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LETICIA RODRIGUES DE SOUSA

THE EFFECT OF INTERLINGUAL HOMOPHONES ON BILINGUAL LEXICAL ACCESS

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Trabalho de conclusão de curso apresentado ao curso de Letras-Inglês do Departamento de Estudos da Língua Inglesa, suas Literaturas e Tradução da Universidade Federal do Ceará, como requisito parcial à obtenção do título de licenciada em Letras-Inglês.

Orientadora: Profa. Dra. Pâmela Freitas Pereira Toassi.

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ABSTRACT

Bilingualism is a highly present phenomenon in most social and geographical contexts nowadays, which makes it relevant to understand how one manages more than one language in the mind. Ample evidence in psycholinguistic research has suggested that when bilinguals perform a task in one of their languages, they cannot prevent themselves from activating the other language. Experimental studies have investigated this issue examining how bilinguals select and recognize words which share similarities across their languages, although phonological overlap has mostly been overlooked in comparison to semantic and orthographic similarities in this research domain. To enhance the understanding of phonological effects on bilingual language processing, the present paper aimed at reviewing in an explanatory and expository nature relevant studies which investigated interlingual homophones: words that sound very similar across languages. The discussion addresses evidence of the role of phonology in word processing and describes the methodological techniques that have been used in a sample of 17 important studies. The analysis of these studies makes it observable that some deviating results have been found regarding the effect of interlingual homophones, but together they corroborate that both languages of a bilingual strongly interact at the phonological level. It has been shown, in addition, that few language pairs have been examined in such experiments, which requires future research with different language pairs, for example with Brazilian Portuguese and English. Taking this into account, the present study is also relevant for offering a first tentative list of words that could serve as stimuli to such investigation.

Keywords: Interlingual homophones. Lexical access. Bilingualism.

RESUMO

O bilinguismo é um fenômeno muito presente na maioria dos contextos sociais e geográficos da atualidade, o que torna relevante entender como se gerencia mais de uma língua na mente. Amplas evidências em pesquisas da área da psicolinguística sugerem que, quando bilíngues realizam uma tarefa em uma de suas línguas, eles não podem evitar a ativação da outra língua. Estudos experimentais investigaram essa questão examinando como bilíngues selecionam e reconhecem palavras que compartilham semelhanças entre seus idiomas, embora a sobreposição fonológica tenha sido negligenciada em comparação com as semelhanças semânticas e ortográficas nessa área de pesquisa. Com o objetivo de aprofundar a compreensão dos efeitos fonológicos no processamento bilíngue da linguagem, o presente trabalho teve como objetivo revisar de forma explicativa e expositiva estudos relevantes que investigaram homófonos interlinguísticos: palavras que soam muito semelhantes entre línguas diferentes. A discussão aborda evidências sobre o papel da fonologia no processamento de palavras e descreve as técnicas metodológicas que foram utilizadas em uma amostra de 17 estudos importantes. A análise desses estudos permite observar que alguns resultados divergentes foram encontrados quanto ao efeito dos homófonos interlinguísticos, mas juntos eles corroboram que as duas línguas de um bilíngue interagem fortemente no nível fonológico. Foi demonstrado, ainda, que poucos pares de línguas foram examinados em tais experimentos, o que requer pesquisas futuras com pares de línguas diferentes, por exemplo, com o português do Brasil e o inglês. Diante disso, o presente estudo também é relevante por oferecer uma primeira lista tentativa de palavras que poderiam servir de estímulo para tal investigação.

Palavras-chave: Homófonos interlinguais. Acesso lexical. Bilinguismo.

SUMMARY

1 INTRODUCTION

Costa (2020, p. 10) stresses that "bilingualism is the rule rather than the exception in the sense that the majority of the world's population can communicate in more than one language." Although appearing to have become more prominent over the past decades, it is not recent that the phenomenon of bilingualism has been observed in most countries including all levels of society and age groups (GROSJEAN, 2013).

Conversely, it is worthwhile to mention the overlooked variety of languages in many countries that are considered to be monolingual nations even though many languages are spoken. In Brazil, for instance, with over 200 languages being spoken (OLIVEIRA, 2008), Portuguese is considered to be the only official language regardless of all the native indigenous people and individuals who live in immigrant communities. Furthermore, people have constant contact with other languages in international border zones.

Thus, bilingualism may be classified in various ways (BLOOMFIELD, 1983; GROSJEAN, 2013; LAMEIRA et al., 2020), but irrespectively of the definition, the general agreement has always been that bilinguals are not two monolinguals in one (GROSJEAN, 1998 apud BASSETI; COOK, 2011). That is, L2 users have other possibilities of language use, and thus may process language differently from monolingual people.

Over the past decades, psycholinguistic studies have aimed to investigate how bilinguals and multilinguals process and organize their languages considering different aspects such as word recognition, word production, lexical access, code-switching, and translation. In order to understand bilingual language processing, such investigations have been done through varied experimental paradigms which have participants perform a linguistic task from which data is collected and analyzed. Research on this area has investigated, for example, how bilinguals process words which share semantic, orthographic, and phonological similarities across their languages.

Taking this into account, the present work aims at reviewing different experimental studies which investigated the processing of interlingual homophones and strengthen understanding of this research domain still little explored in many languages. First, a theoretical background about bilingual lexical access and the role of phonology on language processing is addressed. Second, an explanatory presentation is provided to answer research questions about the findings of the studies, and finally a list of interlingual homophones in the language pair of Brazilian Portuguese and English will then be suggested for future research. The present study is also relevant for being the first to offer a tentative list of interlingual homophones across these two languages. Thus, the discussion follows and is guided by three main Research Questions (RQs):

(RQ1): What experimental techniques have been used to investigate the effect of interlingual homophones on bilingual lexical access?

(RQ2): What language pairs have been examined in interlingual homophone studies and what results have been found?

(RQ3): What words could serve as stimuli to investigate the effect of interlingual homophones across Brazilian Portuguese and English?

The following section discusses the relevant theoretical framework underlying the background information for this paper.

2 THEORETICAL BACKGROUND

One question of particular interest in psycholinguistic research has been how bilinguals access words in their mental lexicon while undergoing a certain linguistic process, such as reading. One of the most traditional experimental tasks used in such studies is the lexical decision task, which requires participants to make a decision about a presented visual input (EYSENCK; KEANE, 2015). Usually, they have to decide whether a letter string forms a word in a target language. Other commonly used tasks are naming, in which participants have to read or name a stimulus out loud; and priming, in which the word the participants have to give a response to is preceded by a related stimulus in order to check its influence or interaction.

Depending on the stimulus item, results regarding their performance reflected in response times (RTs) and accuracy rates can shed light into language processing of people who speak more than one language. It has been found, for instance, that cognate words, which share form and meaning across languages, are more easily processed than other words by bilinguals and multilinguals. This is reflected when participants take less time and make fewer mistakes when responding to such words. (SCHWARTZ; KROLL, 2006; DIJKSTRA et al., 2018; TOASSI; MOTA; TEIXEIRA, 2020).

In addition to semantics, orthographic and phonological codes also interact in the processing of words. Studies that examined the processing of cognates, interlingual homographs, and interlingual homophones have shown that overlap in all levels of representation play a role in visual word recognition (DIJKSTRA; GRAINGER; VAN HEUVEN., 1999; LEMHÖFER; DIJKSTRA, 2004; VAN ASSCHE; DUYCK; BRYSBAERT, 2020). Interlingual homographs are words that share the same written form across languages, and interlingual homophones are words that have high phonological overlap across languages with different meanings and orthography. An interlingual homophonic example between Brazilian Portuguese and English would be the word pair *pai* - pie (/paj - paɪ/).

However, as Carrasco-Ortiz, Midgley and Frenck-Mestre (2012) pointed out, although researchers have broadly agreed that orthography, semantics and phonology all play a role in bilingual word processing, few studies have investigated phonological processing on the bilingual context. Research on this area has mostly focused on investigating orthographic and semantic overlap across languages and, even when interlingual phonological overlap is addressed, specific investigations on the effect of interlingual homophones seem to have received little attention in comparison to other stimuli so widely researched (GOLLAN; FORSTER; FROST., 1997; JARED; KROLL, 2001; JARED; SZUCS, 2002; MARIAN; SPIVEY; HIRSCH., 2003).

Additionally, the studies which indeed had interlingual homophones as critical stimuli have shown some conflicting results (further detailed in section 3). Furthermore, these deviating results may require the investigation of the effect of interlingual homophones on bilingual lexical access using different language pairs than the ones already investigated – a recommendation once made by Lemhöfer and Dijkstra (2004). The following section addresses the debate on how bilinguals access lexical representations in their mental lexicons.

2.1 Bilingual Lexical Access

Lexical Access is related to the process of word recognition and refers to the retrieval and selection of words in one's mental lexicon, entailing both input identification and output production (DIJKSTRA, 2005; DE GROOT, 2011). Dijkstra (2005, p. 180) defines lexical access as "the process of entering the mental lexicon to retrieve information about words." As De Groot (2011) explains, lexical access is the word processing stage which takes place after a match between the printed/spoken input and one of the orthographic/phonological forms stored in the lexicon; and where "all the information stored with this form, including the syntactical and morphological specifications of the word and, most importantly, its meaning, become available for further processing." (p. 155).

Because bilinguals have to manage more than one language, how they access lexical representations in their two languages has been one of the most debated questions in the literature. Scholars have been interested in knowing whether bilinguals store languages separately or not, and whether they activate words only in the contextually relevant language or in both of their languages when they come across a printed or spoken input. Importantly, ample evidence suggests that bilinguals and multilinguals cannot select only one of their languages while undergoing a certain linguistic process, e.g., recognizing words. (SCHWARTZ; KROLL, 2006; DIJKSTRA et al., 2018; TOASSI; MOTA; TEIXEIRA, 2020).

Different models of bilingual language processing have been proposed to account for the evidence representing the organization of the mental lexical of people who know more than one language. According to Multilink (DIJKSTRA et al., 2018), the most recent model accounting for bilingual and multilingual word recognition and translation, it is assumed that bilinguals and multilinguals have an integrated lexicon. The lexicon, where information about words is stored (EYSENCK; KEANE, 2015), is assumed to share and have all the multilingual's languages active at the same time, in parallel coactivation.

According to this model, rather than having to first select the lexicon of a language to then access information about one of its words, bilingual lexical access is language nonselective. This means that "when an input word is presented, lexical candidates from different languages compete for recognition" (DIJKSTRA et al., 2018, p. 660). In this process, the representational levels of orthography, semantics and phonology all interact and influence the bilingual processing of words in a language nonselective way.

In an opposite perspective, though, it is assumed that bilingual lexical access is language-selective (GERARD; SCARBOROUGH, 1989; RODRIGUEZ-FORNELLS et al., 2002). According to this view, when undergoing a certain linguistic process, activation of lexical candidates will be restricted to the context-relevant language – the one the bilingual intends to use – so, when a bilingual reads a text in L1, for example, only L1 words would be potential candidates for recognition.

However, as discussed above, empirical research has provided evidence standing against this account. For example, when the presentation of a word in one of the bilingual's language has an effect on the processing of a similar word in the other language, whether it is interference, facilitation or inhibition, this indicates that both languages are coactivated in parallel. According to the assumptions of Multilink, in bilingual or multilingual lexical access,

> orthographic representations activated on the basis of the input activate their associated semantic representations. In turn, semantic representations activate linked phonological representations in a language nonselective way […]. For instance, the meaning 'HOOD' will activate its phonological representation /hʊd/ in English and /kap/ (for KAP) in Dutch. Other simultaneously active semantic representations will activate THEIR translations; for instance, if the meaning of FOOD is active (because FOOD is a neighbor of HOOD), it will activate the Dutch phonological representation /vutsel/ for VOEDSEL, meaning food. (DIJKSTRA et al., 2018, p. 659).

Implementations of Multilink have focused on cognates and homographs. The model also assumes that orthographic representations are linked to phonological representations across languages only through semantics. As the authors themselves acknowledge, some aspects of phonological representations still need to be further developed in future versions of the model. The role of phonology in word processing is further discussed in the next section.

2.2 The role of phonology in word processing

Regarding the processing of printed words in reading, there are two main views that diverge on their assumptions for the role of phonological processing in visual word recognition. On the one hand, the weak phonological model (COLTHEART et al., 2001 apud EYSENCK; KEANE, 2015) proposes that phonological processing is slower than orthographic processing and is not essential in word recognition. In this theory, phonological processing is more indirect and happens through a non-lexical route where an additional conversion from orthography to phonology takes place (COLTHEART et al., 2001 apud DRIEGHE; BRYSBAERT, 2002).

On the other hand, the strong phonological model (FROST, 1998) assumes that phonology plays a primary role in word processing and predicts that it may be rather mandatory and automatic. Monolingual studies using homophonic stimuli showed that words and pseudowords[1] with the same pronunciation as the targets influenced naming and decision latencies, providing evidence for phonological processing of words. (VAN ORDEN, 1987; LUKATELA; TURVEY, 1994; RASTLE; BRYSBAERT, 2006 apud EYSENCK; KEANE, 2015).

These studies have used the method of priming, which can be defined as "facilitating the processing of (and response to) a target by presenting a stimulus related to it some time beforehand." (EYSENCK; KEANE, 2015, p. 238). The first presented stimulus is referred to as the prime, and the last stimulus as the target – an item which participants usually have to give a response to, whether simply identifying it or making a decision required by an experimental task.

Typically, a priming experiment will include a manipulated prime, related to the target in form or concept, and a control prime, unrelated to the target. If the participants' responses to the target are different for the two types of stimuli, an interference or influence

[1] A pseudoword is a pronounceable string of letters that looks like but does not form a real word. If this item is a homophonic stimulus, it is called a pseudohomophone.

effect is found due to the type of relationship between prime and target. Discussing about the monolingual phonological priming research, Dimitropoulou, Duñabeitia, and Carreiras (2011, p. 186) better illustrate these experiments when they explain that

> These studies have shown that when a target word is preceded by a word or a pseudoword prime with complete or extensive phonological overlap and reduced orthographic overlap with the target (called *homophones* and *pseudohomophones*, respectively), participants make faster and more accurate lexical decisions on the target than when it is preceded by a phonologically unrelated prime or by a prime with equal orthographic but less phonological overlap […].

Thus, such results demonstrate that the phonological code may automatically mediate and facilitate the recognition of words, and such effects have been found both with highly phonologically similar words (homophones) and with highly phonologically similar pseudowords (pseudohomophones).

In another domain of experimental studies which investigate reading processes, Slattery et al. (2011) remark that the literature on Eye-tracking research provides evidence indicating that phonological processing takes place even before the reader fixates sight on a word. Nevertheless, while it has been evidenced that phonology plays an important role in reading, Eysenck and Keane (2015) note that studies investigating patients with damaged phonological processing have shown that visual word recognition is not dependent on phonology.

Still, further evidence against the weak phonological model was also provided by bilingual studies which found that bilinguals reading in one of their languages activate and are influenced by spelling-sound correspondences of the other (nontarget) language even when the task only requires them to read in one language. (see VAN ASSCHE; DUYCK; BRYSBAERT, 2020, for a recent review.)

Brysbaert, Van Dyck, and Van Poel (1999) observed that Dutch-French bilinguals reading in their L2 (French) identified words more easily when they were briefly preceded by stimuli that were homophonic to the target words if pronounced according to the grapheme-phoneme correspondence rules of their L1 (Dutch). The same pattern of results was found when Van Wijnendaele and Brysbaert (2002) replicated the experiment with French-Dutch bilinguals identifying words in their L1 being preceded by stimuli that were homophonic to the target words according to the pronunciation rules of their L2.

Moreover, Duyck (2005) examined the activation of grapheme-phoneme correspondence rules of the nontarget language using stimuli that were homophonic not to the target words, but to their translation equivalents (experiments 1, 2, 5 and 6) or to associated words that belonged to the other language (experiments 3 and 4). In this study, Dutch-English bilinguals recognized L2 words (e.g., back) faster when they were briefly preceded by an L1 pseudoword (e.g., ruch) that had the same pronunciation as the target's L1 translation equivalent (rug /rʏx/). Furthermore, L2 word processing (e.g., church) was also facilitated when preceded by an L1 pseudohomophone (e.g., pous) of an L1 associated word (e.g., paus /pɑus/, which means pope).

In line with the previous findings of Van Wijnendaele and Brysbaert (2002), Duyck also obtained the pseudohomophone translation priming effect (Experiments 1 and 2) when the language pair was reversed, that is, with L1 targets being preceded by L2 pseudohomophone primes of their L2 translations. However, this effect was stronger from L1 on L2 than from L2 on L1, and in the pseudohomophone associative priming (experiments 3 and 4), the priming effect was not significant with L1 targets and L2 primes that were pseudohomophones of L2 associated words. Duyck argued that L2 phonological coding during L1 reading may have taken place in this last experiment, but not strongly enough to activate semantic representations.

Furthermore, the author repeated experiments 1 and 2 with primes and targets in the same language (experiments 5 and 6). This time primes were homophones, not pseudohomophones. It was examined, for example, if L2 targets (e.g., corner) were influenced by L2 primes (e.g., hook /hʊk/) that were homophones to the target's L1 translation (hoek /huk/). Duyck found that L2 word recognition was facilitated with L2 primes that were homophonic to their L1 translations if primes were more frequent than targets, indicating that L2 phonological representations activated both their L1 and L2 meanings. However, this effect was not found when the language of primes and targets was reversed. Duyck interpreted the failure of L1 phonological representations to activate their L2 meanings during L1 processing as indicative of a weaker L2 semantic mapping for such ambiguous words.

In other studies that examined the reading of orthographically similar and phonologically conflicting words across languages in an English naming task (JARED; KROLL, 2001; JARED; SZUCS, 2002), English-French and French-English bilinguals showed strong evidence that phonological representations from the nontarget language are activated while reading out loud in their L2, but in L1 reading this was only observed after naming a block of L2 filler words. Conflicting with the results of Van Wijnendaele and Brysbaert (2002), the results from these naming experiments rather suggest that phonological representations of the nontarget language may be more weakly activated during L1 processing.

In a study which investigated lexical access by Hebrew-English and English-Hebrew bilinguals, Gollan, Forster and Frost (1997) also reported a strong priming effect from L1 to L2, but not from L2 to L1. Interestingly, this study used cognate and noncognate words as the critical stimuli, finding a stronger priming effect for the former. Cognates are words which share form and meaning across languages, differently from noncognates, which only shared meaning in this experiment. Because Hebrew and English have different scripts and thus very limited graphemic overlap, the authors attributed this effect to phonological overlap. As to the effect absence in the L2-L1 direction, the authors claimed that bilinguals rely more on phonology when they read in their L2 than in their L1.

The few studies reviewed so far have provided results that are much more inclined to support strong phonological models of visual word recognition and reading, suggesting that phonological coding happens early and automatic both for monolinguals and bilinguals, and even when exclusively homophonic stimuli are not used in the experiments. Additionally, they suggest that bilinguals cannot suppress the grapheme-phoneme correspondence rules of a nontarget language when they read in one of their languages. Nevertheless, some studies have found difference in effects when the language direction of the experiments was reversed from L1-L2 to L2-L1.

Still, similar effects in both language directions were robustly obtained by Brysbaert and colleagues, and this pattern of results was later replicated by Dimitropoulou, Duñabeitia, and Carreiras (2011) in a study with Greek-Spanish bilinguals, in addition to other studies that investigated other languages with different scripts in the priming paradigm (e.g., ZHOU et al., 2010; LEE; NAM; KATZ, 2005).

Van Assche, Duyck, and Brysbaert (2020, p. 52) remark that it is harder to observe influence from L2 to L1. However, these effects are the most important "because they indicate that the first learned, dominant language is not impervious to a later acquired language." It is important to note that difference in results across studies may be due to the use of different methods, including task demands and the stimuli list used in the experiment. Experimental techniques are further discussed in section 3.

3 EXPERIMENTAL TECHNIQUES

This section is meant to answer the first research question of the present paper: What experimental techniques have been used to investigate the effect of interlingual homophones on bilingual lexical access? The discussion debated here focuses on studies which specifically investigated the processing of homophones, pseudohomophones, or at least highly phonological similar words across languages. Studies that investigated phonological overlap with interlingual homographs or cognates will not receive much attention, unless homophonic stimuli made part of their experimental lists.

Overall, the effect of interlingual homophones in bilingual lexical access research has been investigated with different techniques, including the most traditional ones, such as the lexical decision task (e.g., NAS, 1989; HAIGH; JARED, 2007), naming (e.g., KIM; DAVIS, 2003; LEE; NAM; KATZ, 2005), and priming (e.g., BRYSBAERT; VAN DYCK; VAN POEL, 1999; VAN WIJNENDAELE; BRYSBAERT, 2002; DUYCK, 2005; DIMITROPOULOU; DUÑABEITIA; CARREIRAS, 2011).

Other methods like the generalized lexical decision task (e.g., DOCTOR; KLEIN, 1992; LEMHÖFER; DIJKSTRA, 2004), the Stroop task (e.g., TZELGOV et al., 1996), progressive damasking (e.g., DIJKSTRA; GRAINGER; VAN HEUVEN, 1999), gating (e.g., SCHULPEN et al., 2003), and the recording of neurophysiological measures like event-related potentials (ERPs) in Electroencephalography (EEG) studies (e.g., CARRASCO-ORTIZ; MIDGLEY; FRENCK-MESTRE, 2012; CHRISTOFFELS et al., 2016) have also been used to examine the effect of interlingual homophones.

The mentioned techniques and the findings of the studies will be described along the discussion. It should be noted, however, that most studies make use of more than one technique in different experiments, or even combine them in one experiment alone. Table 1 exemplifies this specification in some relevant studies, chosen by the criteria that they focused on the investigation of interlingual homophonic stimuli in word processing.

Table 1 – Specification of experimental techniques used to study interlingual homophones

STUDY	TECHNIQUES
NAS (1983)	Lexical decision
DOCTOR; KLEIN (1992)	Generalized lexical decision
TZELGOV et al. (1996)	Stroop task
BRYSBAERT; VAN DYCK; VAN POEL (1999)	Masked priming with perceptual identification
DIJKSTRA; GRAINGER; VAN HEUVEN (1999)	• Progressive Damasking • Lexical decision

VAN WIJNENDAELE; BRYSBAERT (2002)	Masked priming with perceptual identification
SCHULPEN et al. (2003)	• Gating task • Cross-modal priming with lexical decision.
KIM; DAVIS (2003)	Masked priming with: • lexical decision • naming • semantic categorization
LEMHÖFER; DIJKSTRA (2004)	• Lexical decision • Generalized lexical decision
DUYCK (2005)	Masked priming with lexical decision
LEE; NAM; KATZ (2005)	Masked priming with naming task
HAIGH; JARED (2007)	Lexical decision
ZHOU et al. (2010)	Masked priming with: • naming • lexical decision
DIMITROPOULOU; DUÑABEITIA; CARREIRAS (2011)	Masked priming with lexical decision
CARRASCO-ORTIZ; MIDGLEY; FRENCK-MESTRE (2012)	Semantic categorization with the recording of event-related potentials (ERPs)
ANDO et al. (2014)	Masked priming with lexical decision
CHRISTOFFELS et al. (2016)	Word-translation naming task with the recording of event-related potentials (ERPs)

Source: Own elaboration.

As depicted in Table 1, the most used techniques have been either the priming method, lexical decision, or a combination between these with other experimental tasks. Because lexical decision has been used both by itself and with other tasks in many studies, it will be the first to be explained, followed by progressive demasking, masked priming, and other less used but not less important techniques that remain to be contemplated: cross-modal priming, gating, Stroop task, and event-related potentials (ERPs).

3.1. Lexical decision studies

In the **lexical decision task**, participants have to decide as quickly and as accurately as possible if a presented sequence of letters forms a word in a target language or not. The items are presented on a screen one after the other, and the participants usually have to respond by pressing a “yes” or a “no” key button. Thus, the experimental stimulus list will include both words and nonwords (or pseudowords). These require participants to respond “no”, while the target words require a “yes” response.

Notably, a nonword in the target language may be a real word in the nontarget language, but in the **language specific lexical decision task**, the participants have to respond “yes” only for items that are words in the language the experimental instructions demand. In another bilingual version of this technique, in the **generalized lexical decision task**, participants have to give a “yes” response for items that are words in either of their languages and reject items that are nonwords in both of them.

Such experiments are usually done by presenting the stimuli to the participants on the screen of a computer, while a software measures the participant’s reaction times (RTs) in milliseconds (ms), also recording accuracy and error latencies. Faster and more accurate responses are indicative of a facilitative effect, whereas slower and less accurate responses indicate an inhibitory effect for a certain type of stimulus (e.g., homographs, homophones, or cognates) in comparison to control words.

Depending on what the subject of interest on a study is, experimenters may manipulate the condition of the target list or the pseudoword list to compare with control items and examine effects that may arise due to similarities across languages, for example, if responses to homophonic stimuli are different (e.g., slower, faster, less or more accurate) from those to control words. Furthermore, the nature of the stimulus list and the experiment might not be revealed to the participants in order to avoid biased responses or strategic effects.

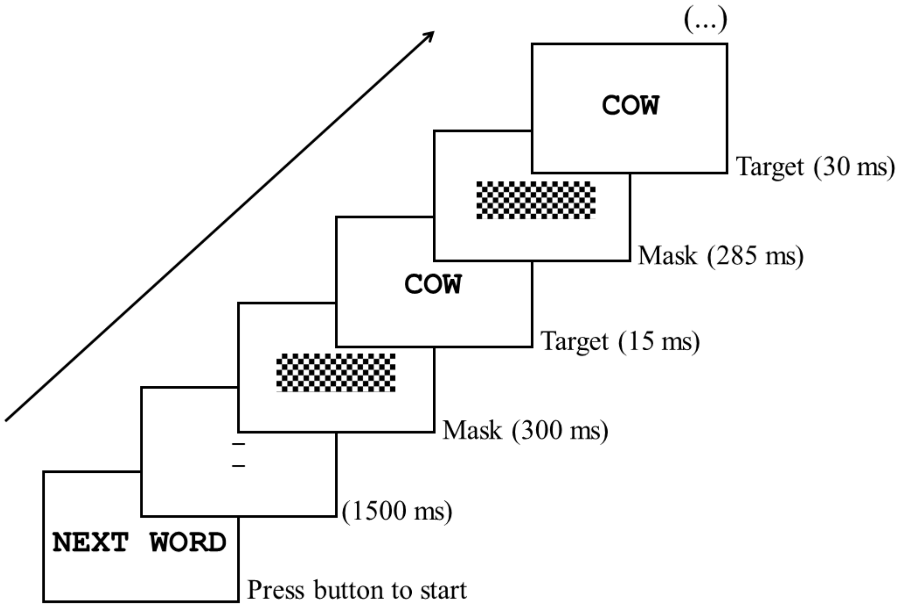
In a language specific lexical decision task, Nas (1983) had Dutch-English participants decide if presented items were real English words, that is, responding “yes” for letter strings that were words in this language, and responding “no” to pseudowords. Because the participants had to accept items that were words only in English, the task implied that all items were read according to the grapheme-phoneme correspondence rules of their L2 (English). Nevertheless, participants could not suppress the activation of lexical representations of the nontarget language (L1 Dutch) when having to respond “no” to interlingual homophonic stimuli. Without their awareness, the nonword list also included pseudohomophones (pseudowords that sounded like Dutch words if read with English pronunciation rules).

Participants made more mistakes and took longer to reject pseudohomophones (e.g., snay), which sounded like a Dutch word (e.g., snee /sne:/), than to reject a control nonword (e.g., rolm) that did not overlap in phonology across languages.

In the study of Doctor and Klein (1992), English-Afrikaans bilinguals performed a generalized lexical decision task, deciding whether items were real words in either of their languages. The word list had three conditions: interlingual homophones, interlingual homographs, and words exclusive to only one of their languages. The nonword list was divided between control nonwords and pseudohomophones that sounded like words either in English or Afrikaans. In relation to homographs, interlingual homophones had an inhibitory effect in lexical decision, that is, participants responded more slowly and less accurately to these words. In addition, pseudohomophones that sounded like Afrikaans words were more difficult to reject, evidencing the activation and interaction of phonological codes.

Inhibition effects for interlingual homophones were also reported by Dijkstra, Grainger, and Van Heuven (1999) in a progressive damasking task (experiment 1) and in an English lexical decision task (experiment 2) with Dutch-English bilinguals. The **progressive demasking task** has been much less used in such studies. In this technique, participants had to press a response key as soon as they identified the presented word, which was gradually displayed while the duration of a mask covering it progressively decreased. The task display is exemplified in Figure 1.

Figure 1 - Progressive demasking task



Source: Own authorship, based on Dijkstra, Grainger, and Van Heuven (1999, Experiment 1).

Each rectangle represents the screen event displayed to the participant. The order of the sequence is represented from bottom to top, so the trial first started with the title "next word", when the participant had to press a button to start. A fixation screen appeared for 1500 ms, and a checkerboard pattern mask then covered all the target word and started alternating with it changing time durations in 15 ms. After the participant pressed the key button to indicate the word had been recognized, they had to type it in a dialog box that appeared for them to enter the word in order to check identification accuracy.

This study examined responses to cognates and false friends that varied in their orthographic, semantic, and phonological overlap. One of the word conditions was the nonhomographic homophone false friend: a word that only overlapped in phonology across English and Dutch, for example the word "cow /kau/" that sounds like the Dutch word "kou" /kɑu/, meaning "cold". The results showed that these words led to inhibition, increasing error rates and reaction times (RTs) in word recognition, whereas interlingual semantic and orthographic overlap led to faster and more accurate responses. The same pattern of results was obtained in their second experiment with lexical decision.

While cognate words have been universally found to facilitate word processing, it is hard to have a consensus about the polarity of the interlingual homophone effect, because studies have reported deviating results. Contradicting the findings of Dijkstra, Grainger, and Van Heuven (1999), other lexical decision studies failed to find an inhibitory effect for interlingual homophones (LEMHÖFER; DIJKSTRA, 2004; HAIGH; JARED, 2007).

Importantly, Lemhöfer and Dijkstra (2004, experiments 1 and 3) used the same critical material as Dijkstra, Grainger, and Van Heuven (1999) with another group of Dutch-English bilinguals performing an English-specific lexical decision task and a Dutch-English generalized lexical decision task. The only differences between these lexical decision experiments and that of Dijkstra and colleagues (1999) were the different participants, and the exclusion of cognate words. Both tasks could not replicate the inhibition effect for phonological overlap found in the previous study, even though they used the same critical material.

Accordingly, Haigh and Jared (2007) rather found that interlingual homophones were responded to more quickly and more accurately than control words when French-English bilinguals performed a lexical decision task in their L2 (English). That is, a facilitatory effect was found. They observed, in addition, that the homophone effect in reaction time may be influenced by factors such as the composition of the experimental list, and the target language of the task: whether it is their dominant or nondominant language.

After the addition of pseudohomophones as distractors in their experimental list, the interlingual homophone effect had only a weak inhibitory trend in the latency data, but remained facilitatory on the error data, that is, participants still made fewer mistakes with interlingual homophones than with control words. When cognates, interlingual homographs and filler words were added, the homophone effect remained facilitatory in the error data but no significant effect was found in the latency data.

Furthermore, Haigh and Jared observed that bilinguals activated phonological representations from both of their languages when reading in their L2, but obtained weak evidence that this happened when reading in the L1. When English-French bilinguals performed the task in their L1 (English), they only found a weak facilitatory impact of L2 phonological activation in the error data, even with participants who were highly proficient and lived in a bilingual environment.

It seems that facilitation and similar effects in both language directions (L2 to L1 or L1 to L2) have been more consistently found in studies that used the **masked priming paradigm** (VAN WIJNENDAELE; BRYSBAERT, 2002; LEE; NAM; KATZ, 2005; ZHOU et al., 2010; DIMITROPOULOU; DUÑABEITIA; CARREIRAS, 2011), which is further discussed in the following section.

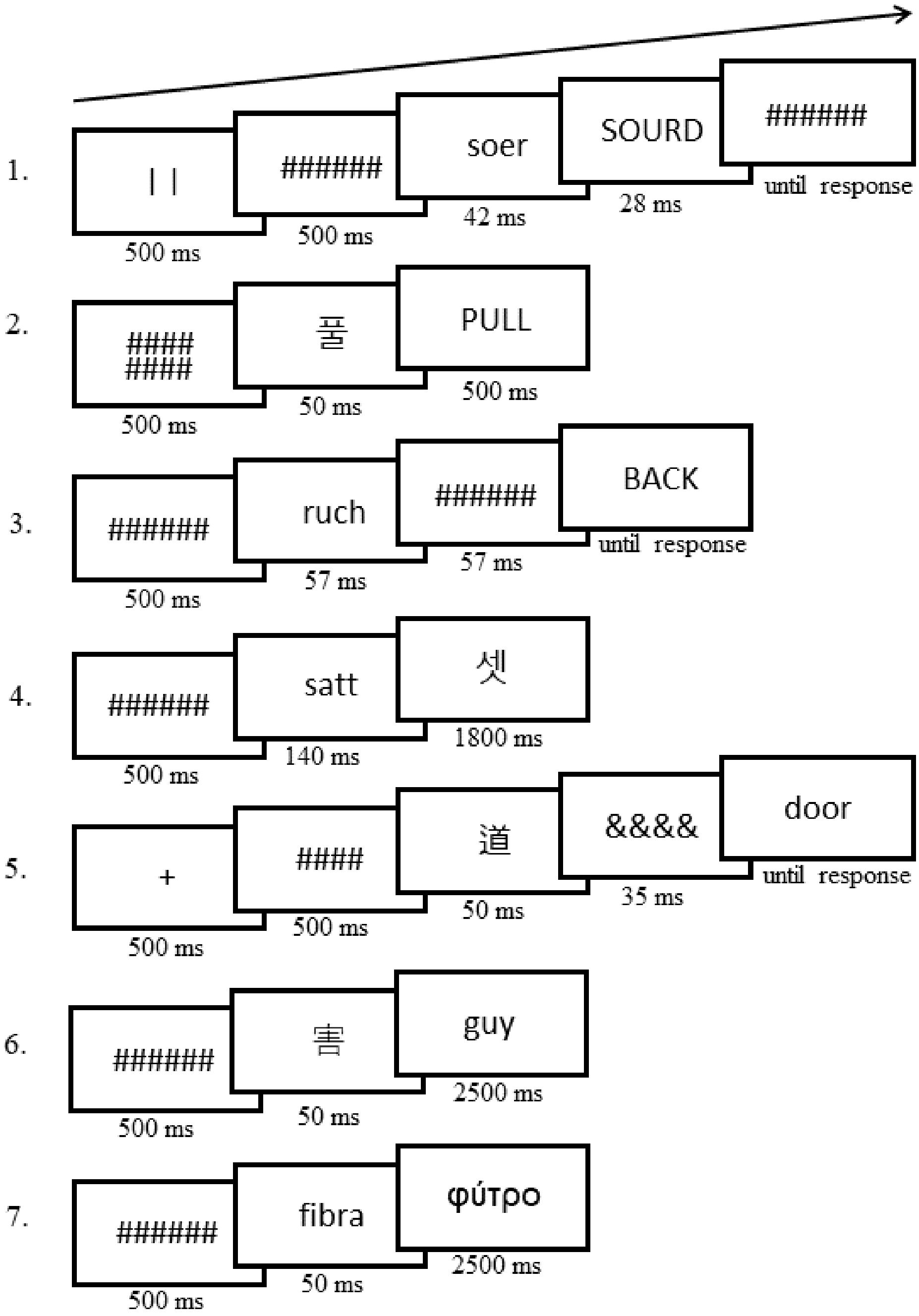
3.2. Masked priming studies

The general rationale for the priming method was already given in section 2.2, but it must be specified that, in masked priming, a visual mask is also displayed before a stimulus (forward mask) or after it (backward mask). Differently from the progressive demasking task, though, mask and target are not flashed alternatively.

Particularly, there is a prime which is presented too briefly to be consciously noticed and participants aren't typically informed of its presence, only being told that they must react to the target word. Even so, responses to targets are modulated by their relationship with primes. This has also been one of the most extensively used techniques to investigate lexical access, and experiments which used it to examine interlingual homophones that were so far cited in this paper are illustrated in Figure 2.

Occasionally, a fixation sign will be first displayed on the screen, represented by central vertical lines, or a central cross that lasts for 500ms. Normally, a forward mask also displayed for 500 ms then precedes the prime, which is then followed by the target. If a backward mask is used, it usually appears after the prime (as in items 3 and 5 of Figure 2) or after the target (as in item 1 of Figure 2). The pattern of the mask – whether it is presented by symbols, scrambled letters, a mosaic or a dashboard pattern – may vary across studies, but its primary role is to completely cover the stimuli. At last, the target may also serve as a backward mask (SÁNCHEZ-CASAS; GARCÍA-ALBEA, 2005) and its presentation lasts until the participant makes a response, or up to a time limit around one or two seconds.

Figure 2 – Masked priming experiments



Source: Own authorship, item 1 based on the experiments of Brysbaert, Van Dyck, and Van Poel (1999), and Van Wijnendaele and Brysbaert (2002); item 2 based on Kim and Davis (2003); item 3 based on Duyck (2005); item 4 based on Lee, Nam, and Katz (2005); item 5 based on Zhou et al. (2010); item 6 based on Ando et al. (2014); item 7 based on Dimitropoulou, Duñabeitia, and Carreiras (2011).

The first item of Figure 2 illustrates the second experiment of Brysbaert, Van Dyck, and Van Poel (1999), which was later replicated by Van Wijnendaele and Brysbaert (2002). The participants had to perform a **perceptual identification task**: trying to identify French words that would very briefly appear in uppercase letters, without being informed that they would sometimes be preceded by a nonword prime that sounded like the target if read according to the pronunciation rules of the nontarget language (Dutch). Even though they believed they were reading and performing a task only in French, both Dutch-French and French-Dutch bilinguals could not prevent themselves from activating phonological information of the nontarget language and identifying the French target word "sourd /suʁ/" more easily when it was preceded by the pseudohophone "soer" than when it was preceded by a graphemic control (siard) or an unrelated prime (chane).

Moreover, Kim and Davis (2003) used the priming paradigm illustrated in the second item of Figure 2 with Korean-English bilinguals performing different response tasks to the target word: deciding whether it formed a real English word (lexical decision), reading it aloud (naming), or deciding whether it belonged to a category, (semantic categorization). In the **semantic categorization task**, the name of a category (e.g., fruit, clothing, vegetables, etc.) appeared before the forward mask, and the critical stimuli composed the negative response set, i.e., the words that did not belong to the categories. It was found that Korean homophonic primes (e.g., 풀 /pul̪/) facilitated responses to English targets (e.g., pull /pʊl/) in lexical decision and naming, though it was only statistically significant in the later. Nevertheless, the results evidenced phonological priming effects across different-script languages and showed that priming can also be modulated by task type.

Item 3 of Figure 2 exemplifies experiment 1 in the study of Duyck (2005), which used masked priming in combination with lexical decision. In this case, the English target "back" was primed by the pseudohomophone "ruch" that sounded like the target's Dutch translation equivalent (rug /rʏx/) if read according to the pronunciation rules of the nontarget language (Dutch). Pseudohomophone priming effects were also found with L2 primes and L1 targets, although effects in the reversed language direction (L1-L2) were stronger.

In another study, illustrated in item 4 of Figure 2, Lee, Nam, and Katz (2005) had Korean-English bilinguals perform a naming task for targets preceded by pseudohomophone primes. This time, prime durations were longer than in other studies (lasting for 140 ms), but according to the authors it was still too brief to be consciously noticed. The results showed that naming Korean targets (e.g., 셋 /set/) was facilitated by nonword primes (e.g., satt) that were homophonic to the target if read according to English pronunciation rules. The same pattern of results was obtained for Korean pseudohomophone primes preceding English target words.

Interlingual homophone priming in both language directions with languages of different scripts were also obtained by Zhou et al. (2010) with Chinese-English bilinguals, and by Ando et al (2014) with Japanese-English bilinguals, illustrated in items 5 and 6 of Figure 2, respectively. Zhou et al. found that Chinese logographic primes (e.g., 道 /dao/) facilitated responses to English targets (e.g., door /dɔː/) and vice versa, both in lexical decision and naming, with no influence of L2 proficiency on priming effects. These findings were later extended to Japanese and English in the study of Ando et al., which also found facilitative phonological priming effects in both language directions with no influence of L2 proficiency or frequency of the target word.

At last, item 7 of Figure 2 illustrates the masked priming experiment of Dimitropoulou, Duñabeitia, and Carreiras (2011), which examined interlingual homophones across Greek and Spanish with lexical decision. Besides finding similar interlingual homophonic effects both with L1 and L2 targets, this study also observed that, differently from word pairs that overlapped only in phonology and differed in orthography, words that were related both phonologically and orthographically did not facilitate lexical decisions to targets. Thus, priming was found with fibra - φύτρο (/fiβra - fitro/), but not with ocio – όριο (/oθio - orio/), providing evidence that orthographic similarity also influences the priming effect of interlingual homophones.

3.3. Other techniques

Beyond such priming experiments that use masked visual stimuli, the **cross-modal priming paradigm** rather includes auditory primes. Schulpen et al. (2003) used this technique with Dutch-English bilinguals performing a lexical decision task to visual English targets being preceded by English or Dutch auditory words that were either interlingual homophones or monolingual controls. The results showed that both Dutch and English versions of auditory homophones (e.g., the spoken English word “leaf” /li:f/ or the spoken Dutch word “lief” /li:f/) primed lexical decisions to visual English targets (e.g., “LEAF”) in comparison to unrelated prime-target pairs (e.g., /spu:n/-LEAF or /spu:t/-LEAF). However, this effect was smaller than that of the monolingual control condition, in which English primes that did not have a Dutch interlingual homophone equivalent preceded visual English targets (e.g., /freɪm/-FRAME), indicating that interlingual homophones were more difficult to process than monolingual controls.

Additionally, Schulpen et al. also observed that participants were sensitive to sublexical cues (e.g., aspiration and final devoicing) in the recognition of auditory interlingual homophones, which may not be the case in the visual domain of word recognition. This sensitivity to sublexical cues was evidenced by the finding that targets preceded by Dutch versions of interlingual homophones were responded to more slowly than those preceded by English primes. This was further supported by the results of another experiment in the same study which used the **gating task**. In this technique, the participants hear increasing speech fragments of words (called gates) which they have to identify and report how confident they are about their answers. Similar to the progressive demasking task, the time presentation of the stimuli keeps getting longer in each gate, until the whole word can be heard.

In the gating experiment of Schulpen et al., Dutch-English bilinguals had to first indicate which word they thought the fragment would be from. Second, they had to report on their word choice confidence, and then indicate the certainty with which they told whether the word was in English or Dutch. The comparisons between identification point (the gate duration where the word was correctly recognized) and language decision suggested that bilinguals are sensitive to sublexical cues in auditory word recognition and that the identification of the language of a target item in spoken word recognition might even happen prelexically, i.e., before it has been recognized.

Another technique that has been less used in interlingual homophone studies but has been quite famous in bilingualism and cognitive control research is the **Stroop task**. In this task, participants have to name the ink color of visual words and ignore their names. As exemplified in Figure 3, the task typically includes a congruent condition in which color names and ink colors are matched, an incongruent condition in which color names are presented in mismatching ink colors, and a neutral condition in which non-conflict items are displayed. The incongruent condition is usually more difficult to process, and participants take longer to respond to such mismatching stimuli. This interference phenomenon is called the **Stroop effect** (DE GROOT, 2011).

Figure 3 - Stroop task conditions

Congruent	Incongruent	Neutral
RED	RED	TABLE
YELLOW	YELLOW	CHAIR
GREEN	GREEN	FORK
BLACK	BLACK	SPOON
SILVER	SILVER	HOUSE
WHITE	WHITE	BOOK

Source: Sabourin and Vīnerte (2020).

Tzelgov et al. (1996) found the stroop effect in a color naming stroop task with Hebrew-English bilinguals. Participants having to name the printed color of a presented letter string in L1 responded slower and less accurately for pseudohomophones that sounded like a different L1 color name according to the L2 pronunciation rules. For example, when the participants saw the letter string “kahol”, which sounds like the Hebrew word for the color blue presented in an incongruent condition with a mismatching ink color that should be reported in Hebrew, their responses were slower and less accurate, showing that spelling-to-sound rules of the nontarget language could not be suppressed when retrieving the color name in the target language.

Finally, beyond the behavioral responses like decision making accuracy and reaction times (RTs), the effect of interlingual homophones on bilingual lexical access has also been examined with electrophysiological measures such as the recording of **event-related potentials (ERPs)** that are captured by EEG (Electroencephalography) electrodes placed on the scalp of the participants. ERPs can be understood as a “small voltage change in the brain’s electrical activity that is induced by a particular stimulus (the ‘event’).” (DE GROOT, 2011, p. 450). These signals, also called components, provide precise temporal information of the occurrence of cognitive processes time-locked to the presentation of a certain stimulus.

Cortical responses referent to such events can be registered with no required behavioral response, namely with participants merely reading or hearing the critical items, but these studies have often been done in combination to experimental tasks (DE GROOT, 2011). Of particular interest to the domain of language processing is the **N400 component**, a negative wave that has its peak at around 400 ms after stimulus onset, known to reflect semantic integration, having larger amplitudes when participants read sentences in which a word does not match with the context (EYSENCK; KEANE, 2015).

Carrasco-Ortiz, Midgley e Frenck-Mestre (2012) observed reduced N400 amplitudes in responses to interlingual homophones for French-English bilinguals, but not for English monolinguals in a semantic categorization task. Participants had to press a key button if the presented item was the name of a city or country while interlingual homophones (e.g., English “Knee /ni:/” and French “nid /ni/”) constituted the negative response set of the task.

The authors concluded that, in line with behavioral studies which have reported facilitatory effects for interlingual homophones (e.g., HAIGH; JARED, 2007), the reduced N400 amplitude adds further support for an interlingual homophonic processing benefit, since in other studies greater amplitudes of the N400 component have been generated by items that involve efforts to inhibit lexical competitors, por example with orthographic neighbors, and reduced N400s have been found with words known to involve facilitated processing, like frequent words and cognates. (MIDGLEY; HOLCOMB; VAN HEUVEN; GRAINGER, 2008; MIDGLEY, HOLCOMB; GRAINGER, 2011 apud CARRASCO-ORTIZ; MIDGLEY; FRENCK-MESTRE, 2012).

In contrast, CHRISTOFFELS et al. (2016) investigated interlingual homophone effects in word production and rather observed increased N400 amplitudes. In their experiment, Dutch-English bilinguals performed a word-translation task in which the responses they had to speak up were interlingual homophones. For example, saying the English word “leaf /li:f/” (homophonic to Dutch “lief” /lif/) in response to the Dutch word “blad”. They found enhanced mistakes and increased N400s both in L1 and L2 production, but amplitudes were more negative in forward translation (L1-L2) than in backward translation (L2-L1). The authors concluded that the N400 modulation suggests an inhibitory effect due to semantic conflicts in output production of these homophones, which were more difficult to process when they performed in their nondominant language. As can be seen, dissimilar effects regarding language direction have been found not only with behavioral studies, but also with brain responses. The next section addresses the language pairs investigated in the studies discussed in section 3.

4 LANGUAGE PAIRS

This section is specifically meant to synthesize the answer to the second research question of the present study: What language pairs have been examined in interlingual homophone studies and what results have been found? The review of the experiments provided above somehow have already provided such response, which is summarized in Table 2, specifying the languages of the participants for each study.

Table 2 - Investigated language pairs

STUDY	PARTICIPANTS
NAS (1983)	Dutch-English bilinguals
DOCTOR; KLEIN (1992)	English-Afrikaans bilinguals
TZELGOV et al. (1996)	Hebrew-English bilinguals
BRYSBAERT; VAN DYCK; VAN POEL (1999)	Dutch-French bilinguals
DIJKSTRA; GRAINGER; VAN HEUVEN (1999)	Dutch-English bilinguals
VAN WIJNENDAELE; BRYSBAERT (2002)	French-Dutch bilinguals
SCHULPEN et al. (2003)	Dutch-English bilinguals
KIM; DAVIS (2003)	Korean-English bilinguals
LEMHÖFER; DIJKSTRA (2004)	Dutch-English bilinguals
DUYCK (2005)	Dutch-English bilinguals
LEE; NAM; KATZ (2005)	Korean-English bilinguals
HAIGH; JARED (2007)	English-French and French-English bilinguals
ZHOU et al. (2010)	Chinese-English bilinguals
DIMITROPOULOU; DUÑABEITIA; CARREIRAS (2011)	Greek-Spanish bilinguals
CARRASCO-ORTIZ; MIDGLEY; FRENCK-MESTRE (2012)	French-English bilinguals
ANDO et al. (2014)	Japanese-English bilinguals
CHRISTOFFELS et al. (2016)	Dutch-English bilinguals

Source: Own elaboration.

As depicted in Table 2, only 3 of 17 studies examined the effect of interlingual homophones with language pairs that did not include English: Dutch-French, French-Dutch, and Greek-Spanish. The rest majority all investigated L1 or L2 speakers of English, probably due to the prestige and global status of this language, or maybe because other different bilingual speakers have so far been overlooked in this research domain of experimental studies in psycholinguistics.

Still, as seen in section 3, interlingual homophone effects have been observed with languages that are fairly similar, such as Dutch and English which both have Germanic roots, with languages that share the same alphabetic script such as English and French, and also with languages that have completely distinct writing systems, such as English and Hebrew, and logographic Asian languages.

Moreover, similar effects were found in both language directions (with L1 influencing L2 and vice versa) in all language pairs reported here, except for French and English. Haigh and Jared failed to find significant L2 to L1 influence with these languages even with highly proficient bilinguals, although such result may be attributed to other factors rather than the French language itself. Besides, as noted by Van Assche, Duyck, and Brysbaert (2020, p. 18), “The dominant language (typically L1) has a stronger effect on the nondominant language (typically L2)”.

Moreover, Dutch-English interlingual homophone investigations have provided diverging evidence either for facilitation or inhibition effects using the same language pair, and even with the same experimental material (DIJKSTRA; GRAINGER; VAN HEUVEN., 1999; LEMHÖFER; DIJKSTRA, 2004).

In their Greek-Spanish study, Dimitropoulou, Duñabeitia, and Carreiras (2011) argued that a pure phonological effect may be more reliably observed with different script languages, because they have only minimal or no orthographic overlap, which may enhance inhibitory effects and even prevent the appearance of phonological activation due to competition at the orthographic level. Accordingly, they found facilitatory effects for prime-target pairs that overlapped in phonology, but not with prime-target pairs that overlapped both in phonology and orthography.

Haigh and Jared (2007) also discuss about the influence of orthography in the effect of homophones in lexical decision. They report that, according to the results of monolingual studies which investigated intralingual homophones, stronger inhibitory effects are found when the members of the homophone have similar spellings (HAIGH; JARED, 2004; PEXMAN et al., 2001, apud HAIGH; JARED, 2007).

With everything considered, it is assumed that the 17 studies presented in Tables 1 and 2 make up, or at least sample, the substantial research on interlingual homophone effects in bilingual word processing, but together they have only examined 9 different language pairs. It would be worthwhile to examine the effect of interlingual homophones with other language pairs to investigate, for example, how Brazilian Portuguese-English bilinguals behave with such type of stimuli in lexical access. The following section addresses interlingual homophone characteristics and offers a tentative list of words that could serve as this type of stimulus for future research.

5 PORTUGUESE-ENGLISH INTERLINGUAL HOMOPHONES

This section aims at answering the third research question of the present paper: What words could serve as stimulus to investigate the effect of interlingual homophones across Brazilian Portuguese and English? Factors took under consideration in the selection of items in the previous studies will be addressed, and a list of word pairs to be refined and applied in future research will be proposed.

Christoffels et al. (2015, p. 629) defines interlingual homophones as “words in the first and second language that have a different meaning, but a very similar pronunciation”. For Carrasco-Ortiz et al. (2012, p. 532), they are “words that enjoy substantial phonological overlap across languages but have different spellings and meanings”. Note that none of these definitions describe that interlingual homophones have to be identical.

If one takes a close look at the material lists of the studies reviewed above, it becomes observable that words often differ in vowel sounds (e.g., bun /bʌn/ - bonne /bɔn/ in the study of Haigh and Jared) and even consonant sounds (e.g., fibra /fiβra/ - φύτρο /fitro/ in the study of Dimitropoulou, Duñabeitia, and Carreiras). However, the authors argue that these might be just slight differences of sounds that bilinguals actually group in a same L1 phonemic category, just as sometimes Portuguese-English bilinguals pronounce the TH sound as /f/ or /d/, for example.

Indeed, finding words that can serve as homophonic stimuli across languages that may have very contrasting phonemes, can be quite challenging. The prerequisite reasoned by Dimitropoulou, Duñabeitia, and Carreiras (2011) is that word pairs have extensive phonological but limited orthographic overlap.

In addition, when constructing the experimental list, in interlingual homophone studies care has also been taken to avoid semantic overlap and, if graphemic overlap is present, matched control words that usually share the same frequency and number of letters are used to isolate such influence (BRYSBAERT; VAN DYCK; VAN POEL, 1999).

Taking these considerations into account, Table 3 provides a tentative list of words that could serve as stimuli to investigate the effect of interlingual homophones across Brazilian Portuguese and English.

Table 3 - Interlingual homophones across English and Brazilian Portuguese

	PHONETIC TRANSCRIPTIONS		**INTERLINGUAL HOMOPHONES**		PHONETIC TRANSCRIPTIONS	
N°	BRIT	AME	**EN**	**PT**	SP	RJ
1	/kæn/		**can**	**quem**	ˈkeɲ	ˈkẽj
2	/ˈsentə(r)/	/ˈsentər/	**center**	**senta**	ˈsẽj.tə	ˈsẽ.tɐ
3	/ˈkʌlə(r)/	/ˈkʌlər/	**color**	**cola**	ˈkɔ.lə	ˈkɔ.lɐ
4	/kɔːt/	/kɔːrt/	**court**	**corte**	ˈkɔɾ.tʃi	ˈkɔx.tʃɪ
5	/ˈsɪti/	/ˈsɪɾi/	**city**	**cite**	ˈsi.tʃi	ˈsi.tʃɪ
6	/deɪ/		**day**	**dei**	ˈdej	
7	/ˈdeɪtə/	/ˈdeɪɾə/	**data**	**deita**	ˈdej.tə	ˈdej.tɐ
8	/fjuː/		**few**	**fio**	ˈfiw	
9	/ˈhəʊpə(r)/	/ˈhoʊpər/	**hoper**	**roupa**	ˈɦo.pə	ˈxo.pɐ
10	/leɪt/		**late**	**leite**	ˈlej.tʃi	ˈlej.tʃɪ
11	/leɪ/		**lay**	**lei**	ˈlej	
12	/ˈliːdə(r)/	/ˈliːɾər/	**leader**	**lida**	ˈli.də	ˈli.dɐ
13	/miːn/		**mean**	**mim**	ˈmiɲ	ˈmĩ
14	/ˈnevə(r)/	/ˈnevər/	**never**	**neva**	ˈne.və	ˈne.vɐ
15	/pɑːs/	/pæs/	**pass**	**pés**	ˈpɛs	ˈpɛjʃ
16	/pɑːst/	/pæst/	**past**	**peste**	ˈpɛs.tʃi	ˈpɛʃ.tʃɪ
17	/pʊʃ/		**push**	**puxe**	ˈpu.ʃi	ˈpu.ʃɪ
18	/paɪ/		**pie**	**pai**	ˈpaj	
19	/seɪ/		**say**	**sei**	ˈsej	
20	/sɔː/		**saw**	**só**	ˈsɔ	
21	/siː/		**sea**	**si**	ˈsi	
21	/ˈselə(r)/	/ˈselər/	**seller**	**cela**	ˈsɛ.lə	ˈsɛ.lɐ
23	/ʃuːt/		**shoot**	**chute**	ˈʃu.ti	ˈʃu.tɪ
24	/ˈʌndə(r)/	/ˈʌndər/	**under**	**anda**	ˈɜ̃.də	ˈɐ̃.dɐ
25	/ˈvæljuː/		**value**	**velho**	vˈɛ.ʎʊ	

Source: Own elaboration. Phonetic transcriptions were consulted on the online Oxford Learner's Dictionaries (available at: https://www.oxfordlearnersdictionaries.com/), and ASHBY et al's (2012) Dicionário Fonético proposed by Portal da Língua Portuguesa (available at: http://www.portaldalinguaportuguesa.org/index.php?action=fonetica), including variations from São Paulo (SP) and Rio de Janeiro (RJ).

The items proposed in Table 3 were chosen attempting to make the word pairs as phonological similar as possible, but it would be relevant to further refine the list in subsequent studies. For instance, in tasks such as lexical decision, the participants should know the words used in the critical stimuli, so it is relevant that the experimental list is composed by high-frequency words, which was not controlled in the elaboration of the present list.

6 FINAL REMARKS

The present study provided an overview of psycholinguistic experimental research that investigated the effect of interlingual homophones in bilingual lexical access, covering important theoretical points in this research domain, such as phonological activation, word recognition, and experimental techniques used in a sample of 17 different studies. The variety of studies reviewed in section 3 constitute substantial evidence of the effect of interlingual homophones in bilingual language processing in different techniques, including visual word recognition, spoken word recognition, brain responses, and word production.

It should be remarked, however, that the literature analysis in the present paper has focused mostly in lexical access on bilingual reading. Although one study on spoken word recognition was included, there are still other works which investigated phonologically similar words with auditory stimuli that were not covered here, but, because it would be unviable not to narrow the present analysis, it was deemed feasible to only include the auditory word recognition study of Schulpen et al. (2003).

Interestingly, as experiments differed in some aspects including task type, stimulus list, and language pairs, some results were also discrepant regarding, for example, L2 to L1 influence, and facilitative or inhibitory effects. Regardless of such divergencies, it became evident that phonology plays a crucial role in bilingual word processing, supporting strong phonological models of visual word recognition and language nonselective bilingual lexical access, even though phonological processing has received little attention by researchers in comparison to semantics and orthography (CARRASCO-ORTIZ; MIDGLEY; FRENCK-MESTRE, 2012).

Nonetheless, considering the few language pairs presented in section 4, it would be relevant to extend such experimental studies to interlingual homophones in other languages that have not been investigated yet, such as Brazilian Portuguese and English, which so far have been restricted to cognate studies (TOASSI; MOTA, 2014, 2018; TOASSI; MOTA;

TEIXEIRA, 2020). Section 5 provided a list of possible stimuli words to investigate the effect of interlingual homophones in this language pair, but it also should be refined in future studies.

It would be interesting to examine, for example, if Portuguese-English bilinguals would show effects from L1 to L2 and vice versa, whether they would show facilitation or inhibition effects, whether they would be sensitive to sublexical cues in auditory word recognition, or even if interlingual homophones would activate semantic representations of the other language in a translation or associative task. Future studies could also use a different experimental list with longer words to investigate, for example, if word stress would have any impact on effects of the critical stimuli, or more importantly to investigate bilinguals that are not necessarily English L2 speakers, including minority languages which would enrich the literature even more.

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