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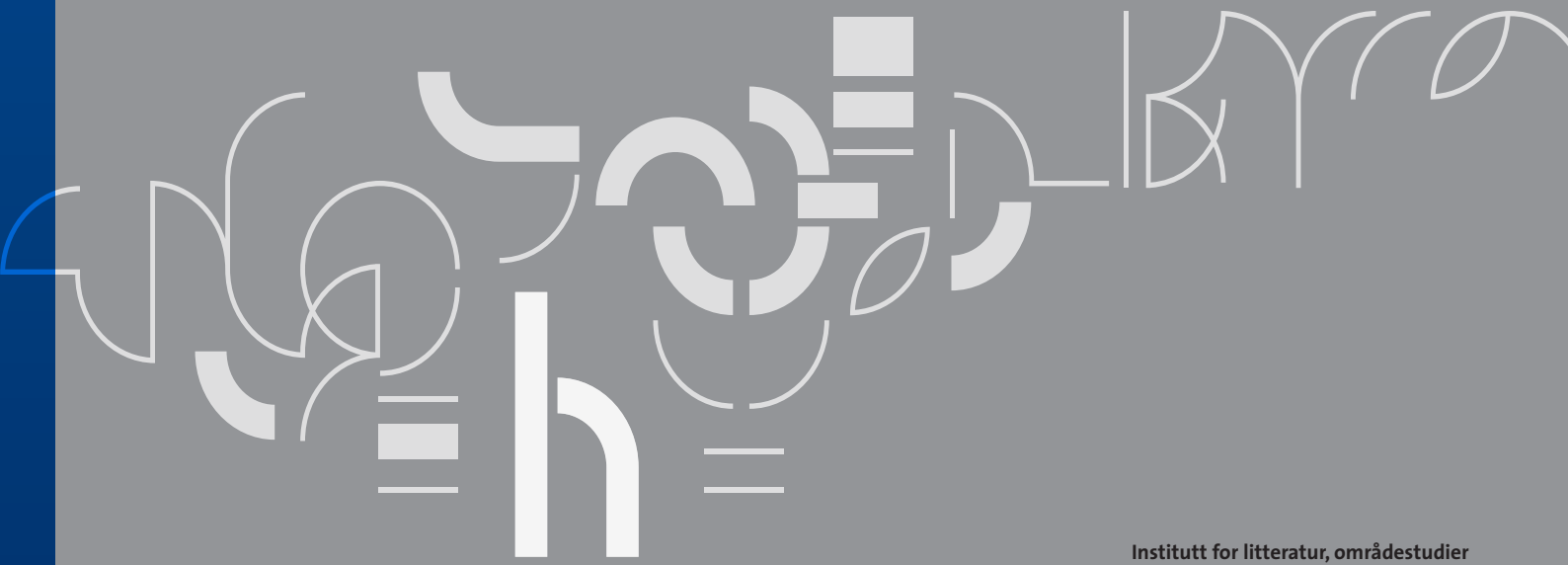
Petra Burkhardt
Department of Germanic Linguistics
University of Marburg



Institutt for litteratur, områdestudier
og europeiske språk

Department of Literature, Area Studies and
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Petra Burkhardt
Department of Germanic Linguistics
University of Marburg

petra.burkhardt@aya.yale.edu

Abstract

This paper investigates the notion of definiteness from a psycholinguistic perspective and addresses Löbner's (1987) distinction between semantic and pragmatic definites. To this end inherently definite noun phrases, proper names, and indexicals are investigated as instances of (relatively) rigid designators (i.e. semantic definites) and contrasted with definite noun phrases and third person pronouns that are contingent on context to unambiguously determine their reference (i.e. pragmatic definites). Electrophysiological data provide support for this distinction and further substantiate the claim that proper names differ from definite descriptions. These findings suggest that certain expressions carry a feature of inherent definiteness, which facilitates their discourse integration (i.e. semantic definites), while others rely on the establishment of a relation with prior information, which results in processing cost.

1 Introduction

There has been a long and ongoing debate about the meaning of definiteness and following from this about a typology of definite expressions (cf. Russell 1905; Strawson 1950; Hawkins 1978; Prince 1981; Löbner 1985; and many others). Definite expressions include definite descriptions, demonstratives, pronouns, proper names, noun phrases (NPs) with a universal quantifier or a possessive as determiner, or generically used NPs, to name a few. Theoretical accounts have addressed on the one hand what kinds of properties are shared by these entities and on the other hand how

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these entities differ from one another. Researchers have for instance been arguing over whether proper names and definite descriptions share the same features (e.g. Russell 1905; Kneale 1962; Geurts 1997) or whether they are fundamentally different (e.g. Kripke 1972). Another issue is whether entities that refer to a unique referent that is common in all possible worlds – such as *the sky* – should be distinguished from entities that depend on contextual support for unambiguous reference – such as *the book* (Hawkins 1978; Löbner 1985). A lot of attention has also been paid to direct anaphors that refer to an entity already available in the discourse representation and to definite expressions that depend on accommodation, since in these latter cases, definiteness does not presuppose previous mention of a discourse referent (Lewis 1979; Heim 1982). In the following section, I provide a brief overview of a number of different theoretical accounts and then introduce Löbner's typology of definiteness, which is experimentally tested in subsequent sections.

2 Definiteness

2.1 A single notion of definiteness

The concept of definiteness has been characterized as a truth conditional semantic phenomenon, but also as a discourse-pragmatic phenomenon. Definiteness presupposes the existence of a referent, a notion that has for instance been discussed with reference to uniqueness, salience, or familiarity. In his classical account, Russell (1905) tied definiteness to the assertion of the uniqueness of the respective referent. Accordingly, a definite expression 'the X' refers to *one and only one* entity of the sort X. This approach was weakened by Christophersen (1939) who introduced the notion of non-ambiguity or intended uniqueness. As a consequence, definiteness is not restricted to sortal concepts and it implies that 'the X' stands for a *particular entity* (but not necessarily for the one and only one). Hence, while the Russellian account of uniqueness encounters difficulties with the presence of two entities of the same sort, this is circumvented by the idea of non-ambiguity. Strawson (1950) also emphasized the referential nature of definite expressions and argued that definiteness presupposes the existence of a referent. Theories that focused on the salience of an entity proposed that a definite expression refers to an entity that is *the most salient entity* in discourse representation satisfying the descriptive content (Lewis 1979; von Heusinger 1997). Within these frameworks, salience hierarchies must be employed and the definite determiner serves as a context-dependent choice function. Finally, in the tradition of the familiarity-based accounts, a definite expression refers to a particular entity *that is already available in the mental model* (Hawkins 1978; Heim 1982). An intricacy for this kind of approach are for instance expressions whose descriptive content suffices to identify a unique referent or the occurrence of indirect anaphors, i.e. definite expressions that are conceptually linked to information available in the discourse representation but that represent discourse-new referents.

What these theoretical traditions have in common is that they primarily focus on the presence of the definite determiner, which either implies uniqueness, non-ambiguity, familiarity, or discourse prominence. More importantly, all of these accounts are based on a single characterization of definiteness that targets unambiguous reference assignment.

2.2 A typological approach to definiteness

Another approach to definiteness is to abandon the idea that it represents a uniform property and to introduce different types of definites (Hawkins 1978; Löbner 1985) or to provide a graded account, as for instance reflected in accessibility scales or givenness hierarchies (Prince 1981; Ariel 1990; Gundel, Hedberg and Zacharski 1993; Aissen 2003).

The present paper focuses on Löbner's approach to definiteness, which proposes a two-way distinction between what he calls semantic and pragmatic definites. Semantic definites exist (relatively) independent of the particular situation of utterance, while pragmatic definites must be specified by information made available by the immediate situation for unambiguous reference (cf. also Hawkins 1978). Exemplars of semantic definites are proper names (e.g. *Hillary Clinton*) or inherently definite nouns (e.g. *the weather*), which have the same denotation in every possible world and thus refer unambiguously in and of themselves. Yet, indexicals (*I, you*) also belong to the class of semantic definites, since they have a limited referential scope and unambiguously identify their referents (speaker and hearer respectively) within a particular situation. The same reasoning considers indirect anaphors or expressions denoting inalienable possession as functional concepts that are clearly constrained by discourse or lexical information. In contrast, the majority of definite NPs (e.g. *the apple*), third person pronouns and demonstratives belong to the class of pragmatic definites, whose reference must be specified by contextual information that varies from situation to situation. Within this approach, definiteness is viewed as a functional concept that implies unambiguous reference, which is conditional on the situation of utterance in the case of pragmatic definites, but is established independently from the situation of utterance in the case of semantic definites.

3 Psycholinguistic considerations

To assess the validity of Löbner's account of definiteness, this paper presents an investigation of online sentence processing utilizing event-related brain potentials (ERPs). While participants read sentences, the electrical brain activity that occurs during this sensory and psychological event is recorded by means of electrodes placed on the participant's scalp, and the analysis of this activity (i.e. ERPs) makes it possible to compare the brain's reaction to specific linguistic events. ERP signatures are time-sensitive measures that can be characterized by their latency (with respect to the onset

of a stimulus), polarity (negative- or positive-going voltage deflection) and topography (maximum activity relative to scalp location).

On the basis of these characteristics, a negative-going potential peaking in amplitude around 400 ms after stimulus onset that shows a broad centro-parietal distribution – the so-called N400 – has been identified as an ERP signature relevant for semantic processing. Generally, the more demanding the interpretation and the more difficult the establishment of a dependency relation is, the more enhanced is the amplitude of the N400 signature. This has been demonstrated for lexical-semantic processing where the amplitude of the N400 is inversely related to the degree of plausibility and contextual coherence (for an overview see Kutas and Federmeier 2000 or Kutas, Van Petten and Kluender 2006). The amplitude of the N400 has proven to be sensitive to fine-grained semantic distinctions, such as the number of semantic features that are shared by a contextually expected word (*palms*) and a presented word (e.g. *They wanted to make the hotel look more like a tropical resort. So along the driveway they planted rows of palms/pines/tulips.* (from Federmeier and Kutas 1999). Moreover, N400-differences are observable during referential processing where pronominal interpretation elicits an enhanced N400-like component when contrasted with the comprehension of proper names (Streb, Rösler and Hennighausen 1999; Burkhardt 2005). In addition, the amplitude of the N400 is a function of the difficulty of dependency formation and reflects the type of referential relation, with increasing amplitudes in the order of coreference relation, accommodation, and absence of a discourse relation (Burkhardt 2006; Burkhardt and Roehm 2007b). These findings have also been discussed with reference to the givenness status of a discourse referent, such that the less given an entity is, the more pronounced is the amplitude of the N400.

With respect to the current research objective, these findings suggest that if a distinction exists between semantic definites (that have a relatively fixed reference) and pragmatic definites (that depend on discourse representation for reference specification and are therefore less given), the latter should evoke increased processing demands during reference assignment.

4 ERP evidence for semantic vs. pragmatic definites

Three pairs of semantic definites (henceforth SDs) and pragmatic definites (PDs) were contrasted in the present investigation to test the validity of this two-way characterization of definiteness: inherently definite NPs vs. context-dependent definite NPs (see 4.2 below), proper names vs. context-dependent definite NPs (4.3), and first person indexicals vs. third person personal pronouns (4.4). Based on previous ERP findings, the predictions for all three contrasts – independent of the particular properties of the respective NPs – were that the more demanding referent selection and identification that is hypothesized to be required for the interpretation of pragmatic definites should be reflected in a more enhanced N400-amplitude.

4.1 Experimental design

4.1.1 Participants

Twenty-one students (10 male; mean age: 22.8 years) from the University of Marburg participated in these investigations. All participants were native speakers of German, right-handed, and reported normal or corrected-to-normal visual acuity.

4.1.2 Procedure

Participants were seated comfortably in front of a computer monitor and were instructed to read sentences for comprehension. Experimental stimuli were presented visually in the center of the computer screen in yellow letters against a blue background and in a segmented manner (definites phrase-wise and all other elements word by word) for 450 ms each and with an inter-stimulus interval of 150 ms. Following the presentation of an experimental sentence, participants had to perform a word recognition task to a visually presented word. 'Yes' and 'no' responses were equally distributed across all items. This task was employed to assure that participants were paying attention to the sentences. Each session started with two brief practice blocks. The experimental session, which consisted of 320 pseudo-randomized stimuli, was carried out in eight blocks with short breaks between blocks.

The electroencephalogram was recorded from 24 Ag/AgCl scalp electrodes mounted in an elastic cap (*EasyCap*). The ground electrode was placed at position C2 (cf. Jasper 1958). Recordings were referenced to the left mastoid and rereferenced offline to linked mastoids. In order to control for artifacts resulting from ocular movements, vertical and horizontal eye movements were monitored by means of two sets of electrode pairs, placed above and below the participant's left eye and at the outer canthus of each eye. Electrode impedances were kept below 5 kΩ. All channels were amplified with a *BrainVision Brain-Amp* amplifier and recorded with a digitization rate of 250 Hz.

Average ERPs were time-locked to the onset of the critical definite entity (marked in bold in the example sentences below) and computed per condition per participant, before grand averages were calculated over all participants. Trials that registered an incorrect or timed-out response (i.e. 2000 ms after presentation of recognition probe) or that contained ocular, amplifier-saturation, or other artifacts were excluded from averaging. For the statistical analysis of the ERP data, repeated measures analysis of variance (ANOVA) was performed with the factor DEFINITENESS (SD/PD). The following electrode positions entered the statistical analysis: F3, F4, F7, F8, FZ, FC5, FC6, FCZ, FT7, FT8, C3, C4, CZ, CP5, CP6, CPZ, P3, P4, P7, P8. All statistical analyses are based on the mean amplitude value per condition in a time-window between 400-600 ms.

4.2 Inherently definite NPs as SDs

First, inherently definite NPs were considered as SDs and contrasted with definite NPs that are dependent on contextual information for unambiguous reference (PDs). Inherently definite NPs are NPs that refer to concepts that are common to all situations such as *the weather, the time,* or *the presence* and are considered rigid designators. Contrary to this, NPs such as *the product, the clock,* or *the strategy* must be specified by the situation of utterance to clearly identify the respective referent.

4.2.1 Materials

Forty pairs of inherently definite NPs and context-dependent definite NPs were selected that were matched for length and frequency of occurrence. The following diagnostics were used to identify inherently definite NPs: i. these SDs do not take an indefinite determiner; ii. they do not allow plural forms; and iii. they cannot be used as sortal concepts. Finally, all NPs were embedded in sentences as exemplified in (1a) for inherently definite NPs as SDs and (1b) for context-dependent NPs as PDs.

(1a) Ich finde, dass **die Zeit** immer wieder sehr schnell vergeht.
I think that **the time** always again very quickly Passes
'I think that **the time** passes very quickly over and over again.'

(1b) Ich finde, dass **die Uhr** immer wieder richtig nervig tickt.
I think that **the clock** always again truly annoying ticks
'I think that **the clock** ticks truly annoyingly over and over again.'

4.2.2 Results

Figure 1 presents the grand average ERPs for inherently definite NPs (red line) and context-dependent definite NPs (blue line) at three selected central electrode sites, whose positions on the scalp are depicted on the graph in the lower right corner. The ANOVA revealed a main effect of DEFINITENESS between 400-600 ms after the onset of the critical entity [$F(1,20)=11.53$, $p<.01$], which is reflected in a more enhanced negativity for context-dependent PDs over inherently definite NPs. (Note that ERP effects reflect the *relative difference* between the waveforms of two critical conditions.) This N400 effect for PDs supports the hypothesis that the integration of definites that depend on contextual information to determine unambiguous reference is subject to increased processing cost.

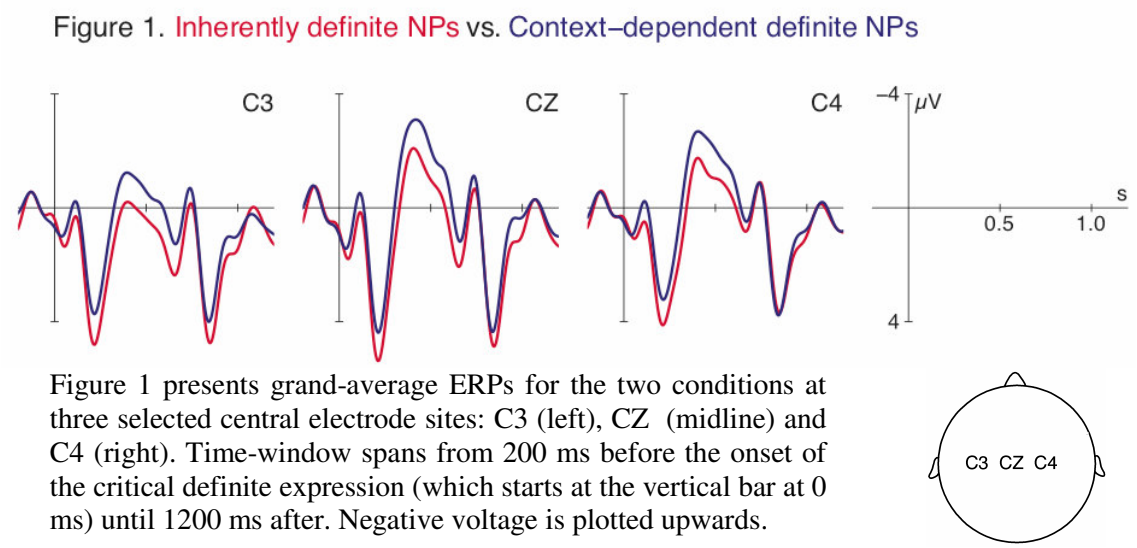

Figure 1 presents grand-average ERPs for the two conditions at three selected central electrode sites: C3 (left), CZ (midline) and C4 (right). Time-window spans from 200 ms before the onset of the critical definite expression (which starts at the vertical bar at 0 ms) until 1200 ms after. Negative voltage is plotted upwards.

4.3 Proper names as SDs

Proper names served as a second test case of the SD-PD distinction. However, their status is discussed controversially in the literature. Some accounts of proper names view them as rigid designators, which represent constant functional concepts and lack descriptional content (Kripke 1972; Löbner 1985), or as indexicals, whose content is conventionally assigned within a particular speaker-hearer interaction (Pelczar and Rainsbury 1998). Accordingly, they are considered inherently definite concepts, which may be supported by the observation that proper names typically cannot be modified by a restrictive relative clause. As a consequence, proper names should differ from context-dependent NPs along the SD-PD divide and should thus show similar electrophysiological properties as the inherently definite NPs discussed in 4.2 above. Contrary to this view, there are accounts that describe proper names as definite description of the sort 'the individual named X', i.e. proper names are considered to denote and describe (Frege 1892; Russell 1905; Kneale 1962; Geurts 1997). Under this approach, proper names carry descriptional content and do not differ from other definite NPs. Hence no electrophysiological difference is predicted to emerge between proper names and context-dependent definite NPs. In addition to the main objective addressing a possible difference between SDs and PDs, the present comparison can thus also shed light on the particular status of proper names.

4.3.1 Materials

Forty sentences containing length and frequency matched pairs of proper names (2a) and definite descriptions (PDs as illustrated in (2b)) were constructed. To make these two instantiations of definiteness more comparable, proper names were presented with a definite determiner (which is possible in German, albeit more often in colloquial speech). This decision is further warranted by an additional comparison with control

sentences that contained proper names without a definite determiner, which yielded no ERP differences.

(2a) Ich finde, dass **der Rolf** doch meistens extrem albern tanzt.
I think that **the Rolf** afterall mostly extremely ludicrous dances
'I think that **(the) Rolf** dances in an extremely ludicrous manner most of the time.'

(2b) Ich finde, dass **der Fluss** doch meistens äußerst trübe aussieht.
I think that **the river** afterall mostly extremely turbid looks
'I think that **the river** looks extremely turbid most of the time.'

4.3.2 Results

The grand average ERPs for proper names (red) and context-dependent definite NPs (blue) are depicted in Figure 2. Context-dependent definite NPs show a more pronounced negative deflection relative to proper names. This differences was confirmed by statistical analysis, which registered a main effect of DEFINITENESS in the time-window from 400 to 600 ms post-onset [$F(1,20)=4.91$, $p<.04$]. In analogy to the findings from section 4.2, the observed N400 reflects increased processing demands exerted during the interpretation of context-dependent NPs. Crucially, proper names differ from definite descriptions – and appear to pattern with inherently definite NPs. This suggests that proper names are less dependent on contextual support, substantiating accounts that advocate a lack of descriptional content and that dissociate proper names from other definite expressions (e.g. Kripke 1972; Löbner 1985).

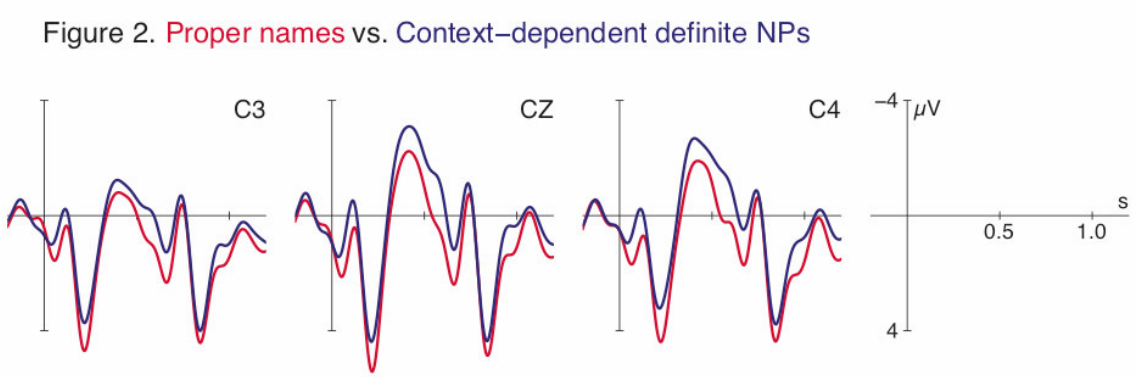

Figure 2 presents grand-average ERPs for proper names (red) and context-dependent NPs (blue) at three selected central electrode sites. The time course is plotted horizontally and spans from 200 ms before until 1200 ms after the onset of the critical expression. Negativity is plotted upwards.

4.4 Indexicals as SDs

The results from the previous two investigations propose that definiteness comes in different flavors as implied by the SD-PD distinction. The final comparison explores whether these findings can be extended to other forms of definite expressions such as pronouns. According to Löbner, pronouns also fall within this semantic-pragmatic distinction, such that indexicals refer to the key participants in a communicative act (i.e. speaker, addressee), while third person pronouns refer to discourse referents that vary to a much greater extent. Indexicals thus carry inherent content and refer in a relatively rigid manner (*I=speaker, you=addressee*), although the actual assignment of speaker/addressee reference varies. Indexicals are thus categorized as SDs. Contrary to this, third person pronouns are less restricted in the selection of their referents and change their reference as a function of context (*she=the singer, my colleague, Barbara,…*). They thus are representations of PDs.

4.4.1 Material

Eighty sentences including either a first person pronoun (3a) or a third person feminine pronoun (3b) were created. In order to make the third person pronouns comparable to the context-dependent NPs discussed above, the sentences did not make available a gender-matching antecedent for the pronoun, pointing towards an extra-sentential referent.

(3a) Emily betont, dass Der Lehrling, den **ich** herzte, gezündelt hat.
Emily emphasizes that The apprentice whom **I** hugged kindled has
'Emily emphasizes that the apprentice whom **I** hugged had kindled.'

(3b) Knut berichtet, dass der Dichter, den **sie** herzte, gelächelt hat.
Knut reports that the poet whom **she** hugged smiled has
'Knut reports that the poet whom **she** hugged had smiled.'

4.4.2 Results

Figure 3 illustrates the grand average ERPs for the first person indexicals (red line) compared to the context-dependent third person pronouns (blue line). The latter show a more pronounced negativity between 400-600 ms relative to the onset of the pronoun. This effect was supported by statistical analysis with a main effect of DEFINITENESS [$F(1,20)=4.41$, $p<.05$]. Together with the findings from full NPs presented in 4.2 and 4.3, this result indicates that irrespective of the form of a definite expression, those expressions that rely on contextual enrichment (PDs) consume more processing resources.

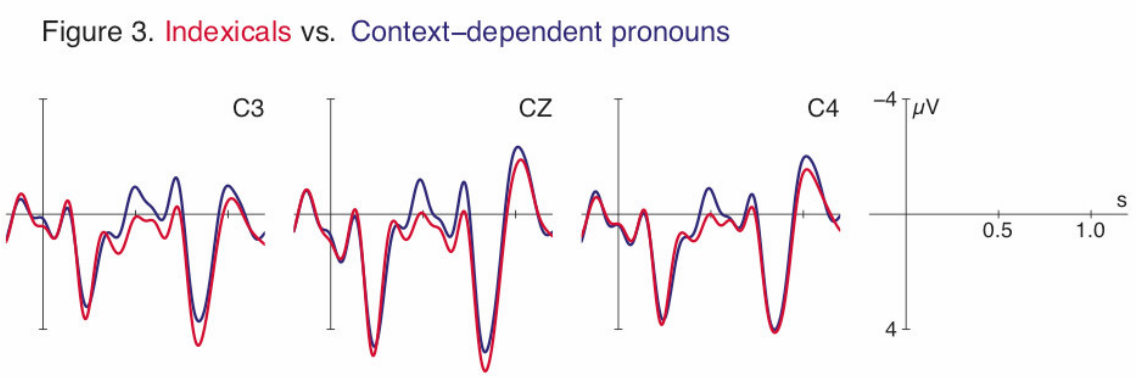

Figure 3 presents grand-average ERPs for first (red) and third person personal pronouns (blue) at three selected central electrodes. The time window spans from 200 ms before to 1200 ms after the onset of the critical pronoun (onset at vertical bar). Negative voltage is plotted upwards.

5 Discussion

This paper examined the notion of definiteness by looking at the online processing of different linguistic expressions, i.e. NPs with a definite determiner, proper names, and pronouns. In spite of their differences in form and function, the electrophysiological results indicate that the distinction between semantic and pragmatic definites as formulated in Löbner (1985) has a bearing on referential processing and should therefore be incorporated in a theory of definiteness. In general, the interpretation of expressions that depend on context-specific information for unambiguous reference exerts processing cost – reflected in a more pronounced N400 signature – while the comprehension of rigid designators is less computationally demanding. This is in line with previous electrophysiological findings that report that the more difficult the formation of a referential dependency is, the more pronounced is the N400-amplitude.

In particular, the first comparison revealed that the inherent definiteness of nouns such as *the weather* or *the future* can be distinguished from context-dependent nouns such as *the cloud* or *the bird.* The second comparison indicated that proper names pattern with inherently definite NPs and differ from definite descriptions (contra Kneale 1962; Geurts 1997; and others). Overall, these two sets of data substantiate the dissociation between semantic definites that are rigid designators and receive referential meaning through intrinsic lexical properties and pragmatic definites that require rich contextual support for unambiguous reference assignment. The third contrast showed that this distinction also holds for pronominal entities, where indexicals that are characterized by a highly constrained reference set represent exemplars of semantic definites, while third person pronouns typify pragmatic definites. In the following, I first discuss the implications of these findings for an account of definiteness. Then I comment on the status of proper names within such a theory.

5.1 Definiteness

The current data demonstrate that the concept of definiteness is not restricted to the occurrence of the definite determiner and that definiteness goes beyond morpho-syntactic encoding. This is supported by the findings from pronouns (4.4), as well as the observation that the presence or absence of a definite determiner has no significant impact on the interpretation of proper names (4.3). Rather, definiteness is a semantic feature associated with a lexical entry that affects the establishment of reference. In the case of semantic definites, definiteness is an inherent property of a noun that must be used as a functional concept. This however renders the occurrence of the definite determiner redundant (at most in the case of inherently definite nouns), but it explains its optionality with respect to other expressions such as names, as well as its absence in certain languages. In the case of pragmatic definites, definiteness is directly conveyed by the definite determiner, which forms a link with its complement and specifies that the head noun should be used as a functional concept (cf. Löbner 1985).

Definite expressions as functional concepts thus identify a referent via a certain dependency relation R between an expression and an entity in the discourse representation. For pragmatic definites, this dependency is constrained by specific discourse-pragmatic information; for semantic definites, the relation must only be linked to a "situation file card" (Heim 1982) or a "situational argument" (Löbner 1985) that relates constant functional concepts to the actual situation of utterance (e.g. *the weather today; I = Ann*). In other words, 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 presupposition of existence, pragmatic definites must search the discourse representation for a proper referent, while semantic definites do not require such a selectional operation and must only be linked to a situation file card. These differences in the establishment of a referential relation are reflected in distinct processing patterns.

An alternative interpretation of the electrophysiological data could be related to the given-new distinction: discourse-new entities have been reported to elicit a more enhanced N400 when contrasted with previously introduced, given entities (Burkhardt 2006). Since all pragmatic definites that were used in the current investigation were discourse-new, while the semantic definites by definition represent inherently given concepts, the observed difference could also be interpreted with respect to the given-new divide, rendering the semantic-pragmatic dissociation an epiphenomenon of the given-new contrast. However, if this were the case, the inherent property of rigid designation shared by the semantic definites would still have to be encoded in the lexical entry to mark their givenness. In addition, the following observations suggest that the semantic-pragmatic distinction represents a valid property that reaches beyond mere givenness. First of all, there are a number of diagnostics for the distinction between semantic and pragmatic definites, targeting so-called definiteness effects in *there*-constructions, cliticization, phonological differences, or the tests mentioned in

4.2.1 above (cf. Löbner 1985; Lyons 1999). Second, additional evidence from Burkhardt and Roehm (2007a) indicates that the difference between definite descriptions and proper names persists independent from the givenness status of the respective expressions: an enhanced N400 was observed for definite descriptions (PDs) over proper names (SDs) representing both new *and* given information. This is an important observation because it suggests that the distinction between these two types of definite expressions is first and foremost semantic in nature – and not primarily guided by the information structural distinction between given and new.[1] Furthermore, it implies that this distinction is more fundamental than intended in Löbner's framework, which explicitly discusses previously introduced, direct anaphors as pragmatic definites.

While most accounts of definiteness mentioned in section 2.1 encounter difficulties with indirect anaphors, inherently definite NPs, proper names, or definite expressions who fail to meet the uniqueness requirement, such as *the mayor of a small town in Bavaria*[2] – which all belong to the class of semantic definites – the two-way distinction offers a sound explanation that manages to take account of these different entities. Overall, the present findings strengthen the relevance of the semantic-pragmatic distinction for a theory of definiteness. This distinction could be expressed through a feature [±DEF], which is specified in the lexical entry of inherently definite entities (thus confining the referential space radically) and the determiner or third person pronoun for pragmatic definites.

5.2 Proper names revisited

The investigation of proper names in section 4.3 further revealed processing differences between proper names and definite descriptions. Proper names registered a processing advantage, reflected in a less pronounced negative deflection, which is a finding that corroborates accounts that regard proper names as rigid designators (e.g. Kripke 1972). The electrophysiological data thus provide a novel piece of evidence for the ongoing debate over the nature of proper names (see also the findings mentioned above from Burkhardt and Roehm 2007a).

This said, proper names may also be a good means to investigate whether the semantic-pragmatic distinction is in fact a two-way contrast associated with a feature [±DEF] or whether it represents a continuum ranging from complete inherent definiteness to full

[1] Another finding that supports this view has been presented in Streb et al. (1999) and Burkhardt (2005) albeit with a different interpretation. Streb et al. (1999) reported an N400 effect for third person pronouns compared to proper names (both given entities, since the respective referents were introduced in a context sentence), while Burkhardt (2005) reported an N400 for previously introduced third person pronouns compared to discourse-new proper names. Assuming that the present generalization is valid, this effect can be reinterpreted as tapping the difference between proper names as semantic definites and third person pronouns as pragmatic definites.

[2] According to Löbner, the definite article determines the definiteness of the head noun *mayor*, but not that of the entire noun phrase.

context dependence (cf. e.g. the definiteness scales in Aissen 2003, but also Ariel 1990). The notion of inherent definiteness should by no means be regarded as a firm concept. This is clearly the case for the indexicals, which change their real world referent in different situations of utterance. The same is also true for proper names, which may have different denotations (e.g. *Hillary* refers to *Hillary Miller* in one case and to *Hillary Fisher* in another). In contrast, *Hillary Clinton* is unambiguously associated with a constant referent. Whether these different degrees of rigidity impact the conception of inherent definiteness remains subject for future research.

6 Conclusion

The present data provide experimental support for a typology of definite expressions along the semantic-pragmatic divide. They demonstrate that definiteness is not exclusively tied to the occurrence of the definite determiner, but represents a more general functional concept that applies at the semantics-discourse interface. In principle, definiteness introduces the presupposition that a relation should be established with a particular entity in discourse representation and this relation is contingent on the respective type of definite expression. Semantic definites possibly carry a feature of inherent definiteness in their lexical entry [+DEF], which facilitates their discourse integration. Pragmatic definites, in contrast, must enter into a discourse relation with previously mentioned referents, which is triggered by the definiteness feature on the definite determiner, demonstrative, or pronoun, and results in processing cost.

References

Aissen, Judith (2003) "Differential object marking: Iconicity vs. economy", Natural Language & Linguistic Theory **21**, 435–483.

Ariel, Mira (1990) *Accessing noun-phrase antecedents*, London/New York: Routledge.

Burkhardt, Petra (2005) *The syntax-discourse interface: Representing and interpreting dependency*, Amsterdam/Philadelphia: John Benjamins Publishing Company.

Burkhardt, Petra (2006) "Inferential bridging relations reveal distinct neural mechanisms: Evidence from event-related brain potentials", *Brain and Language* **98**, 159–168.

Burkhardt, Petra and Dietmar Roehm (2007a) "Definite descriptions and proper names reveal distinct demands during referential processing: Evidence from ERPs", *Cognitive Neuroscience Society*, New York City, 86.

Burkhardt, Petra and Dietmar Roehm (2007b) "Differential effects of saliency: An event-related brain potential study", Neuroscience Letters **413**, 115–120.

Christophersen, Paul (1939) *The articles: A study of their theory and use in English*, Copenhagen: Munksgaard.

Federmeier, Kara D. and Marta Kutas (1999) "A rose by any other name: Long-term memory structure and sentence processing", Journal of Memory and Language **41**, 469–495.

Frege, Gottlob (1892) "Über Sinn und Bedeutung", Zeitschrift für Philosophie und philosophische Kritik **100**, 25–50.

Geurts, Bert (1997) "Good news about the description theory of names", Journal of Semantics **14**, 319–348.

Gundel, Jeanette K., Nancy Hedberg and Ron Zacharski (1993) "Cognitive status and the form of referring expressions in discourse", Language **69**, 274–307.

Hawkins, John A. (1978) *Definiteness and indefiniteness*, Atlantic Highland, NJ: Humanities Press.

Heim, Irene (1982) *The semantics of definite and indefinite noun phrases.* Ph. D. Dissertation, University of Massachusetts, Amherst.

Jasper, Herbert H. (1958) "The ten twenty electrode system of the International Federation", Electroencephalography and Clinical Neurophysiology **10**, 371–375.

Kneale, William (1962) "Modality de dicto and de re", in E. Nagel, P. Suppes & A. Tarski (eds.) *Logic, methodology and philosophy of science. Proceedings of the 1960 International Congress*, Stanford: Stanford University Press, 622–633.

Kripke, Saul (1972) *Naming and necessity*, Dordrecht: Reidl.

Kutas, Marta and Kara D. Federmeier (2000) "Electrophysiology reveals semantic memory use in language comprehension", Trends in Cognitive Sciences **4**, 463–470.

Kutas, Marta, Cyma Van Petten and Robert Kluender (2006) "Psycholinguistics electrified II: 1995-2005", in M. Traxler & M. A. Gernsbacher (eds.) *Handbook of Psycholinguistics*, second edition, New York: Elsevier, 659–724.

Lewis, David (1979) "Scorekeeping in a language game", in R. Bauerle, U. Egli & A. v. Stechow (eds.) *Semantics from Different Points of View*, Berlin: Springer, 172–187.

Löbner, Sebastian (1985) "Definites", Journal of Semantic*s* **4**, 279–326.

Lyons, Christopher (1999) *Definiteness*, Cambridge: Cambridge University Press.

Pelczar, Michael and Joe Rainsbury (1998) "The indexical character of names", Synthèse **114**, 293–317.

Prince, Ellen F. (1981) "Toward a taxonomy of given-new information", in P. Cole (eds.), *Radical pragmatics*, New York: Academic, 223–255.

Russell, Bertrand (1905) "On denoting", Mind **14**, 479–493.

Strawson, P. F. (1950) "On referring", Mind **59**, 320–344.

Streb, Judith, Frank Rösler and Erwin Hennighausen (1999) "Event-related responses to pronoun and proper name anaphors in parallel and nonparallel discourse structures", *Brain and Lanuage* **70**, 273–286.

von Heusinger, Klaus (1997) *Salienz und Referenz. Der Epsilonoperator in der Semantik der Nominalphrase und anaphorischer Pronomen*, Berlin: Akademie Verlag.