

Exploring the existential semantics of the German impersonal pronoun *man* in episodic sentences*

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1. Introduction

German *man* is a dedicated impersonal pronoun (DIP) corresponding to English *one*. Like *one*, German *man* can be used as the subject of generic sentences with an interpretation that is roughly paraphrasable as “people in general”, see (1). Unlike *one*, German *man* also allows for a use in episodic sentences, see (2), where its semantic contribution is roughly that of an existential indefinite (e.g., *someone*).¹

- (1) **Man** muss sich die Zähne putzen.
DIP must SELF the teeth clean
'One has to brush one's teeth.' (≈ “people in general”)
- (2) **Man** hat für dich angerufen.
DIP has for you called
(≈ ‘Someone called for you’) (Fenger 2018:297)

Due to the intuitive similarity between German *man* in episodic sentences and existential indefinites, uses of *man* like in (2) are called “existential uses”.

It is easy to show that existentially used *man* (*man_{ex}*) is not semantically equivalent with *someone*: *man_{ex}* is compatible with single agents, as in (2), as well as groups or pluralities, which is shown by the compatibility of *man_{ex}* with reciprocals (see Zifonun 2000:233);

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¹Further differences between English *one* and German *man* lie in the restriction of German *man* to subject position and its lack of a derived possessive or reflexive (cf. *one’s* and *oneself* for English *one*). In generic sentences, *man* has suppletive forms in the accusative (i.e., *einen*) and dative (i.e., *einem*), which are unavailable in episodic sentences, see Kratzer 1997.

man_{ex}, unlike *someone*, is thus number neutral. Still, *man_{ex}*, just like *someone*, intuitively expresses existential quantification over humans (e.g., Cabredo Hofherr 2015, Fenger 2018, Malamud 2012). The main question in the literature on the semantics of dedicated impersonal pronouns that allow for this use is how this existential interpretation arises.

In the literature, three types of formal analyses have been offered to account for existentially used dedicated impersonal pronouns: (i) analyses assuming that they denote existential quantifiers like *someone* (e.g., Malamud 2006), (ii) analyses assuming that they contribute variables that are unselectively bound by an independent existential quantifier (e.g., Malamud 2012, Zobel 2017), and (iii) an analysis assuming that they contribute an operator on one-place predicates that existentially closes the open argument position of the predicate (Chierchia 1995).²

The rather modest goal of this paper is to show that all three types of analyses fail to adequately capture the semantic behavior of *man_{ex}* if we jointly consider its scope behavior, its discourse anaphoric behavior, and its binding behavior. The upshot of this discussion is that analyses of type (iii) provide the most promising starting point for further investigation. For reasons of space, I will not develop a new analysis of this type here. Also note that I set aside the use in generic sentences in (1), so my discussion in this paper and my observations about *man_{ex}* are not intended to extend to *man* in generic sentences.

The paper is structured as follows. In Section 2, I introduce the semantic behavior of *man_{ex}*. I explore the viability of the three types of analyses for *man_{ex}* by discussing whether and how they can capture this behavior. In Section 3, I present two further observations on the semantic behavior of *man_{ex}* and suggest further avenues for investigation.

2. Challenges for the three types of existing accounts

2.1 First type: *man_{ex}* denotes an existential quantifier

The first type of analyses proposed in the literature for *man_{ex}* takes the pronoun to denote an existential quantifier ranging over the set of humans, as in (3) (see, e.g., Malamud 2006).

$$(3) \quad \llbracket man_{ex} \rrbracket = \lambda P. \exists x [\text{human}(x) \wedge P(x)]$$

Such an analysis predicts that *man_{ex}* shows the same semantic behavior as other expressions that denote existential quantifiers, for instance, the German existential indefinite *jemand* ‘someone’. In particular, we would expect *man_{ex}* and *jemand* to have the same scope behavior. As Zifonun (2000:245) observes, this is not borne out.

In German, the surface order of quantificational expressions much more rigidly determines their scopal relations than in English (e.g., Pafel 2005). That is, when *jemand* occurs as the subject of the clause in the prefield, it is interpreted with high scope relative to other quantifiers occurring linearly to its right. Hence, in (4a), *jemand* is understood to scope over the frequency adverb *dreimal* ‘three times’.

²Chierchia (1995) and Malamud (2006, 2012) aim to provide analyses that account for both the generic and existential uses of dedicated impersonal pronouns. In this paper, I only discuss the consequences of their accounts for the existential use.

- (4) a. **Jemand** hat mich dreimal angerufen. (∃ < 3 times)
 someone has me three.times called
 ‘Someone called me three times.’
- b. **Man** hat mich dreimal angerufen. (3 times < ∃)
 DIP has me three.times called

In (4b), *man* also occupies the prefield position. Hence, if man_{ex} is an existential quantifier, we would expect it to have scope over *dreimal* ‘three times’, as well. This is not what we find. In (4b), *man* is intuitively interpreted in the scope of *dreimal*, which means that, unlike (4a), (4b) can be used to truthfully describe a situation in which the speaker was called three times in total, each time by a different person.

This difference in scope behavior between *jemand* and man_{ex} makes it highly implausible that the proposal in (3) adequately captures the denotation of man_{ex} . That is, man_{ex} does not denote an existential quantifier just like *jemand* or *someone*, which are freely scope taking. The data in (4) is, however, compatible with the assumption that the interpretation of man_{ex} involves existential quantification that is contributed in some other way.

2.2 Second type: man_{ex} denotes an individual variable

The idea that man_{ex} does not contribute an existential quantifier is at the heart of the second type of analyses (e.g., Malamud 2012, Zobel 2017). The main idea is that man_{ex} contributes only an individual variable (ranging over humans) that is existentially closed at the VP-level by existential event closure, see (5).³

- (5) a. $\llbracket man_{ex} \rrbracket = x$
 b. $\llbracket (2) \rrbracket^c = \exists e, x [\tau(e) < c_T \wedge \text{call}(c_A)(x)(e)]$
 IN WORDS: There is an event e and an individual x such that the runtime of e precedes the time of utterance c_T , and e is an event of x calling the addressee c_A .

If man_{ex} only contributes an individual variable, it does not have scope. Like other expressions that contribute bindable variables (e.g., personal pronouns), any perceived scope relations arise indirectly via the quantifiers that bind these variables. Hence, the unexpected low scope observed for man_{ex} in (4b) has to be an effect of existential event closure. This fits the discussion of the properties of existential event closure in the literature (e.g., Champollion 2015): event closure is assumed to have lowest scope with respect to other scope-taking elements since it is introduced right above VP in AspP.

Tying the existential semantics of man_{ex} to event closure also accounts for its low scope with respect to negation, see (6) (see Zifonun 2000:246).

- (6) **Man** hat nicht bei mir eingebrochen.
 DIP has not at me broken-in

³Note that $\tau(e)$ stands for the runtime of the event e , c_T encodes the time of the utterance context c , and c_A denotes the addressee in c .

Example (6) is only true if no one broke in at the speaker's place. This is captured since sentential negation negates the event described by the main predicate—that is, semantically, *nicht* in (6) has scope over existential event closure (see e.g., Penka 2010). Hence, if event closure existentially closes not only the event variable but also the variable contributed by man_{ex} , as in (5b), the existence of an agent for the negated event is predicted to also be negated, just as we observe for (6).

The second type of analyses faces problems on two fronts: first regarding the choice of tying the existential interpretation of man_{ex} to existential event closure, and second regarding the assumption that man_{ex} contributes an individual variable.

First, the problem that arises in connection with tying the existential interpretation to existential event closure concerns the discourse semantic behavior of man_{ex} . If existential event closure is responsible for the existential semantics of man_{ex} , we would expect the existentially closed individual variable x to show the same discourse semantic behavior as the existentially closed event variable e —in particular, regarding the possibility for either to bind/co-refer with anaphoric pronouns. However, we find that the two existentially closed variables differ in this respect. Davidson (1967) famously observed that an event that was introduced in one sentence could be picked up by a 3rd person singular pronoun *it* in a subsequent sentence, see (7).

(7) Jones battered a piece of toast. He did **it** with a knife. (see Davidson 1967:37)

In contrast, man_{ex} cannot serve as the antecedent for either *er* 'he' or *sie* 'she', as illustrated in (8) (e.g., Cabredo Hofherr 2008, Zifonun 2000).

(8) Man hat bei mir eingebrochen. #**Er/sie** hat ein Fenster eingeschlagen.
 DIP has at me broken-in he/she has a window smashed
 (Intended: 'Someone broke in at my place. He/she smashed a window.')

This failure of man_{ex} to serve as an antecedent, hence, has to be attributed to some grammatical aspect of man_{ex} . For instance, proponents of the analysis in (5) might argue that the data in (8) can be attributed to the ϕ -feature make-up of man_{ex} . The current consensus in the literature is that man_{ex} does not bear any number, gender, or person features and that it, hence, triggers default agreement, which is 3rd person, singular, and masculine in German (see e.g., Egerland 2003, Fenger 2018, Malamud 2012).⁴ So, one possibility to account for the failure of man_{ex} to serve as an antecedent for 3rd person singular *er/sie* 'he/she' in (8) could be to attribute it to their difference in ϕ -features (e.g., gender or number features).

For co-reference to fail, the presupposed content that is contributed by the ϕ -features on *er/sie* has to be in conflict with the denotation of man_{ex} (see Sudo 2012 for an overview of the interpretation of ϕ -features). However, no such conflict arises in (8): In accordance with its featural deficiency, the use of man_{ex} does not provide any number or gender information for the agent(s) who broke in at the speaker's place. This, of course, means that

⁴Unlike Egerland (2003) and Fenger (2018), Malamud (2012) proposes that *man* has rather complex featural make-up. Importantly for the present discussion, though, none of these features specify the number or gender of the value of the variable x .

the presuppositions of the 3rd person singular pronouns in the second sentence are not *in conflict* with the denotation of *man_{ex}*. Hence, the infelicity of using *er/sie* in the second sentence could only be attributed to the lack of number and gender information contributed by *man_{ex}*—that is, maybe the presupposed ϕ -content contributed by *er/sie* cannot be accommodated. However, this cannot be behind the infelicity in (8), either, as is shown by the felicity of using *er/sie* with the German indefinite pronoun *wer* (lit. 'who') in (9) (see Fenger 2018:316).

- (9) Bei mir hat wer eingebrochen. **Er/sie** hat ein Fenster eingeschlagen.
 at me has.3rd-sg who broken-in he/she has a window smashed
 'Someone broke in at my place. He/she smashed a window.'

Just like *man_{ex}*, the indefinite pronoun *wer* shows 3rd person singular agreement with the verb but is semantically compatible with singular and plural agents of any gender. Nevertheless, the use of *er/sie* in the second sentence is felicitous and specifies that the speaker takes the agent to be a single male/female person (i.e., the ϕ -content is accommodated). So, the failure of *man_{ex}* to serve as an antecedent for 3rd singular pronouns has to be accounted for differently.

Second, the problem connected to the assumption that *man_{ex}* contributes an individual variable concerns the impossibility of binding relations between *man_{ex}* and individual quantifiers. Malamud (2012) and Zobel (2017) take the availability of a generic use and an existential use for *man* to be a quantificational variability effect (QVE): the existential use arises via existential event closure, the generic use arises when the variable contributed by *man* is bound by the generic operator GEN. The idea that the two uses arise via QVE seems to be supported by further interactions of *man* with adverbial quantifiers. Malamud (2012) provides examples of *man* showing QVE with adverbs of frequency like *normalerweise* 'usually', as in (10), and Zobel (2017) shows that for *man* in episodic sentences, we also find QVE with adverbs of quantity like *größtenteils* 'for the most part', see (11).

- (10) Damals wurde man normalerweise 60 Jahre alt.
 back-then became DIP usually 60 years old
 (\approx 'In those days, most people lived till 60.') (Malamud 2012:5)

- (11) Man war größtenteils in legerer Sommerkleidung gekommen.
 DIP was for-the-most-part in casual summer-dress come
 (\approx 'Most people had appeared in casual summer dress.') (Zobel 2017:370)

For both examples, the quantifier MOST contributed by *normalerweise* 'usually' and *größtenteils* 'for the most part' seems to unselectively bind the variable contributed by *man*. But, if *man* contributes an individual variable that can be unselectively bound by co-occurring adverbial quantifiers, that variable should also be bindable by individual quantifiers. However, when *man_{ex}* occurs in a complex episodic sentence, as in (12a), it cannot be bound by an individual quantifier in the matrix clause, while 3rd person pronouns can, see (12b).

- (12) a. Die meisten Leute_i freuten sich, weil man*_i Sommerkleidung trug.
 most people were.pleased because DIP summer-dress wore
- b. Die meisten Leute_i freuten sich, weil sie_i Sommerkleidung trugen.
 most people were.pleased because they summer-dress wore
 ‘Most people were pleased because they wore summer clothes.’

The sentence in (12a) does not have the same interpretation as (12b). It can only get the interpretation that most visitors were pleased because someone or some group wore summer clothes; in the latter case, that group might even be all of the people present in the situation that is described by (12a) (i.e., most of the people were pleased that all of them wore summer clothes). Importantly, though, *man_{ex}*, unlike *sie* in (12b), cannot covary with the individual quantifier *die meisten Leute* ‘most people’ and has to be interpreted existentially.

We might ask what blocks the variable contributed by *man_{ex}* from being bound by the individual quantifier. Just as in the co-reference case, it is implausible to assume that the variable cannot be bound due to a discrepancy in ϕ -features. The quantifier *die meisten Leute* ‘most people’ in (12a) does not fix a specific gender for the individuals that are quantified over: as a distributive quantifier, *die meisten Leute* would require *man_{ex}* to co-vary with single human individuals of potentially variable gender. Given that *man_{ex}* is number-neutral and unspecified for gender due to its lack of number and gender features, there would be no semantic conflict that could block binding of the variable contributed by *man_{ex}*. Nevertheless, *man_{ex}* in (12a) can only be interpreted existentially.

The observation in (12a) should not be used as motivation to stipulate that the variable contributed by *man_{ex}* has to be bound by existential event closure, though. *Man_{ex}* can sometimes serve as an antecedent/anaphor for itself, see (13a), which is impossible for existentially quantified DPs, see (13b).

- (13) a. Man hat bei mir eingebrochen. **Man** hat ein Fenster eingeschlagen.
 DIP has at me broken-in DIP has a window smashed
 (≈ ‘Someone broke in at my place. They smashed a window.’)
- b. Jemand hat bei mir eingebrochen. Jemand hat ein Fenster eingeschlagen.
 someone has at me broken-in someone has a window smashed
 ‘Someone broke in at my place. Someone smashed a window.’

In (13a), the second occurrence of *man* intuitively refers back to the individuals that broke in at the speaker’s place, which parallels the anaphoric use of the third person singular pronouns *er/sie* in (9). Such an anaphoric interpretation is unavailable for the second occurrence of *jemand* in (13b): the re-use of the existential quantifier suggests that the people who smashed a window differ from those who broke in. Taken together, the parallel between (9) and (13a) and the contrast between (13a) and (13b) suggest that the variable *x* contributed by *man_{ex}* can also remain unbound.

The possibility for *x* to stay unbound, however, not only re-opens the question why individual quantifiers cannot bind *man_{ex}*, see (12a), it generally raises the question why *man_{ex}* cannot be used freely as an anaphor like 3rd person singular pronouns, see (14), assuming

that 3rd person singular pronouns also contribute variables that may remain unbound (e.g., Heim and Kratzer 1998, Kratzer 2009).⁵

- (14) a. Jemand hat bei mir eingebrochen. **Er/sie** hat auch Pauls Rad gestohlen.
 someone has at me broken-in he/she has also Paul’s bike stolen
 ‘Someone broke in at my place. He/she also stole Paul’s bike.’
- b. Jemand hat bei mir eingebrochen. **#Man** hat auch Pauls Rad gestohlen.
 someone has at me broken-in IMP has also Paul’s bike stolen

While *er* ‘he’ or *sie* ‘she’ can be anaphorically related to *jemand* ‘someone’ in (14a), *man* can only be interpreted existentially in (14b) and cannot be understood anaphorically to *jemand* in the first sentence, just like the second occurrence of *jemand* in (13b).

So, the second type of analysis that takes *man_{ex}* to contribute an individual variable that is existentially closed via event closure makes a number of undesirable predictions regarding the discourse anaphoric behavior and binding behavior of *man_{ex}* that proponents of this type of analysis need to exclude separately.

Of all analyses of this type, the one in Malamud 2012, 2013 is the one that has been worked out in most detail. Malamud uses Centering Theory to account for the discourse anaphoric behavior of *man_{ex}*. She argues that *man_{ex}* does not place any individuals on the saliency hierarchy that manages accessibility for subsequent pronominal expressions. As a result, 3rd person singular pronouns cannot be anaphorically related to *man_{ex}*. Furthermore, she suggests (but does not work out in detail) that cases like (13a), where *man_{ex}* is an antecedent/anaphor for itself, can be explained as an effect of the coherence relation that holds between the two clauses with *man_{ex}* in connection with the proposal using Centering Theory. However, Malamud does not address the question why the variable contributed by *man_{ex}* cannot be bound by individual quantifiers (neither does Zobel (2017)).

2.3 Third type: *man_{ex}* denotes an existential operator

The third type of analysis proposed by Chierchia (1995) for Italian impersonal *si* takes dedicated impersonal pronouns to be operators on verbal one-place predicates with an open external argument. The effect of applying the operator is that the single open argument position is existentially closed, see (15).

$$(15) \quad \llbracket man_{ex} \rrbracket = \lambda P. \exists x_{arb} [P(x_{arb})] \quad (\text{see Chierchia 1995:121})$$

The operator idea assimilates *man_{ex}* to the passive operator that is assumed to existentially close the external argument in passivized sentences (e.g., Bruening 2013a).⁶

⁵If 3rd person singular pronouns are definite descriptions, as assumed in recent situation semantic analyses (see Schwarz 2012, Elbourne 2013), no parallel behavior is expected for 3rd person singular pronouns and *man_{ex}* under analysis (5) in (14). However, in that case the anaphoric use of *man_{ex}* in (13a) raises the question whether *man_{ex}* is sometimes interpreted as a definite description.

⁶As Chierchia (1995:121) notes, syntactic parallels with passivization have been noted in the literature before (but see Blevins 2003). Semantic parallels between implicit agents of short passives and the existential

The operator analysis provides the basis to capture most of the data discussed in the previous subsections: (i) The obligatory low scope of *man_{ex}* arises because the operator applies directly at the VP-level to existentially close the external argument—that is, the existential quantifier is introduced below existential event closure; (ii) the observation that *man_{ex}* cannot be bound by individual quantifiers is captured by the fact that *man_{ex}* does not contribute a free individual variable;⁷ (iii) the inability of *man_{ex}* to serve as an antecedent for 3rd person singular pronouns is attributed to the index *arb*, which cannot be used to co-index *x_{arb}* with 3rd person singular pronouns since these pronouns cannot bear *arb*; and (iv), the possibility to use *man_{ex}* as an anaphor for itself can be captured by appealing to pragmatics (as suggested by Malamud, see above).

Given points (i–iv), the operator analysis only fails to capture one of the contrasts discussed in Section 2.2: the contrast between (13a) and (13b).

- (13) a. Man hat bei mir eingebrochen. **Man** hat ein Fenster eingeschlagen.
 DIP has at me broken-in DIP has a window smashed
 (≈ ‘Someone broke in at my place. They smashed a window.’)
- b. Jemand hat bei mir eingebrochen. Jemand hat ein Fenster eingeschlagen.
 someone has at me broken-in someone has a window smashed
 ‘Someone broke in at my place. Someone smashed a window.’

Chierchia suggests that the apparent anaphoric relation between the two occurrences of *man_{ex}* in (13a) can be given a pragmatic account based on the relation between the predicates occurring in the two clauses (see Chierchia 1995:131). Given that *jemand* also has existential semantics, it is unclear, though, why this relation between the predicates does not also result in an apparent anaphoric relation between the two occurrences of *jemand* in (13b). Hence, something more needs to be said to account for this contrast.

The analysis in (15) also has one theoretical drawback. While the special index *arb* captures that *man_{ex}* cannot serve as an antecedent for 3rd person singular pronouns, the index is introduced specifically to capture the discourse anaphoric behavior of dedicated impersonal pronouns. Using *arb* is, hence, only restating the facts. An account with the same empirical coverage as (15) that does away with special indices would be preferable.

3. Conclusion: Desiderata for capturing the existential use

Summarizing the discussion in the previous section, an account of German *man* in episodic sentences (*man_{ex}*) needs to capture its existential semantics in such a way that *man_{ex}* has obligatory low scope, cannot serve as an antecedent for 3rd person pronouns, can only serve as an anaphor for itself (if at all), and cannot be bound by individual quantifiers (but perhaps by adverbs of quantification).

use of dedicated impersonal pronouns are discussed, for instance, in Koenig and Mauner 1999 for French and Zobel 2017 for German.

⁷According to Chierchia, the generic use and the QVE data presented in Section 2.2 can be accounted for by the assumption that adverbs of quantification (incl. GEN) may trigger the application of “*existential disclosure*”, which allows adverbial quantifiers to bind variables that would otherwise be existentially closed.

German ‘man’ in episodic sentences

To this list, I add two further observations that are not problematic for any of the three types of analyses, but which a successful account of *man_{ex}* also needs to capture. First, agents that are described by *man_{ex}* can be “taken up” in subsequent sentences via *bridging definites*, see (16) (see also Koenig and Mauner 1999 for French *on*).

- (16) Man hat bei mir eingebrochen. (‘DIP broke in at my place.’)
a. **Die Täter** haben auch Pauls Rad gestohlen.
the culprits have also Paul’s bike stolen
b. **#Die Männer** haben auch Pauls Rad gestohlen.
the men have also Paul’s bike stolen

The definite DP in (16a) refers to the culprits that broke into the speaker’s place (i.e., the individuals described by *man* in the first sentence). The contrast between (16a) and (16b) shows that this is not a regular anaphoric relation: if *die Täter* ‘the culprits’ is substituted by *die Männer* ‘the men’, the connection between the break-in and the theft of Paul’s bike is not as readily understood—unless it is established contextually that a group of men did the break-in. Hence, the semantics of *man_{ex}* needs to be compatible with bridging inferences.

Second, which individuals are described by *man_{ex}* is sensitive to sets of individuals that are contextually introduced in the preceding sentence (17a) or via a frame-setting PP (17b).

- (17) a. Gestern war Vorstandssitzung. **Man** hat Petras Antrag bewilligt.
yesterday was board.meeting DIP has Petra’s proposal accepted
(≈ ‘Yesterday, there was a board meeting. They accepted Petra’s proposal.’)
b. Bei der gestrigen Vorstandssitzung hat **man** Petra angerufen.
at the yesterday board.meeting has DIP Petra called
(≈ ‘At the board meeting yesterday, they called Petra.’)

In (17), *man_{ex}* can be used to talk about (a subset of) the members of the board (≈ ‘they’), which have become available contextually as a result of the preceding sentence in (17a) or as a result of the frame-setting PP in (17b). So, the denotation of *man_{ex}* seems to be able to “access” the individuals that are present in the situation described.

The discussion in Section 2 showed that analyses of types one and two fail to account for a number of central aspects of the semantic behavior of *man_{ex}* (i.e., its scope and/or binding behavior). At this point, the most promising current avenue for exploring the denotation of *man_{ex}* based on the data is to investigate the viability of an operator analysis for *man_{ex}* (as in Chierchia 1995) and the semantic similarity between *man_{ex}* and passivization.

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