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## Situations, Alternatives, and the Semantics of ‘Cases’

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Situations have come to play a significant role in semantic theory. They have been advocated as an alternative to possible worlds, giving a more fine-grained notion of sentence meaning, in situation semantics (Barwise/Perry1981, Kratzer 2014) and more recently, truthmaker semantics (Fine 2012, 2014, 2017), or else for the analysis of particular linguistic phenomena, such as perception reports, definite descriptions, E-type pronouns, conditionals, adverbs of quantification and generic sentences. Yet while situations are generally considered important for semantics, their semantic role is generally considered an implicit one, with situations acting as parameters of evaluation, implicit arguments, or truthmakers, but not as semantic values of referential NPs.

This paper is about constructions that do involve explicit reference to situations, namely noun phrases with the noun *case* as head (*case*-NPs). *Case*-NPs, this paper will argue, involve reference to situations in their role as truthmakers within a space of alternatives, that is, ‘cases’. *Case*-constructions in English (and corresponding constructions in other languages) take the form of NPs with *case* as head noun and a clausal modifier (a *case*-clause) as in (1), of *case*-anaphora as in (2), and of the predicate *is the case*, as in (3):

### Case-NPs with a *case*-clause as modifier

- (1) a. the cases in which a student failed the exam  
 b. the case in which it might rain tomorrow

### Case-anaphora

- (2) a. John might go to the party. In that case, I will go too.  
 b. If John has lost, Mary is happy. In that case, she will celebrate.  
 c. Mary claims that John has won the race. In that case, we will celebrate.

### The predicate *is the case*

(3) It is sometimes the case that S.

In addition to clausal *case*-NPs as in (1), there are nominal *case*-NPs, such as *the case of the stolen statue* and *a case of flu*, which share significant similarities with clausal *case*-NPs. They will not be the focus of this paper, however, but addressed only in an appendix (Appendix 1).

The paper outlines a semantic analysis of *case*-constructions that is cast within a development of truthmaker semantics in the sense of Fine (2012, 2014, 2017) and alternative semantics (Hamblin 1973, Rooth 1982, Kratzer / Shimoyama 2002, Aloni 2007, Ciardelli / Roloefsen / Theiler 2017, Santorio 2018), the view that a sentence may stand for several alternatives at once. More specifically, the analysis is based on two overall claims:

[1] *Case*-constructions involve situations in their role as truthmakers of sentences in the sense of Fine's truthmaker semantics. That is, they involve actual or possible (or even impossible) situations that are exact truthmakers of sentences.<sup>1</sup>

[2] *Case*-constructions involve situations only within a case space, a set of alternative situations (or kinds of situations) which are either the truthmakers of a sentence or the truthmakers of an epistemic state of uncertainty associated with the use of the *case*-construction.

*Case*-constructions bear on a range of other issues in philosophy of language and natural language semantics, besides truthmaker semantics and alternative semantics, in particular the ontology of situations and related categories of entities, the nature and range of kind reference, actuality or existence entailments of lexical items, the semantics of conditionals and its involvement of situations, and the relation of the predicate *is the case* to the truth predicate *is true*.

While not all languages have *case*-constructions, a noun for 'case' appears in more or less the very same constructions in a range of European languages, including German (*Fall*), French (*case*), Italian (*caso*), and Spanish (*caso*). Some of the important properties of *case*-constructions are displayed more transparently in other languages than English, which this paper will then make use of.

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<sup>1</sup> Fine's notion of a truthmaker in 'truthmaker semantics' differs from the notion of a truthmaker in metaphysics. The former has a purely semantic purpose, the latter a metaphysical one, namely that of grounding truth. See Appendix 2 for discussion.

The paper will first argue for the involvement of situations as exact truthmakers in *case*-constructions and present an outline and extension of truthmaker semantics. Second, it will show the involvement of a case space in *case*-constructions and outline a semantic analysis of *case*-constructions of the various sorts based on a truthmaker-based version of alternative semantics. One appendix will be about the semantics to nominal *case*-construction; a second appendix will discuss the relation of the notion of a truthmaker involved in *case*-constructions to the philosophical truthmaker debate.

## 1. Situations, quantification over cases and reference to kinds of cases

The overall view this paper develops is that cases, the entities *case*-constructions make reference to, are situations (or kinds of situations) in their role as truthmakers, and that within a space of alternative situations (or kinds of situations), a '*case space*'.<sup>2</sup> This section will focus on the first part, situations in their role as truthmakers; the next section will focus on the involvement of a case space in the semantics of *case*-constructions.

### 1.1. The ontology of cases

Let me start with clarifying the ontology of situations, the entities that can play the semantic role of truthmakers. Situations are considered primitives and fully specific parts of actual, possible, or even impossible worlds. Situations involve entities having properties or standing in relations to other entities, at a particular time or time-independently. Such entities form the domain of a situation. Situations need not involve a continuous temporal or spatial location.

Situations that may be cases need to be distinguished from other, related sorts of entities. First of all, situations are not on a par ontologically with events and states.<sup>3</sup> Events and states may be *in* situations and thus part of the domain of a situation, but not vice versa. Events and states have aduration and thus may last for a time, but not so for cases. Cases differ from

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<sup>2</sup> More precisely, *case*-constructions involve reference to situations in the role of truthmakers of sentences or else reference to *kinds* of situations acting that way.

<sup>3</sup> Fine calls the entities that play the truthmaker role 'states' rather than 'situations'. Fine's notion of a state is a technical one and has little to do with states as referents of state-referring terms (*(the state of) John's being tired*) and as the entities stative predicates (*lie, stand, weigh, believe*) describe.

events and states also in the sorts of existence predicates they may accept.<sup>4</sup> Events do not go along with the existence predicate *exist*, but only with event-specific existence predicates such as *happen* and *take place*. *Happen* and *take place* are not applicable to cases.<sup>5</sup> Only the existence predicate *occur* is applicable to cases, more precisely kinds of cases (as in *The case in which a student passed the exam has never occurred*). States go along with the existence predicate *obtain* or even *exist* (as in *The state of war still obtains / exists*). But neither *obtain* nor *exist* is applicable to cases.

The situations that *case*-constructions make reference to are situations that are fully specific parts of possible (or even impossible) worlds. They are thus on a par with worldly facts in the sense of Austin (1950, 1961b), rather than non-worldly facts in the sense of Strawson (1949).<sup>6</sup> Non-worldly facts are entities that stand in a 1-1-relation to true propositions and are describable by fact descriptions of the sort *the fact that S* (however non-worldly facts may be conceived ontologically).<sup>7</sup> Clearly, *case*-NPs do not stand for possible non-worldly facts. *Case*-NPs with existentially quantified *case*-clauses as below make this particularly clear:

- (4) a. several cases in which a student passed the exam  
       b. the three cases in which a student passed the exam

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<sup>4</sup> Existence predicates form a semantically characterizable class of predicates in natural language. What distinguishes them from other types of predicates is that they may yield true sentences with a subject not standing for an actual entity and negation, as is illustrated with *exist* below:

- (i) Vulcan does not exist.

Existence predicates then include *occur*, *happen*, *take place*, and *obtain*. See Moltmann (2013b, to appear a) for a discussion of existence predicates in natural language.

<sup>5</sup> Natural languages generally display different existence predicates for different sorts of entities. Thus, *exist* applies to material and abstract objects (or empty terms describing them) as in (1) and (2a), but not to events, as seen in (2b):

- (ii) a. The number four exists.  
       b. ??? The accident existed yesterday.

These semantic selectional restrictions can be traced to *exist* and *occur* conveying different ways in which entities relate to space and time (Moltmann 2013b, to appear a).

<sup>6</sup> For the distinction between worldly and non-worldly facts see also Fine (1982).

<sup>7</sup> For an ontological account of non-worldly facts as pleonastic entities or entities abstracted from true sentences see Moltmann (2013a, Chap. 6).

If several students passed the exam, then there are several cases in which a student passed the exam, not a single case in which a student passed the exam. This permits a suitable quantifier domain for (4a) and plural referent for (4b). By contrast, if several students passed the exam, there will still be only a single non-worldly fact described by *the fact that a student passed the exam*. Also disjunctions make the difference between cases and non-worldly facts apparent and show that cases take the role of truthmakers rather than being constituted by true propositions. A true disjunction such as *S or S'* will correspond to exactly one non-worldly fact, describable as *the fact that S or S'*. By contrast, there will be as many cases as there are situations making either disjunct true. This then allows the use of the plural and a numeral in the examples below:

- (5) a. the cases in which Mary has received an invitation or John has received one  
 b. the two cases in which it rains or it snows

Cases, as fully specific truthmakers, cannot be existentially quantified or disjunctive.

Cases also do not share the existence predicate specific to non-worldly facts, namely *obtain*. The fact that a student passed the exam may 'obtain', but not so for the case in which a student passed the exam.

Cases that have the status of future epistemic alternatives may come with a special 'case'-specific existence predicate. Most strikingly, German chooses *eintreten* 'to enter' and French *se produire* 'produce itself' as the existence predicate reserved for cases of that sort:<sup>8</sup>

- (6) a. Der Fall, daß Hans nicht zurückkommt, ist nicht eintreten.  
 'The case that John won't return could enter.'  
 b. Le cas ou Jean retourne ne s'est pas produit.  
 'The case that John returns did not produce itself.'

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<sup>8</sup> *Eintreten* excludes epistemically possible situations of the present or the past:

- (i) a. ??? Der Fall, daß n eine Primzahl ist, kann eintreten / ist eingetreten.  
 'The case that n is a prime number could enter / has entered.'  
 b. ??? Der Fall, daß Hans das Licht angelassen hat, ist eingetreten.  
 'The case that John has left the light on has entered.'

In English, *present itself* can be used as an existence predicate specific to future epistemic alternatives. *Eintreten* and *se produire* as existence predicates apply to no other kind of entity (except to a very restricted class of events, such as deaths).

Cases as epistemic alternatives differ from entities referred to as ‘possibilities’ with respect to the attribution of existence. Possibilities as mere possibilities ‘exist’ (*the possibility that John may not return exists*).<sup>9</sup> By contrast, merely possible cases do not ‘exist’. If they have the status of existing (that is, ‘present themselves’), then they are not merely possible situations, but actual ones.<sup>10</sup>

Cases thus are fully specific situations and as such distinct from events, states, facts, and possibilities. In their role as epistemic future alternatives they may moreover come with their own case-specific existence predicate.

## 1.2. Cases as exact truthmakers

*Case*-NPs such as (4a) quantify over situations that are truthmakers of the *case*-clause. More precisely, they quantify over exact truthmakers of the *case*-clause, namely, in (4a), situations in which exactly one student passed the exam and nothing else happened, which means situations wholly relevant for the truth of the sentence *a student passed the exam*. They will not quantify over sums of such situations or larger situations which make the *case*-clause true but include other things that are not relevant for its truth. Similarly, sentences like (4b) and (5a,b) refer to exact truthmakers of the *case*-clause.

Fine’s relation of exact truthmaking  $\Vdash$  is the relation that holds between a situation  $s$  and a sentence  $S$  just in case the existence of  $s$  necessarily entails the truth of  $S$  and  $s$  is wholly relevant for the truth of  $S$  (Fine 2017). If  $s$  is an exact truthmaker of a sentence  $S$ , then a larger situation properly including  $s$  need no longer be an exact truthmaker of  $S$ , namely if that situation involves ‘information’ not relevant for the truth of  $S$ .

The notion of an exact truthmaker is similar to, yet distinct from that of a minimal situation supporting a sentence (Kratzer 2002, online). There are two important reasons for

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<sup>9</sup> Possibilities thus are best considered entities abstracted from a modal propositional content, just as non-worldly facts would be viewed as entities abstracted from a true propositional content (Moltmann 2013a, Chap. 6).

<sup>10</sup> Cases also differ from states of affairs: states of affairs ‘exist’ whether or not they ‘obtain’. States of affairs accept two different existence predicates, *exist* and *obtain*, conveying two different modes of being, quite unlike cases.

using the notion of an exact truthmaker rather than that of a minimal truthmaker (Fine 2017). First, there are sentences that have exact verifiers, but lack minimal verifiers (e.g. *there are infinitely many prime numbers*).<sup>11</sup> Second, a sentence such as *it is windy or it is rainy and windy* has two exact verifiers, a situation in which it is (just) windy and a situation in which it is (just) windy and rainy, but it would have only one minimal verifier (a situation in which it is windy) (Fine 2017).<sup>12</sup> *Case*-constructions clearly involve exact verifiers, rather than minimal verifiers. Thus, the first case does not prevent *case*-constructions from applying (*the case in which there infinitely many prime numbers*). The second permits reference to a plurality of two cases (*the two cases in which it is windy or it is rainy and windy*), which should be excluded if cases were minimal truthmakers.<sup>13</sup>

### 1.3. The actuality condition on the noun *case*

*Case*-NPs as in (4a) range over actual situations only and not merely possible ones, and so for the situations that (4b) refers to. I will call this the *Actuality Condition*. Where does this condition come from? The Actuality Condition does not come from the truthmaking relation itself since the truthmaking relation, in truthmaker semantics, is a relation that holds between actual as well as possible situations and sentences (as well as impossible ones). Moreover, it could not be a general condition on quantification or reference. Natural language does permit quantification over and reference to non-actual entities, explicitly with NPs such as *the success we could have achieved* or *every letter John needs to write*, but also implicitly with conditionals and modals quantifying over non-actual worlds or situations.<sup>14</sup> The Actuality Condition rather is a general presupposition of what I call *ordinary argument positions* of natural language predicates, argument positions that with non-actual entities would result in a

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<sup>11</sup> See also Kratzer (2002, 2014) and Yablo (to appear) for discussion.

<sup>12</sup> The NP *the two cases in which it is windy or it is windy and rainy* may not normally sound that good. But that can be traced to conditions on the individuation of situations, which, like all entities, should generally not overlap if they are to be countable. This would be a condition imposed by the count noun *case*, rather than the truthmaking relation itself.

<sup>13</sup> The notion of an exact truthmaker has a range of further application, for example adverbials (Moltmann 2007) and intensional definite descriptions (*the book John needs to write*, cf. Moltmann 2013a, Chap. 5, to appear). It is expected that it applies to all the semantic phenomena for which situations have been invoked, including restrictions of the domain of quantifiers and definite NPs and perception reports.

<sup>14</sup> See Priest (2005) and Moltmann (2013b), as well as other Meinongians for the defense of that view.

sentence that is neither true nor false. Ordinary argument positions are, for example, the argument positions of sortal nouns (*building, person, woman*). Non-ordinary argument positions include the object argument positions of intensional and intentional transitive verbs (*look for, mention, think about*) (which allow for truth with non-actual entities as arguments) and the subject position of existence predicates (which allow for falsehood with nonactual entities as arguments) (Priest 2006, pp. 59-60; Moltmann 2013b, 2015).<sup>15</sup> For one-place predicates, the Actuality Condition is given below, where  $D_c$  is the domain of entities considered actual in the context  $c$ :

(7) The Actuality Condition on ordinary (one-place) predicates

For an ordinary one-place predicate  $P$  and a context  $c$ , if for an entity  $d$ ,  $d \in [P]^c$  or  $d \in [not P]^c$ , then  $d \in D(c)$ .

The Actuality Condition also concerns situations once situations are considered part of the domain of entities and potential arguments of predicates. The Actuality Condition then applies to the noun *case*, requiring that its arguments (situations) be in the domain  $D_c$  of entities considered actual in the context  $c$ .

The Actuality Condition can be fulfilled also if the context is no longer that of the utterance, but shifted to that of a reported propositional attitude or epistemic state, due to the presence an attitude verb or modal expression. Such a context shift may even be triggered by an adjectival modifier of *case* (*possible / improbable / unlikely / hypothetical case*) (cf. Section 4.2.).

#### 1.4. Reference to kinds of cases

*Case*-NPs as in (4) and (5) stand for particular cases and need to be distinguished from singular definite descriptions that stand for *kinds of cases*, such as the following:

- (7) a. the case in which a student passes the exam  
 b. the case in which it is rainy on a Sunday

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<sup>15</sup> Priest (2006) is not specific as to what predicates are subject to the condition. In Moltmann (2015), I take existence predicates as well as intentional and intensional predicates (with respect to the relevant argument positions) to be exempt from the condition.



Generic case descriptions as in (7a, b) are kind terms in the sense of Carlson (1977). Even though they are not of the form of bare plurals or mass nouns, they are semantically on a par with terms like *gold* or *giraffes* when used as kind terms. Thus, generic case descriptions allow for the application of typical kind predicates as in (8a) and exhibit the existential reading of episodic predicates as in (8b) characteristic of bare plurals and mass nouns acting as kind terms (Carlson 1977):<sup>16</sup>

- (8) a. The case in which someone passes the exam has never occurred before.  
 b. I have never encountered the case in which a candidate was unable to speak during the oral exam.

Unlike case descriptions, fact descriptions of the sort *the fact that S* are never kind terms allowing for predicates as in (8a, b). *The fact that a student passes the exam* and *the fact that it is rainy on a Sunday* stand for single quantificational facts, not a kind whose instances are particular facts involving particular individuals or days.

*Case*-NPs with disjunctive *case*-clauses may also stand for pluralities of kinds of cases as in (9a), though the same *case*-clause may give rise to a single kind of case as in (9b):<sup>17</sup>

- (9) a. the two cases in which someone arrives late or someone cannot come  
 b. the case in which someone arrives late or someone cannot come

(9a) refers to the plurality of the two kinds of cases in (10a), whereas (9b) refers to the kind of case in (10b):

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<sup>16</sup> Note that the noun *case* also allows for kind reference with the bare plurals:

- (i) Cases in which someone passes the exam are rare.

For some reason, kind predicates like *rare* or *unusual* are better in German than in English with definite NPs standing for kinds of cases:

- (ii) Der Fall, in dem ein Student das Examen schafft, ist, selten / ungewöhnlich.  
 'The case in which a student passes the exam is rare / unusual.'

<sup>17</sup> Several readings are also available with *case*-clauses involving disjunctions of indefinites:

- (i) The cases in which a customer bought a book or a newspaper.

- (10) a.  $k([\textit{someone arrives late}])$ ,  $k([\textit{someone cannot come}])$   
 b.  $k([\textit{someone arrives late or someone cannot come}])$

The two interpretation of the disjunctive *case*-clause in turn will have to be based on two distinct kind-indexed syntactic structures, namely  $[\textit{someone arrives late}]_k$  or  $[\textit{someone cannot come}]_k$  and  $[\textit{in which someone arrives late or someone cannot come}]_k$ .

## 2. Outline of truthmaker semantics

### 2.1. Basics of truthmaker semantics

The following gives an outline of truthmaker semantics for the present purpose of the semantics *case*-constructions. Truthmaker semantics involves a domain of situations containing actual, possible as well as impossible situations. This domain is ordered by a part relation and is closed under fusion. The following standard conditions on the truthmaking of sentences with conjunctions, disjunctions, and existential quantification then hold (Fine 2012, 2014, 2017):<sup>18</sup>

- (11) a.  $s \Vdash S \textit{ and } S'$  iff for some  $s'$  and  $s''$ ,  $s = \text{sum}(\{s', s''\})$  and  $s' \Vdash S$  and  $s'' \Vdash S'$ .  
 b.  $s \Vdash S \textit{ or } S'$  iff  $s \Vdash S$  or  $s \Vdash S'$ .  
 c.  $s \Vdash \exists x S$  iff  $s \Vdash S[x/d]$  for some entity  $d$ .

As in Fine (2017), I take the truthmaking conditions for disjunction to be exclusive, which means disjunctions won't have as truthmakers sums of situations that are truthmakers of the disjuncts. Plural *case*-NPs with disjunctive *case*-clauses reflect that in the choice of a numeral modifier:

- (12) a. the two cases in which Mary received an invitation or John received one

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<sup>18</sup> The truthmaking condition for sentences with universal quantification and conditionals are less obvious and in fact controversial. I will not give truthmaking conditions for them here since they won't be specifically relevant for the semantics of *case*-constructions. See Armstrong (2004) and Fine (2017) for discussion and somewhat similar proposals concerning universal quantification.

b. ??? the three cases in which Mary received an invitation or John received one

The unacceptability of *three* in (12b) means that a sum of a situation in which Mary received an invitation and a situation in which John received an invitation won't count as a truthmaker of the disjunctive *case*-clause.

Truthmaking conditions for negative sentences are a matter of controversy. Negative sentences are generally considered a challenge to the truthmaking idea since it is not obvious what sort of entity there is in the world that could make the sentence *John failed to show up* or *no one is satisfied* true. On some views of truth-making, negative sentences do have truthmakers; on others, they don't.<sup>19</sup> The semantics of *case*-NPs itself bears on the issue. Negative *case*-clauses generally do not pose an obstacle for the referentiality of definite case descriptions, including of the generic sort:

- (13) a. We discussed the case in which John does not show up.  
 b. The case in which no one is satisfied is not a good prospect.  
 c. The cases in which either John did not show up or he did not pay attention are numerous.

Clearly, *case*-constructions require a notion of truthmaking that assigns truthmakers to negative sentences. Fine's (2012, 2014, 2017) truthmaker semantics accomplishes that by assigning sentences not only truthmakers or verifiers, but also falsifiers. This allows a straightforward formulation of the truthmaking conditions of negative sentences: a truthmaker for  $\neg S$  is a falsifier for  $S$ . With  $\Vdash$  as the relation of (exact) falsification, the condition is given below:

- (14)  $s \Vdash \text{not } S$  iff  $s \Vdash S$

Also complex sentences (conjunctions, disjunctions, existential quantification) are assigned both truthmaking and falsemaking conditions (Fine 2017). A sentence  $S$  then has as its meaning a pair  $\langle \text{pos}(s), \text{neg}(S) \rangle$  consisting of a *positive denotation*, the set  $\text{pos}(S)$  of verifiers of  $S$ , and a *negative denotation*, the set  $\text{neg}(S)$  of falsifiers of  $S$ .

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<sup>19</sup> See Mulligan/Simons/Smith (1984) and Armstrong (1997, 2004) for discussion.

In this paper, I will disregard negation and will focus entirely on non-negated sentences. Given that, it will suffice to make use only of the positive denotation of sentences, which will simply be given as ‘[S]’ for a sentence S.

## 2.2. Extensions of truthmaker semantics

### 2.2.1. Kinds of situations as truthmakers

For purpose of the semantics of *case*-constructions, Fine’s truthmaker semantics needs to be extended so as to allow kinds of situations to be truthmakers (the referents of kind-referring *case*-NPs). Kinds of situations as truthmakers are involved in examples such as (9a) as opposed to (9b), repeated below:

- (15) a. the two cases in which someone arrives late or someone does not come  
 b. the case in which someone arrives late or someone does not come

In (15a), the two kinds of cases, the case in which someone arrives late and the case in which someone cannot come, act as the truthmakers of the complex *case*-clause and together form the plural referent of the entire NP. (15b), by contrast, refers to the kind of the situations that are truthmakers of the disjunctive *case*-clause.

Kinds of cases are considered entities *sui generis*, but which are strictly individuated by their instances. First, the identity of kinds of cases strictly depends on their instances, as below, where *I* is the relation of instantiation:

- (16) For any two kinds of truthmakers *k* and *k'*,  $k = k'$  iff for all *s*,  $s I k \leftrightarrow s I k'$ .

Moreover, like kinds in general (referents of bare plurals and mass nouns), kinds of cases strictly inherit their properties from their instances. In the present context, this concerns mainly the truthmaking relation:

- (17) Truthmaking inheritance condition for kinds

For a sentence *S* and a kind of situation *k*,  $k \Vdash S$  iff for every situation *s*, if  $s I k$ , then  $s \Vdash S$ .

Just as any bare plural or mass noun defines a kind as its referent, every sentence defines a kind whose instances are the sentence's truthmakers:

(18) For any sentence  $S$ , there is a kind of truthmaker of  $S$ ,  $k(S)$ , such that for every situation  $s$ ,  $s \models k(S)$  iff  $s \models S$ .

A sentence  $S$ , in addition to its ordinary semantic value  $[S]$ , will then have a kind-based semantic value  $[S]_{\text{kind}}$ , based on kind-indexing:

(19) The kind-based positive denotation of sentences

For a sentence  $S$ ,  $[S]_k = k(S)$

For a disjunction  $S$  or  $S'$  (as in (15a)), the ordinary semantic value can itself consist in a set of kinds of truthmakers (of the disjuncts), in which case we have:

(20)  $[[S]_k \text{ or } [S']_k] = \{[S]_{\text{kind}}, [S']_{\text{kind}}\}$ .

The number of kind-based meanings will of course increase with the complexity of the sentence.

Kind-based meanings permit reformulating standard alternative semantics in terms of truthmaker semantics if kinds of situations are identified with propositions. In alternative semantics, questions are assigned as meanings sets of propositions that are possible answers. They would now be sets of kinds of situations. Thus, a disjunctive question (which I return to in the context of *case*-anaphora in Section 6) will be assigned as its meaning the set of kinds of situations that are truthmakers of the disjuncts, so that (20) will also be the meaning of (21):

(21) Did someone arrive late or did someone not come?

Kind-based meanings thus will serve different semantic purposes, being involved in the semantics of *case*-NPs as well as that of disjunctive questions.

### 2.2.2. Extensions of truthmaker semantics

Truthmaker semantics as outlined in the previous section needs to be supplemented by an account of context-dependency. I will make use of a notion of context that serves strictly the purposes of this paper, setting aside all other linguistic issues of context dependency. This context is a local, shiftable context  $c$  which can be taken to be either the utterance  $u$  of the sentence itself or else a reported attitude or epistemic state  $e$ , in the case of a sentence embedded under an attitude verb or epistemic modal.<sup>20</sup> As a local context,  $c$  may shift for the evaluation of an embedded sentence in the scope of an attitude verb or modal expression. The context for the evaluation of the entire sentence will be the *primary context* and the shifted context for an embedded sentence a *secondary context*. A context  $c$  will be associated with a domain  $D(c)$ , which consists in entities considered actual by the agent(s) associated with  $c$ . A sentence then denotes a set of situations (its exact truthmakers) only relative to a context  $c$ . A simple sentence such as *The president is responsible* then has a (positive) meaning relative to a context  $c$ , which consists in the set of situations containing the president in  $D(c)$  and the attribution of responsibility to him.<sup>21</sup>

Another extension of truthmaker semantics consists in the application of the truthmaking relation  $\Vdash$  to situations and epistemic states, such as beliefs, judgments, inquiries, and considerations.<sup>22</sup> The belief that John left has as truthmakers situations in which John left that are prior to that belief. Moreover, the belief that John won the race or Mary did has two types of truthmakers: the kind of situation in which John won and the kind of situation in which Mary won. These are the very same situations that resolve a state of an inquiry whether John won the race or Mary did. Beliefs with disjunctive contents may thus share their truthmakers with corresponding states of uncertainty or acts of inquiry.

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<sup>20</sup> Such contexts can be taken to consist in attitudinal objects, in the sense of Moltmann (2013a, 2014, 2017a), which include claims, requests, beliefs, inquiries, and considerations. See also Fn 21.

<sup>21</sup> Such sentence meanings can be obtained compositionally, for example if *is responsible* is assigned a denotation  $[is\ responsible]^c$  relative to a context  $c$  that is a function mapping an individual  $d$  to the set of situations  $s$  in which  $d$  is responsible. The meaning of *The president is responsible* is then obtained by function application:  $[The\ president\ is\ responsible]^c = [Is\ responsible]^c([the\ president]^c)$ . In this paper, to keep things simple, I take predicates to denote sets of entities.

<sup>22</sup> In Moltmann (2013a, 2014, 2017a), I take epistemic states to belong to the more general category of attitudinal objects, which includes desires, claims, imaginations, and requests. Attitudinal objects, most importantly, have a content consisting of truthmaking or satisfaction conditions, yet they share the particularity and concreteness of events.

### 3. The semantics of *case-nominals* with clausal modifiers: preliminary version

Based on the notion of truthmaking, the semantics of *case-nominals* describing particular cases can, in a preliminary version, be given as follows:

(22) The semantics of *case-nominals* describing particular cases (preliminary version)

For a context  $c$ ,  $[case\ in\ which\ S]^c = \{s \mid s \in [case]^c \ \& \ s \in [S]^c\}$

Here *case* is taken to have simply the meaning of ‘situation’, though this will be modified in the next section.

The semantics of *case-nominals* describing kinds of cases, similarly, will be as in (23a), where  $case_{kind}$  has the meaning derived from that of *case* in (23b) (again with a meaning of *case* that will be modified shortly):

(23) a. The semantics of *case-nominals* describing kinds cases (preliminary version)

For a context  $c$ ,  $[case_{kind}\ in\ which\ [S]_k]^c = \{k \mid k \in [case_{kind}]^c \ \& \ k \in [S]_{kind}^c\}$

b. For a context  $c$  and kind of situation  $k$ ,  $k \in [case_{kind}]^c$  iff for all  $s$ , if  $s \ I \ k$ , then  $s \in [case]^c$

Here only the kind-based semantic value of the *case*-clause can apply; the ordinary semantic value would be inapplicable.

In (22) and (23), the semantic contribution of the clause *in which S* is treated as that of an intersective modifier of the noun *case*, denoting the set of truthmakers of  $S$ , the meaning it shares with  $S$  (or *that S*). The contribution of the preposition is thus ignored.

There is support for that analysis and that is that in other languages than English, for example German (as well as in French, Italian, and Spanish), *case*-clauses may be formed without a preposition, with what corresponds to a *that*-clauses rather than an *in which*-clause.<sup>23</sup>

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<sup>23</sup> Definite *case*-NPs in German thus look like English definite NPs with *fact*, *possibility*, *idea*, *proof* etc.) as head, which select *that*-clauses rather than *in which*-clauses.

(24) der Fall, daß jemand zu spät kommt  
 ‘the case that someone is late’

One might think that one difference between *that*-clauses and *in which*-clauses is that the latter but not the former are relative clauses. However, this view is not universally accepted. Thus, Kayne (2010) argues that *that*-clauses are also relative clauses, a view that would support an analysis of clauses as in (24) as intersective modifiers.<sup>24</sup>

However, the question remains what semantic contribution the preposition *in* could have in *in which*-clauses. Two observations bear on the issue. First, in general *in* can relate a clausal content to a situation even if that situation is an exact truthmaker of the clause, as in *the situation in which a student is late*. This means *in* can relate a situation to itself. Second, *where* can be used in place of *in which* (*the cases where a student was late*). This indicates that *in* has in fact a locative meaning which includes self-containment of a situation. The semantics of the construction *case in which S* (for particular cases) should then be  $\{s \mid \exists s'(s \in [case]^c \ \& \ \langle s', s \rangle \in [in]^c \ \& \ s' \in [S]^c)\}$ , where pragmatic conditions are to ensure *in* to be restricted to conveying self-containment.

#### 4. The Case Space Requirement

The semantics of *case*-nominals given so far requires an important modification: a situation or kind of situation can be a case only within a *case space*, a set of at least two alternatives. This *Case Space Requirement*, as I will call it, is part of the lexical meaning of the noun *case*. The Case Space Requirement is of particular theoretical interest in that it connects truthmaker semantics to alternative semantics.

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<sup>24</sup> Note that with other determiners than the definite one, German switches to *in which*-clauses:

- (i) a. ein Fall, in dem / \* daß es regnet  
       ‘a case in which / that it rains’
- b. mehrere Fälle, in denen es regnete  
       ‘several cases in which it rained’

This indicates that *that*-clauses are syntactically selected by certain nouns and in addition need to be licensed by the definite determiner, whereas *in which*-clauses appear when those two conditions are not fulfilled. The alternation between *that*-clauses and *in which*-clauses thus is a syntactic one and not indicative of a semantic difference.



The Case Space Requirement is reflected in the semantics of all types of *case*-constructions: *case*-NPs with clausal modifiers, *case*-anaphora, and the predicate *is the case*, as we will see. Case spaces may be determined in two distinct way: by a *case*-clause (*sentential case spaces*) or by an epistemic state of uncertainty (*epistemic case spaces*).

#### 4.1. Sentential case spaces

The Case Space Requirement manifests itself first of all in that sentences cannot be used for case reference that have as truthmakers single known facts in the past or present or single time-less facts:

- (25) a. ??? We discussed the case in which John returned yesterday.  
 b. ??? The case in which John has solved the problem was unexpected.  
 c. ??? The case in which it is raining outside bothers us.  
 d. ??? The case in which 3 is a prime number is well-known.

The unacceptability of such examples contrasts with the acceptability of the corresponding sentences with fact descriptions:

- (26) a. We discussed the fact that John returned yesterday.  
 b. The fact that John has solved the problem was unexpected.  
 c. The fact that it is raining outside bothers us.  
 d. The fact that 3 is a prime number is well-known.

It also contrasts with the acceptability of *case*-NPs with existentially quantified an disjunctive *case*-clauses, as in (4a, b) and (5a, b), which involve more than one case as semantic value. Cases are not just isolated actual situations, but rather situations within a space of alternative situations.

There are other ways in which the Case Space Requirement may be satisfied by a *case*-description than by an existentially quantified or disjunctive *case*-clause. First, the Case Space

Requirement may be satisfied by a *case*-clause that is true at different times and thus has different time-related truthmakers:<sup>25</sup>

(27) the cases in which John won the race

Also a definite NP in the *case*-clause may lead to a case space, namely if it has different referents at different times or places:

(28) a. the cases in which the president was a democrat

b. the cases (over the years) in which the number of students was less than 1000

(29) a. the cases in which the head of state is a king

b. the cases (in this country) in which the number of students is less than 1000

Another way to meet the Case Space Requirement is for the *case*-clause to describe a part of a mathematical case distinction, involving variables in a mathematical extension of English:

(30) the cases in which  $n$  is a prime number

The Case Space Requirement is not a requirement that the *case*-NP refer to a plurality of particular cases. The requirement may also be satisfied if the *case*-NP refers to a single particular case within a set of alternatives that is determined by the *case*-clause.

One such construction by which this is possible is modification of the *case*-NP by cardinal or superlative adjectives:

(31) a. the first case in a student failed the exam

b. the worst case in which the two people had a dispute

Here the adjectival modifier relates to an order on a set of alternative situations making the *case*-clause true, and it ensures that the *case*-NP refers to a unique element in that set.

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<sup>25</sup> The same *case*-clause can modify a *case*-NP standing for a kind whose instances are truthmaking situations at different times, as in *The case in which John won the race has occurred only twice*.

Another way for a *case*-NP to refer to a single case among a set of alternatives involves contrastive focusing of a constituent of the *case*-clause:

- (32) a. The case in which Géreon won the race was totally unexpected.  
 b. I recall the case in which John was éager to do his homework.

Contrastive focusing goes along with a set of alternatives relevant in the context of the utterance (Rooth 1992). Specifically, given the present context, contrastive focusing sets up alternative situations involving contextually relevant semantic values other than the semantic value of the focused constituent. In (32a), these are situations in which a relevant person other than John won the race. In (32b), these are situation in which John was something other than eager to do his homework. These situations together with the situation referred to make up the case space.

A case space induced by focusing is also involved in the semantics of *case*-NPs with *only* as modifier, a modifier that associates with focus:

- (33) Mary remembered the only case in which Géreon won the race

Here the case space consists in different situations of someone winning the race among which there will be just one, involving Gereon, for *only* to select.

Contrastive focus and expressions associating with focus are among the main motivations for alternative semantics, a semantic approach on which a sentence has as semantic value a set of propositions or alternatives, rather than a single proposition. Thus, Rooth (1992) assigns a focused sentence a focus-semantic value, the set of contextually relevant propositions that are obtained by replacing the semantic value of the focused constituent by other semantic values. The ordinary semantic value of the sentence will be a proposition, and the sentence presupposes that that proposition be part of the focus-semantic value.

Alternative semantics has also been applied to questions, which have been assigned as their semantic value the set of true and false answers (Hamblin 1973), to disjunctions, which have been assigned as their semantic value the sets of the propositions expressed by the disjuncts (Aloni 2007), to conditionals (Santorio 2018), and to certain types of indefinites (Kratzer/Shimoyama 2002).

There is a significant connection between truthmaker semantics and alternative semantics. Truthmaker semantics, in a way, provides a version of alternative semantics, a version on which the alternatives are not propositions, but truthmaking situations. Truthmaker semantics assigns sets of (possibly different) truthmaking situations to disjunctions and to existentially quantified sentences, rather than sets of propositions. Truthmaker semantics can be reformulated, though, so as to assign kinds or sets of truthmakers to disjuncts, the correlates of propositions, and for certain purposes it needs to be so reformulated (such as for the semantics of *case*-NPs standing for pluralities of kinds of cases).

Deviating somewhat from Rooth, I will not assign the very same sentence  $S$  containing a focused constituent two different semantic values, but rather distinguish two syntactic structures for  $S$ : a syntactic structure without focus structure and a syntactic structure with focus structure. Truthmakers of  $S$  without its focus structure will be the ordinary truthmakers of  $S$ , whereas truthmakers of  $S$  with its focus structure,  $S[Y_{\text{focus}}]$  (with a focused constituent  $Y$ ), will include truthmakers for the result of replacing the focused constituent  $Y$  by a different expression  $X$  relevant in the context  $c$  of the same syntactic category as  $Y$  ( $CAT_{Y, c}$ ):

(34) Truthmaking for sentences with focus structure

For a context  $c$  and a situation  $s$ ,  $s \models S[Y_{\text{focus}}]^c$  iff  $\exists X(X \in CAT_{Y, c} \ \& \ s \models S[X/Y]^c$

Truthmaker Semantics for the present purposes has a significant advantage over standard alternative semantics since it allows *case*-NPs to make reference to a plurality of cases as well as reference to a single case within a background of alternatives. A unified semantics of *case*-NPs would not be available on the standard, propositions-based version of alternative semantics, which does not allow for reference to particular cases.

Truthmaker semantics extended to kinds as truthmakers will allow for sets of kinds of cases as case spaces, for examples such as the one below:

(35) the case in which an Américan wins the race

In (35) the case space will consist in kinds of the sort the case in which an American wins the race, the case in which a Frenchman wins the race, the case in which a German wins the race etc.

Unlike with reference to an actual situation, alternatives for kinds of situations are always available, since they do not require factual situations to exist (that is, a kind of situation may have only possible, nonfactual situations as instances).

Semantically, the involvement of a case space means that the noun *case* does not just take a particular situation or kind of situation as an argument, but also a set of alternative situations or kinds of situations, a case space. The case space must include the situation argument of *case* and have at least two elements. In the examples discussed in this section, the case space is determined by a sentence, the *case*-clause (possibly together with its focused structure), as the set of truthmakers or of kinds of truthmakers of that sentence:

(36) Definition of a sentential case space

For a sentence  $S$ ,  $CS(S) = \{s \mid s \models d \ \& \ \exists s'(s' \models S \ \& \ s \neq s')\}$ .

A sentential case space will be based on a syntactic (indexing) relation between the noun *case* and the *case*-clause, as in (36a) or for a *case*-clause with focusing as in (36b):

- (37) a. For a context  $c$ , [the case <sub>$i$</sub>  in which  $S_i]^c = \text{the } s[\langle s, CS(S) \rangle \in [case]^c \ \& \ s \in S^c]$   
 b. For a context  $c$ , [the case <sub>$i$</sub>  in which  $S[Y_{\text{focus}}]_i]^c = \text{the } s[\langle s, CS(S[Y_{\text{focus}}]) \rangle \in [case]^c \ \& \ s \in S^c]$

The semantic contribution of focus in the *case*-clause will consist in determining the case space only.

## 4.2. Epistemic case spaces

Besides being determined by a sentence, a case space may also be determined by an epistemic state. Such an epistemic case space consists of alternatives supported by an epistemic state of uncertainty associated with the utterance of *case*-construction. This epistemic state may be indicated by an epistemic modal of possibility, as in (38a), or understood implicitly, as in

(38b), when the case referred to is not a known fact, but considered a possibility. (38a, b) contrast with (38b), where the *case*-NP refers to an actual particular case:<sup>26</sup>

- (38) a. We cannot exclude the case in which John might have returned yesterday.  
 b. We cannot exclude the case in which John returned yesterday.  
 c. ??? The case in which John returned yesterday surprised us.

The contrast below makes the same point:

- (39) a. The case in which it might be/is raining outside needs to be taken into consideration.  
 b. ??? The case in which it is raining outside bothers us.

The *case*-NP in (39a) unlike that in (39b) does not describe an actual situation, but rather one epistemic possibility besides others.

In (38a, b), the case space consists in the (kinds of) situations that are truthmakers of the epistemic state of uncertainty indicated by the (explicit or implicit) epistemic modal:

(40) Definition of an epistemic case space

For an epistemic state  $d$ ,  $CS(d) = \{s \mid s \models d \ \& \ \exists s'(s' \models d \ \& \ s \neq s')\}$ .

By contrast, in the case of a sentential case space, the case space consists of (kinds of) situations that are truthmakers of a sentence. The noun *case* is thus subject to the general condition below:

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<sup>26</sup> Some speakers do not accept the modal in (38a). Those speakers appear to also not accept the modal below, where it does not contribute to the propositional content either:

- (i) the possibility that John might not return.

This particular ‘harmonic’ use of the modal can be found in other languages as well, for example German, where both (iia) and (iib) are acceptable:

- (i) a. der Fall, daß Hans nicht zurückkommen könnte.  
 ‘the case in which John might not return’  
 b. die Möglichkeit, daß Hans nicht zurückkommen könnte  
 ‘the possibility that John might not return.’

(41) Lexical condition on the noun *case*

For a context  $c$ , a situation  $s$  and a set  $X$ , if  $\langle s, X \rangle \in [case]^c$ , then for an epistemic state or sentence  $d$ ,  $X = CS(d)$  and  $s \in X$ .

In (38a, b) and (39a), the modal does not contribute to the propositional content of the *case*-clause, since the *case*-NP refers not to a situation of a possibility obtaining, but to one possible situation among others that are being considered. The contribution of the epistemic modal is just to indicate the epistemic state of uncertainty that goes along with maintaining the content of the *case*-clause and thus is that of a mere ‘force indicator’ (Papafragou 2007).<sup>27</sup>

Besides being indicative of an epistemic state, the (explicit or implicit) modal in *case*-NPs ensures the satisfaction of the Actuality Condition, by shifting the context of evaluation for *case*. The Actuality Condition will then be fulfilled with respect to a domain of objects associated with the state of uncertainty rather than that of the utterance context. The question, though is: how is that possible since the noun *case* is not in the scope of the modal which introduces that secondary context? Here appeal can be made to an influential syntactic view according to which the head noun of a relative-clause construction (*case* in *case in which S*) has a representation inside the relative clause, related to the head noun in its upper position either by movement (Vergnaud 1974, Kayne 1994, Carlson 1977, Cinque 2015) or by matching (Chomsky 1965, Cinque 2015).<sup>28</sup> Making use of the former account means that (42a) can have as input to semantic interpretation the syntactic representation in (42b) with reconstruction of the noun *case* into the lower position and the *in which*-clause in its original adverbial position. The denotation of (42a) will then be (42b), which involves a shift of the local context to that of an epistemic state  $e$ , which considered an argument of *might*.<sup>29</sup>

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<sup>27</sup> In fact, for those speakers that accept an overt modal, the very same semantic effect can be achieved using sentence adverbials:

- (i) the case in which John has perhaps / possibly already returned

<sup>28</sup> The motivations for that syntactic view include connectivity effects, such as the antecedent of *each other* being inside the relative clause below:

- (i) the respect for each other that Sue and Mary display

<sup>29</sup> For an elaboration of the view on which modals are predicates of epistemic states or more generally modal objects see Moltmann (2015b, 2017a, 2018).

- (42) a. the case in which John might return  
 b. the  $t_i$  [ might John [in which case<sub>i</sub>] return]  
 c. [*the case in which John might return*]<sup>c</sup> = the situation  $s$  such that  $\exists s' (<s', s> \in [in]^c \& <s, CS(e)> \in [case]^c \& s' \in [S]^c)$ , for a relevant epistemic state  $e$ , such that  $e \in [might]^c$

In (42c), the Actuality Condition is to be satisfied with respect to  $D(e)$  and *case* will take the case space determined by  $e$  as its second argument.

Also descriptions of mathematical uncertainties (at the relevant point in time) can be case-constitutive, with or without overt epistemic modal:

- (43) a. The case in which there is a solution to the equation is would be very interesting.  
 b. The case in which there might a largest prime number has long been ruled out.

By contrast, sentences describing known mathematical facts cannot set of a case space:

- (44) a. ??? The case in which 2 is a prime number is interesting.  
 b. ??? The case in which there is no largest prime number is well-known.

Another indication for an epistemic case space may come from an adjectival modifier of a *case*-NP description. *Case* -NPs permit adjectival modifiers indicating epistemic uncertainty, as in (45a), but are less good with those indicating a stronger form of acceptance, as in (45b):

- (45) a. in the unlikely / improbable / unforeseeable case in which the treasure is returned  
 b. ??? in the likely / probable / foreseeable case in which the treasure is returned

*Case*-NPs exclude factive modifiers:

- (46) ??? the fortunate / regrettable case in which Mary returns

The epistemic states indicated in (45a) are clearly associated with a case space, less so the ones indicated in (45b) and certainly not the ones in (46c), which exclude alternatives.



Epistemic modal adjectives as in (45a), like epistemic modal verbs, involve a shift of the local context to that of the epistemic state in question. This means that the Actuality Condition is to be satisfied with respect to the domain associated with that epistemic state, not the domain of the primary context.

To summarize, if the *case*-clause does not set up a case space itself, then a state of uncertainty, indicated by an (explicit or implicit) modal expression may set up a case space. In that case, the Actuality Condition needs to be satisfied only with respect to the secondary context introduced by the modal, not the primary context (that of the utterance of the entire sentence).

One might try to unify the two sorts of case spaces by taking a case space set up by a sentence to be a special case of an epistemic case space. However, this is implausible for a *case*-clause with an indefinite as in (4a, b). Thus, two distinct sources for a case space need to be distinguished, one being the *case*-sentence itself, the other an epistemic state of uncertainty. Whereas the former is based on a syntactic relation between *case* and the *case*-clause, the latter is tied to the local, secondary context of evaluation.

Case spaces are also set up by an overt or implicitly understood future tense:

- (47) a. The case in which I will solve the problem is very unlikely.  
 b. The case that it will rain tomorrow cannot be excluded.  
 c. The case in which John returns tomorrow can be excluded.

Future tense sets up a case space because it represents different options or at least different epistemic possibilities. Future tense is generally considered a modal, which means it would introduce a modal object whose truthmakers make up the case space, on par with the epistemic state introduced by epistemic modals.

## 5. *Case-anaphora with conditionals, disjunctions, and questions*

*Case*-anaphora give further support for cases as situations in the role of truthmakers within a space of alternatives. These are in particular *case*-anaphora whose antecedent is introduced by an utterance of a different speaker, by a particular visual situation, by conditionals, by disjunctions, by yes/no-questions, and by particular types of attitude reports and modal sentences.

The involvement of a case space in the difference it makes whether the *case*-anaphor relates to a preceding utterance of the same speaker or of a different speaker. The *case*-anaphor is not very good in the discourse below:

(48) ??? John won the race. In that case, Mary will be happy.

Here *that case* should refer to the kind of situations in which John won the race. However, being described by an assertion of the same speaker, it does not come with alternatives and thus does not belong to a case space. The Case Space Requirement can be fulfilled, though, when the preceding sentence is asserted by a different speaker:

(49) A: John won the race.

B: In that case, Mary will be happy.

The *case*-anaphor in B's utterance is acceptable only if B is not yet convinced that John won the race. In that case, the *case*-anaphor will relate to a weaker attitude than belief, say of B's hypothetical acceptance that John won the race, as a reaction to A's assertion. That attitude allows for alternatives and thus sets up a case space.

The Case Space Requirement is also apparent in the absence of an antecedent sentence introducing the case. Compare (50a) and (50b) uttered out of the blue:

(50) a. In that situation, I would flee.

b. In that case, I would flee.

(50a) and (50b) are appropriate in different visual contexts. Whereas (50a) is appropriate when confronted with a single situation, (50b) is acceptable only when pointing at one situations among several that are visually displayed.<sup>30</sup>

Let us then turn to *case*-anaphora relating to the utterance of a preceding sentence by the same speaker. First, yes/no-questions support *case*-anaphora, as in the single-speaker discourse below, in which the speaker decides not wait for the addressee's answer to the question:

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<sup>30</sup> Thanks to a referee for pointing out the source of the potential unacceptability of (51b).

(51) Did John win the race? ... In that case, Mary will be happy.

A yes/no-question is associated with an attitude of inquiry supporting two alternatives and thus sets up a case space, a requirement for the use of a *case*-anaphor within the same context.

Also disjunctive declarative sentences permit *case*-anaphora. The reason is that an assertion with a disjunctive content permits as many alternatives as there are disjuncts. As such, it sets up a case space for a *case*-anaphor applying within the same local context:<sup>31</sup>

- (52) a. John will interview or Mary will. In either case, we should be well-prepared.  
 b. The exam will be about Goethe, Schiller, or Kleist. In all three cases, the same sorts of questions will be asked.

Finally, conditionals support *case*-anaphora:

- (53) a. If it rains, we won't go.  
 b. In that case / In such a case, we will stay home.  
 c. Let's better not think about that case.

*That case* in (53b) and (53c) refers to the kind of situation that is an exact truthmaker of the antecedent of the conditional. The attitude associated with the antecedent of a conditional is that of hypothetical acceptance, not that of belief (Stalnaker 1984). Being a state of hypothetical acceptance permits it to set up a case space, consisting of the kind of situation satisfying the antecedent, but also an alternative kind of situation falsifying the antecedent.

*In that case* itself forms the antecedent of a conditional, involving reference to the situations that are truthmakers of the antecedent of *that case*. The noun *case* can also serve to form non-anaphoric conditionals, as in English in (54a) and the German translation with *im Fall* in (54b):<sup>32, 33</sup>

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<sup>31</sup> Note that the presence of *either* in (53a) and *three* in (53b) shows the exclusive semantics of disjunctions just as in the case of *case*-NPs with disjunctive *case*-clauses: situations in which John and Mary will interview could not constitute a third case, and similarly for situations, for example, in which the exam is about both Goethe and Schiller.

<sup>32</sup> *In case* can also act as a complementizer:

(i) We will take an umbrella in case it rains.

- (54) a. In a case in which it rains, we will have to cancel the garden party.  
 b. Im Fall, daß es regnet, werden wir das Gartenfest absagen.

There are reasons independent of the occurrence of the noun *case* for taking truthmaking to be involved in the semantics of conditionals. Thus Fine (2012, 2014) argues for a truthmaker-based (as opposed to a possible worlds-based) semantics of counterfactual conditionals. A truthmaker-based account of conditionals in general can be based on the following schema, for a suitable relation *R* between antecedent and consequent situations:<sup>34</sup>

- (55) *If S, then S'* is true iff for every situation *s*,  $s \Vdash S$ , there is a situation *s'* such that  $sRs'$  and  $s' \Vdash S'$ .

Such a semantics can be carried over to prepositional phrases *in that case* as below:

- (56) *In that case S* is true iff for every situation *s* such that  $s I [that\ case]$ , there is a situation *s'*,  $s R s'$  and  $s' \Vdash S$ .

*Case*-anaphora raise the question of how the Actuality Condition associated with the noun *case* is satisfied, since *case*-anaphora generally do not make reference to situations considered actual. Given the semantics in (56), it is satisfied because *case*-anaphora involve reference to kinds of case, not particular cases and kinds of cases always satisfy the Actuality Condition.

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Here the main clause is said to be true in view of one possible future course of events, namely in which a situation-like case as described by the *case*-NP occurs. In English, the construction is grammaticalized, containing no determiner before *case* and no complementizer *that* after it (\* *in the case it rains*, \* *in the case that it rains*).

<sup>33</sup> There are differences between ordinary *if*-conditionals and *case*-conditionals. *If*-conditionals can go along with adverbs of quantification, of which the *if*-clause appears to act as a restriction, but *case*-conditionals cannot:

- (i) a. If a student fails the exam, he usually tries again.  
 b. ??? In case a student fails the exam, he usually tries again.

<sup>34</sup> See also Kratzer (online) and references therein for analyses of conditionals on the basis of situations.

*Case*-anaphora are subject to general constraints on anaphora. In particular, a *case*-anaphor can refer only to a situation that has been made at least as explicit as its alternatives, as seen in the contrast between simple yes/no questions and disjunctive ones below:

- (57) a. Will you come? In that case / ??? In either case, I would come too  
 b. Will you come or not? In both cases / In either case / ??? In that case, I would come too.

Simple *yes/no*-questions provide a single case for a subsequent *case*-anaphor, even though they set up a case space with two alternatives. By contrast, corresponding alternative questions, which set up the same case space, provide two cases for a subsequent *case-anaphor* to refer to.<sup>35</sup>

## 6. *Case*-anaphora with attitude verbs and epistemic modals

The Case Space Requirement manifests itself also with *case*-anaphora relating to a sentence embedded under an attitude verb in a preceding sentence. Such *case*-anaphora display striking differences in acceptability with respect to the choices of different attitude verbs.

First of all, as expected, (non-disjunctive) complement clauses of factive attitude verbs do not support subsequent *case*-anaphora. This holds both within the same secondary context as in (58a) and for the primary context as in (58b):

- (58) a. ?? John is happy that he won the election. In that case, he wants to celebrate.  
 b. ?? John noticed that Mary is at home. In that case, Bill is at home too.

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<sup>35</sup> Constraints on the linguistic representation of antecedents are familiar from the semantic literature on anaphora, from examples such as:

- (i) a. Someone left. He did not come back.  
 b. ??? Not everyone stayed. He did not come back.

*Case*-anaphora, though, are not expected to fall under the very same constraint as ordinary pronominal anaphora since they refer within a case space and do not have pronominal form. But *case*-anaphora show contrasts analogous to that in (i):

- (ii) a. John believes that Mary will go to the party. In that case, I will go too.  
 b. ??? John doubts that Mary won't go to the party. In that case, I will go too.

Factive attitudes do not set up a case space, neither for the context of the described agent nor the speaker's context. There is one exception to that, of course, and that is when the complement clause itself sets up a case-space and the reported attitude thus supports different alternatives, such as the disjunctive complement below:<sup>36</sup>

(59) John knows that he will win or lose. In either case, he will continue training..

Complement clauses of certain nonfactive attitude verbs do support *case*-anaphora (within the same secondary context), for example *hope* and *fear*:

(60) John hopes / fears that Mary is at home. In that case, he believes that Bill is at home too.

A hope or fear that S come with uncertainty as to whether S, that is, an epistemic state that supports alternatives to S and thus sets up a case space. A reported hope or fear that S also support *case*-anaphora within the primary context, namely if the speaker himself hypothetically accepts that S:

(61) John hopes / fears that Mary is at home. In that case, I would believe that Bill is at home too.

*Fear* and *hope* contrast with *believe*, which does not support *case*-anaphora within the secondary context, as in (62a), but only within the primary context, as in (62b), and only if the agent of the described attitude is not the speaker, as in (62c):

(62) a. ??? John believes that Mary is at home. In that case, he believes that Bill is at home too.

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<sup>36</sup> Also focus in a factive complement can support a *case*-anaphor. Below the *case*-anaphor is the complement of a predicate expressing an objectual attitude:

(i) John is delighted that Géreon won the election. We were completely unprepared for that case.

Here it is the background attitude of taking different winners into consideration that supports the alternatives in the case space.

- b. John believes that Mary is at home. In that case, I would believe that Bill is at home too.
- c. ??? I believe that Mary is at home. In that case, I believe that Bill is at home too.

A belief that S does not support alternatives to S and thus does not set up a case space. (62b) presupposes that the speaker is uncertain as to the truth of John's belief.

Other positive, truth-directed attitudes, for example assertions, exhibit the very same pattern as belief:

- (63) a. ??? John claims that Sue won the race. In that case, he wants to celebrate.
- b. John claimed that Sue won the race. In that case, I will celebrate.
- c. ??? I claim that Sue won the race. In that case, I will celebrate.

Assertions do not come with a state of uncertainty that would support alternatives to the reported content, but another agent may adopt that content against the background of a weaker epistemic state which sets up a case space for a *case*-anaphor to relate to.

Attitude verbs such as *think*, *imagine*, and *dream* do not support *case*-anaphora at all within the secondary context:<sup>37</sup>

- (64) a. ?? John thinks that that Mary is not interested in him. In that case, he wants to ask Sue out.
- b. ?? John imagines that he is rich. In that case, he imagines to be very generous.
- c. ?? John dreamt that he was a bird. In that case, he wanted to fly.

The reason is that attitudes such as thinking (in the sense of 'entertaining'), imagining and dreaming are not epistemic in nature and could thus not be associated with an epistemic state

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<sup>37</sup> Verb of saying such as *remark*, *say*, *whisper*, *scream*, and *write* also fail to support *case*-anaphora in a subsequent sentence, both within the primary and the secondary context:

- (i) John said /whispered/screamed that Sue won the race. ??? In that case, Bill will be disappointed.

Verbs of saying arguably describe merely locutionary, not illocutionary acts, and thus do not serve to specify truth or satisfaction conditions (Moltmann 2017).

of uncertainty.<sup>38</sup> They will hence not be able to set up an epistemic case space for a *case*-anaphor within the same secondary context.

Case spaces can be set up by epistemic modals. Epistemic modals of possibility and necessity both support *case*-anaphora, though speakers differ somewhat as to which modals better support them:

- (65) a. John might have arrived. In that case Mary should be relieved.  
 b. John must be at home. In that case, Mary will be at home too.

The support of *case*-anaphora with epistemic *must* obviously presupposes that epistemic *must* is not factive, a view defended by Karttunen (1972).<sup>39</sup> Epistemic *may* and, to an extent, *must* thus are indicative of an epistemic state permitting alternatives and thus setting up a case space.

By contrast, deontic and ability modals do not permit *case*-anaphora:

- (66) a. You may take an apple. ??? In that case, you may take a pear too.  
 b. ??? You must leave. In that case, your wife will leave too.  
 c. ?? John can lift the table. In that case, he should carry it upstairs.

A case space for the noun *case* can be set up only by an epistemic state, not an obligation or permission, even if obligations and permissions come with truthmakers (or satisfiers) (Fine to appear a, b, Moltmann 2017, 2018).

## 7. The predicate *is the case*

The predicate *is the case* appears to be a predicate synonymous with the truth predicate *is true*. However, *is the case* has a very different semantics, namely in which the contribution of

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<sup>38</sup> Disjunctive *that*-clauses with *imagine* do not generally improve subsequent *case*-anaphora. This makes clear that *case*-anaphora could not involve a sentential case space, but only an epistemic one:

(i) ?? John imagined that he is was a king or a president. In either case, he imagined to be well-liked.

<sup>39</sup> However, see von Stechow/Gillies (2010) for a defense of the factivity of *must*.



the noun *case* plays a central role, with its involvement of the truthmaking relation, the Actuality Conditions, and the Case Space Requirement.

There is a first of all a syntactic difference between *is the case* and *is true*. *Is the case* is a syntactic predicate that allows as subject only a *that*-clause or a pronoun such as *that*, but not an ordinary NP, in contrast to *is true*:<sup>40</sup>

- (67) a. That it is raining is not the case.  
 b. John feared that it might rain. That was in fact the case.  
 c. \* John's claim is the case.  
 d. That it is raining / That / John's claim that S is true.

*Is true* can act as a predicate of truthbearers like claims, but not so for *is the case*.

With *that*-clauses as in (68), *the case* and *is true* appear to mean the same thing:<sup>41</sup>

- (68) a. That it is raining is the case.  
 b. That it is raining is not true.

However, there are significant semantic differences between *is true* and *is the case* with *that*-clauses. Those differences are, for some reasons, not as well-reflected in English as, say, in

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<sup>40</sup> One might think that *the case* unlike *true* does not have the status of a predicate. However, standard linguistic criteria diagnose *(is) the case* as a predicate syntactically. First, *the case* like *true* can be the predicate in small-clause constructions, a standard criterion for predicate-hood:

- (i) a. I consider it true that John is a genius.  
 b. I consider it clearly the case that John is a genius.

Second, like *true*, *the case* can combine with other copula verbs than *be*, such as *remain* and *seem*:

- (ii) a. That John is the best player will always remain the case.  
 b. The generalization remained true despite the changing circumstances.  
 (iii) a. That John is happy does not seem the case.  
 b. That John is happy does not seem true.

<sup>41</sup> This assumption is a hallmark of the deflationist view of truth (Horwich 1990), according to which 'the key idea [...] is that there seems no reason to distinguish *being true* from *being the case*. If there is no distinction between being true and being the case, presumably there is also no distinction between 'It is not the case that *p*' and 'It is not true that *p*' (Stoljar, online).

*Is the case* is often regarded a redundant expression even by philosophers that do not share the deflationist view of truth. An exception is Correia/Mulligan (online), for whom *is true* is a predicate applying to propositions and *is the case* a predicate applying to states of affairs. This appears mistaken, though, since *is the case* cannot actually apply to terms of the sort *that state of affairs*.

German with *ist der Fall* ‘is the case’ and *ist wahr* ‘is true’, which I will therefore focus on.<sup>42</sup>  
The most important semantic differences concern adverbial modifiers.

First, *ist wahr* and *ist der Fall* differ in their acceptance of location modifiers. Location modifiers are perfectly fine with *ist der Fall*, but often hard to make sense of with *ist wahr*:

(69) a. In unserer Firma ist es nicht der Fall, daß Angestellte ohne Erklärung entlassen werden.

‘In our firm, it is not the case that employees get fired without explanation.’

b. ??? In unserer Firma ist es nicht wahr, daß Angestellte ohne Erklärung entlassen werden.

‘In our firm, it is not true that employees get fired without explanation.’

(70) a. In Hans’ Familie ist es nicht der Fall, daß Kinder ihre Eltern respektieren.

‘In John’s family, it is not the case that children respect their parents.’

b. ??? In Hans’ Familie ist es nicht wahr, daß Kinder ihre Eltern respektieren.

‘In John’s family, it is not true that children respect their parents.’

Whereas (69a) and (70a) are perfectly natural as statements of facts, (69b) and (70b) are hardly acceptable or at least convey a particular metasemantic notion of location-relative truth.

Furthermore, *ist der Fall* is fine with adverbs of quantification, with which *ist wahr* is hardly acceptable or at least conveys a particular metasemantic notion of time-relative truth:

(71) a. Es ist immer mehr der Fall, daß der Alzheimerpatient etwas vergißt.

‘It is more and more the case that the Alzheimer patient forgets something.’

b. ??? Es ist immer mehr wahr, daß der Alzheimerpatient etwas vergißt.

‘It is be more and more true that the Alzheimer patient forgets something.’

(72) a. Es war zweimal der Fall, daß jemand von der Versammlung abwesend war.

‘It was twice the case that someone was absent from the meeting.’

b. ??? Es war zweimal wahr, daß jemand von der Versammlung abwesend war.

‘It was twice true that someone was absent.’

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<sup>42</sup> This may be because English *is true* is actually polysemous, permitting also a use equivalent to *is the case*.

In contrast to *ist der Fall*, with *ist wahr*, the subject clause needs to be (more or less) truth-conditionally complete, that is, complete regarding context-dependent elements (such as quantifier restrictions, temporal or spatial locations etc, though the proposition expressed may of course involve ‘unarticulated constituents’).

A further difference between *is true* and *is the case* shows up with adverbs that may act as degree quantifiers such as German *kaum* ‘hardly’. With *is the case*, such adverbs can act only as adverbs of quantification, whereas with *is true* they most naturally act as degree modifiers:

(73) a. Es ist kaum der Fall, daß Hans Kaffee trinkt.

‘It is hardly the case that John drinks coffee.’

b. ??? Es ist kaum wahr, daß Hans Kaffee trinkt.

‘It is hardly true that John drinks coffee.’

Whereas (73a) means that there are only rare cases of John drinking coffee, (73b) means something like ‘it can hardly be said that John drinks coffee’.

The semantics of *is the case* involves quantification over truthmakers, that is, exact truthmakers. That exact truthmaking is involved is apparent from the way adverbs of quantification are understood:<sup>43</sup>

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<sup>43</sup> This recalls Lewis (1975) use of ‘case’ in connection with adverbs of quantification, though for Lewis cases are n-tuples consisting of objects and relations.

Adverbs of quantification actually do not strictly count cases, but epistemic situations correlated with cases. Thus (i) appears false:

(i) It is a billion times the case that someone is Indian.

Moreover, (iia) appears true, as opposed to (iib):

(ii) a. It is more often the case that a natural number is even than it is prime.

b. It is as often the case that a number is prime as it is that it is even.

That adverbs of quantification quantify over epistemic situations is not restricted to *case*-sentences, given the intuitive truth of (iii):

(iii) A natural number is more often even than prime.

This means that the standard treatment of adverbs of quantification as unselective quantifiers ranging over n-tuples of entities (Lewis’ ‘cases’) is not generally adequate.

- (74) a. It was twice the case that John made a mistake.  
 b. It was only once the case that John lost the game.  
 c. It was three times the case that John or Mary received a gift.

*Twice* in (74a) counts those and only those situations that are completely relevant for the truth of *John made a mistake*, that is, situations that include nothing but John, a single mistake, and the make-relation holding between the two. *Twice* does not count any larger situations. Similarly, *once* in (74b) counts just situations of a single event of John's losing the game, not any larger situations. Finally, *three times* in (74c) counts situations in which either John or Mary received a gift. It does not count larger situations or sums of such situations.<sup>44</sup> Adverbs of quantification with *is the case* do not count non-worldly facts, which could be quantificational and disjunctive. Otherwise, there would only be a single fact to be counted in (74a) and (74c).

The predicate *is the case* itself does not involve reference to a particular case, but rather, in the absence of an adverb of quantification, existential quantification over cases. This is clear from the interpretation of *is the case*-sentences in the scope of negation and in the antecedent of a conditional:

- (75) a. It is not the case that a student failed the exam.  
 b. If it is the case that a student fails the exam, then that student should be given the chance to repeat it.

(75a) states that there is no situation that makes the sentence *a student failed the exam* true. Also (75b) involves existential quantification over cases as part of the evaluation of the antecedent.

*Is the case* clearly carries the Actuality Condition since *is the case* does not involve quantification over merely possible situations (which, recall, would be permitted by existential quantification in natural language as well as the truthmaking relation).

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<sup>44</sup> As with nominal *case*-constructions, there are also conditions on the individuation of situations at play, though it is hard to tell whether they are due to the count status of *times* rather than that of *case*:

- (i) It was twice the case that John made more than one mistake.  
 (i) counts situations that are already independently individuated and as such contain a particular number of mistakes.

Moreover, *is the case* comes with the Case Space Requirement. The Case Space Requirement manifests itself in the fact that *is the case* is hardly acceptable when it is not in the scope of negation, the antecedent of a conditional, or the scope of an adverb of quantification – in contrast to *is true*:

- (76) a. ?? It is the case that it is raining.  
 b. It is not the case that it is raining.  
 c. If it is the case that it is raining, we need an umbrella.  
 d. It was sometimes the case that it was raining.

(76a) involves an assertion, which will not set up a case-space.<sup>45</sup> By contrast, the scope of negation in (76b) and the antecedent of the conditional in (78c) are associated with states of consideration, which do set up a case space.<sup>46</sup> In (76d), *sometimes* ranges over a domain of situations (with or without rain) that forms a case space.

The truth conditions of *is the case*-sentences involve existential quantification over truthmakers, as below, where *case* will express the very same relation between situations and case spaces as when it occurs as the head of an NP:<sup>47</sup>

- (77) *It is the case that S* is true in a context *c* iff for the epistemic state *e* associated with *c*,  
 $\langle s, CS(e) \rangle \in [case]^c$ .

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<sup>45</sup> The acceptability of *That S is the case* improves with the addition of adverbials like *in fact*:

- (i) It is in fact the case that it is raining.

That is because *in fact* is indicative of a background state of uncertainty, which sets up a case space that can fulfill the Case Space Requirement.

<sup>46</sup> *Not* also associates with focus, in which case it is the focus-semantic value of its scope that sets up the case space:

- (i) It is not the case that every student failed the exam.

<sup>47</sup> The semantics of *it is the case that S* recalls the semantics that Austin (1950) proposed for independent sentences in general. On Austin's view, with the utterance of a sentence, a speaker refers to an (actual) situation and claims that the situation referred to is of the type specified by the sentence uttered. The situation referred to with the utterance of a sentence thus is meant to be a truthmaker of that sentence. On the present view, this is only part of the constructional meaning of *is the case*. With *is the case*, adverbs of quantification range over 'cases' and location adverbials act as predicates of cases. Austin's motivations for implicit situation reference were of course quite different from the present ones. The situation referred to, for Austin, is responsible for contextual restrictions on quantification domains, the interpretation of tense etc. The present motivation for invoking truth-making is the semantics of *case*-constructions.

Compositionally, the semantics of an *is the case*-sentence can be obtained by construing the relation between the *that*-clause and the *is the case*-predicate one of higher-order predication. The *is the case*-predicate itself will then denote the of set of sets in (78a), and the *is the case* sentence will have the truth conditions in (78b):<sup>48</sup>

- (78) a.  $[is\ the\ case]^c = \{X \mid \exists s(s \in X^c \ \& \ \langle s, CS(d_c) \rangle \in [case]^c)\}$   
 b. *That S is the case* is true in a context *c* iff  $[S]^c \in [is\ the\ case]^c$ .

A location modifier in that construction will act as a predicate of the situations the sentence will quantify over as cases:<sup>49</sup>

- (79)  $[in\ NP\ is\ the\ case\ that\ S]^c = \{X \mid \exists s(s \in X \ \& \ \langle s, [NP]^c \rangle \in [in]^c \ \& \ \langle s, CS(d_c) \rangle \in [case]^c)\}$

An adverb of quantification such as *sometimes* will itself introduce a quantifier binding the case variable introduced by *case*, just as adverbs of quantification, viewed as unselective quantifiers, do with indefinites (Lewis 1975):<sup>50</sup>

- (80) For a context *c*,  $[is\ Q\text{-times}\ the\ case]^c = \{X \mid \text{for } Q\text{-many } s: s \in X \ \& \ \langle s, CS(d_c) \rangle \in [case]^c\}$

Note that on this analysis, the definite determiner *is the case* makes no semantic contribution, only the noun *case* does. That is because *the case* in that context does not have the status of a referential NP. Several diagnostics show that. First, *the case* in *it is the case*

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<sup>48</sup> Of course, the sentence *that S is the case* should itself have a set of truthmakers as its meaning. Just as in the case of conditionals, I will restrict myself here to just giving its truth conditions.

<sup>49</sup> *Is the case* with a location adverbial involves a condition of maximality: (74a) is about the maximal situation in the firm, not just some situation within the firm. This condition is part of general conditions on individuating situations and required by the count status of case. Note that *the situation in our firm*, with the count noun *situation*, generally also understood as referring to the maximal situation in the firm, unless a particular contextually relevant situation is meant.

<sup>50</sup> The semantics of the *is the case*-predicate raises similar issues for compositionality as indefinites or the Davidsonian event argument, being represented by a variable that can be bound either by adverb of quantification or an existential quantifier, issues that I will not address further in this paper.

does not permit any other determiner than the simple definite determiner:

- (81) a. \* It is not that case that S.  
 b. \* It is not a case that S.

Second, it does not permit adjectival or relative-clause modifiers:, as in (86):

- (82) a. \* It is not the improbable case that S.  
 b. \* That S is not the case that we expected.

Third, it cannot act as the antecedent of a *case*-anaphor:

- (83) That no one comes to the party might be the case. ?? But we would not like that case.

*The case in is the case* rather appears to be something like a referential residue with *the* acting as a pleonastic determiner.<sup>51</sup>

## 8. Conclusion

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<sup>51</sup> There is a potential alternative analysis of *is the case*-sentences that one might think of, namely as specificational sentences (Higgins 1979), sentences of the sort below:

- (i) a. That John is innocent is the truth.  
 b. That we would all go is the idea.  
 c. That one can walk home is the advantage.  
 d. That John is incompetent is the problem.

But there are some major differences between *is the case*-sentences and specificational sentences. One difference is that *is the case*-sentences do not permit extraposition, unlike specificational sentences:

- (ii) a. \* It is the truth that John is innocent.  
 b. \* It is the idea that we would all go.

Moreover, *is the case*-sentences do not permit inversion, unlike specificational sentences:

- (iii) a. The truth is that S  
 b. The idea is that S.  
 c. \* The case is that S.

Thus, an analysis of the *is the case*-construction as a specificational sentence is hardly an option.

In everyday speech, talk about ‘cases’ is abundant, and it is surprising that constructions with the noun *case* (or similar nouns in other languages) have received close to no attention in the linguistic or philosophical literature. *Case*-constructions bear significantly on central issues in contemporary semantic theory and philosophy of language, most importantly the notion of a possible situation or world and its role in semantics, as well as the recent theoretical developments of truthmaker semantics and alternative semantics.

The fact that there are two distinct sources of case spaces for *case*-constructions gives a broader motivation of alternative semantics. Alternative semantics is generally pursued as a formal semantic theory of a range of constructions that explains their particular linguistic behavior. *Case*-constructions make clear that alternative semantics is just as much a matter of the semantics of the mind, specifically that of states of uncertainty, consideration, or inquiry.

The overall theoretical importance of *case*-constructions raises the question of how general those constructions are across languages. As a matter of fact, not all languages have *case*-constructions, not even all European languages. Chinese lacks them, as do Danish and Swedish, to mention just three. Even though *case*-constructions are not universal, the ingredients of their semantics should be, namely the truthmaking relation, situations with their conditions of individuation, sententially and epistemically determined alternatives, kind reference, and lexical actuality conditions.

Reference to situations with the noun *case* raises a more general and important issue, namely the ontological status of possibilities (possible worlds or situations), without which the semantics of conditionals, modals, and perhaps attitude reports seems hardly possible. In natural language semantics, it is common to posit possible worlds as parameters of evaluation, for the purpose of the semantics of modals, conditionals, and attitude reports. As parameters of evaluation, possible worlds are often considered ‘mere posits’ by the theorists, not involving an ontological commitment on the part of the language use. There is also the view, however, that parameters of evaluation should be attributed the same cognitive reality as referents of referential NPs since a grasp of entities acting as parameters should be part of knowing the truth conditions of sentences and of the meaning of constructions specifically involving them. It is then expected that there should be explicit, non-technical terms for such entities in at least some languages. It appears that at least in English there aren’t any terms in the core (non-technical part) of language that stand for entire worlds.<sup>52</sup> *Case*-constructions

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<sup>52</sup> Of course, there is the term *possible world*, used by theorists to refer to entire possible worlds. However, even though a legitimate part of English, *possible world* is a ‘technical’ term in the (ontological) periphery, not the



clearly belong to the core (non-technical part) of language, and they indicate that what is involved in the semantics of conditionals, attitude reports, and epistemic modals are not worlds, but situations, and that in their role as truthmakers.

## Appendix 1: Nominal *case*-NPs

This appendix will discuss *case*-NPs with nominal modifiers rather than clausal ones and suggest an extension of the truthmaker-based semantic analysis of clausal *case*-NPs to them.

### 1. Property-related and object-related cases

The *case*-NPs below seem to have a semantics quite different from that of *case*-NPs with clausal modifiers, which were the focus of this paper:

- (1) a. a case of flu  
       b. the case of the stolen statue

*Case*-constructions of the sort in (1a) seem to stand for instances of universals, and can be called *property-related cases*. *Case*-constructions as in (1b) refer to cases tied to particular objects and can be called *object-related cases*.

There are good reasons not to posit an ambiguity in the word *case* in nominal and clausal *case*-constructions. First of all, the European languages that have *case*-constructions (such as English, Italian, French, and Spanish) generally display all three constructions, clausal *case*-NPs and the two types of nominal *case*-NPs in (1).<sup>53</sup> Moreover, *case* in all three constructions displays the Actuality Condition and the Case Space Requirement. The two nominal *case*-constructions moreover are semantically close to each other since they may describe the very same cases, as below:

- (2) a. The case of the new cancer patient is a case of stage 2 cancer.

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core of language. See Moltmann (to appear b) for the core-periphery distinction relevant for natural language ontology.

<sup>53</sup> By contrast, the word for *case* as in *briefcase* translates very differently in those languages.

b. The case of the missing statue just is the case of the recent museum theft.

Property-related cases may be medical cases, legal cases, or manifestations of particular types of behavior or art movements, for example:<sup>54</sup>

(3) a. This is a case of insanity.

b. What John has is a case of schizophrenia.

c. The incident is a case of fraud.

d. John's behavior toward Mary is a case of harassment.

e. This building is an unusual case of art deco.

Property-related cases are often tropes, as in (3a) and perhaps (3b,c, d), but may also be objects, it appears, as in (3e).<sup>55, 56</sup>

Typical object-related cases are generally restricted to contexts of medicine or law.<sup>57</sup> Further examples of object-related cases are those below:

(4) a. the case of that incident

b. the case of the man that has suffered from this illness for more than 20 years

c. the case of the stolen statue

A property-related case has generally very different sorts of properties than what I will call its *correlated object* and should be considered an entity distinct from it.<sup>58</sup>

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<sup>54</sup> In French, property-related cases may be described with bare plurals, as below (de Velde (ms)):

(i) J'ai connu des cas de journalistes honnêtes.

'I knew of cases of honest journalists.'

<sup>55</sup> Trope-like cases appear to have inspired Woltersdorff's (1980) use of the noun *case* for tropes.

<sup>56</sup> However, not all instances of universals are cases. For example, for an instance of a universal to be a case, it needs to have a particular complexity that does not make it too obviously an instance of the universal. Whiteness and darkness do not have instances that are cases (?? *a case of whiteness*, ?? *a case of darkness*), but insanity, fraud, and honesty do.

<sup>57</sup> Legal cases are also associated with a special *case*-construction in English of the sort *the case Dominique Strauss-Kahn*, which is a close apposition and syntactically distinct from the construction in (1b).

<sup>58</sup> The construction *the city of Munich* does convey an identity relation between the referent of the complement and the referent of the entire NP. But this is not so for object-related *case*-NPs.

First, a case and its correlated object display different readings of predicates expressing object-related attitudes, and that whether the correlated object is a material object, a trope, or an event:

- (5) a. Mary thought about the case of the disabled student. (as a medical / legal case , ..)
- b. Mary thought about studied the disabled student.
- c. Mary thought about the disability of the student.
- (6) a. The coach remembered an unexpected victory.
- b. The coach remembered the case of an unexpected victory.

(5a), (5b) and (5c) mean different things. Unlike (5b) and (5c), understanding (5a) requires understanding what kind of case the case is meant to be, a legal or medical case, for example. What case it is depends on which features of the student or his disability are relevant, from a medical or legal point of view, for example. Those features will be constitutive of the medical or a legal case. Importantly, the features may include not only intrinsic properties of the object in question, but also relations it enters to other entities. No identification of relevant features is required for (5b) and (5c), where the object of study may simply be the student himself or his disability.<sup>59</sup> In (6a) the coach is likely to remember the details of the victory (as experienced by himself), whereas in (6b) it suffices entirely that the coach remembers just the fact that a victory happened (which he probably was not involved in).

Cases and their correlated objects differ also when acting as objects of discussion and evaluation:

- (7) a. We discussed the case of the book.
- b. We discussed the book.
- (8) a. The case of the stolen statue is interesting.
- b. The stolen statue is interesting.
- c. The theft of the statue is interesting.
- (9) a. John compared the case of the first student to the case of the second students.

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<sup>59</sup> An object-related case thus involves a filtering condition regarding the correlated object, which determines which properties or relations are constitutive of the object-related case. This condition may be called an *ontological case filter* mimicking the more familiar, but unrelated, syntactic notion of a ‘Case Filter’ of Chomsky (1981).

b. John compared the first student to the second student.

Again *case*-terms require the identification of relevant features of the correlated object making up the kind of case in question.

Finally, cases and their correlated objects generally have different part-whole structures. A case does not inherit its part-structure from its correlated object. Thus, (10a) has a different meaning from (10b), which is about the parts of an artifact, and from (10c), which is about the (temporal) parts of an event:

- (10) a. Part of the case of the stolen statue is familiar.  
 b. Part of the stolen statue is familiar.  
 c. Part of the theft of the stolen statue is familiar.

The part structure of a case involves not spatial, functional, or temporal parts, but rather partial content regarding the situation made up from the relevant properties (intrinsic or relational) holding of the correlated object.

Thus, object-related cases are ontologically distinct from the correlated objects if the latter are material objects or events. The understanding of evaluative properties and the part structure of object-related cases indicate that object-related cases are on a par with cases that are situations acting as truthmakers of sentences, motivating a unified account of cases described by clausal and object-related *case*-NPs. Object-related cases carry just those properties relevant for verifying that the correlated object meets the contextually given condition. For the semantics of object-related *case*-terms, sentences are not available; instead simple propositions of the form  $\langle P, o \rangle$  can be considered the entities that truthmakers stand in the truthmaking relation to, where P is a contextually given property of the relevant legal or medical type. The noun *case* in object-related *case*-NPs will also involve a case space, a set X of alternative situations  $s$ ,  $s \Vdash \langle P, d \rangle$  for a suitable object  $d$ . An object-related *case*-nominal will then have the semantics below:

- (11) For a context  $c$ ,  $[case\ of\ the\ stolen\ statue]^c = \{ \langle s, X \rangle \mid \langle s, X \rangle \in [case]^c \ \& \ s \Vdash \langle P, [the\ stolen\ statue]^c \rangle \}$

Give that object-related cases can be identical to property-related cases, property-related case nominal would have the semantics below, where  $X$  is a set of situation  $s$ ,  $s \Vdash \langle [theft], d \rangle$  for objects  $d$  in, a suitable contextually given set  $A_c$ :<sup>60, 61</sup>

(12) For a context  $c$ ,  $[case\ of\ theft]^c = \{ \langle s, X \rangle \mid \langle s, X \rangle \in [case]^c \ \& \ s \Vdash \langle [theft], d \rangle \text{ for some } d \in A_c \}$

Object-related cases may differ from their correlated objects in yet other respects. Generally, it is difficult for a case to have properties of concreteness. Thus, cases generally do not have a spatial location, even if their underlying object has:

(13) a. ??? The case of the stolen statue is on the table.  
b. The statue is on the table.

Event-related cases, moreover, do not have the temporal properties of correlated events, such as having a duration or being sudden:

(14) a. A snowfall might be long-lasting / sudden.  
b. ?? The case of a snowfall might be long-lasting / sudden.

A case of an event no longer has the temporal structure of the event.

Moreover, cases generally do not act as objects of perception:

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<sup>60</sup> A somewhat different treatment is required when *case* occurs predicate-initially, as below:

(i) John's illness is a case of cancer.

It is plausible that (i) is not an ordinary subject-predicate sentence, but rather is on a par with (ii):

(i) Wisdom is a property not many people have.

The predicate in (ii) arguably does not just attribute a property to the semantic value of the subject, but involves its reification as a property object (Moltmann 2013a, Chapt. 6). Similarly, the predicate in (i) would involve 'filtering' of the subject referent as a case.

<sup>61</sup> For property-related cases a more direct semantics may be available, once truthmaking is extended from a relation of an entity to a sentence or epistemic state to a relation of an entity to a property (Fine, p.c). The latter relation should then not be understood as instantiation, though. Instantiation is understood either as a relation between tropes and properties or between objects and properties. But cases are neither tropes nor objects.

(15) a. ??? I saw / noticed the case of the broken vase.

b. I saw / noticed the broken vase.

Finally, cases generally are not causally efficacious (except, of course, as objects of mental attitudes):

(16) a. An overweight baby caused the cradle to break apart.

b. ?? The case of an overweight baby caused the cradle to break apart.

These restrictions are expected if cases are on a par with worldly facts, rather than material objects or events.<sup>62</sup> Events are spatially located, have a temporal structure and duration, and enter causal relations, but not facts, at least not on a common view.<sup>63</sup>

## Appendix 2: Cases and the truthmaker debate in metaphysics

Fine's notion of truthmaker in 'truthmaker semantics' differs from the use of 'truthmaker' in metaphysics. Truthmaking in the sense of Fine and in the sense relevant in the context of this paper is simply the relation between a situation *s* and a sentence *S* such that *s* makes *S* true

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<sup>62</sup> The restrictions are not strict, though. Under special circumstances, object-related and property-related cases appear to act as objects of perception and relata of causal relations:

(i) a. This case of musical experimentation sounds horrible.

b. This one case of cholera / The case of that cholera infection was the cause of a great epidemic.

Cases described by nominal *case*-terms may differ from worldly facts also in that they may go along with the existence predicate *exist* or the existence predicate *happen*, unlike cases described by clausal *case*-terms, which have their own special existence predicate:

(ii) a. The case of the cancer patient that Mary described exists / ??? occurred / ??? presented itself.

b. That case of fraud happened yesterday.

Here object-related cases inherit their mode of existence from the correlated object. Similarly, object-related and property-related cases may inherit perceptual or causal properties from the correlated objects. Perhaps *case* has another, related meaning, allowing nominal *case*-NPs to describe objects reduced to only some of their properties, those fulfilling the condition in question. Such 'filtered objects' are like the original objects, but they will have only some of the properties of the original objects, such as their modes of being and A filtered object would be something in between a 'thin particular' and a 'thick particular' in Armstrong's (1997) sense.

<sup>63</sup> Note, though, that in Situation Semantics, situations (worldly facts) have been considered objects of (immediate) perception (Barwise /Perry 1981).

and is wholly relevant for the truth of *S*. Truthmaking in a different sense is a central topic of discussion in contemporary metaphysics and concerns the question whether the truth of a sentence needs to be grounded in ultimate reality, and in particular grounded in entities, that is, in truthmakers. Advocates of truthmaking for the grounding of truth generally do not assume that the truthmaking relation plays a role in the semantics of natural language itself. The metaphysical interest in truthmaking is completely different from that of truthmaker semantics in the sense of Fine, where the truthmaking relation only serves semantic purposes and truthmakers are not necessarily part of the world, but include both actual *and* possible (and even impossible) situations. Truthmakers thus are not meant to be part of what there ultimately is or to ‘carve reality at its joints’. Truthmaker semantics, however, can be used so as to address the metaphysical question of the grounding of truth, by restricting it to sentences that are in fact true and taking actual situations to be truthmakers (even if they are not part of ultimate reality). Cases as truthmakers can then shed light on the issue of the nature of truthmakers that the philosophical debate raises.

Some philosophers, in particular Mulligan / Simons / Smith (1984) and Lowe (2006), take truthmakers to be fully individuated entities that play an independent role in the world, for example as objects of perception and relata of causal relations. Truthmakers on their view consist in events, tropes and objects.<sup>64</sup> An event of John’s walking, for example, would be a truthmaker of the sentence *John walked*, and John himself the truthmaker of the sentence *John exists*. A difficulty for that view is that fully individuated entities cannot fulfill the condition of exact truthmaking. There are always features about a particular walk, for example, that may not be relevant for the truth of *John walked* (for example the location of the walk and the way the walking was performed), and there are various aspects of John not relevant for the truth of *John exists*. Truthmakers suited for exact truthmaking need to be thinner than fully individuated objects. This is what the notion of a situation or case is meant to achieve. Situations or cases are primarily part of the world, not entities *in* the world.

Another potential difficulty for the view that truthmakers are ordinary objects is that it is not compatible with presentism, the view that only objects at the present moment exist (Sider 2001, Merricks 2007). Given presentism, most true sentences will fail to have a truthmaker or will at some point lose their truthmaker if truthmakers are entities of the sort of events, tropes, and objects. Truthmakers conceived of as situations or ‘cases’, by contrast, appear to be

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<sup>64</sup> Events and tropes also act as truthmakers in the semantic analysis of Moltmann (2007), where truthmaking is applied to the semantics of event and trope nominalizations and the semantics of adverbials.

compatible with presentism. Cases are entities that exist not in time, but time-independently – and thus, derivatively, at any time. This is reflected in the use of tense in natural language. Existential quantification over cases whose correlated objects are past events is possible with present tense. By contrast, existential quantification over past events requires past tense. Talking about events in the past, (1a) and (2a) are perfectly fine (that is, possibly true); but (1b) and (2b) are not, as opposed to (1c) and (2c):

- (1) a. There are at least three cases of this disease.  
       b. ??? There are at least three outbreaks of this disease.  
       c. There were at least three outbreaks of the disease.
- (2) a. There are only three cases in which someone managed to cross the border.  
       b. ??? There are only three crossings of the border.  
       c. There were only three crossings of the border.

Cases are situations constituted by the holding of tensed properties or relations. As such, they will exist not relative to a particular time; but at any time.

There is another type of object-related entity that shows the same time-independence as event-related cases. These are entities constituted by the lasting legacy of a person, such as philosophical or literary figures. Below, we see that present tense can be used to quantify over philosophical figures that, as persons, no longer exist, which is not possible with entities viewed simply as persons:

- (3) a. There are three famous philosophers that had studied in Tübingen, Hegel, Fichte and Schelling.  
       b. ??? There are three people that had studied in Tübingen and became famous philosophers, Hegel, Fichte, and Schelling.  
       c. There were three people that studied in Tübingen and became famous philosophers, Hegel, Fichte, and Schelling.

Philosophical figures are ontologically distinct from the actual persons, they are persons reduced to their philosophical views and achievements. As such, they share their time-independent existence (once they have come into existence in the first place) with cases.



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