# (Argument) clauses and definite descriptions*

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## Abstract

It has been proposed that some types of clauses should be considered definite descriptions (especially free relatives, interrogatives, and conditionals). I will propose a generalization: All clauses are or contain a definite description (as an argument). I will argue (i) that argument clauses are definite descriptions, (ii) that at least some kinds of adverbial and attributive clauses are predicates including a definite description, and (iii) that independent clauses (as well as illocutive subclauses) include a definite description as the argument of the mood prefix. In each of these cases, the existence of a definite description seems crucial in explaining fundamental semantic facts. Assuming (i), for instance, explains many startling semantic similarities between referential noun phrases and argument clauses. Four types of definite descriptions are identified that are crucial for the semantics of noun phrases and clauses.

## Keywords

Semantics, clause, argument clause, noun phrase, definite description, interrogatives

## 1 Introduction

I will argue that generally there is an intimate connection between clauses – no matter whether they are argument, attributive, adverbial, parenthetical, or independent clauses – on the one hand and definite descriptions of various kinds on the other. As a first step, I will try to show that there is strong evidence for argument clauses being definite descriptions. As a second step, I will take some kinds of non-argument clauses and argue that they have a close connection to definite descriptions, too, resulting in clauses either possibly being definite descriptions themselves or encompassing a definite description (as an argument).

I will use *definite description* as a purely semantic notion: An expression is a definite description iff its semantics can be represented by the description operator (i.e., the iota operator *ι*) and a predicate. This is a generalization of the use of the term where definite descriptions are noun phrases or determiner phrases with a definite article (see, for instance, Elbourne 2013: 1 for this quite common use). This restricted use is often extended to noun phrases beginning with a possessive or a Saxon genitive and to pronouns as well (see, for example, Heim 2019). However, even this modest extension already calls for a more general notion of a definite description. When, now and then, it is proposed that such and such a type of clause is a definite description (see references in §2 and §5), it is obvious that a semantic notion of definite description is necessary. With such a notion, expressions of various syntactic categories can be definite descriptions: There can be

nominal definite descriptions, i.e., noun phrases that are definite descriptions, as well as pronominal ones, clausal ones, and perhaps others.

The question as to whether definite descriptions are referential terms (as Frege suggested), quantifiers (as Russell suggested), or something else is still subject to much controversy (see the overview in Elbourne 2013: 2 and the discussion in Heim 2019). It will become apparent that what we need is a referential and not a quantificational version of the description operator. Apart from this theoretical decision, I will try to be as neutral as possible in regard to any framework. The analyses I propose could ideally be implemented in any semantic framework which allows definite descriptions as defined above.

## 2   Properties of argument clauses

Associating argument clauses with definite descriptions suggests that there is a relation between argument clauses and noun phrases. Depending on one's syntactic framework, argument clauses and noun phrases have certain similarities. It is an old idea that there is a link between the definite article and the subjunction *that* or *dass*. The 19th century grammarian Herling, for instance, called the subjunction *dass* a sentential article ("Satzartikel") in his *Syntax der deutschen Sprache* (1832).[1] Both the article and the subjunction might be the head of their phrases. Nevertheless, we cannot take them to be instances of the same syntactic category. In many languages (including English and German), argument clauses and noun phrases differ in their distribution to a significant extent (see, among others, Dryer 1980 for English and a number of unrelated languages as well as Oppenrieder 1991, 2008: §4 for German). Thus, it is unreasonable to assume that argument clauses are noun phrases. In German, for instance, argument clauses are normally extraposed; only under very special conditions can they occur in sentence-medial position (in the "Mittelfeld"). For noun phrases it is just the other way round. Both types of phrases can, however, occur in sentence-initial position (in the "Vorfeld", or left-dislocated); they can both be right-dislocated, too.

In semantics, we find many more similarities: Noun phrases and clauses can be arguments of verbs, adjectives, and nouns (cf. (1)); they behave similarly in logical reasoning (e.g., universal instantiation (cf. (2)), existential generalization (cf. (3))), and with respect to anaphoric reference (cf. (4)) or quantificational variability (cf. (5)); they are both possible topics (see the possibility of left-dislocation), etc.

(1)        Dass er zurücktritt, stimmt (/ist wahr, ist eine Tatsache).
           that he resigns      is-right (/is true,  is a    fact)
           'It is true that he resigns.'

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[1] For more on the development of the declarative subjunction in German, see Axel-Tober (2017).

(2)    a. He reads every book she reads.
      She reads 'Harry Potter'.
      Thus, he reads 'Harry Potter'.
    b. He admires everything she admires.
      She admires that the rescue succeeded.
      Thus, he admires that the rescue succeeded.

(3)    a. She is not convinced of the theory.
      Thus, there is something she is not convinced of.
    b. He is not convinced that the theory is true.
      Thus, there is something he is not convinced of.

(4)    a. You are not the only one who heard of the rumour. I have heard
      of it too.
    b. I have heard that the president will resign. But I do not believe
      that this might be true.

(5)    a. For the most part, we know the reviewed novels.
      ›We know most of the reviewed novels.‹
    b. For the most part, we know which novels are being reviewed.
      ›For most novels we know that they are being reviewed.‹

As arguments, clauses behave like referential terms: They are neither sensitive to negation nor to quantifiers.[2] (6a) and (6b) as well as (7a) and (7b) have the same meaning; the same is true with respect to the pairs in (8) and (9).

(6)    a. Marie weiß  nicht, dass Peter kommt.
      Mary  knows not    that  Peter comes
    b. Dass  Peter kommt, weiß  Marie nicht.
      that  Peter comes   knows Mary  not
      'Mary doesn't know that Peter is coming.'

(7)    a. Marie weiß  nicht, ob       Peter kommt.
      Mary  knows not    whether Peter comes
    b. Ob       Peter kommt, weiß  Marie nicht.
      whether Peter comes   knows Mary  not
      'Mary doesn't know whether Peter is coming.'

(8)    a. Einige wissen nicht, dass Peter kommt.
      some  know   not    that  Peter comes
    b. Dass Peter kommt, wissen einige nicht.
      that  Peter comes  know   some  not
      'Some people don't know that Peter is coming.'

(9)    a. Einige wissen nicht, ob      Peter kommt.
      some  know   not   whether Peter comes

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[2] I rely on the Frege/Geach criteria for referential terms; see Geach ([1962] ³1980: §§40–42), Heim & Kratzer (1998: §6.1.1), and Pafel (2005: §1.2.1).

  b. Ob  Peter kommt, wissen einige nicht.
   whether Peter comes know some not
   'Some people don't know whether Peter is coming.'

Thus, it seems obvious that argument clauses are no quantifiers. In this respect, they are similar to proper nouns, demonstratives, and many uses of definites. Even free relatives do not behave like quantifiers: The two sentences in (10) have the same truth-conditional meaning.

(10) a. Wer schweigt, redet nicht.
    who is-silent speaks not
  b. Es ist nicht der Fall, dass redet, wer schweigt.
    it is not the case that speaks who is-silent
    'Who is silent is not speaking.'

Against this background, I will assume that argument clauses are referential terms but I will be indifferent with respect to the true nature of the referents of clauses – whether they are propositions, state of affairs, situations, facts, or whatever.[3] I will mostly stick to the traditional term *proposition*.

  If an argument clause is not a referential term in its own right, it should be a definite description, as its similarities to definites and demonstratives suggest. Since Jacobson's (1995) and Dayal's (1995) work on free relatives, it is standard to assume that one type of clause, i.e., free relatives, represents definite descriptions (for a more recent study, see Caponigro et al. 2012). With respect to the clear relation between free relatives and *wh*-interrogatives, it is no surprise that there are proposals to analyze *wh*-interrogatives as definite descriptions (see Jacobson 1995 and Pafel 1999).

## 3  Argument clauses as clausal definite descriptions

Let us assume that argument clauses in general are definite descriptions of propositions. We do not seem to gain much when we analyze the argument clause in *It is quite certain that Peter came* as the description ›the *p* such that *p* is identical to being true that Peter came‹. Now let us take a look at the relation between sentences (11) and (12). The fact that (13) is a valid argument suggests that the *that*-clause and the *whether*-clause refer to the same proposition (cf. Groenendijk & Stokhof 1982: §1.1).[4]

(11)  Mary knows that Peter came.

(12)  Mary knows whether Peter came.

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 [3] Free relatives are a special case since they can refer to various kinds of particulars.
 [4] Recently, Inquisitive Semantics argued for "an *integrated* theory" where declaratives and interrogatives express propositions (see Ciardelli et al. 2019).

(13)      Mary knows whether Peter came.
          Peter came.
          Thus, Mary knows that Peter came.

If the two embedded clauses are definite descriptions of the same proposition, the *whether*-clause must be a definite description that differs from the one representing the co-denotational *that*-clause: Otherwise (11) and (12) would be synonymous. This looks like an *Abendstern/Morgenstern* [evening star/morning star] case, namely "same reference, different sense". The *whether*-clause could be the description ›the *p* such that *p* is true and either identical to being true that Peter came or to being false that Peter came‹. If Peter came, this description denotes the proposition that Peter came.

  In the same vein, the assumption that argument clauses are definite descriptions denoting propositions makes it possible to give a simple account of the relation between direct and indirect quotations.

(14)    a. Heine said that he likes Moritz the most.
        b. Heine said: 'I like Moritz the most.'

The *that*-clause and the citation have the same reference and denote the same proposition but differ dramatically in their sense.

(15)    a. that he likes Moritz the most
           ›the *p* such that *p* is being true that Heine likes Moritz the most‹
        b. 'I like Moritz the most'
           ›the proposition denoted by *I like Moritz the most* uttered in context *C* with Heine being the speaker in *C*‹

(For details and further arguments in favour of this propositional view on direct quotations, see Pafel 2011: §7).

  A definite can denote an individual (*the tree in front of me*) as well as a plurality (*the trees in front of me*).[5] This seems to be the case with argument clauses, too. It is quite reasonable to assume that the interrogative clause in *Peter knows which novel Mary was reading last year* denotes an individual proposition whereas the clause in (16) denotes a plurality of propositions.

(16)      Peter knows which novels Mary was reading last year.

If Mary was reading novel **a**, novel **b**, and novel **c**, the interrogative clause denotes the propositions ›Mary was reading novel **a** last year‹, ›Mary was reading novel **b** last year‹, and ›Mary was reading novel **c** last year‹ (cf. Karttunen 1977). The clause denotes the plurality that encompasses all true propositions of the kind

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  [5] As for the notion of plurality (fusion, mereological sum), I rely on mereology (see, among others, Simons 1987, 2006 and Lewis 1991: §3.4 as well as the contributions in Kleinschmidt 2014). Mereology is ontologically innocent in the sense that it does not postulate additional entities besides the individuals which make up the plurality. If the part-of relation ($\leq$) is taken to be primitive, the fusion of **a** and **b** or the plurality of **a** and **b** (formally **a**$\oplus$**b**) can be defined as the entity that has all and only the parts of **a** and **b** as parts. Pluralities in this sense are not sets in the sense of set theory.

›Mary was reading *x* last year‹ – with *x* being a novel – and encompasses nothing else. Thus, it denotes the smallest plurality that encompasses all true propositions of this kind. The phenomenon of quantificational variability (cf. (5b)) indicates that we really have a plurality here (cf. Berman 1991 and Lahiri 2002).

Let '$\iota$x[$\phi$x]' denote the entity (individual, plurality, or mass) that is maximal with respect to $\phi$, i.e., that is $\phi$ and that has all entities that are $\phi$ as parts.[6] Then the entity which is smallest with respect to $\phi$ is denoted by

(17)        $\iota$x[$\phi$x $\wedge$ $\forall$y($\phi$y $\rightarrow$ x$\leq$y)].

In (16) $\phi$ is the property of having all true propositions of the kind ›Mary was reading *x* last year‹ as parts, with *x* being a novel (see Pafel 1999: §4 for a derivation of the semantics of (16) along these lines).

There are definite noun phrases that denote smallest pluralities too. Take the subject noun phrase in sentence (18).

(18)        The speakers of all factions met outside parliament.

If there are three factions in parliament and each one has one and only one speaker, the subject denotes a plurality of three persons. This is the inverse-linking reading of the subject noun phrase.[7] Its meaning can be represented with a definite description of the kind (17): ›The smallest plurality such that for each faction, its speaker is part of it‹ ($\phi$ being the property of being an *x* such that for each faction, its speaker is part of *x*). Incidentally, the subject noun phrase in (18) behaves like a referential term since it is not sensitive to negation, see (19).

(19)    a. The speakers of all factions didn't meet outside parliament.
        b. It is not the case that the speakers of all factions met outside parliament.

In many inverse-linking cases like (20), however, the noun phrase with the inverse-linking reading (*at least one politician from each European country*) is a quantifier (the semantic category of the determiner of the noun phrase seems crucial). To be more precise, it is an existential quantifier whose meaning can be analyzed in a similar manner:

(20)        Mary is in contact with at least one politician from each European country.

(21)        at least one politician from each European country
            ›There is a plurality *x* such that for each European country, at least one politician from that country is part of *x* and *x* is ...‹

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[6]   This has become a standard way to give the semantics of iota-terms or definites since Sharvy (1980) proposed a generalization of Russell's theory of definite descriptions based on the notion of maximality (see, more recently, among others, Heim 2019; Schwarz 2013 and von Fintel et al. 2014).

[7]   The inverse-linking reading of noun phrases is characterized by the fact that a quantifier which is contained in a noun phrase outscopes the operator introduced by the determiner in the noun phrase. For inverse-linking in German, see Pafel (2005: §3.5).

An analysis of the inverse-linking reading along these lines does not make use of any special tool. The semantic paraphrases can be immediately translated into the language of standard first-order predicate logic augmented with the mereological part-of relation and variables denoting pluralities (cf. (17)). The special feature is the additional operator on top (the iota-operator or the existential quantifier) and the part-of relation, which are not indicated by any overt element in the noun phrase. Compare this stipulation of additional semantic structures with the complexities assumed in recent analyses of the inverse-linking reading (Grudzińska & Zawadowski 2017; Joh 2008; Kobele 2010; Sailer 2015; Zimmermann 2002).

Let us now return to referential smallest-plurality descriptions. With their help, it is possible to cope with the distributive or pair-list reading of *wh*-interrogatives (see Pafel 1999 for details).

(22)     I know which novel each of the three politicians read.

(23)     which novel each of the three politicians read
         ›the smallest plurality *p* such that for each politician *x* the proposition
         of the kind ›*x* read *y*‹ – with *y* being the novel *x* read – is part of *p*‹

The pair-list reading is a reading where a universal quantifier outscopes the *wh*-phrase.[8] Hardly any semantics of interrogatives can deal with this scope relation as a scope relation; an analysis based on smallest-plurality descriptions can, however.

Up to now, two types of definite descriptions have been identified: the ordinary type and the smallest-plurality denoting type. When we take a look at the non-exhaustive, mention-some reading of interrogatives (see Xiang 2016 for a recent investigation), there is a third type of definite description as well. Take sentence (24) as an example.

(24)     Mary knows where one can buy good food.

The sentence can be true in a situation where Mary knows one or two shops which sell good food but does not know all shops where good food can be bought. Thus, it makes no sense to assume that the interrogative denotes all true propositions of a certain kind. It helps, however, if we assume that the interrogative denotes a certain type of proposition, namely the type whose instances are true propositions of the kind ›One can buy good food in *x*‹ with *x* being a location or shop. Sentence (24) is true if, for at least one proposition instantiating this type, Mary knows this proposition to be true.

The type whose instances are $\phi$ is denoted by the definite description

(25)     $\iota x[\forall y(\textbf{Instance-of}(y,x) \leftrightarrow \phi y)].$[9]

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[8]  For a concise summary of the empirical facts concerning the scope interaction between *wh*-phrases and ordinary quantifiers, see É. Kiss & Pafel (2017: §9) and Pafel (2005: Ch. 5). For a comprehensive investigation of this kind of scope interaction in German, see Pafel (1991, 2000).

[9]  As for the nature of types, I assume that they are abstract entities and not identical to (the mereological sum of) their instances.

Descriptions denoting types are often assumed in the analysis of indefinites. We can take, for instance, the indefinite in (26) to denote a type whose instances are good restaurants.

(26)        Mary knows (some) good restaurants.

The sentence is true iff Mary knows at least some of these instances.

The parallelism in the analysis of (24) and (26) is obvious: They have a type-denoting description in common as well as structurally similar truth conditions.

In a quite different domain, type-denoting descriptions are useful as well, namely with respect to interrogative clauses as arguments of predicates like *wonder*. It is well known that *wonder* and *know* differ with respect to entailment and quantificational variability. As far as entailment is concerned, (27a) is a valid inference whereas (27b) is not (see Groenendijk & Stokhof 1982).

(27)    a.  Mary knows who came. Peter came. Ergo, Mary knows whether Peter came.
        b.  Mary wonders who came. Peter came. Ergo, Mary wonders whether Peter came.

As for quantificational variability, (28a) does not have the reading (28b) (see Berman 1991 and compare (5b)).

(28)    a.  For the most part, we wonder which novels are being reviewed.
        b.  ›For most novels we wonder whether they are being reviewed.‹

The embedded clause in *Mary wonders who came* cannot denote the proposition ›Peter came‹ even if this proposition were true. Neither the denotation of the embedded clause nor the truth value of the sentence depends on the truth or falsity of the proposition ›Peter came‹. Thus, the embedded clauses in (29a) and (29b) must differ not only in sense but also in reference.

(29)    a.  Mary wonders whether Peter came.
        b.  Mary knows whether Peter came.

They differ if we assume that the interrogative clause, as the argument of *wonder*, denotes a type of proposition, namely the type whose instances are true propositions and are either identical to being true that Peter came or to being false that Peter came.

Generic causals seem to be an independent phenomenon, which is evidence for clauses having the option of denoting types – types of propositions, states of affairs, situations, facts, or whatever. Compare the singular causal (30a) with the generic causal (30b).

(30)    a.  That I was sitting too long at the breakfast table had the consequence that I missed my train this morning.
        b.  That I sit too long at the breakfast table has the general consequence that I miss my train.

In (30b) we seem to refer to a type of situation – the I-sit-too-long-at-the-break-fast-table situation – and quantify over typical instances of the type.

Inverse-linking readings of indefinites point to a further kind of type-denoting description. Sentence (31) is true iff Mary is in contact with a group of people such that for each European country there is at least one inhabitant belonging to the group.

(31)      Mary is in contact with people from all European countries.

The indefinite *people from all European countries* denotes the type whose instances are pluralities such that for each European country, there is one inhabitant belonging to the plurality and the plurality encompasses nothing else. The indefinite denotes the "smallest" type whose instances are pluralities of people from each European country.

The smallest type whose instances are $\phi$ is denoted by a definite description of the form

(32)      $\iota$x[$\forall$y(**Instance-of**(y,x) $\leftrightarrow$ ($\phi$y $\wedge$ $\neg\exists$y'($\phi$y' $\wedge$ y'<y)))].

As for (31), $\phi$ is the property of being a plurality such that for each European country, there is one inhabitant belonging to the plurality. Note that if Mary is in contact with a group of people such that for each European country there is an inhabitant belonging to the group and, for one or more countries, more than one inhabitant belongs to the group, this group would not be an instance of the smallest type as defined in (32) because there is a smaller group such that for each European country, there is only one inhabitant belonging to the group. To be smallest, the type can only contain instances with exactly one inhabitant per European country. This restriction is compatible with the truth condition of (31) but might seem unnecessarily restrictive.

The smallest-type description, however, is necessary to cope with the distributive or pair-list reading of interrogative clauses embedded by predicates like *wonder*.

(33)      Mary wonders which novel each of the three politicians read.

The type of propositions Mary wonders about is the smallest type whose instances are pluralities $p$ such that for each politician $x$ the proposition of the kind ›$x$ read $y$‹ – with $y$ being the novel $x$ read – is part of $p$.

Now we have four kinds of definite descriptions: ordinary ones on the one hand and definite descriptions denoting smallest pluralities, types in general, or smallest types on the other.

Incidentally, one could believe that concealed questions might be additional evidence that there is a relation between definite descriptions and interrogative clauses as, prototypically, concealed questions are definite noun phrases whose meaning amounts to the meaning of an interrogative clause. However, I do not think that concealed questions are additional evidence for this view. (The fact that a definite description is expanded to an interrogative is no evidence that the

interrogative itself is a definite description.) Nevertheless the view I propose must be compatible with the properties of concealed questions, which is the case, as far as I can tell. The sentence *Sam knows the governor of California*, for instance, means that Sam knows $p$ such that, for some $x - x$ being the governor of California, $p$ is identical to being true that $x$ is the governor of California (cf. Nathan 2006: 18). I can be silent on the difficult question as to how the (literal) meaning of the noun phrase is mapped onto the proposition.

Concealed questions are of interest in our context as it seems that they can be definite descriptions beyond the ordinary type when we take quantificational and indefinite concealed questions into consideration (as discussed in Frana 2020). The meaning of a sentence with a quantificational concealed question like *Mara knows every book that Erin read this summer*, for instance, can be analyzed with the help of a smallest-plurality description. The concealed question denotes the smallest plurality $p$ such that for every $x$, $x$ being a book that Erin read this summer, the proposition identical to being true that $x$ is a book that Erin read this summer is part of $p$. This amounts to the so-called set reading of quantificational concealed questions. A pair-list reading of such a concealed question can be analyzed in a similar vein. In the reading of *Clara knows every capital* where Clara knows the capital of every country, what is at stake is the smallest plurality $p$ of propositions such that for every $x$, $x$ being a country, there is a $y$, $y$ being the capital of $x$, such that the proposition identical to being true that $y$ is the capital of $x$ is part of $p$. The meaning of a sentence with an indefinite concealed question like *Mara knows a book that Erin read this summer* can be analyzed with a type-denoting description: ›the type of propositions whose instances have the form ›$x$ is a book that Erin read this summer‹ with $x$ being a book that Erin read this summer‹. The sentence is true if there is at least one proposition belonging to this type of propositions such that Mara knows it to be true.

## 4   The indispensability of clausal definite descriptions

If one follows the view I presented, many intricate details must be explored concerning compositional semantics and the syntax/semantics interface. Is it worthwhile?

We know that the notion of a definite description is a necessary tool for the semantic analysis of noun phrases. I have provided evidence that definite descriptions are appropriate for dealing with the semantics of argument clauses too, i.e., evidence that their semantics can be covered by an independently required semantic tool. Applying this tool we can cope with diverse readings of declarative and interrogative clauses and the semantic relations between these clauses. If we consider definite descriptions as a common base, many similarities between noun phrases and argument clauses are straightforward to explain (cf. §2 above) and startling similarities are revealed between the semantics of noun phrases and

clauses. Ergo, it is worthwhile, and perhaps even mandatory, to work out the technical details of a definite-descriptions approach concerning argument clauses.

## 5   A look beyond argument clauses

It might even be the case that definite descriptions are a required tool for the semantic analysis of clauses in general. Let us look at independent clauses, i.e., sentences, first. It would be strange to assume that they are definite descriptions. But this is not what we are claiming.

Some aspect of a sentence is responsible for the sentence to have a certain illocutionary potential. It has been assumed for a long time – Frege's judgement stroke and Stenius' modal signs being prominent examples – that there is some kind of mood or illocutionary "prefix" which is combined with the propositional content of the sentence. Against this background, the argument of the prefix could well be a definite description providing the propositional content.

Thus, independent clauses are no obstacle to the proposed definite-description view on clauses. On the contrary, assuming that sentences include a definite description of their propositional content is appropriate to explain inferences like the one in (13).

(13)      Mary knows whether Peter came.
          Peter came.
          Thus, Mary knows that Peter came.

We can look at parenthetical clauses and other subclauses with an illocutionary potential of their own – let us call them "illocutive subclauses" – in the same way (in German, non-restrictive as well as continuative relative clauses, V2-parentheticals, and free *dass*-clauses belong to this group).

What about clauses without an illocutionary potential, i.e., adverbial and attributive clauses in particular? They do not seem to be definite descriptions but seem to be predicates instead.

Take the *after*-clause in (34) as an example. It is plausible that the temporal clause delivers a predicate on the topic time of the sentence. The meaning of the predicate can be sketched as: ›$t$ is located after the time span in which they have been eating‹ (cf. von Stechow 2002: §11).

(34)      They went for a walk after they had eaten.

Although it is a predicate, its semantics includes a definite description of a time span. It is uncontroversial that the *after*-clause introduces a temporal relation, a relation between two time spans. If the first argument of this relation is the topic time of the sentence, the second argument should be delivered by a definite description of a time span. The possibility of expressing a very similar meaning with the help of a prepositional phrase (*After the meal they went for a walk*) enforces this view. The preposition is a temporal relation, the first argument is the topic

time of the sentence, and the second argument must be a definite description denoting the time span of the event denoted by the noun phrase.[10]

Not only *after* but also the other temporal subjunctions (*before*, *when*, *while*, *since*, *until*, etc.) denote temporal relations between times, that is for sure (temporal relations between events are ultimately temporal relations between times). It would, however, be premature to claim that in all these cases, the second argument is a definite description of a time (span). It is a realistic possibility, however.

This view gains support from looking at the fact that there are two kinds of *when*-clauses in German – clauses with the subjunction *als* and clauses with the subjunction *wenn*. Semantically, they differ dramatically: In (35), the *als*-clause must be interpreted specifically (it refers to a concrete event), whereas the *wenn*-clause must be interpreted generically.

(35)    a. Als  Marie den Raum betrat,  richteten sich   alle Augen auf sie.
            as   Mary the  room  entered focus     REFL all  eyes   on her
            'When Mary entered the room, everyone was looking at her.'
        b. Wenn Marie den Raum betrat,  richteten sich   alle Augen auf sie.
            when Mary the  room  entered focus     REFL all  eyes   on her
            'Whenever Mary entered a room, everyone looked at her.'

In (35a) the topic time of the sentence is determined as the time which is identical to the time of Mary's entering the room. The second argument of the temporal relation is a definite description of a determinate point in time. (35b), however, means that whenever Mary entered a room everyone was looking at her. Here the second argument seems to be related to a type-denoting definite description, namely the type whose instances are (past) times of Mary entering a room. The sentence is a generic quantification over the instances of this type.

The relation between the two clauses is analogous to the relation between a definite noun phrase and a generic indefinite. We can observe a similar relation when we compare the *if*-clause of a singular conditional with the *if*-clause of a generic conditional (see Pafel 2022: §4; compare, too, the causals in (30)).

Now, one might conjecture that every case where the subjunction denotes a relation is a case where the clause is a predicate with a definite description as its argument (this would encompass causal, purpose, result, adversative, and concessive clauses). Take causal clauses as an example. In the sentence *She missed the train today because she sat at the breakfast table too long* the causal subclause can be analyzed as the predicate ›*f* is caused by the fact that she sat at the breakfast

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10    In Beaver & Condoravdi's (2003) analysis of *after*- and *before*-clauses, the second argument of the temporal relation has the form *earliest(T)*, with *earliest* being an operator that maps a set of times $T$ to the $t$ such that for all $t'$ – being an element of $T – t$ is before or simultaneous to $t'$. Thus, *earliest(T)* amounts to a definite description. It must be noted, however, that in Anscombe's (1964) influential analysis, the second argument of *after* is bound by an existential quantifier and the second argument of *before* by a universal quantifier. Beaver & Condoravdi (2003) argue that a uniform analysis of *after* and *before* is possible with the help of the *earliest*-operator, which reproduces the results of Anscombe's analysis, but they admit that this operator cannot be the last word as it inherits empirical problems from Anscombe's analysis.

table too long‹. The same is true for epistemic causals: *She must have been sitting at the breakfast table too long because she missed the train* with the causal sub-clause meaning something like ›*f* can be inferred from the fact that she missed the train‹. In speech-act related causals there is such a predicate, too, but it is part of the propositional content of the causal clause, as in these causals the causal clauses are illocutive clauses with a propositional content of their own. In *Did she sit at the breakfast table too long, because she missed the train* we have a question (*Did she sit at the breakfast table too long?*) and a commentary (›my question [is motivated by the fact that she missed the train]‹ – predicate plus definite description in brackets).

What, however, if the subjunction does not seem to be denoting a relation, as is the case with the subjunction *if* and conditionals?[11] Take the counterfactual (36).

(36)    Wenn sie   spazieren gegangen wären, hätten       sie   viel
        if     they stroll     walked   were   would-have they much
        verpasst.
        missed
        'If they had gone for a walk, they would have missed a lot.'

The meaning of the counterfactual can be given as follows: ›That they missed a lot is true in the courses of the world which differ minimally from the actual course of the world in that they went for a walk.‹ The conditional clause, thus, has a meaning like ›*p* is true in the courses of the world which minimally differ from the actual course of the world in that they went for a walk‹ (see Pafel 2022 for details).[12] As for the meaning of the conditional clause, we find the same structure that we observed with respect to the temporal clause: a one-place predicate consisting of a two-place predicate (*true in*) and a definite description (*the minimally different worlds*). Once again, there is a prepositional equivalent:

(37)    In dem Fall, dass sie   spazieren gegangen wären, hätten       sie
        in  the  case that they stroll     walked   were   would-have they
        viel   verpasst.
        much missed
        'In the case they had gone for a walk, they would have missed a lot.'

The view is widespread that there is an intimate connection between conditional clauses and definite descriptions: Bittner (2001), Schein (2001), Schlenker (2004), and Bhatt & Pancheva (2017) even take them to be definite descriptions.

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[11]   One might think that the subjunction *that* does not denote a relation either. According to Kratzer (2006) and Moulton (2015: §2), however, it denotes the content relation (simplified: ›*x* is the content of *y*‹). I cannot detect independent evidence for this assumption. As for the German counterpart *dass*, by minimally focussing the subjunction we get verum focus (Höhle 1992).

[12]   The minimal difference is an essential ingredient of many semantic accounts of counterfactuals. They differ in the way they conceptualize the minimal difference but this is not relevant here.

I deviate slightly from this view in taking them to be predicates encompassing a definite description.[13]

What about relative clauses, however? Non-restrictive relative clauses are, as already mentioned, illocutive subclauses. Thus, it is reasonable to assume that the argument of the mood prefix is a definite description. What about restrictive relative clauses? Take the relative clause in *the families who went for a walk*. It is common to assume that, semantically, such a clause is a predicate with the relative pronoun being a variable (›$x$ went for a walk‹) or creating a predicate abstraction (›$\lambda x.x$ went for a walk‹) (see Heim & Kratzer 1998: Ch. 5).

In principle, however, the predicate could be more complex including a definite description of a plurality: ›$x$ belongs to the plurality of entities that went for a walk‹ There is even evidence for the necessity of this more complicated analysis. In relative clauses, we observe the distributive (or pair-list) reading that we are familiar with from interrogative clauses. Take (38), for example.

(38)    die Bücher, die     jeder  gelesen hat
        the books   which  every  read    has
        'the books which everyone has read'

This noun phrase has a reading where it denotes a plurality of books such that for every (contextually given) $x$, it encompasses the books $x$ has read. In German, there is every reason to assume that the universal quantifier (*jeder*) is clause-bound, i.e., it cannot be raised out of the relative clause. We can cope with the distributive reading if we (i) take the relative pronoun to be a quantifier which can be outscoped by the universal quantifier and (ii) assume a definite description as part of the relative-clause semantics. In (38), this definite description has the meaning ›the plurality such that for every $x$ there is a maximal $y$, $x$ has been reading $y$, such that $y$ is part of the plurality‹. The relative clause is a part-of predicate with the description as the argument:

(39)    die jeder gelesen hat
        ›$v$ is part of the plurality $w$ such that for every $x$ there is a maximal $y$, $y$ has been read by $x$, such that $y$ is part of $w$‹ [for short: ›$v$ is part of $w^*$‹]

The noun phrase (38) is a smallest-plurality description:[14]

(40)    die Bücher, die jeder gelesen hat
        ›the smallest plurality $v$ such that $v$ are books and are part of $w^*$‹

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[13]   Verb-related counterfactual *as if*-clauses can be analyzed in the same vein: The clause is a relational predicate of "manners" with a definite description as an argument (Uebel 2020).

[14]   In Pafel (1999) I argued that analyzing *wh*-phrases as existential quantifiers which introduce maximality is an essential ingredient for the analysis of pair-list readings in interrogative clauses. Relative phrases and the pair-list reading in relative clauses can be analyzed in exactly the same way. Incidentally, the noun phrase (38) has, additionally, a reading where the relative phrase outscopes the universal quantifier (›the books which all have read‹).

Now, there is only one small step to make to free relatives. As I have already mentioned, it has been proposed for some time that they are definite descriptions. With the tools now at hand, we can provide an analysis of ordinary free relatives and free relatives with a distributive reading.

(41)    (Wir haben gekauft,) was  wir brauchten
        (we  have  bought)  what we  needed
        '(We bought) what we needed'
        ›the smallest plurality *v* such that, for some maximal *x*, we needed *x*, *x* is part of *v*‹

(42)    (Wir haben gekauft,) was  jeder  am liebsten mag
        (we  have  bought)  what every  at best     likes
        '(We bought) what everyone likes most'
        ›the smallest plurality *v* such that for every *x* there is a maximal *y*, *x* likes *y* most, such that *y* is part of *v*‹

It might also be the case that the so-called transparent free relatives – see, for instance, Grosu (2016) for a recent analysis – can be analyzed with the help of type-denoting descriptions.

Thus, we come full circle as free relatives were our first example of a clause being a definite description.


## 6  Summary

Now and then, it has been proposed that some specific types of clauses should be considered definite descriptions (especially free relatives, interrogatives, and conditionals). In this article, I proposed a generalization: All clauses are or contain definite descriptions. I argued that argument clauses are definite descriptions, that at least some kinds of adverbial and attributive clauses are predicates including a definite description, and that independent clauses as well as illocutive subclauses include a definite description as the argument of the mood prefix. In each of these cases, assuming the existence of a definite description is crucial in explaining fundamental semantic facts. We became acquainted with four kinds of definite descriptions, which are crucial in the nominal as well as in the clausal domain (ordinary definite descriptions, definite descriptions denoting smallest pluralities, types in general, or smallest types).


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