The SEM-CS distinction and its psychological reality: Evidence for semantic versus conceptual priming in the mass/count domain

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We present experimental evidence from priming studies that suggests that the distinction between semantic and conceptual features has a psychological reality in language comprehension, thus supporting approaches that distinguish a level of grammatical semantics from general, non-linguistic conceptual structures (e.g. Bierwisch 1983, Lang 1994).

The background of our investigation is an approach that models semantics as a linguistic interface level of the conceptual system. According to this account, languages determine a specific view of the conceptual system (CS), a linguistic level of meaning that can be defined as the CS-interface to language (cf. Wiese 2002). Crucially, this interface, SEM, forms a system in its own standing, with an organisation that does not necessarily reflect conceptual structures. SEM translates conceptual representations into a format that is accessible by language. Hence one of the functions of semantic representations is to account for the way conceptual distinctions are correlated with grammatical distinctions.

In the nominal mass/count domain the relevant conceptual distinction is that between substances and objects, and the relevant grammatical distinction in languages like English and German is that between transnumeral and plural nouns. The two kinds of distinctions can be in a one-to-one correspondence, as in the case of a mass noun like ‘beef’ (reference to substance, transnumeral) versus a plural noun like ‘cows’ (reference to objects, plural). However, as the case of collective nouns like ‘cattle’ shows, this is not necessarily so: ‘cattle’ is a transnumeral noun, but it refers to objects, rather than to a substance.

What distinguishes ‘cattle’ and ‘cows’ is not the conceptual domain (since both nouns refer to objects), but the way the concepts are presented in language, leading to a shift in focus: in the case of ‘cows’ the focus is on individual elements, whereas in the case of ‘cattle’ the focus is on the whole set. The individuation in these cases is a linguistic, ‘semantic’ phenomenon, rather than a conceptual one; the grammatical distinction between ‘cows’ and ‘cattle’, or – cross-linguistically – between ‘furniture’ and ‘meubles’ does not reflect salient conceptual differences.

We propose semantic representations for mass and count nouns that account for these distinctions and yield a three-fold classification of nominals, based on two features, [± struc] and [± ind]. According to this analysis, semantic representations are [+ struc] if and only if they have an internal structure that determines what counts as a minimal instance of the nominal concept; they are [+ ind] if and only if they contain an individuation function that provides direct access to individual elements.

These features distinguish ‘cattle’ from both ‘cows’ and ‘beef’ on the semantic level: while ‘cattle’ falls into the same class as ‘beef’ morpho-syntactically (both are transnumeral) and falls into the same class as ‘cows’ conceptually (both denote objects, rather than substances), the semantic representation of ‘cattle’ differs from that of ‘beef’ in having a relevant internal structure (‘cattle’ is [+ struc], whereas ‘beef’ is [– struc]), and it differs from that of ‘cows’ because it does not contain an individuation function (‘cattle’ is [– ind], whereas ‘cows’ is [+ ind]).

Does this distinction have a psychological reality? We have addressed this question by investigating whether facilitation (in the form of priming) can be obtained for collective nominals [– ind, + struc] versus plural nominals [+ ind, + struc] as well as mass nominals [– ind, – struc]. Priming patterns evident from previous research suggest the activation of networks based on linguistic association (e.g. ‘salt’ and ‘pepper’) as well as cognitive-conceptual similarity (e.g. ‘bowl’ and ‘mug’) (cf. de Mornay-Davies 1998). In addition, priming has been obtained for complex syntactic structures (e.g. Potter & Lombardi 1998).
Our model predicts that if SEM is accessed for the purposes of language comprehension, then priming effects reflecting the proposed semantic distinctions should be observed in real-time. Previous evidence supports this prediction for collectives versus mass nominals: Wiese and Piñango (2000, 2001) show that semantic ‘collectivity’ (i.e., [− ind, + struc]) has a facilitating effect with respect to nominals [− ind, − struc] in a lexical decision task during sentence comprehension.

In follow-up experiments in German, using a uni-modal lexical decision design, we have now replicated these results and shown that our prediction is also borne out with respect to plural nominals. We found that exposure to a collective nominal (e.g. ‘Mobiliar’, furniture: the prime) reduces the time needed for the subsequent activation of another collective nominal (e.g. ‘Vieh’, cattle: related target) compared to both a plural nominal (e.g. ‘Kühe’, cows: unrelated target) and a mass nominal (e.g. ‘Blei’, lead: unrelated target).

The following list gives an overview. ‘CC’ identifies the related condition where prime and target share the semantic features [− ind, + struc]. In the ‘CP’ condition the target is a plural nominal, hence prime and target differ semantically with respect to the individuation feature: unlike the prime, the target contains an individuation function in its semantic representation. In the ‘CM’ condition the target is a mass noun, hence prime and target differ semantically with respect to the structure feature: the prime, but not the target, has a semantic representation with an internal structure that identifies minimal instances of the nominal concept. The means are over reaction times for lexical decisions on the respective targets. Significant differences were observed between the reaction times for CC versus CP (p = 0.008) as well as for CC versus CM (p = 0.0048).

- CC (e.g. ‘MOBILIAR’ – ‘VIEH’): mean = 710.85 ms.
- CP (e.g. ‘MOBILIAR’ – ‘KÜHE’): mean = 733.17 ms.
- CM (e.g. ‘MOBILIAR’ – ‘BLEI’): mean = 734.88 ms.

These results suggest that the proposed semantic features are accessed as comprehension unfolds: SEM features have an impact on the activation of linguistic items in real-time, independent of morpho-syntactic features or conceptual domains. We interpret this as evidence that the distinction between grammatical semantics and a general conceptual system has a psychological reality in language comprehension.

References