Semantic vs. pragmatic definites: Evidence for presupposition cost from sentence processing

This paper investigates the notion of definiteness from a psycholinguistic perspective and addresses Löbner’s (1985) distinction between semantic and pragmatic definites. To forecast, the current processing data suggest that this distinction has psychological reflexes.

There is an ongoing debate about the meaning of definiteness and the number and types of definite entities (e.g. Russell, 1905; Strawson, 1950; Hawkins, 1978; Löbner, 1985; and many others). Definite noun phrases (NPs) include definite descriptions, demonstratives, pronouns, possessive constructions, proper names, or NPs with a universal quantifier as determiner, and research has focused on which properties are shared by these entities and how they differ from one another. Researchers have for instance been arguing over whether proper names and definite descriptions share the same features (e.g. Geurts, 1997) or whether they are fundamentally different (e.g. Kripke, 1972).

In the following research, I investigated Löbner’s approach to definiteness, which proposes a two-way distinction between so-called semantic and pragmatic definites. Semantic definites exist independently of the particular situation of utterance and are rigid designators, while pragmatic definites depend on the immediate situation for unambiguous reference (cf. also Hawkins, 1978). Instantiations of semantic definites are proper names (e.g. *Hillary Clinton*), inherently definite nouns (*the weather*), or indexicals (*I, you*), while third person pronouns and the majority of definite NPs belong to the class of pragmatic definites (*he, the table*).

To assess the validity of this distinction, this paper discusses three studies from online sentence processing in German. Psycholinguistic experimentation represents one means of testing linguistic theories, and the following experiments utilized event-related brain potentials (ERPs) to investigate whether the distinction between semantic and pragmatic definites is reflected in language comprehension processes. While participants read sentences, the electrical brain activity that occurs during this sensory and psychological event was recorded. The analysis of this activity (i.e. ERPs) makes it possible to examine the brain’s reaction to a specific linguistic stimulus, in the present case to semantic and pragmatic definites. ERP signatures are time-sensitive measures that are characterized by their latency (with respect to a stimulus onset), polarity and topography.

The present investigation is guided by previous findings from the processing of definiteness that has shown that the integration of definite NPs that unambiguously refer to an entity introduced in previous discourse (1.a) differs from definite NPs that depend on accommodation (1.b).

(1.a) Mary visited a conductor in Boston. She said that the conductor was really friendly.
(1.b) Mary visited a concert in New York. She said that the conductor was astonishing.

In terms of ERP signatures, the degree of salience of an entity is reflected in amplitudinal changes of a negative-going potential peaking about 400ms after stimulus onset, the so-called N400 (cf. Burkhardt, 2006). The more demanding the integration is, the more enhanced is the N400 (e.g. accommodation shows a more enhanced N400 compared to coreference). With respect to the current research question, this suggests that if the distinction between semantic definites (that have a relatively fixed reference) and pragmatic definites (that depend on the discourse representation for reference specification) exists, the latter should evoke increased processing cost during reference assignment.

**Experiment 1** contrasted two types of definite NPs, semantic definites, which refer to concepts that are common to all situations and are considered rigid designators (i.e. inherently definite NPs, such as *the weather, the time, the air*) and pragmatic definites, which must be specified by the discourse for unambiguous reference (*the view, the clock, the strategy*). All items were matched for frequency and length. The analysis revealed that pragmatic definites give rise to a more pronounced N400, reflecting the search for a referent in discourse representation.

(2.a) **Semantic definite:** Ich finde, dass das Wetter immer wieder für eine Überraschung sorgt.
\(I\) think that the weather is up for a surprise over and over again.

(2.b) **Pragmatic definite:** Ich finde, dass das Produkt immer wieder aufdringlich beworben wird.
\(I\) think that the product is over and over advertised in a presumptuous manner.
Experiment 2 looked at proper names as semantic definites and contrasted them with discourse-dependent pragmatic definites. To make these two conditions more comparable, proper names were introduced with a definite determiner (which is possible in German). The results supported the findings from Experiment 1 by also showing a more enhanced N400 for pragmatic definites.

(3.a) **Semantic definite:** Sie meint, dass der Arno sehr häufig mit Prellungen heimkommt.  
_Elisabeth thinks that the Arno comes home with bruises quite frequently._

(3.b) **Pragmatic definite:** Sie meint, dass der Anker sehr häufig verfrüht gelichtet wird.  
_Elisabeth thinks that the anchor is quite frequently hoisted prematurely._

Experiment 3 investigated pronouns that also fall within this semantic-pragmatic distinction in Löhner’s account. Indexicals (i.e. first and second person pronouns) refer to the participants in a communication situation (i.e. speaker, addressee), while third person pronouns refer to varying discourse referents. Indexicals therefore carry inherent content (I=speaker, you=hearer) and are categorized as semantic definites, while third person pronouns change their reference as a function of context (she=the singer, my colleague, Barbara,…) and represent pragmatic definites. To facilitate integration of the pragmatic pronouns, the material included a proper antecedent (Elisabeth in (4.b)). The prediction that pragmatic definites show a more pronounced N400 was borne out in this study.

(4.a) **Semantic definite:** Elisabeth denkt, dass der Sprinter, den ich küssete, gestürzt ist.  
_Elisabeth thinks that the sprinter whom I kissed fell._

(4.b) **Pragmatic definite:** Elisabeth denkt, dass der Sprinter, den sie küssete, gestürzt ist.  
_Elisabeth thinks that the sprinter whom she kissed fell._

This series of studies looked at the notion of definiteness in differing linguistic expressions, i.e. definite NPs, proper names, and pronouns. Despite their differences in form and function, the results indicate that the distinction between semantic and pragmatic definites as for example spelled out in Löhner (1985) has a bearing on referential integration. Expressions that depend on discourse for unambiguous reference exert processing cost, while rigid designators are less computationally demanding. These findings thus indicate that the division between semantic and pragmatic definites is empirically valid. In particular, experiment 1 reveals that the inherent definiteness of nouns such as the weather can be dissociated form context-dependent nouns such as the cloud. Experiment 2 suggests that proper names differ from definite descriptions (contra Geurts, 1997 and others). And Experiment 3, shows that such a distinction also applies to pronouns, suggesting that a general notion of definiteness must be formulated that goes beyond definiteness-marking proper.

In sum, definite NPs introduce the presupposition that reference is made to a specific entity and they therefore trigger the establishment of a relation R between an expression and an entity in discourse representation. The nature of this relation R depends on the particular information encoded by the complement and the information available in the discourse representation. Previous research has shown that if the presupposition that reference is made to a specific discourse entity must be accommodated, increased integration cost is exerted (cf. Burkhardt, 2006). The current findings provide evidence for another instantiation of presupposition cost: the existence of semantic definites is presupposed due to their inherently rigid designation in every possible discourse, while pragmatic definites require particular reference specification in a given discourse. To satisfy the definiteness presupposition, pragmatic definites by definition must search the discourse space to select a referent, which results in enhanced integration cost – while semantic definites do not require such a selection operation. This operation is not exclusively tied to the occurrence of the definite determiner – as the comparison of indexicals and third person pronouns reveals – but represents a more general functional concept that applies at the semantics-discourse interface.