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INTRODUCTION: Priming paradigms in bilingualism research

GUNNAR JACOB
Potsdam Research Institute for Multilingualism, University of Potsdam, Germany
HARALD CLAHSEN
Potsdam Research Institute for Multilingualism, University of Potsdam, Germany

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The present thematic set of studies comprises five concise review articles on the use of priming paradigms in different areas of bilingualism research. Their aim is to provide readers with a quick overview of how priming paradigms can be employed in particular subfields of bilingualism research and to make readers aware of the methodological issues that need to be considered when using priming techniques.

In a priming experiment, the researcher manipulates the linguistic relationship between two stimuli, the prime and the target. In lexical priming experiments, for example, a prime-target word pair (X→Y) that is semantically, phonologically, or morphologically related is presented, with participants performing a task such as lexical decision or naming on the target word Y. Dependent measures such as response latencies or accuracy rates are compared with measures from a control condition (Z→Y) in which the same target is preceded by an unrelated control prime Z. This comparison is informative with regard to the role of semantic, phonological, or morphological relatedness in word recognition.

Priming techniques offer a number of advantages over other commonly used experimental paradigms. One major advantage is that the target stimulus for which the measures are obtained is the same across the experimental conditions that are compared with each other. This ideally yields minimal pairs that only differ in the one critical linguistic variable that is intended to be investigated. Although this is not always possible in practice, priming experiments are probably less susceptible to uncontrolled stimulus properties than other experimental paradigms in which different sets of stimuli are compared with each other. In unprimed lexical decision or naming experiments, for example, the researcher may of course try to match stimuli from different conditions as closely as possible with regard to potentially confounding factors. However, it is still true that different items (e.g., high vs. low-frequency words) are compared with each other, which raises the risk of uncontrolled stimulus properties affecting the experimental results. Another advantage is that priming experiments allow targets to be presented immediately at the offset of the prime, which makes it possible to directly tap into on-line language processing while unwanted effects of episodic memory are reduced. Priming techniques also come with a number of practical virtues. Priming is a versatile experimental technique that can be used to study different domains of language (semantics, phonology, orthography, grammar). Stimuli can be presented auditorily, visually, or cross-modally, to study spoken and written language comprehension and production. Tasks assigned to participants are simple and straightforward, which makes priming a suitable technique for different kinds of participant groups, including children and the elderly. Priming effects can also be tested across different languages, which makes the technique particularly attractive for bilingualism research. Finally, priming experiments require minimal technical equipment. They can be run on almost any laptop computer using experimental software packages such as EPrime® (https://pstnet.com/products/e-prime) or DMDX (http://www.u.arizona.edu/~kforster/dmdx/dmdx.htm) and do not need a special research lab.

In recent years, the number of priming studies of bilingual language processing has increased considerably. With that in mind, the current set of reviews offers the BLC readership an update of recent advances in a variety of different fields in which priming techniques are commonly employed.

The first two reviews are concerned with behavioural priming studies of auditory and visual word recognition. Gor (2018) shows how priming techniques can be employed to investigate sensitivity to subtle phonological distinctions during auditory word recognition in late bilinguals. Jacob (2018) presents a summary of priming studies investigating the processing of morphologically complex words in bilinguals, and shows how priming studies can provide detailed insight into how complex words are represented in, and accessed from, a bilingual persons' mental lexicon.

Two further contributions deal with behavioural priming studies at the sentence level. Van Gompel and Arai (2018) present an overview of current findings from cross-linguistic structural priming studies. These studies provide insight into how a bilingual person's two languages influence each other during language production. Marinis (2018) discusses ways of employing the cross-modal priming paradigm to study on-line sentence processing in bilinguals, an approach that is

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particularly suited to investigating syntactic dependencies during sentence comprehension, as it allows for measuring the (re)activation of syntactic antecedents at specific loci within a sentence.

While most priming experiments employ behavioural measures such as lexical-decision times or naming latencies, the final review by Bosch and Leminen (2018) is concerned with how priming designs can be used for brain studies of language. Bosch and Leminen (2018) focus on electrophysiological studies and show how different kinds of priming effects are reflected in a bilingual person's event-related brain potentials. They argue that this approach provides insight into particular areas of difficulty for late bilinguals that go beyond the more familiar behavioural priming studies.

As mentioned above, priming techniques are advantageous in a number of ways. However, the design, analysis and interpretation of priming experiments with bilingual participants also raise methodological issues. What constitutes an appropriate control group of participants in a priming study with bilinguals? What follows for the interpretation of results from the fact that prime-target pairs are typically related to each other in multiple ways? What do priming effects tell us about linguistic representations and processing mechanisms? The current reviews include discussions of these and other methodological issues and give valuable suggestions for how to deal with them.

Given the recent interest in priming techniques, we believe that the collection of reviews presented here is timely. We hope that these studies will encourage researchers to employ priming techniques in their own studies of bilingual language comprehension and production.

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