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## Short Communication

# Acquisition of conscious and unconscious knowledge of semantic prosody

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## ABSTRACT

An experiment explored the acquisition of conscious and unconscious knowledge of semantic prosody in a second language under incidental and intentional learning conditions. Semantic prosody is the connotational coloring of the semantics of a word, largely uncaptured by dictionary definitions. Contrary to some claims in the literature, we revealed that both conscious and unconscious knowledge were involved in the acquisition of semantic prosody. Intentional learning resulted in similar unconscious but more conscious knowledge than incidental learning. The results are discussed in terms of second language learning and the nature of unconscious knowledge.

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## 1. Introduction

A key issue in understanding how people learn a second language is the relative role of conscious and unconscious learning (e.g. DeKeyser, 2003; Ellis, 1994a, 1994b; Ellis et al., 2009; Hulstijn, 2005; Krashen, 1981, 1985; Rieder, 2003; Schmidt, 1990, 1995; Williams, 2004, 2005, 2009). We will consider in particular the relevance of the conscious–unconscious distinction to the acquisition of the semantics of words in a second language. Using studies of the relation of vocabulary acquisition to intelligence and global amnesia, Ellis (1994a) argued that conscious learning is necessarily involved in the acquisition of the semantics of vocabulary. However, this widely-accepted viewpoint was challenged by a number of studies in which amnesia (with an impaired declarative memory system) still allowed intact learning of word meaning. For example, Vargha-Khadem et al. (1997) described three children with global anterograde amnesia who had suffered hippocampal injury early in life. Despite having severe difficulty in remembering episodes of everyday life, they showed normal vocabulary and reading development and considerable academic progress in school lessons. Verfaellie, Koseff, and Alexander (2000) reported that PS, a severely amnesic patient, performed well above chance in a recognition test of word meanings, indicating learning of a novel vocabulary after suffering amnesia. Even with impaired declarative memory, these participants acquired the meaning of novel words, which suggested that the process of abstracting the meaning of words may occur without explicitly recalling episodes of word used in daily experience. That is, learning vocabulary may in part occur implicitly.

Williams (2004, 2005) provided further evidence for both implicit and explicit learning of form–meaning connections. In his 2005 experiments, for instance, the learning materials were sentences containing ‘determiner + noun’ phrases, in which four novel determiners (ne, gi, ro, ul) were used. The appropriate determiner depended on two semantic values, the animacy and distance of the noun. Participants were only informed that the four novel words functioned like the English definite

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article. They were asked to encode the distance between the speaker and the object. In the training phase, participants were instructed to listen, repeat and form images of the sentences containing these novel articles and nouns. In the test phase, participants selected the most appropriate noun phrase for each sentence from two alternative completions (e.g. *gi cushions/ro cushions*) on the basis of what they had learned during the training phase. Results showed that when asked what criteria they had used to make their choices, only seven of the 24 participants freely reported the relevance of animacy. These participants were thus classified as “aware” by Williams; the remaining 17 participant as “unaware”. Both these groups performed significantly above chance in the subsequent test. Williams’ study suggested that not only explicit but also implicit learning occurs in meaning acquisition when the target semantic feature is implicit in the lexical representation (e.g. the animacy of the noun), and this semantic feature enters into a grammatical agreement with the form (i.e. the form of the novel determiners).

Considering the acquisition of word meaning more generally, Evans (2006, 2009) proposed that word meanings, influenced by situated usage-events, are dependent on the utterance context in which they are embedded. So acquiring the semantic knowledge of a word is neither a one-to-one form-meaning mapping process (Labov, 1973), nor a once-and-for-all learning event, even if some meaning can be temporarily extracted from a single exposure to a word (Horst & Samuelson, 2008). Instead, learners need to abstract meaning of a word from varied instances of its use. Crucial to the meaning of a word is its semantic prosody, which plays a leading role in the integration of a lexical item with its context (Sinclair, 1996). Semantic prosody is a kind of connotational coloring resulting from a given word taking on the affective meaning common to all its typical collocates (surrounding words). It is an obligatory component of the extended meaning of the lexical item (Sinclair, 2004). Prosodies are often positive or negative; that is, the target word is frequently collocated with positive or negative surrounding words, respectively. Prosody thus reflects the attitude of the speaker or writer towards some pragmatic situation (Louw, 2000). For example, the word “cause” may seem to have the simple meaning “to bring about”, but because the word is largely used in contexts in which a negative event has been brought about, the word has a negative semantic prosody. Semantic prosody appears on the face of it inaccessible to a speaker’s conscious introspection (see Xiao & McEneaney (2006), for a review). Sinclair (1994) referred to semantic prosody as “subliminal”, believing that we only become aware of it when we see a large number of typical instances at once. Semantic prosody is implicit in natural language, in the sense that it is implied by actual word use, though seldom explicitly articulated. The primary aim of this study was to empirically explore whether semantic prosody is acquired consciously or unconsciously.

Several studies have investigated how incidental versus intentional learning influences the involvement of conscious knowledge in second language vocabulary acquisition (e.g. Hulstijn, 2001, 2003; Laufer & Hulstijn, 2001; Rieder, 2003). Our second aim was to explore whether the contribution of conscious or unconscious knowledge depends on different learning conditions. In our experiment, participants learned semantic prosody under two different conditions: incidental vs. intentional learning (i.e. reading sentences for comprehension vs. finding rules in sentences). In order to rule out pre-experimental knowledge, six target words were replaced by pseudo-word substitutes presented as real words. In the training phase, participants in the read condition were only asked to read and understand sentences containing the target pseudo-words. Participants in the rule search condition were required to find the rule governing use of the target pseudo-words in the same sentences. After training, there was a test phase involving acceptability judgments on new phrases.

In order to facilitate assessment of the conscious status of knowledge, Dienes and Scott (2005) distinguished between “structural knowledge” and “judgment knowledge” (see also Dienes, 2008a; Fu, Dienes, & Fu, 2010; Scott & Dienes, 2008; Scott & Dienes, 2010). When a person reliably makes a judgment, the judgment itself constitutes a particular knowledge content, that is, judgment knowledge. The knowledge of the structure of a domain that enabled the judgment is structural knowledge. Either of them can be conscious or unconscious. Two ways to assess the conscious status of judgment knowledge are the zero-correlation and guessing criteria. If judgment accuracy is above baseline but confidence does not relate to accuracy (zero-correlation criterion) or the participant believes they are guessing (guessing criterion), then judgment knowledge is shown to be unconscious (given some assumptions: Dienes & Perner, 2004). Both criteria are based on forced confidence ratings for each item in the test. Because ratings are taken immediately as a judgment is made, they are more sensitive than post-task free report (as demonstrated by Ziori and Dienes (2006)).

To assess the conscious status of structural knowledge, after each judgment Dienes and Scott (2005) asked subjects to choose from four options to indicate the basis of their judgment: pure guessing, intuition, a rule or rules they could state, or a memory. “Guessing” indicated that they felt their judgment had no basis, just like flipping a coin; “intuition” that they had some confidence in their judgment but absolutely no idea why it was right; “memory” that the judgment was based on a recollection from the training phase; and “rules” that they judged according to a rule or rules obtained in the training stage that they could state if asked. Compared to free report, participants need not report the exact rule, so the procedure is easy to administer and evaluate. Among the four attributions, ‘guess’ and ‘intuition’ are prima facie cases of unconscious structural knowledge and ‘rules’ and ‘memory’ of conscious structural knowledge. If the participant has above-baseline classification performance when attributing the basis of their judgment to guessing or intuition (rules or memory), they have acquired unconscious (conscious) structural knowledge. Dienes (2008a) reviewed evidence that this way of distinguishing conscious and unconscious structural knowledge picks out knowledge types that qualitatively differ in ways theoretically expected (see also Rebuschat, 2008, for an application of these methods to second language learning).

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