to elements which are given. Since the elements above the object are new, the result would be presupposition failure.

We have already seen in (2) that in such a configuration the word order must change, as in (12).

$$(12) \quad S V O \rightarrow O \boxed{G} V S$$

The question that arises is why we need to change the order, why we can't just omit the operator. This is in fact a non-trivial question. If we did not insert the operator, the structure would be syntactically well-formed and interpretable. Furthermore, if we follow Schwarzschild (1999) and others in assuming that for α to be given there must be an antecedent in the previous discourse (or α must be implied by the previous discourse), the object should be interpreted as given even without the G-operator being inserted. In short, there does not seem to be any problem with the structure without reordering. I argue that the reason why the structure without reordering is not felicitous is because it violates the principle of Maximize Presupposition (Heim, 1991; Sauerland, 2007), (13).

(13) **Maximize Presupposition**

In context C used the most informative presupposition satisfied in C.

The principle asserts that if a presupposition may be grammatically marked, it must be marked. In Czech, there is a tension between Maximize Presupposition that prefers the G-operator to be inserted low in the structure and the need to avoid presupposition failure. To avoid the conflict between Maximize Presupposition and presupposition failure we need to reorder the structure.⁷ In particular, I assume that the reordering is a result of free movement which is in general dispreferred but which may be licensed if it gives rise to an otherwise unavailable interpretation (cf. Reinhart 1995, 2006; Fox 1995, 2000).⁸ The resulting structure is licensed by the interfaces only if it satisfies Maximize Presupposition and does not lead to presupposition failure.

To summarize, the proposal derives the relation between word order and information structure through interaction of Maximize Presupposition, the need to avoid presupposition failure, and the economy condition on movement. The only component not familiar from other areas is the recursive G-operator. In section 5, I will argue that the interaction can be modeled in a grammar which uses reference set computation.

So far we have encountered two basic situations: (i) basic word orders in which it was sufficient to plug a G-operator which marked everything upwards as presupposed, and (ii) structures in which there was a given element below a new element and the structure must have been reordered. Crucially, I have argued that reordering is licensed only if it can avoid a conflict between two pragmatic requirements: Maximize presupposition and presupposition failure.⁹

The question that immediately arises is what happens if the interpretative conflict cannot be avoided by movement because movement is excluded on independent syntactic grounds.

⁷Movement in order to strengthen presupposition, even though not in connection with Maximize Presupposition, has been explored in other recent work, cf. for example Wagner 2005, To appear.

⁸The movement is furthermore restricted by independent syntactic restrictions on movement in Czech. For more details see Kučerová 2007.

⁹Notice that the proposal predicts that if a language does not have a recursive G-operator but a non-recursive one, such as English (Sauerland, 2005), the conflict between Maximize Presupposition and presupposition failure does not arise and reordering is not expected.

3 Further predictions: Coordination

In the cases we have discussed so far movement was dispreferred but it could have been licensed if it avoided an interpretive conflict between Maximize Presupposition and presupposition failure. The question is what happens if movement is not only dispreferred but is not allowed. It is not clear what exactly the prediction is: either one of the pragmatic notions might get violated, or there might be another strategy that could be used to solve the conflict.

An obvious place to look at is syntactic islands. However, the predictions are not easy to test because islands often coincide with an atomic type. Thus, we cannot be sure whether there is a G-operator that terminates on the edge of the island. Fortunately, there is an exception: coordinations. Since a coordination preserves its semantic type it is possible to construct examples in which inserting the G-operator should necessarily lead to presupposition failure because the operator would propagate out of the coordination. There are two basic cases to consider: (i) a structure in which a coordination is adjoined to an atomic semantic type, and (ii) a structure in which a coordination is not adjoined to an atomic semantic type. In particular we will look at DP coordinations.

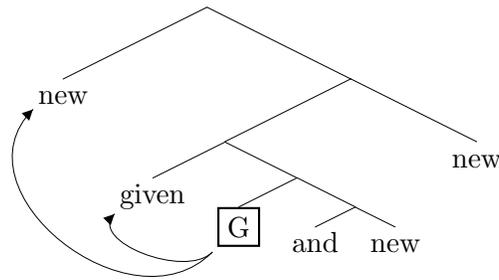
In the case of a coordination adjoined to an atomic semantic type we predict that there should be no problem with a DP coordination if it is adjoined to an atomic semantic type (e.g., a coordinated subject). We predict that the structure should be well formed as long as the given part of the coordination precedes the new part of the coordination. This prediction is borne out as can be seen in (15) and (16). The relevant context is given in (14).¹⁰

- (14) Na programu byla diskuse o nové učitelce. context
 on program was discussion about new teacher
 ‘The topic of the program was a discussion about a new teacher.’
- (15) **Učitelku** a (její) žáky to překvapilo. ← ✓ DP & DP
 teacher and her students it surprised
 ‘The teacher and (her) students were surprised by it.’
- (16) #Žáky a **učitelku** to překvapilo. ← # DP & DP
 students and teacher it surprised
 ‘A teacher and (her) students were surprised by it.’

Let’s now consider predictions for the later case, i.e., the case in which a DP coordination is not adjoined to an atomic semantic type. The predictions are unclear. As illustrated by (17), inserting the G-operator necessarily leads to presupposition failure. On the other hand, if the operator is not inserted, the Maximize Presupposition principle is violated. If we look at the actual data, in (18), we see that the structure is not felicitous, suggesting that the pragmatic requirements must be obeyed.

¹⁰Notice that the appropriate structure must be base generated. It cannot be derived by movement. This immediately raises the question of how is the right structure selected. I will address the question in section 5.

(17)



- (18) #To se nelíbilo ani **učitelce** ani žákům. ← # new > DP & DP
 it REFL not-liked nor teacher nor students
 ‘Neither a teacher nor students were happy about it.’

Interestingly, the grammar provides a way out: if the given element is pronominalized,¹¹ the final structure is felicitous, (19).

- (19) a. To se nelíbilo ani **jí** ani žákům. ✓pronoun
 it REFL not-liked nor her nor students
 ‘Neither she nor students were happy about it.’
 b. To se nelíbilo ani **té učitelce** ani žákům. ✓that DP
 it REFL not-liked nor that teacher nor students
 ‘Neither the/that teacher nor students were happy about it.’

This is puzzling. Why should pronominalization be relevant? I argue that the reason is that the lexical entries of pronouns give rise to a presupposition, thus Maximize Presupposition may be satisfied even if the presupposition is not added by the G-operator. The prediction of this move is clear: If pronouns never require to be marked by the G-operator, they should not undergo movement because of givenness. This prediction is borne out as can be seen in (20). If the object ‘Pavel’ is realized as a pronoun, it cannot precede the new subject ‘Marie’. On the other hand, if the object is realized by the full DP ‘Pavel’, the reordering is mandatory. The example in (21) is here as a control, showing that in principle there is nothing wrong with a pronoun being sentence initial.

- (20) What do you know about Pavel?
 a. Marie **ho** viděla na nádraží. ✓new > pron.
 Marie.Nom him.Acc saw on railway-station
 b. #Marie **Pavla** viděla na nádraží. # new > DP
 Marie.Nom Pavla.Acc saw on railway-station
 c. #**Jeho** viděla Marie na nádraží. # pron. 1st
 him.Acc saw Marie.Nom on railway-station

¹¹The given element may be either realized by a personal pronoun or the DP must be modified by a demonstrative pronoun. The two strategies lead to a slightly different interpretations. I put the difference aside and concentrate only on structures with personal pronouns.

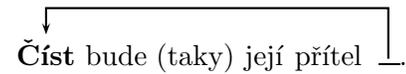
- d. **Pavla** viděla Marie na nádraží. ✓DP first
 Pavel.Acc saw Marie.Nom on railway-station
 ‘Marie saw him/Pavel in the railway-station.’
- (21) JEho Marie neviděla. Jenom Petra.
 him.Acc Marie.Nom not-saw only Petr.Acc
 ‘Marie didn’t see HIM. She saw only Peter.’

We can conclude that if a lexical entry of α gives rise to a presupposition, there is no need to introduce the presupposition by the G-operator. Notice that in the case of pronominalization it is crucial that we have motivated the reordering as marking of given elements. If we semantically marked new elements, the distinct behavior of pronouns and full DPs would be entirely unexpected.

3.1 A remaining puzzle

An interesting question which I will not be able to answer this time is what happens if there is no nominal alternative that could rescue the interpretation. A place to look at are verbal coordinations. The relevant scenario is in (22). As we can see in (23), verbs also move for pragmatic reasons. They also obey the requirement that the given verb must precede the new one, compare (24) and (25).

- (22) Many of my friends have recently decided to change their lifestyle. . .
 a. Tak jedna moje kamarádka bude víc **číst**. ← scenario
 so one my friend will more read
 ‘For example, a friend of mine will read more.’

- (23) 
Číst bude (taky) její přítel
 read will also her friend
 ‘Her boyfriend will read as well.’

- (24) A její přítel bude [**číst** a překládat]. ← ✓VP & VP
 and her friend will read and translate
 ‘And her boyfriend will read and translate.’
- (25) #A její přítel bude [překládat a **číst**]. ← # VP & VP
 and her friend will translate and read
 ‘And her boyfriend will translate and read.’

Unfortunately, at this point we cannot conclude more from the facts. The reason is that it is not clear where the relevant semantic boundary lies. Furthermore, we cannot exclude the possibility that the relevant structures contain coordination reduction. More research needs to be done in order to understand the data.

4 Establishing the domains

Under the definition in (9), the G-operator terminates on an atomic semantic type. If this is correct then it follows that given elements should gather on the closest left edge corresponding to an atomic type.¹² This is the closest structural point where they achieve the desirable interpretation. This section looks closely at whether this prediction is borne out.

Let's first consider finite clauses. Since finite clauses correspond to propositions, we expect given elements not to be able to move out of a finite clause. This is correct, as witnessed by (26).¹³

- (26) For a long time I didn't know what was going on with Mary. But then...
- a. mi Petr řekl, že **Marii** potkalo velké štěstí.
 me Petr.Nom told that Marie.Acc met big happiness
 'Peter told me that Marie got extremely lucky. (She won a lottery.)'
- b. #**Marii** mi Petr řekl, že potkalo velké štěstí.
 Marie.Acc me Petr.Nom told that met big happiness

Infinitives too correspond to propositions.¹⁴ Thus, we predict given elements not to be able to move out of infinitives as well. As can be seen in (27), this is correct.¹⁵

- (27) What happened to the antique chair you got many years ago from Mary?
- a. Petr se pokusil / chtěl / dokázal **tu židli** spálit.
 Petr REFL tried wanted managed that chair burn.Inf
 'Petr tried/wanted/managed to burn the chair.'
- b. #**Tu židli** (se) Petr pokusil / chtěl / dokázal spálit.
 that chair (REFL) Petr tried wanted managed burn.Inf
 'Petr tried/wanted/managed to burn the chair.'

Interestingly, in Czech different tenses have different morphological formation. While present tense is synthetic (the lexical verb is fully inflected), future tense is analytic (formed by an auxiliary and an infinitive). If we assume that a tense auxiliary selects for a proposition, we expect to find a difference in locality of movement of given elements between the Present tense and the Future tense. As can be seen in (28) and (29), this is indeed so. While in the Present tense, given elements move to the left edge of the finite clause, the movement in the Future tense is more local.

¹²For much what follows, it is enough to look only at propositional types.

¹³All infelicitous examples in this section are grammatical but the fronted element cannot be interpreted as given. The fronted element usually obtains topic or contrastive reading; for example, *Mary is fond of Peter, not of Bill.*, (32-c), or *As to the chair, Peter wanted to burn it, but he definitely wanted to keep the table.*, (27-b).

¹⁴I use the word proposition both for tense and tenseless propositions.

¹⁵There is no problem with moving out of infinitives in general. For example clitics may freely move out of infinitives in Czech.

- (28) *Present: given elements move to the left edge*
- What is happening to the book?
 - Tu knihu** || dává Marie Petrovi. ← **synthetic**
the book.Acc gives Marie.Nom Petr.Dat
'Marie gives the book to Petr.'
- (29) *Future: given elements may move only locally:*
- What will happen to the book?
 - Marie bude **tu knihu** dávat Petrovi. ← **analytic**
Marie.Nom will the book.Acc give.Inf Petr.Dat
'Marie will give the book to Peter.'
 - #**Tu knihu** bude Marie dávat Petrovi.
the book.Acc will Marie.Nom give.Inf Petr.Dat
'Marie will give the book to Peter.'

One might object that the contrast is related to the future tense being formed by an infinitive. The same contrast is attested in a more minimal environment, in particular in the Past tense. In Czech there is a difference between 3rd person and 1st/2nd person. Only 1st and 2nd person have an overt tense auxiliary, there is no auxiliary for 3rd person. Thus, we predict that given elements move further in sentences with 3rd person subjects than in sentences with 1st or 2nd person subjects. As can be seen in (30) and (31), the prediction is borne out.

- (30) *3sg.:*
- What happened to the boat that got damaged in the last storm?
 - Loď** opravil jeden technik.
boat.Acc repaired one technician.Nom
'A technician repaired the boat.'
- (31) *1pl.:*
- What happened to the boat that got damaged in the last storm?
 - Jeden technik a já jsme **loď** opravili.
one technician.Nom and I Aux.1pl boat.Acc repaired
'A technician and I repaired the boat.'

Since small clauses correspond to propositions as well, we expect given elements to be unable to move out of small clauses. This is correct, as witnessed by (32).

- (32)
- Why does Peter look so happy?
 - Marie je **na Petra** pyšná ____.
Marie.Nom is of Petr proud
'Marie is fond of Peter.'
 - #**Na Petra** je Marie pyšná.
of Petr is Marie proud

To sum up, movement of a given element is attested only within the smallest propositional domain that contains the element. This is expected under the proposal which assumes that movement for givenness is licensed only if it is needed to create a configuration in which the G-operator may be inserted without causing presupposition failure.

5 The evaluation component

The proposal developed in this paper relies on an architecture of grammar which allows comparison of different structures. This follows both from the economy condition on movement and the pronominalization facts. One possible way to account for the data is to assume a grammar which computes global comparison over structures. To make the proposal precise, we need to define two components: (i) a reference set over which the comparison is computed, and (ii) an evaluation metric. The definition of the reference set I argue for is given in (33).

(33) **Reference set for Maximize Presupposition evaluation**

For purposes of Maximize Presupposition, the reference set, toward which Maximize presupposition is evaluated, consists of all derivations

- a. that are based on the same numeration and free insertion of G-operator, and
- b. that make the same assertion.

One may wonder whether this is sufficient. The seeming counterexample comes from the pronominalization cases. If we assume that the relevant reference set is based on the same numeration, we do not expect a full DP and its pronominal realization to be within the same numeration. One possibility is to treat pronouns as DP ellipses (Elbourne , 2005), or we could formalize pronouns as pronunciation of ϕ -features as suggested in Heim (2008). In both cases, the numeration would contain the full DP. The difference between pronominal or full lexical realization would be realized only in the morphophonological component.

Let's now turn to defining the relevant metric. I argue that the evaluation must consider two main factors: (i) grammatical well-formedness of structures (ungrammatical structures cannot enter the comparison), and (ii) pragmatic considerations. The syntactic and pragmatic parameters are listed in (34) and (35), respectively.

(34) **SYNTAX:**

- a. the reference set may contain only grammatically well-formed structures
- b. the optimal structure has the smallest number of movement necessary to obtain an otherwise unavailable semantic interpretation (Reinhart , 1995; Fox , 1995, 2000; Reinhart , 2006)

- (35) INTERPRETATION:
- a. a presupposed element must be marked as given (either lexically, or by a G-operator) [\approx Maximize Presupposition]
 - b. a new element cannot be marked as given [\approx Presupposition Failure]

6 Conclusion

Based on word order patterns in Czech I have argued that reordering which relates to information structure arises from the tension between two pragmatic drives and an economy condition on otherwise free movement operation. The syntactic part of the proposal guarantees that only syntactically well-formed structures would be considered. I have argued that movement is dispreferred and is licensed only if it enables an otherwise unavailable semantic interpretation (Reinhart , 1995; Fox , 1995, 2000; Reinhart , 2006). The syntactic output is evaluated with respect to Maximize presupposition (Heim , 1991) and presupposition failure.

My particular implementation consists of a recursive G(iven)-operator which takes a new material as its complement and which adds a presupposition to all upward elements. I have suggested that the operator terminates on an atomic semantic type, which is supported by the facts about domains in which given elements may move. Finally, I have argued that the reference set for purposes of Maximize Presupposition is defined as the set of derivations that have the same numeration and the same assertion.

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