Contextual versus Inherent Properties of Entities in Space

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Abstract[1]

The relation between the locatum and the relatum of a spatial expression is asymmetric in two respects. The first asymmetry concerns the contextual properties of the two entities: it is assumed that the location of the locatum is less likely than the location of the relatum to be part of the common ground. The second asymmetry pertains to inherent properties: the relatum is more likely than the locatum to belong to a type of entities that occupy a fixed place in space. The aim of this paper is to inspect the interplay between contextual and inherent properties of entities with respect to their impact on the encoding of spatial relations. Based on elicited semi-spontaneous data from German, Greek, and Yucatec Maya, we argue that the inherent properties of entities that relate to their potential to occur in several locations have implications for the assumptions of the speaker about the common ground. As a consequence, the observable effects of these inherent properties and the effects of the context are reducible to a single concept of common-ground related assumptions.

1 Preliminaries

This paper compares the impact of contextual and inherent properties of entities on the linguistic encoding of spatial relations. Two entities are involved in a spatial relation: an entity that is localized in space, i.e., the locatum, and an entity with respect to which the location of the locatum is specified, i.e. the relatum. For instance, the spatial relation in (1) involves the locatum *the cat* and the relatum *the table*.

[1] The present investigation is part of our research within the SFB 632 “Information Structure” at the University of Potsdam/Humboldt University Berlin (financed by the German Research Foundation).

(1) The cat is sitting on the table.

We distinguish between two types of properties that determine the assignment of the locatum and the relatum role in discourse: contextual and inherent properties. Contextual properties relate to the information status of the entities involved and are often established in a particular discourse situation. The inherent properties of entities apply independently of the situation in which they are involved, e.g., animacy, movability, size, shape, etc. In this paper, we investigate a single inherent property that relates to the potential of an entity to occupy different places in space: the concept of movability. Further inherent properties of entities, such as animacy or size, may affect the encoding of spatial relations, and probably are related to movability to some extent. However, these properties are not examined or discussed in this paper.

As regards the contextual properties, there is an asymmetry concerning the availability of the entity's location in the common ground. We conceive of the common ground as the set of propositions held to be true by both the speaker and the hearer (cf. Stalnaker 1974 and 1998). More precisely, we take common ground as the set of propositions that the speaker thinks that he shares with the hearer. By implication, every entity (be it an object or a location) that figures in a proposition that is part of the common ground also is part of the common ground. Linguistic expressions can denote entities which are part of the common ground. In this case, we will say that information status of the entities (their status with respect to the common ground) is *given*. Otherwise, we will say that the information status of the entity is *new.* Since the locatum is the entity that is linguistically localized in space, its location is typically not part of the common ground: its location is new. Since the relatum is the entity chosen to specify the place of the locatum, its location is expected to be part of the common ground: its location is given. For instance, a discourse context in which the speaker assumes that the hearer is familiar with the location of the dog, but is ignorant of the location of a cat may trigger the spatial description (2a) rather than the spatial description (2b).

(2) a. The cat is to the right of the dog.
b. The dog is to the left of the cat.

This asymmetry in the information status of the entities' places, which we will call *contextual* in what follows, permits for some expectations about the inherent properties of the entities that are likely to occur as locata and relata in spatial descriptions. Entities differ in their potential to occur in different locations: Some entities normally occupy fixed places in space, e.g., houses, trees, etc., whereas other entities change location: e.g. higher animates, pieces of furniture, etc. In a discourse context, the location of a non-movable entity is more likely to be part of the common ground than the location of a movable entity and, as a consequence of the asymmetry in contextual properties, non-movable entities are more likely expected to figure as relata. Accordingly, the sentence (3b) is expected to occur in a restricted number of contexts in comparison to (3a).

(3) a. The cat is to the right of the house.
b. The house is to the left of the cat.

The aim of this paper is to empirically investigate the interrelation between contextual and inherent properties with respect to the encoding of a description of spatial layouts. Previous accounts of spatial descriptions have proposed several factors that may affect the assignment of the locatum and the relatum role, as for instance givenness of entities (Hörnig, Oberauer, & Weidenfeld 2005, Levelt 1989, Miller & Johnson-Laird 1976, Vandeloise 1986), factual movement (Huttenlocher & Strauss 1968, Levelt 1989, Talmy 2000), movability (Miller & Johnson-Laird 1976, Talmy 2000: 183), perceptual salience (Miller & Johnson-Laird 1976, Langacker 1987, Talmy 2000), size (Levelt 1989, Miller & Johnson-Laird 1976, Talmy 2000), the asymmetry of spatial regions (Clark 1973, Clark & Clark 1978), etc. Our production study manipulates two contextual properties, the information status of entities and places, and movability as a crucial inherent property. We will argue that the observed effects with respect to these properties may be explained by a single rule that is contextual in nature, i.e., to assign the role of locatum to the entity whose location is new.

Although we are aware that movability of an entity is not a clear-cut binary distinction, but rather a matter of the degree to which an entity can be expected to occupy different places at different points in time, we will treat movability as a binary distinction for the purposes of this study (non-movable vs. movable). For example, we will categorize an entity like a house as non-movable, although it is not inconceivable that we encounter one and the same house at different places at different times. For the aims of the present investigation we will deal with two situation types containing two entities:

(a) a situation type in which both entities are movable;
(b) a situation type in which one entity is movable and the other one is not.

Situation type (b) involves an asymmetry in movability whereas situation type (a) is symmetric with respect to movability. The only assumption required for (b) is that entities differ in their potential to occupy different locations in different situations. Take for instance the difference between persons and houses. It is much easier to imagine different situations in which a person, as compared to a house, occupies different locations. That means that we assume a subset S of inferable situations, that contains those situations which occur at a certain level of chance such that it accounts for the intuitive difference between persons and houses. At this level, we assume that movable and non-movable entities are categorically distinguished. Movable entities may occupy different locations in situations that are part of the subset S. Non-movable entities occupy the same location in every situation belonging to the subset S , or semi-formally:

(4) Let s and s' be situations such that $s, s' \in S$, and let l be a location in space, then the property of the entity e of being non-movable $e[-m]$ is defined as

follows: Iff there is a situation *s* in which an entity *e* occupies a location *l*, then it holds for any situation *s´* that the entity *e* occupies *l*.

For movable entities (*e*[+m]), this definition does not hold – the location of a movable entity in one situation does not determine the location of that entity in other possible situations.

Turning now to the contextual properties, two properties of entities will be discussed: first, the information status of the entity's location, i.e., whether the speaker assumes that the hearer knows the location of the entity in a situation *s*, and, second, the information status of the entity itself, i.e., whether the speaker assumes that the hearer knows of the existence of the entity in a situation *s*. The two contextual properties are not independent from one another: if an entity is not part of the common ground, its location cannot be part of the common ground either. On the other hand, if an entity is part of the common ground, then its location may be part of the common ground or not. In sum:

(5) The location of *e* can be part of the common ground only if *e* is part of the common ground.

In order to investigate the effects of the contextual and inherent properties, a production study manipulating movability and the information status of entities and their placements was performed in German, Greek, and Yucatec Maya (see Section 2). To anticipate the results, the data show that contextual and inherent properties of entities have an influence on the role choice in asymmetric spatial descriptions (see Section 3.2). Descriptions are asymmetric if in a relational description the speaker assigns one entity the locatum role and the other one the relatum role. The data also show that speakers sometimes produce symmetric spatial descriptions by assigning both entities the locatum role. The speaker can do this by producing two non-relational localizations by means of spatial adverbs, for example, *The woman is on the left and the man is on the right*, or by producing a reciprocal relational localization in which both entities figure as locatum and relatum, for example, *A woman and a man are standing next to each other*. In the Result Section, we will deal with the distinction between asymmetric and symmetric description under the heading: choice of propositional format (see Section 3.1).

2 Production study

2.1 Method

The method we present in the following formed part of a pilot version of a tool for linguistic fieldwork named QUIS (=*Questionnaire on Information Structure*; see Skopeteas et al. 2006), which contains 29 production tasks concerning several aspects of information structure. The aim of this pilot version was to create a cross-linguistic data set in order to identify the locus of typological variation with respect to the encoding of information structure. Since the purpose of this phase was an exploration of factors that have an influence on or interact with information structure, the experimental design (in particular the number of items) had to be restricted to a minimum.

For the most part, the production study was an interactive game with two consultants, a speaker and a hearer. On most trials, both consultants were given an identical set of three pictures, each depicting two entities. The target picture of a set was highlighted in the speaker's set but not in the hearer's set. The task of the speaker was to briefly describe the target picture such that the hearer would be able to identify it in her own set. The target picture of a set varied in what it had in common with the non-target pictures (see conditions outlined in Section 2.3). The stimuli were created through the 3D rendering software package POSER 5.0. Figure 1 and 2 illustrate speaker's sets consisting of three pictures each, one of which is highlighted. The picture background was designed to evoke the impression that the presented picture frame is identical for all pictures, but the obtained descriptions indicated that consultants might have ignored the details of the picture background (see Discussion in Section 4).

The picture sets in Figure 1 and 2 involve an asymmetry in movability: they pair a non-movable entity, a tree, with movable entities, a boy in Figure 1 and a boy, a woman, and a man in Figure 2. Two variants of picture sets with a movability asymmetry (designated by 'M↗') were composed by combining two sets of movable entities – Set A = {*boy*, *woman*, *man*}; Set B = {*dog*, *cat*, *lion*) – with a corresponding set of non-movable entities – Set A = {*tree*, *house*, *street lamp*}; Set B = {*house*, *well*, *fence*}. Similar variants of picture sets for pairings of two movable entities (movability symmetry, designated by 'M↕') were composed by combining the movable entities within either set A (extended by *girl*) or set B (extended by *horse*).

Before we address the contextual asymmetries in the picture sets, we need to clarify how the contextual variables, i.e., the information status of entities and their placement in the target picture, relate to the properties of the picture sets. Recall that in the interactive game the task of the speaker was to produce an utterance to the effect that the hearer is able to identify the target picture among a set of three pictures. In order to do so, the speaker must differentiate between entities and placements of entities common to all three pictures and entities and placements of entities that are unique to the target picture. Only the latter are apt to discriminate the target picture. The speaker knows that the hearer knows in advance that entities and placements of entities common to all pictures must also be part of the target picture. Hence, these entities and their placements are part of the common ground and count as given. In contrast, entities and placements of entities unique to the target picture are unknown to the hearer prior to the speaker's utterance. Such discriminative information unique to the target picture is not part of the common ground and counts as new.

Figure 1 illustrates a single asymmetry in contextual properties (designated by 'C↗'), i.e., an asymmetry in the information status of the entities' locations.

All three situations involve the same two entities, the boy and the tree. Hence the tree as well as the boy are given. However, the spatial relation between the tree and the boy differs in the three situations. The pictures in Figure 1 were meant to imply that the place of the tree is the same in all three situations (given entity at given place), but the place of the boy is a different one in in all three situation. Hence, the place of the boy in the target picture is new (given entity at new place).

Figure 1: Illustration of the stimulus material (speaker's set, condition C↗M↗)

Figure 2 illustrates a twofold asymmetry in contextual properties (designated by 'C↗↗'), i.e., an asymmetry in the information status of the entities' locations together with an asymmetry in the information status of the entities themselves. The pictures in Figure 2 were meant to imply that they all show the same tree at the same place, hence the tree as well as its place is given (given entity at given place). The movable entity is a different one in each picture, thus the boy in the target picture is new. Moreover, since the place of the boy is occupied by a different entity in the other two pictures, the place of the boy in the target picture is new, too (new entity at new place).

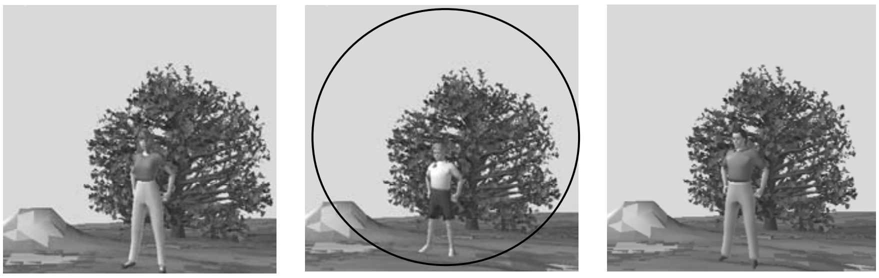


Figure 2: Illustration of the stimulus material (speaker's set, condition C↗↗M↗)

Consultants were instructed as follows:

[to the speaker] "Make a short statement describing what is going on in the highlighted scene, such that your partner will be able to identify it. Please do not mention the picture, just give a short description of the highlighted scene, so that it is clearly identified from the others. Before you make your description, look very carefully about the differences between the scenes, so that your description effectively identifies the highlighted one". [to the hearer] "You listen carefully to your partner. After s/he finishes her/his description, please point at the scene which you suppose is the highlighted one in her/his sheet".

In the picture set in Figure 2, the two entities are arranged along the saggital axis (front-back), while in the second variant of picture sets, the entities were arranged along the lateral axis (left-right). Possible effects of regions (front > back; see Clark 1973, Clark & Clark 1978) or of the relative size of movable entities were outbalanced by testing conditions with two movable entities twice: the corresponding contextual manipulation was applied once to either entity.

In addition to picture sets, speakers were occasionally given a single target picture which they were asked to describe briefly. These trials, in which both entities and their places are new (contextual symmetry, designated by 'C$\updownarrow$'), constitute the baseline condition for trials with picture sets which all involve a contextual asymmetry.

The trials were part of a large field session that contained several tasks being used as fillers to one another (total duration: ca. 60 min.). Each session contained one single target picture description which was elicited early in the session, and four trials of the interactive game with picture sets. All trials were maximally separated from one another within the one-hour session. The relative order of the interactive game was pseudo-randomized in order to control for effects of the previous mention of the stimulus.

2.2 Object languages

The production study was performed in German, Greek, and Yucatec Maya. The relevant structural properties of all three languages are quite similar. Verbs used in static spatial descriptions are either 'be'/'exist'-verbs or verbs encoding postural properties of the locatum (e.g., 'stand', 'lay', etc.). In the presence of a NP complement, spatial regions are expressed in all three languages through prepositional elements, i.e., simple prepositions in German, complex prepositions (adverb+preposition) in Greek, and relational substantives in Yucatec Maya. In the absence of a NP complement, spatial regions are expressed through adverbs in German and Greek and through relational substantives in Yucatec Maya. The order that most frequently surfaces in German main clauses is SVO. The pragmatically neutral word orders in Modern Greek and Yucatec Maya are verb initial, VSO and VOS respectively, but the most frequent order in speech production is SVO with topicalized S in both languages.[2]

[2] For the encoding of spatial relations in German see Wunderlich (1982), for Greek see Fries (1991) and Theophanopoulou-Kontou (2000), and for Yucatec Maya see Goldap (1991) and Lehmann (1992).

It is important to note that we do not have a differential hypothesis concerning the interaction of inherent and contextual properties of the entities in these three languages, as it will become clear in the expectations we formulate in the following section. We are dealing with factors that influence the choice of propositional format and role assignment. There is no reason to assume that the structural differences between German, Greek, and Yucatec Maya grammars have an impact at this level. A potential influence of the grammar on role choice could be the availability of selectional restrictions with respect to the inherent properties of the locatum or the relatum. For instance, in some languages spatial relators (adpositions or verbs) display very specific selectional restrictions with respect to the inherent properties of the arguments.[3] In such a grammar, lexical constraints may have an influence on role assignment, but this does not apply on German, Greek, and Yucatec Maya.

The structural differences of our object languages may have an impact on the word order (e.g., the verb-second constraint in German, or the availability of structurally marked topic and focus positions in Yucatec Maya) or the prosodic realization of the utterance (German and Greek are intonational languages while Yucatec Maya is a tonal language), but we do not assume that these differences influence the choice of propositional format and the role assignment that are at issue in this paper.

2.3 Conditions and expectations

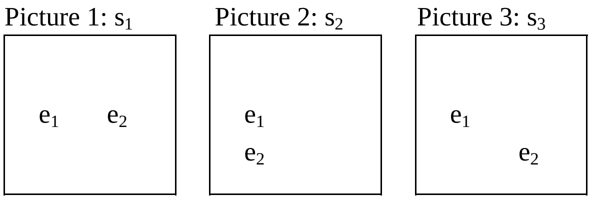
Our experimental conditions vary whether two entities are symmetric or asymmetric with respect to contextual properties (‘C’) and with respect to movability (‘M’). The shorthand ‚⇕’ designates a symmetry, the shorthand ‚↗’ designates an asymmetry.

Depending on how the speaker conceptualizes the depicted situation, she will use one of two different types of propositional format to encode her description (Klein, 1991: 83f.; Levelt, 1989: 152ff.). If she conceptualizes the relation between the two entitites as symmetric, she will probably choose a symmetric description, whereas an asymmetric conceptualization will probably result in the choice of an asymmetric (relational) propositional format. Only in the latter case we can make specific predictions about the influence of the asymmetries on the roles assigned to the arguments in a relational statement.

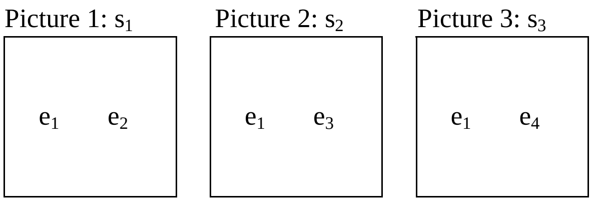
In what follows we describe each of the seven experimental conditions in turn, together with our specific predictions. We begin with the three conditions pairing two movable entities, i.e., those conditions with a movability symmetry. Movability symmetry is designated by ‘M⇕’. The first condition combines the

[3] See the example of Atsugewi in Talmy (1983: 239), in which a set of verb suffixes encode around fifty distinctions of spatial relations confounded with inherent properties of the relatum.

movability symmetry with a contextual symmetry, designated by ‘C↕’. The second and third condition combine the movability symmetry with a single (C↗) and with a twofold (C↗↗) contextual asymmetry, respectively. The correspondence between the contextual asymmetries and the picture sets is illustrated in Figure 3. Figure 3a represents the general schema of a single contextual asymmetry (C↗) exemplified above in Figure 1; Figure 3b represents the general schema of a twofold contextual asymmetry (C↗↗) exemplified above in Figure 2 (Figure 1 and 2 involved a movability asymmetry).



(a) *single contextual asymmetry* C↗ *of entities’ placements*



(b) *twofold contextual asymmetry* C↗↗ *of entities and their placements*

Figure 3: Correspondence between contextual asymmetries and picture sets

(1) C↕M↕*:* This is the general baseline condition which lacks an asymmetry with respect to both, movability and contextual properties. In C↕M↕, the speaker’s task was to briefly describe a single target picture pairing two movable entities, indicated by ‘e_1[+m]’ and ‘e_2 [+m]’. There is no contextual asymmetry since the hearer, an imaginary addressee in this condition, would have no idea which entities the target picture showed at which place, that is, both entities and their placements are new. In C↕M↕, the speaker was expected to produce an asymmetric relational description by assigning the locatum and the relatum role at random to the two entities, or, more interestingly, to avoid an asymmetry in the description by producing a symmetric description (e.g., *The woman is on the right and the man is on the left* or *A man and a woman are standing next to each other*).

(2) C↗M↕*:* In this condition with a single contextual asymmetry, illustrated in Figure 3a, all three pictures displayed the same two movable entities. One of the two entities, e_1[+m], was displayed at the same place in all three pictures; the other entity, e_2[+m], was displayed at a different place in each picture. Such a picture set was meant to imply that e_1 occupies the same place and e_2 occupies different places in the three depicted situations, s_1, s_2, and s_3. That is, e_2 should

be conceived of as having undergone a movement between the target situation (being any of the three situations s_1, s_2 or s_3) and the two non-target situations. In C↗M↕, e_1[+m] and e_2[+m] differ only with respect to the information status of their location in the target picture. The place of e_1[+m] is given and the place of e_2[+m] is new. Since we expect that new rather than given places of entities are communicated, we predict that the speaker will more likely assign the locatum role to e_2[+m] and the relatum role to e_1[+m] (e.g., *e_2 is to the right of e_1*) rather than the other way around (e.g., *e_1 is to the left of e_2*).

(3) C↗↗M↕*:* In this condition with a twofold contextual asymmetry, illustrated in Figure 3b, one entity, e_1[+m], was displayed at the same place in all three pictures. The entity paired with it was a different one in each picture, e_2[+m] in s_1, e_3[+m] in s_2, and e_4[+m] in s_3. Hence, e_1 in the target picture was given and the entity paired with it was new (being any of the three entities e_2, e_3 or e_4). This established the first contextual asymmetry. The three different paired entities e_2, e_3, and e_4 were displayed at the same place relative to e_1 in the respective pictures. Such a picture set was meant to imply that e_1 occupies the same place in the three depicted situations, s_1, s_2, and s_3, and, accordingly, e_2, e_3, and e_4 also occupy the same place in the respective situations. This means that the placement of the paired new entity is unique to the target picture and is therefore new, too. This established the second contextual asymmetry, which coincides with the single contextual asymmetry in C↗M↕. Accordingly, we again predict that the speaker will be likely to assign the locatum role to e_2[+m] and the relatum role to e_1[+m] (for the sake of simplicity we use e_2 to designate the paired new entity of the target picture). Beyond this prediction, we wanted to know whether the twofold contextual asymmetry strengthens the effect of the single asymmetry in C↗M↕.

We now continue by describing the four conditions with a movability asymmetry, designated by 'M↗'. Our general prediction for a movability asymmetry is that speakers tend to assign the locatum role to a movable entity e[+m] and the relatum role to a non-movable entity e[–m]. The baseline effect of a movability asymmetry is assessed by combining it with a contextual symmetry (C↕M↗). Convergent effects are assessed by combining it with converging predictions of a single (C↗M↗) or twofold contextual asymmetry (C↗↗M↗). We call these two conditions a *harmonic combination* of an asymmetry in movability and contextual properties. Finally, we look what happens if the predictions for a movability asymmetry contradicts the predictions for a twofold contextual asymmetry. We call this condition a *disharmonic combination* of an asymmetry in movability and contextual properties, designated by C↗↗M↘.

(4) C↕M↗*:* This is the baseline condition for a movability asymmetry combined with symmetric contextual properties. As in C↕M↕, the speaker's task was to briefly describe a single target picture, in this instance pairing a non-movable entity e_1[–m] with a movable entity e_2[+m]. As in C↕M↕, there was no contextual asymmetry. In C↕M↗, we expected that the speaker will produce an

asymmetric relational description by assigning the locatum role to e_2[+m] and the relatum role to e_1[–m].

(5) C↗M↗: This condition harmonically combines the movability asymmetry with a single contextual asymmetry (see Figure 3a). C↗M↗ is identical to C↗M⇕, except that e_1 is non-movable: e_1[–m]. The place of e_1[–m] is given and the place of e_2[+m] is new. We predict that the speaker will probably assign the locatum role to e_2[+m] and the relatum role to e_1[–m]. Condition C↗M↗ was designed to reveal whether a convergent asymmetry in movability and in the information status of the entities' placements is stronger than either one without support from the other, i.e., compared to C↗M⇕ and C⇕M↗.

(6) C↗↗M↗: This condition harmonically combines the movability asymmetry with a twofold contextual asymmetry (see Figure 3b). C↗↗M↗ is identical to C↗↗M⇕, except that e_1 was non-movable: e_1[–m]. The non-movable entity e_1[–m] and its place are given; the movable entity e_2[+m] and its place are new. We predict that the speaker will be more likely to assign the locatum role to e_2[+m] and the relatum role to e_1[–m] than the other way around. Condition C↗↗M↗ was designed to reveal whether a convergent asymmetry in movability and in the information status of the entities together with their placements is stronger than either one without support from the other, i.e., compared to C↗↗M⇕ and C↗M↗.

(7) C↗↗M↘: This condition combines the movability asymmetry with a twofold contextual asymmetry (cf. Figure 3b), though in a disharmonic fashion. C↗↗M↘ also equals C↗↗M⇕, but this time e_1 is movable and e_2 is non-movable. Hence, the movable entity e_1[+m] and its place are given and the non-movable entity e_2[–m] and its place are new. The contextual asymmetry predicts that the speaker will probably assign the locatum role to e_2[–m] and the relatum role to e_1[+m]. Conversely, the movability asymmetry predicts that the speaker will probably assign the locatum role to e_1[+m] and the relatum role to e_2[–m]. C↗↗M↘ was designed to examine role assignment in a case where the contextual asymmetry conflicts with the movability asymmetry due to their disharmonic combination. The conflict is based on the fact that the invariant placement of the given movable entity e_1[+m] with respect to the picture frame was meant to imply that the placement of e_1[+m] is given. Once the speaker accounts for the inherent property of the three different entities e_2[–m], e_3[–m], and e_4[–m] of being non-movable, she must come to conclude that the placement of e_1[+m] is unique to the target picture and is therefore new. Thus, in C↗↗M↘, the speaker is facing two options. First, she may disregard movability and assign the roles according to the contextual asymmetry based on pictorial information (note that the task of the speaker was to enable the hearer to discriminate the target *picture*). In this case, e_2[–m] should figure in the locatum role. Second, role assignment may rely on the movability asymmetry. In this case, e_2[–m] should figure in the relatum role. We also consider the possibility that speakers might avoid asymmetric descriptions in this condition and instead resort to a

symmetric description. We postpone a more detailed discussion of this issue to the end of the final discussion.

To summarize our predictions, we expect for all conditions, except for the general baseline condition C⇕M⇕ and the disharmonic condition C↗↗M↘, that speakers preferably choose e_2 as locatum compared to e_1. We are interested in whether the conditions differ in the strength of the predicted preference. For C⇕M⇕, we predict that speakers assign roles at random to the two entities, if they produce an asymmetric description at all. For C↗↗M↘, we have formulated alternative hypotheses: if role assignment is primarily influenced by contextual properties, e_2 is the preferred locatum; If role assignment is primarily influenced by movability, e_1 is the preferred locatum; if the influence of contextual and inherent properties outweigh each other, speakers might frequently produce symmetric descriptions.

Table 1 gives an overview of the conditions together with the predictions. Abbreviations should be read as follows: '=' stands for symmetry; $e_1 < e_2$ in movability asymmetry holds if e_1[–m] and e_2[+m]; $e_1 < e_2$ in contextual asymmetry of locations holds if the location of e_1 is given and the location of e_2 is new; $e_1 < e_2$ in contextual asymmetry of entities holds if e_1 is given and e_2 is new; $e_1 < e_2$ in role assignment means that e_1 is less likely to be assigned the locatum role than e_2.

Conditions				Predictions	
	movability asymmetry	contextual asymmetry of locations	contextual asymmetry of entities	symmetric description	asymmetric description 'Locatum='
C⇕M⇕	$e_1 = e_2$	$e_1 = e_2$	$e_1 = e_2$	√	$e_1 = e_2$
C↗M⇕	$e_1 = e_2$	$e_1 < e_2$	$e_1 = e_2$	–	$e_1 < e_2$
C↗↗M⇕	$e_1 = e_2$	$e_1 < e_2$	$e_1 < e_2$	–	$e_1 < e_2$
C⇕M↗	$e_1 < e_2$	$e_1 = e_2$	$e_1 = e_2$	–	$e_1 < e_2$
C↗M↗	$e_1 < e_2$	$e_1 < e_2$	$e_1 = e_2$	–	$e_1 < e_2$
C↗↗M↗	$e_1 < e_2$	$e_1 < e_2$	$e_1 < e_2$	–	$e_1 < e_2$
C↗↗M↘	$e_1 > e_2$	$e_1 < e_2$	$e_1 < e_2$	?	e_1 ? e_2

Table 1: Summary of conditions and predictions

3 Results

In all three languages, we obtained 10 descriptions per condition, except for C↗M⇕ and C↗↗M⇕, for which we obtained 20 descriptions (material was doubled due to outbalancing). A spatial description was scored as "Locatum=e_2" if the role of locatum was assigned to the entity whose placement was unique to the target picture, i.e., if roles were assigned as predicted in most of the conditions. In C⇕M↗, the non-movable entity was labeled e_1 and the movable entity was labeled e_2 (Locatum=e_2 was predicted) (see Greek example (6)).

(6) énas ánðras stékete
INDEF[4]:NOM.SG.M man: NOM.SG.M stand:3.SG
ebrós apó to ðédro.
in.front from DEF:ACC.SG.N tree:ACC.SG.N
'A man stands in front of the tree.' (C⇕M↗; Loc=e_2)

In the disharmonic condition C↗↗M↘, scoring led to e_2 being non-movable and e_1 being movable, i.e., Locatum=e_2 indicates role assignment as suggested by contextual asymmetry whereas Locatum=e_1 indicates assignments as suggested by the asymmetry in movability (see German example (7)).

(7) Ein Hund steht rechts
INDEF:NOM.SG.M dog:NOM.SG.M stand:3.SG right
neben einem kleinen Gebäude.
next INDEF:DAT.SG.N small:DAT.SG.N building:DAT.SG.N
'A dog stands on the right next to a small building.' (C↗↗M↘; Loc=e_1)

In C⇕M⇕, the two entities were arbitrarily labeled e_1 and e_2. A spatial description was scored as 'Locatum= e_1&e_2' if it was symmetrical, i.e., if either entity figured in the role of locatum (see German example (8)).

(8) Ein Hund und eine
INDEF:NOM.SG.M dog:NOM.SG.M and INDEF:NOM.SG.F
Katze sitzen nebeneinander.
cat:NOM.SG.F sit:3.PL next.to:one.another
'A dog and a cat sit next to one another.' (C⇕M⇕; Loc=e_1&e_2)

Table 2 presents the results for German, Greek, and Yucatec Maya separately, as well as summed up over the three languages. Proportions (%) of subcategorized valid data (Locatum=e_1/e_2/e_1&e_2) in the tables were calculated on the basis of the total valid data. Descriptions were judged as "invalid" if they mentioned only one of the two entities, which in some cases was sufficient to identify the target picture. These descriptions were discarded from the analysis because they did not instantiate two arguments, a property we consider to be crucial for the purposes of our analysis. Apart from these invalid descriptions, a few observations are missing due to technical errors (e.g. in the conditions C⇕M⇕ and C⇕M↗ for Yucatec Maya).

The data presented in Table 2 were produced by 20 native speakers per language. German speakers were students at the University of Potsdam, Greek speakers were students at the University of Athens, and Yucatec Mayan speakers were inhabitants of the village Yaxley (Quintana Roo: Mexico) occupied with

[4] Glosses: ACC=accusative, ANIM=animate, CL=classifier, DAT=dative, DEF=definite, DIM=diminutive, D(n)=deixis, EXIST=existential, F=feminine, INAN=inanimate, INDEF=indefinite, LOC=locative, M=masculine, N=neutral, NOM=nominative, POS=positional, POSS=possessor, PL=plural, SG=singular, HESIT=hesitation.

rural activities.[5] Each speaker produced 5 descriptions, i.e., he was exposed to half of the experimental conditions, that contained the 7 conditions in Table 1, whereby C↗M↕ and C↗↗M↕ were implemented twice, and a further condition, which disharmonically combined the movability asymmetry with the single contextual asymmetry, C↗M↘. This condition is not reported in this paper since the data revealed a difficulty of the consultants to interpret the stimuli.

	Loc=	C↕M↕ *n* (%)	C↗M↕ *n* (%)	C↗↗M↕ *n* (%)	C↕M↗ *n* (%)	C↗M↗ *n* (%)	C↗↗M↗ *n* (%)	C↗↗M↘ *n* (%)
German	e_2	3 (30)	9 (45)	10 (56)	10 (100)	8 (100)	10 (100)	0
	e_1	2 (20)	6 (30)	2 (11)	0	0	0	8 (100)
	e_1&e_2	5 (50)	5 (25)	6 (33)	0	0	0	0
	Total	10	20	18	10	8	10	8
Greek	e_2	4 (44)	10 (53)	13 (72)	9 (100)	10 (100)	10 (100)	2 (22)
	e_1	3 (33)	6 (32)	3 (17)	0	0	0	7 (78)
	e_1&e_2	2 (22)	3 (16)	2 (11)	0	0	0	0
	Total	9	19	18	9	10	10	9
Yucatec Maya	e_2	0	10 (56)	6 (30)	2 (100)	9 (90)	10	1 (10)
	e_1	0	2 (11)	2 (10)	0	0	0	8 (80)
	e_1&e_2	2	6 (33)	12 (60)	0	1 (10)	0	1 (10)
	Total	2	18	20	2	10	10	10
TOTAL	e_2	7 (33)	29 (51)	29 (52)	21 (100)	37 (96)	30 (100)	3 (11)
	e_1	5 (23)	14 (25)	7 (12)	0	0	0	23 (85)
	e_1&e_2	9 (43)	14 (25)	20 (36)	0	1 (4)	0	1 (4)
	Total	21	57	56	21	28	30	27

Table 2: Spatial descriptions in German, Greek, and Yucatec Maya

[5] The German data were collected and transcribed by A. Arnhold, K. Mozcko and A. Pankau. The Greek data were collected and transcribed by Th. Georgakopoulos, Yannis Kostopoulos, G. Markopoulos, and S. Skopeteas. The Yucatec Maya data were collected by S. Skopeteas, transcribed by A. Colli Colli, and analyzed in cooperation with E. Verhoeven.

The obtained data do not substantially differ in the languages at issue, which is in line with our expectation that their structural differences do not interact with the properties of role assignment. Hence, the following discussion has to account for the cross-linguistic data pattern that is plotted in Figure 5, which corresponds to the proportions of subcategorized valid data across all three languages (see “TOTAL” in Table 2). As is evident from Figure 5, we are facing two distinct, though related, phenomena, which we will discuss in turn, namely whether descriptions were asymmetric or not (cf. 3.1 Choice of Propositional Format), and how roles were assigned in asymmetric descriptions (cf. 3.2 Role Choice).

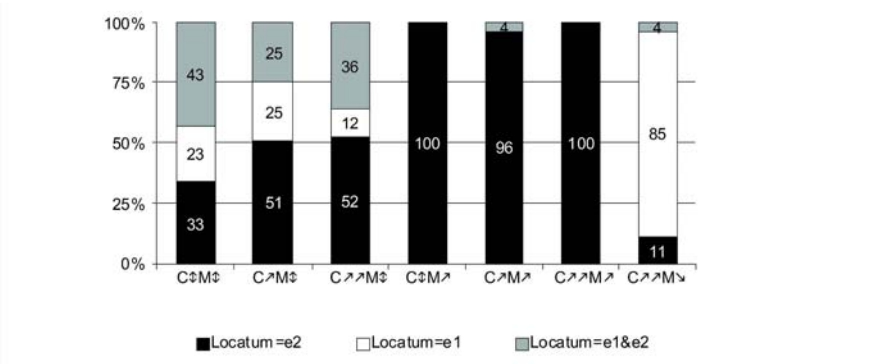


Figure 5: Role assignment in spatial descriptions

3.1 Choice of propositional format

As mentioned in section 2.3, we distinguish between two forms of descriptions, symmetrical and asymmetrical ones. The relation of the two entities in the picture can either be expressed by an asymmetric description, in which case the speaker has to make a decision about which of the entities she will assign the locatum and the relatum role. If the proposition is expressed by a symmetric description of the situation, no such decision has to be made.

(9) a. CANDIDATE 1 (symmetric description):
an entity e_i occupies a location l_i, an entity e_j occupies a location l_j.
b. CANDIDATE 2 (asymmetric description):
an entity e_i occupies some location l_i relative to an entity e_j.

Candidate 2 is illustrated in examples (6) and (7) above and will be dealt with in detail in the next section. Candidate 1 subsumes several types of descriptions that have in common that both entities are assigned the locatum role symmetrically. In one type, the two entities occupy a place l_i and a place l_j with respect to the entire configuration constituted by the two entities or, alternatively, with respect to the picture window. This type of spatial description is illustrated by the Yucatec Maya example in (10).

(10)

yàan...	le	mìis-o’	t-u	x-no’h,
EXIST	DEF	cat-D2	LOC-POSS.3.SG	F-right
yàan	le	pèek’-o’	t-u	x-ts’íik.
EXIST	DEF	dog-D2	LOC- POSS.3.SG	F-left

‘The cat is at the right side and the dog is at the left side.’ (C↗M↕)

In another type of description, the two entities are localized reciprocally, i.e. with respect to each other: an entity e_i occupies some place relative to the entity e_j and the entity e_j occupies some place relative to the entity e_i. This conceptualization is encoded in the following example from German by means of the reciprocal pronoun *einander* ‘one another’.

(11)

Ähm ,	der	Mann	und	die
HESIT	DEF:NOM.SG.M	man:NOM.SG.M	and	DEF:NOM.SG.F

Frau	stehen	dicht	bei	einander.
woman:NOM.SG.F	stand:3.PL	close	to	one.another

‘Hmm, the man and the woman stand close to one another.’ (C↗M↕)

In the Greek example (12), reciprocity is encoded through adverbial reduplication. The same sentence with a single adverb would not have reciprocal meaning: *énas skílos ce mia ɣáta íne ðípla* ‘a dog and a cat are at the side (of the picture/of the speaker, etc.)’).

(12)

énas	skílos	ce	mia
INDEF:NOM.SG.M	dog:NOM.SG.M	and	INDEF:NOM.SG.F

ɣáta	vrískode	ðípla	ðípla.
cat:NOM.SG.F	be.located:3.PL	at.the.side	at.the.side

‘A dog and a cat are next to one another.’ (C↗M↕)

Symmetric descriptions almost never occurred with an asymmetry in movability. This result – at least for the reciprocal descriptions – may be traced back to the preference for relata to have a fixed location in space (compare results on role choice in Section 3.2). Reciprocal descriptions require that both implied simple descriptions are possible expressions, i.e., a description of the type “e_1 and e_2 are located relative to each other” is possible if both descriptions “e_1 is located relative to e_2” and “e_2 is located relative to e_1” are possible, too (Talmy 2000: 184). In the case of a movable and a non-movable entity, the preference to choose non-movable entities as relata rules out the description with movable relatum, and hence the requirement for the formation of a reciprocal description is not fulfilled. In this sense, the reason that speakers do not produce sentences of the type “a house and a man are next to each other” is that men are suboptimal relata for houses. Symmetric descriptions also contain non-reciprocal constructions as the one exemplified in (10), in which both entities are localized either with respect to the entire spatial configuration or with respect to the picture window. These descriptions involve two conjuncts. We assume that constraints at the discourse level (relating to discourse coherence) require that parallel conjuncts with the same structure predicate about a list of individuals that share some common properties. Individuals that differ in movability such as “man” and “house” are not well suited for forming a list of this kind, which rules out descriptions of the type “a house is on the left and a man is on the right”.

The rationale that rules out symmetric descriptions in case of a movability asymmetry should also hold for a contextual asymmetry. Symmetric descriptions were most frequent in the maximally symmetric baseline condition C⇕M⇕, in which they were expected to occur. However, they also occurred in conditions with a contextual asymmetry in all three languages. This finding was unexpected and will be taken up in the Discussion.

3.2 Role choice

Role choice presupposes that the speaker has conceptualized the situation as an asymmetric relation between the two entities and hence is planning to express the conceptualized content by an asymmetric description. The speaker then has to specify which entity figures as locatum and which entity figures as relatum. Given a situation with two entities e_1 and e_2, the available set of candidates contains the following more specific versions of (9):

(13) a. CANDIDATE 2.1:
entity e_1 occupies some place relative to the entity e_2.
b. CANDIDATE 2.2:
entity e_2 occupies some place relative to the entity e_1.

We begin by examining the pure impact of contextual asymmetries on role assignment in the conditions C↗M⇕ and C↗↗M⇕. Taking both conditions together across all three languages, roles in asymmetric descriptions were frequently assigned as predicted: e_2 was assigned the locatum role in 73% of all asymmetric descriptions (58 out of 79). Thus, role assignments were affected by which entity’s placement was unique to the target picture and was thus taken to be new, e_2, and which entity’s placement was common to all three pictures and was thus taken to be given, e_1. Speakers preferred to communicate the new place of an entity by assigning this entity the role of locatum. Our data do not suggest that the impact of the single contextual asymmetry with respect to the entities’ places is further strengthened by the twofold contextual asymmetry, i.e., by the information status of the entities themselves: we found 29 predicted assignments in either condition. This outcome is difficult to interpret, however. Asymmetric descriptions were more frequent in C↗M⇕ than in C↗↗M⇕, 43 versus 36. Relative frequencies of predicted assignments, in comparison to opposite assignments, are thus higher in C↗M↕ than in C↗↗M↕, but asymmetric descriptions are less frequent in the former than in the latter.

Opposite role assignments also occurred in all three languages (27%). When we now consider the rather large amount of symmetric descriptions (about one fourth), asymmetric descriptions with predicted role assignments make up one half of the utterances. Thus it seems that the picture stimuli induced the intended contextual asymmetry only to a moderate extent.

Next we turn to the impact of movability. Figure 5 reveals at a glance that movability has a very strong impact on role assignment (note that the movability asymmetry predicts that e_1 is assigned the locatum role in the disharmonic condition C↗↗M↘). The movability asymmetry completely determines role choice already in the baseline condition C↕M↗. Without exception, the movable entity is assigned the locatum role and the non-movable entity is assigned the relatum role, as in (14) from German.

(14)	Eine	Person	steht	vor
	INDEF:NOM.SG.F	person:NOM.SG.F	stand:3.SG	in.front.of
	einem	Busch.		
	INDEF:DAT.SG.M	bush:DAT.SG.F		
	‘A person stands in front of a bush.’ (C↕M↗)			

When asymmetry in movability combines harmonically with asymmetry in contextual properties, we observe just the same: The locatum role is always assigned to the movable entity and never to the non-movable entity (there is one symmetric localization in C↗M↗ in Yucatec Maya), as in (15) from Yucatec Maya and (16) from Greek.

(15)	hun-tùul	xíipal	wa’l-akbal	táanih	te’eh
	one-CL.AN	boy	stand-POS	in.front	LOC:DEF
	k’áax-o’.				
	tree-D2				
	‘A boy stands in front of the tree.’ (C↗↗M↗)				

(16)	to	aɣóri	vrískete	brostá	apó
	DEF:NOM.SG.N	boy:NOM.SG.N	be.located:3.SG	in.front	from
	éna	ðéndro.			
	INDEF:ACC.SG.N	tree:ACC.SG.N			
	‘The boy is located in front of a tree.’ (C↗M↗)				

Finally, we turn to the disharmonic condition C↗↗M↘. Across the three languages, there are one symmetric and twenty-six asymmetric descriptions. In the latter case, roles were assigned most often in line with the movability asymmetry (Locatum = e_1; 23 times: 88%) and only occasionally in line with the contextual asymmetry (Locatum = e_2; 3 times: 12%) (cf. 17).

(17)	píso	apó	ton	ádra	vrískete
	behind	from	DEF:ACC.SG.M	man:ACC.SG.M	is.located:3.SG
	éna		ðédro.		
	INDEF:NOM.SG.N		tree:NOM.SG.N		

‘A tree is located behind the man.’ (C↗↗M↘)

Consistent with the previous observation that movability exhibited a much stronger impact on role assignment than contextual properties in our experimental setting, movability also prevailed most of the time when it stood in direct competition with contextual properties in the disharmonic condition C↗↗M↘. We assess the pure existence of opposite role assignments in C↗↗M↘ (which never occurred in any of the neutral or harmonic conditions C⇕M↗, C↗M↗, or C↗↗M↗) as a hint that role assignment was sometimes based on contextual properties alone, i.e., that movability was occasionally disregarded.

4 Discussion

The most striking effect that we observed in our data in all three languages was the almost deterministic influence of movability on role choice. When paired with a movable entity, the non-movable entity was assigned the role of the relatum almost without exception. There was a distinctively less strong influence of the contextual properties with respect to the information status of places in the predicted direction. The information status of the entities themselves seemed to have no additional impact. With an asymmetry only in contextual properties, roles were infrequently assigned oppositely as predicted, but there was a substantial number of symmetric localizations. Symmetric localizations can be taken to indicate that the speaker did not apprehend an asymmetry as regards contextual properties. This is to say that the speaker did not seem to apprehend the place of one entity as given and the place of the other one as new.

How can we account for the considerable difference in the impact of the asymmetry in inherent movability and the asymmetry in the information status of the places of entities? We could posit two rules. The first rule applies to movability and states that whenever one of two entities is movable and the other one is non-movable, then the former is assigned the locatum role and the latter is assigned the relatum role. The second rule applies to the information status of places and states that whenever one of two entities occupies a new place and the other one occupies a given place, then the former one is assigned the locatum role and the latter one is assigned the relatum role. The different impact of the two asymmetries can then be explained by the first rule being considerably stronger than the second rule. This explanation would account for the observation in the disharmonic condition: when the two rules are brought into conflict, the first rule on movability outweighs the second rule on the information status of places with almost no exception. However, we find such an account unsatisfactory. In positing two separate rules we would disregard that (non-)movability and the information status of places are not independent of each other. For example, if someone doesn't notice that an entity moves from a known place to a different place or if someone doesn't remember the movement, the place of the moved entity will be new to that person. This only happens, of course, if the entity in question is movable. We believe that in our production study, movability had a strong direct influence on whether a place of an entity in the depicted situation was apprehended as given or new.

To begin with, we would like to argue that speakers more likely apprehended an asymmetry in the information status of places of entities if the contextual asymmetry was harmonically combined with a movability asymmetry (e.g., C↗M↗), compared to a lacking movability asymmetry (e.g., C↗M↕). This is a strong claim. Although the claim is compatible with the data it is not really supported by them. The problem is that role assignments in agreement with the movability asymmetry were already at ceiling without contextual asymmetry (cf. C↕M↗), leaving no room for an additional effect of the contextual asymmetry. Therefore, we take some effort to explain in more detail how on our view movability links to contextual properties. Consider a speaker who sees three pictures (cf. Figure 2: C↗↗M↗): a target picture showing a boy in front of a tree$_j$, together with two context pictures showing a woman in front of the tree$_j$ and a man in front of the tree$_j$, with the tree being the same in all three pictures. The tree is depicted at the same place within the three picture frames and all three pictures share the same background. We are convinced that the speaker will conceive of the tree as being placed invariably in the three depicted situations. The speaker will almost inevitably draw this inference because the tree is a non-movable object (cf. our definition (4) of non-movability). It necessarily follows that the place of the boy in the target picture is new. Now consider condition C↗↗M↕ without a movability asymmetry. The speaker sees a boy in front of a girl$_j$ on the target picture, a woman in front of the girl$_j$ and a man in front of the girl$_j$ on the two context pictures, with the girl being the same in all three pictures. The girl is depicted at the same place within the three picture frames and all the pictures share the same background. Admittedly, the background was no salient part of our picture stimuli. When we disregard the background, the only indication that the girl is invariably placed in the three depicted situations is the fact that the girl is depicted at the same place within the picture frames. On the intended interpretation, the girl occupies the same place in all three situations and the boy in the target situation must have moved towards the girl with respect to the non-target situations. Since the girl is movable, it is also possible that she is the one who has moved towards the boy in the target picture relative to the two non-target situations, whereas the boy may not have moved. On this interpretation, the boy's place would be apprehended as given and the girl's place would be new (notice that the boy's place does not count as given as operationalized in our experimental setting: the boy's place is not common to all three pictures). If the picture set is apprehended in this way, we would expect the speaker to assign the girl rather than the boy the locatum role. Since both the girl and the boy are movable, it is equally possible that the speaker apprehends both places as new. In this case, the speaker apprehends no asymmetry in the information status of the entities' places at all. In the face of these considerations, it is remarkable that the contextual asymmetry exerted the predicted effect at all. In the first place, however, these considerations were intended to illustrate that movability might have its influence by way of affecting the apprehension of the information status of places instead of appealing to a separate rule to deal with movability in role assignment. What we argue for, is that the considerably weaker effect of the asymmetry in the information status of places compared to the movability asymmetry does not show that role assignments depended much more on the latter asymmetry than on the former. Rather we think that the apprehension of an asymmetry in the information status of places was much more reliably induced by the movability asymmetry compared to the pictorial manipulation. The question is whether we can account for the disharmonic combination of movability and information status of places in line with this argument.

We now turn to the disharmonic condition. Consider a speaker who sees a boy$_j$ in front of a tree on the target picture, the boy$_j$ in front of a house and the boy$_j$ in front of a street lamp on the two context pictures, with the boy being the same in the three pictures. The boy is depicted at the same place within all three picture frames and all three pictures share the same background. Now, the idea was that the disharmonic condition induces a conflict–but what is that nature of the conflict? On the view that we advocate, there is some indication that the boy is invariably placed in the three depicted situations since he is depicted at the same place within the picture frames. However, the stimulus set also provides evidence that the boy is not placed invariably in the three depicted situations and this is the source of the conflict. If the boy would have been invariably placed, then the speaker must assume that the paired non-movable objects must occupy different places with respect to the target situation and the other situations. The data tell us in this case that speakers avoid such a conclusion. On our view, the data tell us that the place of the boy instead of the place of the tree is apprehended as new. The implication of inherent movability is much stronger than the evidence on the basis of an invariant placement in the picture frame. On this view, the conflict is settled on the basis of the apprehension of the information status of places instead of two separate conflicting rules.

Up to now, we can explain why the place of the boy fails to induce a contextual asymmetry if paired with a non-movable entity, for example, a tree. However, we cannot explain the role choice since the place of the tree in the target picture is new, too, as operationalized in our setting. In order to establish the missing link, we next consider the baseline condition with a movability asymmetry (C↕M↗) where we are faced with the same problem: the places of both entities are new.

The basic idea is to translate inherent movability into a contextual asymmetry as regards the information status of places. In the baseline condition, there is one single picture showing one single situation with two new entities, e.g., a boy in the front and a tree in the back, the places of which are new, too. Since there is no more than one situation explicitly involved in the baseline condition, we argue that the speaker, in translating the movability asymmetry into an asymmetry in the information status of places, relies on counterfactual situations. A counterfactual situation would be one in which the boy is, for instance, in the back and the tree in the front. We might describe this counterfactual situation by stating: *The boy could have been behind the tree*. Could we also say: *The tree could have been in front of the boy*? On our intuition, the former statement is much more acceptable than the latter. The role assignment in the latter counterfactual statement is clearly dispreferred compared to the role assignment in the former counterfactual statement. We explain this difference in terms of an opposite asymmetry in the information status of the places of the two entities that the two counterfactual statements convey. *The boy could have been behind the tree* conveys that the place of the boy is new with respect to the factual situation in which the boy is in the front and the tree is in the back. Hence, the boy must have moved. *The tree could have been in front of the boy* conveys that the place of the tree is new with respect to the factual situation, implying that the tree must have (been) moved. Since the tree is non-movable, the role assignment in the latter counterfactual statement is infelicitous. One might object to this explanation that the movability asymmetry *per se* causes the effects of opposite role assignments. However, if we replace the tree by a girl, we get the same effects. The counterfactual statement *The boy could have been behind the girl* also conveys that the place of the boy is new with respect to the factual situation in which the boy is in the front and the girl is in the back. Correspondingly, *The girl could have been in front of the boy* conveys that the place of the girl is new with respect to the factual situation. With this argument we cannot demonstrate that speakers describing pictures in the baseline condition C↕M↗ actually considered counterfactual situations. Yet we take this assumption to be a serious alternative to posit a separate rule to deal with movability as a determinant of role assignment in asymmetric spatial descriptions.

We now come back to the disharmonic combination. We have shown above how an asymmetry in movability counteracts the pictorial evidence on the asymmetry of the information status of the entities' places. We have been facing the problem that without a contextual asymmetry we cannot explain role choice in the baseline condition with a movability asymmetry (C↕M↗). Based on our argument developed for the baseline condition, we now argue that the asymmetry in inherent movability in the absence of any additional pictorial evidence translates into a contextual asymmetry by way of counterfactual situations.

With this line of arguments we have covered quite a distance from our data and from the original claim that inherent movability directly affects the apprehension of the givenness of places. As regards empirical investigations, our discussion has been more of a starting point than a conclusion. What we think we can learn from these considerations is that speakers most often referred to the depicted situation(s) rather than to the picture(s) themselves even though their task was to discriminate the target picture. To conclude, our approach has the advantage that one single rule is sufficient to account for the data:

(R) If a speaker wants to describe a configuration of two entities e_i and e_j in space, with the location l_i of e_i, being new and the location l_j of e_j, being not new (sometimes by way of a counterfactual situation), then the speaker chooses e_i as the locatum.

References

Clark, E. V., & Clark, H. H. (1978): Universals, relativity, and language processing. In J. H. Greenberg, (ed.): Universals of Human Language, Vol. I. Stanford, CL: Stanford University Press, 225-277.

Clark, H. (1973): Space, time, semantics and the child. In T. E. Moore (ed.): Cognitive Development and the Acquisition of Language. New York: Academic Press, 27-63.

Fries, N. (1991): Prepositions and prepositional phrases: a contrastive analysis. In G. Rauh (ed.): Approaches to Prepositions. Tübingen: Narr, 53-75.

Goldap, C. (1991): Lokale Relationen im Yukatekischen. Eine onomasiologische Studie. Frankfurt: Lang.

Hörnig, R., Oberauer, K., & Weidenfeld, A. (2005): Two principles of premise integration in spatial reasoning. Memory & Cognition, 33, 131-139.

Huttenlocher, J., & Strauss, S. (1968): Comprehension and a statement's relation to the situation it describes. Journal of Verbal Learning and Verbal Behavior, 7, 300-304

Klein, W. (1991): Raumausdrücke. Linguistische Berichte, 132, 77-114.

Langacker, R. W. (1987): Foundations of Cognitive Grammar. Vol. I: Theoretical Prerequisites. Stanford, CL: Stanford University Press.

Lehmann, C. (1992): Yukatekische lokale Relatoren in typologischer Perspektive. Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung, 45, 626-641.

Levelt, W. (1989): Speaking: From Intention to Articulation. Cambridge, MA: MIT Press.

Miller, G. A., & Johnson-Laird, P. N. (1976): Language and Perception. Cambridge, MA: Harvard University Press.

Prince, E. F. (1981): Towards a taxonomy of given-new information. In P. Cole (ed.): Radical Pragmatics New York: Academic Press, 223-255.

Skopeteas, Stavros, Ines Fiedler, Sam Hellmuth, Anne Schwarz, Ruben Stoel, Gisbert Fanselow, Caroline Féry, and Manfred Krifka 2006. Questionnaire on Information Structure (QUIS). Interdisciplinary Studies on Information Structure (ISIS), Vol. 4. Universitätsverlag Potsdam, Germany.

Stalnaker, R. (1974): Pragmatic Presupposition. In: M. Munitz and P. Unger (eds.): Semantics and Philosophy. New York: New York University Press, 197-213.

Stalnaker, R. (1998): On the Representation of Context. Journal of Logic, Language and Information 7, 3-19

Talmy, L. (1983): How language structures space. In: Pick, Herbert L. & Acredolo, Linda P. (eds.): Spatial orientation: Theory, research, and application. New York and London: Plenum Press, 225-282.

Talmy, L. (2000): Toward a Cognitive Semantics. Vol. I: Concept Structuring Systems. Cambridge, MA; London: MIT Press.

Theophanopoulou-Kontou, D. (2000): Spatial adverbs and case in Greek: a diachronic account [in Greek]. Glossologia, 11-12, 1-40.

Vandeloise, C. (1986): L'espace en français: Sémantique des prépositions spatiales. Paris: Seuil.

Wunderlich, Dieter (1982): Sprache und Raum. Studium Linguistik, 12, 1-19, and 13, 37-59.

Wunderlich, D. & Herweg, M. (1991): Lokale und Direktionale. In: A. v. Stechow & D. Wunderlich (eds.): Semantik: Ein internationales Handbuch der zeitgenössischen Forschung. Berlin, New York: De Gruyter, 759-785.

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