Retrieval of irregular polysemes: Evidence from priming and eye-movements

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We investigated the representation and processing of **irregular** polysemes like *cold*(illness; temperature) which have multiple, semantically-related senses that cannot be derived via productive rules and homonyms (*bank:* financial institution; side of river) whose meanings are semantically unrelated. Eye-tracking investigations of homonyms (Duffy et al., 1988; Tabossi & Zardon, 1993)show that lexical access is affected by the relative frequency of meanings, indicating that meanings are stored separately. While only a homonym's dominant meaning is accessed in the absence of context, previous context supporting the subordinate meaning leads to meaning competition. In eye-tracking investigations, **regular** polysemes (mostly metonyms like *novel*: object; content) are either unaffected(Frisson & Pickering, 1999) or marginally affected (Frazier & Rayner, 1990)by sense frequency and biasing context. Thus, they may have a single entry from which either interpretation can be derived with equal ease. Evidence regarding **irregular** polysemes is mixed. Some studies support separate entries(Klein & Murphy, 2001). Others support a single-entry account (Beretta et al., 2005).Crucially, no study has carefully controlled the relative frequency or degree of semantic relatedness of irregular polysemes senses. These factors were controlled in priming and eye-tracking experiments.

In Experiment 1, prime words were visible. In Experiment 2, primes were masked and "invisible". Trials consisted of a homonymous (BANK) or polysemous (SOUR) prime and a target instantiating their dominant (ROB | LEMON) or subordinate (SWIM | DAIRY) meaning. Inconsistent context words preceded primes (LEMON – SOUR – DAIRY) on half the trials and were counterbalanced across lists. Targets following unrelated words served as baselines. Lexical decisions were made to each visible word.

Without context, dominant meanings were facilitated for homonyms after visible primes, and inhibited after "invisible" primes. For polysemes, both dominant **and** subordinate meanings were numerically facilitated and inhibited respectively, favoring a single-entry account. When contexts required switching from dominant to subordinate senses, only polyseme targets were facilitated following visible primes. Following invisible primes, only homonym targets were facilitated. Thus, again, homonyms and polysemes patterned differently. When contexts required switching from subordinate to dominant meanings, equivalent facilitation was observed for both homonyms and polysemes following visible primes. No effects were observed following "invisible" primes. Results from switching conditions are explained by semantic relatedness interacting with feedback from orthography and lateral inhibition (Hino & Lupker, 1996; Locker et al., 2003).Specifically, shared semantic features of polysemes counteract inhibition from dominant context words.

We also eye-tracked clauses containing homonyms or irregular polysemes that were preceded or followed by a subordinate-reading context clause. We substituted matched words to provide a baseline. Only homonyms and their spillover region took longer to read following context clauses. Subordinate contexts only following homonyms were read more slowly. However, longer reading times were observed in the polyseme spillover region. This suggests that interpreting irregular polysemes has a short-term cost arising from a delay in sense commitment which has not been shown for regular polysemes (Frisson & Pickering, 1999; Frazier & Rayner, 1990).

In sum, irregular polysemes are processed differently than homonyms suggesting that they are represented differently. Our results are most consistent with a single-entry account where shared features ease retrieval of less frequent senses following inconsistent contexts, and moderate full commitment to either sense.

Polyseme, *Context-Before*: Even though *the orchestra had not practiced much* everybody agreed that the **notes**/tones were clear enough.

Homonym, *Context-Before*: Because *the dinosaur was very exotic* everybody paid close attention to the **horns**/bones during the visit.

Polyseme, *Context-After*: Everybody agreed that the **notes**/tones were clear enough even though *the orchestra had not practiced much*.

Homonym, *Context-After*: Everybody paid close attention to the **horns**/bones during the visit because *the dinosaur was very exotic*.