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Distinguishing languages from dialects: A litmus test using the picture-word interference task

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ABSTRACT

Linguists have been working to develop objective criteria for distinguishing languages from dialects for well over half a century. The prevailing view amongst sociolinguists is that no objective criteria can be formulated. The aim of this study is to examine whether language processing can provide insights into this problem by comparing bidialectal behavioural effects to bilingual effects reported in the literature. Previous research has demonstrated that when bilinguals name an object in Lx while simultaneously processing a translation equivalent distractor word in Ly, naming times are sped up relative to an unrelated condition (Costa, Miozzo, & Caramazza, 1999). Using the same methodology, we evaluated whether a comparable facilitation effect arises when the distractor word is a dialectal or register variant of the picture name. Across 5 experiments we found no trace of translation equivalent facilitation. Instead, we repeatedly observed between-dialect and between-register interference, in contrast to the between-language facilitation effect. This behavioural divergence between bilingual vs. bidialectal processing suggests that this paradigm could provide an objective litmus tests for identifying the boundary between dialects and languages.

A language is a dialect with an army and a navy.

Max Weinreich

1. Introduction

Linguists have been trying to formulate an objective method for distinguishing languages from dialects for well over half a century. In linguistic circles, the language vs. dialect distinction is often drawn on the basis of size, prestige, and mutual intelligibility (Hudson, 1996; Wei, 2000). All three of these criteria are problematic and can lead to artificial distinctions and inconsistent classification. Norwegian, Danish, and Swedish are granted full language status (prestige) despite high levels of mutual intelligibility, whereas Mandarin and Cantonese are classified as dialects of Chinese (low prestige), despite low levels of mutual intelligibility. In these examples we see situations where size and prestige conflict with mutual intelligibility. Wei (see also Hudson, 1996) argues that 'language' and 'dialect' cannot be objectively distinguished since they are socially and politically constructed. But what if languages and dialects were processed differently? If such a difference could be identified, might that offer an objective tool for addressing this complex and long-standing question? The aim of this paper is to evaluate the potential for just such a psychological approach.

The problem of distinguishing languages from dialects can complicate scientific and political enterprises. Simple questions such as 'how many languages do you speak' can become difficult to answer. If you speak two dialects of Chinese, are you a monolingual, bilingual, or bidialectal speaker? And what does the latter term mean, from a processing perspective? Psycholinguistic research has largely focused on monolingual and bilingual processing without considering the potential relevance or role of dialects. From one perspective, bidialectal speakers could be classified as monolingual, since they only speak one language. From another perspective, they could be viewed as similar to bilinguals who speak highly related, mutually intelligible languages.

As more and more of the world's population becomes bilingual, interest in bilingual language processing has grown. A pervasive question within the bilingualism literature asks how bilinguals control the selection of the language appropriate to the conversational situation, avoiding catastrophic interference from the unintended language. Some models of bilingual language production propose that words, rules, and structures belonging to a language are bound together by a common representation that allows them to be activated or inhibited en masse (De Bot, 1992; De Bot & Schreuder, 1993; Green, 1986, 1993, 1998; Poulisse & Bongaerts, 1994). These models use these grouping representations to accommodate the well-established finding that both languages of a bilingual are active during speaking (and listening). According to these models, representations from both languages receive activation, i.e., the flow of activation is not restricted to one language.

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Then, all representations associated with the unintended language node are reactively inhibited. This prevents them from being inadvertently selected or from causing too much interference. These reactive inhibition models can be contrasted with other models which eschew the need for system-wide inhibition in favour of a language-specific selection mechanism (Costa & Caramazza, 1999; Costa et al., 1999; Roelofs, 1998). Models that incorporate language-specific selection also acknowledge that representations from both of a bilingual's languages become active during speaking (and listening), but they propose that the lexical selection mechanism can effectively ignore the activation of elements from the unintended language. Under both of these model types, language independence and separation are achieved via some organizing principle such as a language membership tag.

Unlike bilingualism, the existence of bidialectalism is not well established. In fact, Hazen (2001) argues that there are no true bidialectal speakers, although many people can comprehend multiple dialects of their native language. Hazen notes that "no one has seriously investigated whether humans are capable of maintaining two dialects in the same way they can maintain two languages" (2001; p. 88). For Hazen, true bidialectalism entails the stable native-like mastery of two distinct dialects, without any cross-contamination or merging of phonology, vocabulary, or syntax. It also implies the ability to switch between the two dialects, without mixing the features from the two systems, just as bilinguals can do (but see Goldrick, Runnqvist, & Costa, 2014 for evidence for cross-contamination between languages for later learners).

Thus, for bidialectalism to exist, according to Hazen's definition, dialects would need to be represented and processed like languages, i.e., bound together via a shared dialect tag. But Labov (1998) argues that dialects are more co-dependent than languages. In a study of the tense/aspect system of African-American Vernacular English, Labov contends that the two varieties are not separate systems but are rather co-dependent. He argues that if the sets of rules for two dialects are not mutually exclusive (instances of code switching aside) then the two systems cannot be said to be separate or independent. This notion of co-dependence suggests that dialect membership for rules and representations might not be as clear cut as for languages; many rules and representations would be associated with both of a speaker's dialects. As a result, the set of rules and representations belonging to a dialect might not be bundled together as they would be for a language and therefore cannot be inhibited or ignored in the same way. If correct, we would not expect to see similar behavioural effects from bilinguals and bidialectals in experimental investigations; instead, we would expect bidialectal processing to mirror monolingual processing. The picture-word interference paradigm has provided some clear cases where monolingual and bilingual speakers produce different behavioural outcomes, and this task may provide a possible test case for evaluating lexical selection and dialect control processing in bidialectal speakers.

1.1. Within-language effects from the picture-word interference paradigm

The picture-word interference paradigm has been used extensively to investigate lexical selection processes. The paradigm capitalizes on the well-known fact that multiple lexical candidates are activated when trying to select a single word. Participants name pictures while ignoring simultaneously presented distractor words. Depending on the nature of the relationship between the target word and the distracting stimulus, naming times can be sped up or slowed down. When the distracting stimulus is drawn from the same semantic category as the target word (e.g., target = CAT; distractor = pig), picture naming times are slowed down relative to an unrelated condition (e.g., target = CAT, distractor = pin). This observation has been termed the *semantic interference effect* (Glaser & Düngelhoff, 1984; Schriefers, Meyer, & Levelt, 1990). It arises due to activation from the distractor word converging with activation of a semantic alternative to the target picture. In other words, the distractor word strengthens a lexical candidate that is not the intended word, resulting in slower target selection times. Some findings suggest that the magnitude of the interference effect is negatively correlated with the semantic distance between target and distractor (Aristei & Abdel Rahman, 2013; Vigliocco, Vinson, Damian, & Levelt, 2002), although the reverse has also been reported (Mahon, Costa, Peterson, Vargas, & Caramazza, 2007).

In contrast, distractor words that share phonological content with the target picture (e.g., target = CAT, distractor = car) speed picture naming relative to an unrelated condition — the classic *phonological/orthographic facilitation effect* (Glaser & Düngelhoff, 1984; Lupker, 1979; Schriefers et al., 1990; Starreveld & La Heij, 1995; Starreveld & La Heij, 1996). This effect arises due to activation from the distractor word converging with activation from the target word onto shared phonological representations, resulting in faster selection times. The magnitude of this effect is positively correlated with the amount of segmental similarity; the more segments shared between target and distractor, the larger the facilitation effect will be (Abdel Rahman & Melinger, 2008), with maximal facilitation in the identity condition, when the distractor word is the name of the target picture (Glaser & Glaser, 1989).

None of the above distractor effects emerges as the result of a single processing mechanism. Rather, the magnitude and direction of distractor effects results from a trade off between component effects arising at different processing stages (c.f., the Swinging Lexical Network (SLN) account proposed by Abdel Rahman & Melinger, 2009). For example, semantic interference will only be observed if priming at the conceptual level is smaller than lexical competition (cf. Melinger & Abdel Rahman, 2013). Similarly, phonological facilitation will only be observed if priming from the distractor at the word form level is larger than any costs incurred during lexical selection.

1.2. Between-language effects from the picture-word interference paradigm

The challenges arising from the co-activation of semantic alternatives is compounded for bilinguals, as the non-target language is active during processing (e.g., Green, 1986; Poulisse & Bongaerts, 1994). Despite evidence that both linguistic systems are active, even when processing in a monolingual context, representations from the non-target language do not always interfere with picture naming. Specifically, translation equivalents, which could be expected to generate the largest semantic interference effects due to their perfect semantic match with the picture, actually speed picture naming (Costa & Caramazza, 1999; Costa et al., 1999). Costa and colleagues presented bilingual speakers with pictures for a naming response. Pictures were simultaneously presented with distractor words from either the target language or the non-target language. The semantic relationship between the distractor words and the target picture was also manipulated, such that the distractor word either denoted the picture itself (same meaning), a categorically related alternative (same category), or a semantically unrelated word. Compared to the unrelated conditions, same category distractors from both languages slowed picture naming times comparably, replicating previous demonstrations of between-language interference (Hermans, Bongaerts, de Bot, & Schreuder, 1998). However, and crucially for our purposes, the different-language same meaning distractors sped picture naming. We will refer to this as the *translation equivalent facilitation effect*.

Costa and colleagues (Costa & Caramazza, 1999; Costa et al., 1999) interpret this finding in support of a language-specific selection mechanism (see also Roelofs, 1998; but see Hall, 2011 & Hermans, 2004 for alternative interpretations). In other words, although words from both languages are activated during production, only those representations from the target language compete for selection and slow naming times. Consistent with the trade off view put forward in the SLN account, translation equivalent distractors prime the meaning of the picture, speeding conceptual level processes, but the distractor itself will not compete for selection, incurring no selection time penalty, resulting in a net facilitation effect. This pattern was observed in L1 and