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Do elevators compete with lifts?: Selecting Dialect Alternatives

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Abstract

Recently, Melinger (2018) demonstrated that translation equivalent dialectal words compete for selection in a way that translation equivalent words from a non-target language do not. She argued that dialectal words are stored as within-language representations. However, Dylman and Barry (2018) showed that within-language synonyms behave like between-language translation equivalents, calling Melinger's interpretation into question. The aim of the present study is to compare dialectal and non-dialectal synonyms distractor effects with the same experimental design to elaborate our understanding of how dialectal lexical items are stored and retrieved during production. In two experiments, American translation equivalents slow British picture naming times, replicating the findings from Melinger (2018). In a third experiment, synonymous distractor words did not slow picture naming times, replicating the findings from Dylman and Barry (2018). A proposal couched within the Swinging Lexical Network approach is proposed to explain the discrepant findings.

1. Introduction

Language is rich with expressive options. For almost any concept we wish to convey, language offers the speaker choices in terms of levels of specificity (dog vs. poodle), tone or register (dog vs. pooch), dialect (elevator vs. lift), to name just a few. Models of lexical selection have primarily focussed on the question of how speakers select the "correct" word to convey their meaning, avoiding similar but mismatching alternatives, e.g., saying dog rather than cat. The theoretical focus in the literature has thus been on explaining quick and accurate utterance production in the face of similar, but not same, meaning alternatives. Few studies have addressed the question of how speakers choose between alternatives that convey the same meanings but with different social or pragmatic connotations.

Bidialectal speakers, i.e., people who speak multiple regional dialects, must choose words and grammatical rules that are appropriate to their current social situation. In other words, much like bilingual speakers, they need to keep their two dialects separate when speaking. Many people across the world, including the UK, speak more than one dialect. While much linguistic research has looked at distributional patterns of dialectal usage (e.g., Trudgill & Hannah, 2008 for English varieties) and psychological research into dialects processing has expanded over the past decades (e.g., Antoniou, Grohmann, Kambanaros, & Katsos, 2016; Floccia, Goslin, Girard, Konopczynski, 2006; Kirk, et al, 2016; Martin, Garcia, Potter, Melinger, & Costa, 2016; Ross & Melinger, 2016; Sumner & Samuels, 2009; Vangsnes, Söderlund, & Blekesaune, 2017; Woutersen et al., 1994), still little is known about how dialects are psychologically represented and processed by a speaker. It is unclear whether dialects are represented and processed like separate languages or as vocabulary within a single language. In fact, it is unclear whether there is anything *special* about dialect

processing at all.

Distinguishing languages from dialects in a consistent and objective manner has always been fraught with difficulty (Haugen, 1966; Hazen, 2001; Hudson, 1996; Wei, 2000). Rather than relying on linguistic features, Melinger (2018) proposed that a psychological test could provide such an objective functional (or psychological), rather than a linguistically formal, diagnostic. Specifically, by comparing bidialectal processing to both bilingual and monolingual processing, it can be determined, for a particular dialect pair, whether bidialectal processing mirrors the former or the latter pattern. The aim of the present study is to further assess the efficacy of this approach by examining another dialect pair (British and American English) as well as non-dialectal synonyms.

1.1 Monolingual vs. bilingual lexical selection

It is a well-known fact that multiple lexical candidates are activated when trying to select a single word. Even in the constrained context of a picture naming experiment, multiple lexical candidates become activated and are considered for selection. For monolinguals, active candidates slow target selection times. For example, if a picture evokes multiple valid labels (e.g., sofa – couch), picture naming times will be slower than if the picture has only one likely label (e.g., bed; Alario, Ferrand, Laganaro, Brauenfelder, & Segue, 2004; Barry, Morrison, & Ellis, 1997; Vitkovitch & Tyrell, 1995). Similarly, in the picture-word interference (PWI) paradigm, if a picture co-occurs with a categorically related distractor word (e.g., picture = CAT, distractor word = pig), then picture naming times will be slower than if the picture co-occurs with an unrelated distractor word (e.g., picture = CAT, distractor word = pin). This *semantic interference (SI) effect* (Glaser & Düngelhoff, 1984; Schriefers, Meyer, & Levelt, 1990) ostensibly, arises due to activation from the distractor word converging

with conceptual-driven activation for 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 due to lexical competition.[1]

The situation is even more complex for bilingual speakers. Not only do they have all the same issues deriving from the activation of semantic alternatives, they have the added task of ensuring they select words from the appropriate language. Semantic interference has been observed from distractor words drawn from the target language (target=BANANA, distractor = apple) and from the non-target language (target = BANANA, target = manzana (*the Spanish word for apple*)) and the magnitude of these effects is comparable (Costa, Miozzo, & Caramazza, 1999; Hermans, Bongaerts, de Bot, & Schreuder, 1998).

This would initially suggest that, at a fundamental level, monolingual and bilingual lexical selection share a common mechanism. However, the story is not so straightforward. Translation equivalents, namely the picture name in the non-target language (target = APPLE, distractor = manzana), have been shown to speed picture naming compared to the unrelated condition, not slow it (Costa & Caramazza, 1999; Costa, et al., 1999; Dylman & Barry, 2018; Roelofs, Piai, Garrido Rogriguez, & Chwilla, 2016). We will refer to this as the *translation equivalent facilitation effect*. Costa and colleagues interpret this finding in support of a language-specific selection mechanism (see also Roelofs, 1998; but see Hall, 2011 & Hermans, 2004 for

[1] Note, alternative explanations of this effect that do not rely on a competitive selection mechanism have also been proposed (Mahon, Costa, Peterson, Vargas, & Caramazza, 2007; Oppenheim, Dell, & Schwartz, 2010). However, for the purposes of the present investigation, we will not discuss these models further.

alternative interpretations). In other words, the translation equivalent facilitation effect argues against cross-language competition.

To capture bilingual effects from PWI studies and other paradigms, 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). Initially, representations from both languages receive activation, i.e., the flow of activation is not restricted to one language. Subsequently, representations associated with the unintended language node are reactively inhibited. This prevents them from being inadvertently selected or from causing too much interference (but see Costa & Caramazza, 1999; Costa, et al., 1999; Roelofs, 1998 for an alternative language-specific selection mechanism). Under this view, the semantic interference observed from cross-language semantically related distractors arises because the distractor activates its translation equivalent in the target language, making within-language interference stronger. In the case of same meaning distractors, the activation from the distractor coincides with the target activation rather than a competitor, resulting in facilitation.

Translation equivalent facilitation was viewed as a particularly important processing distinction between monolinguals and bilinguals because almost all models of monolingual lexical selection assume that synonyms would produce robust semantic interference. This assumption was based on a number of empirical findings in the literature. First, Jescheniak and Schriefers (1998) demonstrated mediated semantic interference between near-synonyms using the same PWI paradigm. Specifically, distractor words that were phonologically similar to an alternative picture label (soda, similar to sofa) slowed picture naming (target = COUCH), implicating competition.

Second, pictures with more labels are named more slowly than pictures with a single label (Alario et al, 2004; Barry et al, 1997; Vitchovitch & Tyrell, 1995). This *codability effect* has also been taken as evidence that two endogenously activated representations will compete for selection, slowing response times. If sofa competes with couch when endogenously activated, then it follows that it should also compete when one is activated exogenously by the distractor word. Finally, semantic interference effects are larger when the distractor word is closely related to the target (e.g., target = WHALE, distractor = shark) than distantly related (distractor = rabbit), the so-called *semantic distance effect* (Rose, Aristei, Melinger, & Abdel Rahman, 2019, Vigliocco, Vinson, Damian, & Levelt, 2002). Following the trend line within these data, one would predict that synonyms should result in even slower naming times, due to the increased feature overlap at the conceptual level.

Despite the supporting evidence from across the literature, the question of whether synonyms compete in a PWI task had never been tested directly, until recently. Dylman and Barry (2018) conducted a series of picture-word interference experiments comparing the effects of synonymous distractor words (picture = GLASSES, distractor = spectacles) to unrelated distractor words (picture = GLASSES, distractor = cellophane). They conducted parallel experiments with bilingual participants and translation equivalents and had participants producing either the preferred picture label (e.g., glasses) or the dispreferred picture label (e.g., spectacles). In the bilingual experiments, they replicated previous demonstrations of the translation equivalent facilitation effect for naming in both L1 and L2, with larger effects when naming in the L2. Critically, they also observed robust facilitation from within-language synonymous distractor words when participants produced the dispreferred picture label. When participants were instructed to produce the preferred

picture label, synonymous distractors produced no reliable effect on naming times. The implication of this study is that the translation equivalent facilitation effect may, in fact, not be a unique marker of bilingual processing but may instead be a standard characteristic of synonym processing.

1.2 Bidialectal Processing

Dylman and Barry (2018), like Costa and colleagues (1999), interpret their results as evidence that words that convey more or less the same meaning do not compete for selection. However, another critical piece of the puzzle comes from work on dialectal lexical selection. Dialectal alternatives are similar to translation equivalents and synonyms in that they represent two (or more) words that convey the same meaning. They are distinct, however, in that they additionally convey some sociolinguistic information, such as the regional origins or socio-economic background of the speaker. Comparatively little is known about how bidialectal speakers select words from their distinctive dialects. Melinger (2018) investigated this question directly using the same PWI design developed by Costa and colleagues to demonstrate the translation equivalent facilitation effect, described above. Focussing on bidialectal Scottish participants who spoke Standard Scottish English and a variant of Scots English, she failed to replicate the translation equivalent facilitation effect when producing Scottish dialectal words with English distractors (target = BREEKS, distractor = trousers) or when producing English words with Scottish distractors (target = TROUSERS, distractor = breeks). Instead, she found translation equivalent interference in the latter case and no measurable distractor effect in the former case. Furthermore, she also tested between and within dialect semantic effects from same category competitors; she found that the magnitude of the translation equivalent interference was comparable to the interference observed from categorically related

distractor words from either dialect (target = TROUSERS, distractor = slippers or baffies).

Melinger (2018) interpreted these results as providing further evidence for a distinction between bilingual and monolingual processing, with Scots dialect falling into the latter category. Specifically, she proposed that no dialect membership tags were instantiated in the mental lexica of Scottish bidialectal speakers. Instead, dialect membership could be represented as a conceptual feature, following proposals from La Heij (2005). Melinger dubbed this *dialectal co-dependence*, in contrast to linguistic independence, following Labov (1989). However, the assumption underlying this co-dependence – independence dichotomy was that dialectal translation equivalents would be processed like other within-language synonyms, an assumption that has since been challenged by the findings from Dylman and Barry.

Melinger's (2018) study stands as one of the first investigations into bidialectal lexical selection and the results paint a clear picture for the Scottish context. While Melinger argued that translation equivalent interference was inconsistent with a view that dialects were processed like distinct languages, the findings from Dylman and Barry (2018) challenge her conclusion that dialectal alternatives are processed like within-language synonyms. Instead, the overall picture suggests that there may indeed be something special about selecting dialectal, or sociolinguistically-marked, lexical alternatives.

However, before drawing such a conclusion, there are several characteristics of the particular dialectal pair that Melinger (2018) investigated that might have influenced the experimental outcome. First, Scots English is primarily a spoken form without a standardized written form. For that reason, Melinger used auditory distractor words rather than written distractors. This could have influenced the polarity of the distractor

effects. Previous observations of the translation equivalent facilitation effect have been obtained using written, rather than auditory, distractors (Costa et al, 1999; Costa & Caramazza, 1999; Dylman & Barry, 2018; Hermans, 2004). Distractor modality can, in some cases, impact the polarity of distractor effects. For instance, Bloem and La Heij (2003) found that categorically related written distractors induced interference in a word translation task while categorically related pictorial distractors induced facilitation, which was interpreted as evidence that pictorial distractors do not automatically activate their lexical representations. Polarity reversals have also been observed with lexical distractors. Specifically, superordinate distractor words have been found to induce facilitation when presented visually (Vitkovitch & Tyrrell, 1999) but interference when presented aurally (Hantsch, Jescheniak, & Schriefers, 2005). Investigating the source of this polarity reversal, Hantsch, Jescheniak, and Schriefers (2009) systematically demonstrated the polarity reversal to be attributable to distractor modality, arguing that facilitative response congruency effects can emerge more easily when the target and distractor are both presented visually. Therefore, observing interference from dialectal translation equivalents rather than facilitation could be attributable to the modality of the distractors rather than to the properties of the bidialectal lexicon.

Second, there is great variability in terms of how much Scottish participants actively use Scots English. Dialect usage has been implicated as a factor relevant to the representation and processing of dialectal forms in comprehension tasks. Sumner and Samuels (2009) investigated this by focussing on the New York City dialect which includes a non-standard r-less variant of r-final words (e.g., baker, talker) which contrasts with the standard rhotic variant. In a long-term repetition priming task, they found overt producers of the r-less variant demonstrated reliable long-term repetition

priming between dialects while covert speakers, namely those who grew up around the r-less variant but did not produce the variant themselves, did not. Similarly, in a dialect switching study, Kirk, Kempe, Scott-Brown, Philipp, & Declerck (2018) found that participants with high rates of self-reported dialect usage demonstrated bilingual-like symmetrical switching costs (see Costa & Santesteban, 2004) while those with lower rates of self-reported dialect usage showed asymmetrical switch costs, as observed for language learners (see Costa, Ivanova, & Santesteban, 2006). These studies highlight that an individual's dialect usage pattern may influence experimental outcomes.

Finally, Melinger (2018) acknowledged that the construct of a single Scottish dialect is a fallacy and that regional variation within Scotland is widespread. For instance, the word *baffies* is commonly used in the area of Dundee but is less known in nearby Fife. Although all of her participants self-reported using a regional dialect, not all of them came from the same region of Scotland. Thus, familiarity with individual items may have varied between individuals. This degree of between-speaker variability is unlikely to have been present in the bilingual and synonym studies of Costa and colleagues (1999) or Dylman and Barry (2018).

1.3 The present study

The results from Dylman and Barry (2018) challenge the view that translation facilitation effects depend on language membership nodes (Green, 1998). They also challenge the conclusions from Melinger (2018) that Scottish dialect words are represented as part of the English vocabularies of her participants, as they show that within-language synonyms do not produce interference. However, before considering how to reconcile these findings, the robustness of the original Melinger finding needs

to be assessed and the contribution of the specific dialect pair, the modality of the distractors, and the active usage of the two dialects need to be evaluated.

In the present study, we tested for dialectal translation equivalent interference between British and American dialect alternatives. We asked British participants to name pictures of common objects in Standard British English, their default and preferred dialect. At the same time, participants were also presented with British and American distractor words. In Experiment 1, spoken distractor words were presented, following Melinger (2018). Two versions of this experiment were conducted. In Experiment 1a, all distractor words were spoken in a northern English accent while in Experiment 1b they were spoken with an American accent. This accentual manipulation was included because previous research has shown that comprehension processes can be impacted by the accent of spoken words (Cai, et al, 2017; Martin, Garcia, Potter, Melinger, & Costa, 2016). Therefore, to rule out the possibility that any observed between-dialect translation equivalent interference is due to the inconsistency between the dialect membership of the distractor word and the accent in which it is spoken, we included a between-participant manipulation of accent. In Experiment 2, written distractors were presented, bringing the method more in line with previous work on translation equivalent distractor effects (Costa et al., 1999; Costa & Carmazza, 1999; Dylman & Barry, 2018; Hermans, 2004). In Experiment 3, synonymous distractor words that are not dialectally marked were presented, using the same experimental design as that used in Experiments 1&2.

We focus on the contrast between British and American dialects of English because they have many interesting features that stand in contrast to the Scots dialect/Standard Scottish English pair investigated by Melinger (2018). First, American English is a standardized variant with a familiar and proscribed orthographic system, allowing

written distractors to be used. This allows us to compare the distractor effect emerging from spoken vs. written distractors directly. It also allows us to rule out any effect that literacy in the non-dominant dialect may have had on the results. Second, British participants are broadly familiar with American vocabulary, as they gain exposure from various media, including the internet. However, most American words have not gained a sufficiently strong foot hold in Britain to be part of the active vocabulary. Hence, we can ascertain whether the mixed experience and usage pattern of Scots dialect words reported by Melinger might have impacted on her findings. Finally, we assume no regional variation and little between-speaker variability in the familiarity of the American words.

Following Melinger, (2018), we expect to find translation equivalent interference when dialectal distractor words are presented auditorily. If the polarity of the translation equivalent effect is bound by the modality of the distractors, then either facilitation or no effect should be observed when distractors are presented visually. If dialect and synonyms are processed in the same way, then we should see similar translation equivalent effects across all experiments. But, if dialectal words are processed differently from within-language synonyms, then the translation equivalent effects from Experiments 1 & 2 should be distinct from the synonym effects in Experiment 3. Finally, following all previous studies, semantic interference from related distractors should be observed, irrespective of distractor modality, dialect membership, or frequency.

2. Experiment 1

Experiment 1 used the experimental design from Costa, et al. (1999) and Melinger (2018), applied to the British/American context. Participants named pictures in their preferred British dialect while simultaneously hearing British English or American

English distractor words spoken in a northern English accent. Distractor words could either refer to the picture, a categorically related object, or an unrelated object. Of particular interest was whether the dialect translation equivalent of the picture name would speed picture naming times, as language translation equivalents and synonyms do, or slow picture naming, as was found for Scottish dialectal alternatives. Two versions of this experiment were conducted, one with distractors spoken with a British accent (Exp 1a) and one with distractors spoken with an American accent (Exp 1b).

2.1 Method

2.1.1. Participants

Forty-eight participants were recruited to take part in this study, equally divided between 1a and 1b. All were monolingual native British English speakers. The experimental procedure was approved by the Dundee University's Psychology Ethics Committees, and participants gave written informed consent prior to testing.

2.1.2 Materials

Pretest. To select the stimuli for this experiment, 44 potential pictures were identified that had distinct, non-cognate, names in British and American English (e.g., elevator vs. lift; flashlight vs. torch). These pictures were presented to a separate set of 14 British participants paired with either their British label or their American label. Additionally, 29 pictures were also paired with an incorrect but semantically related British label (e.g., Aubergine was paired with the label Avocado). For each picture-label pair, participants were asked to rate, on a 5-point scale, how appropriate the label was for the picture. The scale ranged from 1 (This word is not appropriate for this picture) to 5 (This is the best word to describe this picture and I would use this label). The midpoint allowed the choice of 'this is a good label for this picture, but I

would not use it myself'. In total, 117 pictures were presented to each participant for an acceptability rating, with some pictures being rated with 3 different labels (British label, American label, semantically related label).

The results of the pretest questionnaire showed that generally, pictures presented with the British English labels were rated more appropriate than the American English alternative labels. Using the mean ratings for each picture, we were able to reduce and improve our target picture set to 32 pictures, with British English labels (M = 4.69, SD = .415) being significantly more appropriate than the American English synonyms (M = 2.93, SD = .456); t (31) = 18.424, p <.001.

The frequencies of the British and American picture labels were extracted from the Sublex database (Van Heuven, Mandera, Keuleers, & Brysbaert, 2014) using the Zipf frequency measure (log frequency of occurrence within the British National Corpus (BNC)). Frequencies for the relevant part of speech were used rather than total lexeme frequency. The average Zipf of the British picture labels was 3.51 while the average Zipf of the corresponding American labels for British speakers was 2.91. A paired t-test revealed a significant difference in Zipf, t(31) = 2.99, p=0.005. As predicted, the British words were significantly more frequent in the British corpus than the corresponding American words.

British picture labels and their American equivalents were paired with pictures to create six distractor conditions: two same meaning distractors, two same category distractors, and two different meaning distractors. Thus, we had a 3 (distractor relatedness) x 2 (dialect) design. In the same meaning conditions, target pictures were either paired with their British name (e.g., target = SPANNER, distractor = spanner) or their American name (e.g., target = SPANNER, distractor = wrench). In the same category condition, pictures were presented together with picture labels drawn from

the same semantic category either in British (e.g., target = SPANNER, distractor = torch) or in American (e.g., target = SPANNER, distractor = flashlight). In the unrelated condition, these same British and American picture labels were paired with unrelated pictures (e.g., target = SPANNER, distractor = biscuit or cookie). Care was taken when pairing distractor words with target pictures to prevent any spurious semantic, associative, phonological or orthographic relationship between the distractor word and the target picture name. Because the American picture names were never produced in this experiment, phonological overlap between the American picture name and distractor words was allowed. A full set of stimuli used in Experiments 1&2 can be found in Appendix A.

Pictures were scaled to fit within a 3.5cm square and always appeared centred on the computer screen. Distractors were presented auditorily over headphones at an SOA of -150ms (Damian & Martin, 1999). For Experiment 1a, the distractors were recorded by an English female and were pronounced with a northern English accent. For Experiment 1b, the distractor words were recorded by an American female with a midwestern accent. Each individual sound file was edited to include 200ms of silence before each word onset and a cue was embedded in the sound file at 350ms (150ms post-speech onset), which triggered the presentation of the target picture.

Stimuli were presented in 2 blocks consisting of 192 trials each, with the order of trials in each block varying across participants. Each picture appeared twice in each distractor condition, once in each block (hence a total of 12 repetitions of each picture). The block trials were pseudo-randomized with the restriction that the same picture, the same distractor word, the beginning phoneme of picture names, and the picture category did not repeat in consecutive trials. There was also the restriction that stimuli from the same experimental condition could appear in no more than three

consecutive trials. A further control was that the distractor word in trial *n* could not be the name of the picture in trial *n+1*.

2.1.3. Procedure

Each trial began with a centrally presented fixation cross displayed for 500ms on a light grey screen. Then, a 250ms blank screen preceded the onset of the distractor word (50ms + 200ms silence at start of sound file). 150ms after the onset of the distractor word, the target picture was presented for 1000ms and participants had 2000ms to respond. Participants were instructed to name the picture as quickly and accurately as possible while ignoring the distractor words. Naming latencies were measured with a voice key and each response was recorded into an individual .wav file. Recorded responses were inspected post-test for accuracy using CheckVocal (Protopapas, 2007).

Prior to the main experiment, participants were familiarized with the pictures and their British names. Participants were given a booklet with all pictures and their British names in alphabetical order. Participants could study this booklet as long as they liked to ensure they understood which word should be used to refer to each picture. Following this familiarization phase, participants practiced naming each picture once. Naming errors were corrected by the experimenter. If necessary, the booklet was shown to the participants again. No mention of the American alternative names was made at any point in the instructions to the experiment. Prior to the main experiment, 12 practice trials with distractor words drawn equally from the 6 conditions were presented.

The entire testing session lasted approximately 45 minutes. Each participant was tested individually in a sound attenuated booth. Presentation of the experiment was controlled using DMDX software.

2.2. Results

Mean response times (RTs) for correct trials, standard deviations and mean proportion of errors in the experimental conditions are presented in Table 1. Trials in which the participant produced the wrong word, stuttered, hesitated or failed to respond, and trials with voice key failures, including any trial with RT faster than 250ms, were classified as errors and discarded from the RT analysis (Exp 1a: N=297; Exp 1b: N= 263). Additionally, any trial which was 2.5 standard deviations from a participant's condition mean was treated as an outlier (Exp 1a: N=263; Exp 1b: N=248). Additionally, a further 198 trials from Exp 1a and 201 trials from Exp 1b were lost due to computer errors. In total, 8458 trials in Exp 1a and 8670 trials in Exp 1b were included in the final analysis. As error rates were low (~3%), they were not analysed further.

Table 1: Mean response times (RTs) for correct trials and percentage of errors in the experimental conditions for Exp 1a and Exp 1b.

	Dialect			
	British Accent		American Accent	
	British	American	British	American
Distractor Conditions	RT (errs)	RT (errs)	RT (errs)	RT (errs)
Same meaning	712 (1.8)	818 (3.8)	760 (2.2)	854 (3.1)
Same category	785 (3.5)	817 (3.9)	801 (2.2)	845 (4.5)
Unrelated	764 (3.1)	790 (3.5)	785 (2.4)	813 (3.1)
Identity effect (unrelated – same meaning)	52	-28	25	-40
Categorical Interference (unrelated – same category)	-21	-27	-16	-32

The data for Exp 1a and Exp 1b were analysed separately; each was submitted to 3 (distractor relatedness) by 2 (dialect) analyses of variance (ANOVAs) to investigate the effect of distractor word relatedness and dialect on picture naming response times. Separate analyses were conducted with participants *(F_1)* and items *(F_2)* as random variables.

2.2.1 Experiment 1a: British accented distractors

The analysis revealed a moderate main effect of distractor relatedness, $F_1(2,46) = 21.9$, $p < .001$, $\eta p2 = .488$; $F_2(2, 62) = 9.1$, $p < .001$, $\eta p2 = .228$, and a main effect of dialect, $F_1(1,23) = 67.8$, $p < .001$, $\eta p2 = .747$; $F_2(1,31) = 209$, $p < .001$, $\eta p2 = .871$. Crucially, we observed a significant interaction between distractor relatedness and dialect, $F_1(2,46) = 22.7$, $p < .001$, $\eta p2 = .497$, $\varepsilon^2 = 0.817$; $F_2(2, 62) = 21.3$, $p < .001$, $\eta p2 = .407$. This moderate interaction reflects the fact that the same meaning condition induced significant facilitation when distractors were in British English, $t_1(23) = -4.7$, $p < .001$; $t_2(31) = 5.6$, $p < .001$, but significant interference when the distractors were in American English, $t_1(23) = 4.0$, $p = .001$; $t_2(31) = 2.5$, $p = .017$. Hence, we observed significant within-language facilitation and significant between-dialect interference. Additionally, both British English, $t_1(23) = 3.4$, p = .002; $t_2(31) = 2.3$, $p = .032$, and American English, $t_1(23) = 4.2$, $p < .001$; $t_2(31) = 2.3$, $p = .026$, same category distractors slowed naming times relative to their respective unrelated conditions. The American same category condition did not differ significantly from the American same meaning condition, Mdiff = 1.1ms, *t's* <1, indicating the increased semantic distance between target picture and distractor did not impact the magnitude of the interference effects (cf. Mahon et al., 2008; Aristei & Abdel Rahman, 2013, but see Rose et al., 2019).

2.2.2 Experiment 1b: American accented distractors

The analysis revealed a small main effect of distractor relatedness, $F_1(2, 46) = 9.7$, $p = .001$, $\eta p2 = .298$, $\varepsilon = .72$; $F_2(2, 62) = 9.1$, $p < .001$, $\eta p2 = .228$, and a large main effect of dialect, $F_1(1, 23) = 162$, $p < .001$, $\eta p2 = .876$; $F_2(1,31) = 209$, $p < .001$, $\eta p2$

[2] When the sphericity assumption was violated in any of the experiments, the respective Huyhn-Feldt ε value for correction is reported together with the uncorrected degrees of freedom.

= .871. Crucially, we observed a significant interaction between distractor relatedness and dialect, $F_1(2, 46) = 12$, $p < .001$, ηp2 = .344; $F_2(2, 62) = 21.3$, $p < .001$, ηp2 = .407. This interaction reflects the fact that the same meaning condition induced significant facilitation when distractors were drawn from the British dialect, $t_1(23) = -2.4$, $p = .026$; $t_2(31) = 5.6$, $p < .001$, but significant interference when the distractors were drawn from the American dialect, $t_1(23) = 5.2$, $p < .001$; $t_2(31) = 2.5$, $p = .017$. Hence, even when the distractor were spoken in an American accent, we again observed significant within-language facilitation and significant between-dialect interference. Additionally, semantically related distractors drawn from the British dialect, $t_1(23) = 3.1$, p = .005; $t_2(31) = 2.3$, $p = .032$, and the American dialect, $t_1(23) = 4.3$, $p < .001$; $t_2(31) = 2.3$, $p = .026$, slowed naming times relative to their respective unrelated conditions. As in Exp 1a, the American same category condition did not differ significantly from the American same meaning condition, Mdiff = -8.7ms, *t's* <1, indicating the increased semantic distance between target picture and distractor did not impact the magnitude of the interference effects (cf. Mahon et al., 2008; Aristei & Abdel Rahman, 2013, but see Rose et al., 2019).

2.3. Discussion

The results from Experiments 1a and 1b provide a clear replication of the results from Melinger (2018). For British distractors, we observed significant identity facilitation and semantic interference. However, for American distractors, we observed comparable interference both from semantic competitors and from the dialect translation equivalent. This pattern of results was observed in both versions of the experiment, both when distractors were spoken with the more familiar English accent and the less familiar American accent. The parallel findings across spoken accents supports a stability and robustness to the findings, as even when distractors may have

been slightly harder to process (Cai, et al, 2017; Martin, et al., 2016), the semantic effects remained. Cai et al observed that accent impacted the specific meanings listeners accessed and sometimes dialectal alternatives can mean different things in different dialects. For instance, while 'yard' is the American equivalent of the British word 'garden', 'yard' also refers to a unit of measurement in both dialects. The availability of multiple meanings for some of the distractor words might have led to different meanings being available depending on the accent spoken. For example, when the British speaker produced the word 'yard', British participants might have accessed the 'unit of measurement' meaning more than when they heard the same word spoken by the American speaker. Inspecting our stimulus list, there were five American dialect words that have alternative meanings in British English. To examine whether the availability of multiple meanings when produced in different accents might have contaminated the findings, we excluded the relevant five items (hood, suspenders, yard, shot, can) and tested again for between-dialect translation equivelant interference using a paired-sample t-test. The observed interference persisted in this analysis, both when distractors were spoken in the British accent, $t_2(26) = 3.7$, $p = .001$, and when spoken in the American accent, $t_2(26) = 4.1$, $p < .001$.[3]

Importantly, the findings again contrast with the pattern obtained from between-language translation equivalents (Costa et al., 1999; Costa & Caramazza, 1999) and synonyms (Dylman and Barry, 2018). However, as with Melinger's Scottish study, it is possible that the aural modality of the distractors may render an interference effect more likely. As mentioned above, previous researchers have suggested that facilitation may win out when the semantic congruency between target and distractor

[3] I would like to thank the reviewer for this suggestion.

is strengthened (Bloem & La Heij, 2003; Hantsch et al, 2009). It is possible that sharing presentation modality may be one way that congruency can be highlighted. Hence, in Experiment 2 we assess the same dialect translational equivalent distractor effect in the visual modality.

3. Experiment 2

In Experiment 2, the same picture-distractor combinations were used, but visual distractors replaced the auditory presentation used in Experiment 1. If our observation of semantic interference for between-dialect translation equivalents is driven by the modality of the distractor presentation, then we should see a polarity reversal of the between-dialect translation effect in Experiment 2, bringing our dialect translation effect closer in line with both the between-language translation facilitation effect and the synonym facilitation effect. However, if our observation of between-dialect translation interference results from fundamental lexical selection processes and reveals an authentic contrast between bidialectal and bilingual processing, then we should see translation equivalent interference, as observed in Experiment 1.

3.1. Methods

3.1.1. Participants

Twenty-four British participants were recruited to take part in this study. All were monolingual native English speakers. The experimental procedure was approved by the Dundee University's Psychology Ethics Committees, and participants gave written informed consent prior to testing.

3.1.2. Materials and procedures

The stimuli were exactly the same as in Experiment 1. The only difference is that, rather than present the distractor words over headphones, the distractor words were presented visually, superimposed on the picture. Distractors were written in bold red font with an outer glow effect to blur the edges for better legibility, see Figure 1. Distractors occurred in one of two locations for any single picture (American distractors in one position and British distractors in another) but varied between pictures, to achieve maximal visual integration with the object.

Figure 1. Sample stimuli with visual distractors from different conditions

Randomized presentation orders were prepared as in Experiment 1. Stimuli were presented in 2 blocks consisting of 192 trials each, with the order of trials in each block varying across participants. Each picture appeared twice in each condition.

The trial structure was as follows: A centrally-located fixation cross appeared for 500ms followed by a blank screen for 50ms before the picture and distractor word were presented for 1000ms (SOA = 0ms). Participants had up to 2000ms to respond. Other aspects of the procedure were identical to Experiment 1. Testing lasted approximately 30 minutes. Recorded responses were inspected post-test for accuracy using CheckVocal (Protopapas, 2007).

3.2. Results

Mean response times (RTs) and standard deviations for correct trials in the experimental conditions are presented in Table 2. For four participants, the data from

the second block of naming overwrote the data for the first block; therefore for those subject we have only have 1 naming trial for each picture in each condition. Trials in which the participant produced the wrong word, stuttered, hesitated or failed to respond were classified as errors and discarded from the RT analysis (N=380). Additionally, any trial which was 2.5 standard deviations from a participant's condition mean was treated as an outlier (N=251). Additionally, a further 768 trials, specifically the second block of trials from 4 participants, were lost due to computer errors. In total, 7817 trails were included in the final analysis. Due to the error rate being only 4.5%, errors were not analysed further.

Table 2: Mean response times (RTs) for correct trials, standard deviations and mean percentage of errors in the experimental conditions

	Dialect			
	British		American	
Distractor Conditions	RT (errs)	*SD*	RT (errs)	SD
Same meaning	717 (1.8)	92	786 (5.3)	93
Same category	786 (5.2)	88	796 (5.6)	93
Unrelated	770 (4.2)	95	771 (4.6)	88
Identity effect (unrelated – same meaning)	53		-16	
Categorical Interference (unrelated – same category)	-16		-26	

The data were submitted to 3 (distractor relatedness) by 2 (dialect) analyses of variance (ANOVAs) to investigate the effect of distractor word relatedness and dialect on picture naming response times. Separate analyses were conducted with participants *(F_1)* and items *(F_2)* as random variables. The analysis revealed a moderate main effect of distractor relatedness, $F_1(2,46) = 27$, $p < .001$, $\eta p2 = .540$, $\varepsilon = .832$, $F_2(2,62) = 18.7$, $p < .001$, $\eta p2 = .376$. It also revealed a large main effect of dialect, $F_1(1,23) = 62$, $p < .001$, $\eta p2 = .731$; $F_2(1,31) = 24.8$, $p < .001$, $\eta p2 = .444$. This finding reflects faster overall naming times when distractors are in British English

compared to American English. Crucially, we again observed a significant interaction between distractor relatedness and dialect, $F_1(2,46) = 18.2$, $p < .001$, $\eta p2 = .442$; $F_2(2,62) = 22.3$, $p < .001$, $\eta p2 = .419$. This interaction reflects the fact that the same meaning condition induced facilitation when distractors were in British English, $t_1(23) = -5.3$, $p < .001$; $t_2(31) = -7.8$, $p = .001$, but interference when the distractors were in American English, $t_1(23) = 1.94$, $p = .065$; $t_2(31) = 2.8$, $p = .009$. This latter effect, however, only reached conventional levels of significance in the by-item analysis. Additionally, both British English, $t_1(23) = 2.3$, p = .029; $t_2(31) = 2.4$, $p = .021$, and American English, $t_1(23) = 5.3$, $p < .001$; $t_2(31) = 2.4$, $p = .019$, same category distractors slowed naming times relative to their respective unrelated conditions. The American same category condition did not differ significantly from the American same meaning condition, Mdiff = 10.2 ms, $t_1(23) = 1.3$, p = .215; $t_2 < 1$.

3.3. Discussion

Experiment 1 showed that the pattern of results with spoken American dialect distractor words was the same as Melinger's (2018) study with Scottish dialect distractors. In Experiment 2 spoken distractor words were replaced with written distractors. The experiment was otherwise identical to Experiment 1 and the results are likewise similar. For British distractor words, we found within-dialect identify facilitation and semantic interference from related distractors. For American distractor words, we again found translation equivalent interference, not facilitation, although this effect was marginal in the by-subjects analysis. Semantically related distractors also produced robust interference. As before, the magnitudes of the semantic interference effect for within- and between-dialects effects were comparable and also both comparable to the magnitude of the translation interference effect. Thus, we can

confidently conclude that the modality of the distractor word does not determine the polarity of the translation-equivalent distractor effect.

These results confirm that, in contrast to both cross-language translation equivalents (Costa et al, 1999) and within-language synonymous distractors (Dylman & Barry, 2018), dialectal translation equivalents interfere with the production of target picture labels. This suggests that, contrary to the proposal by Melinger (2018), dialectal alternatives might indeed be processed differently to within-language synonyms. However, before we consider what the organizational implications of this result are, we must ensure that the discrepant results between dialectal alternatives and synonymous distractors are not attributable to methodological differences between the experiments conducted by Dylman and Barry (2018) and those reported here. Hence, in Experiment 3 we use the same method and design as used in Experiment 1 to test for effects from synonymous distractor words.

4. Experiment 3: Synonyms

Dylman and Barry (2018) observed within-language facilitation from synonymous distractor words when producing the dispreferred label and no discernible effect when naming the preferred picture label. One possibility for the discrepancy in results between dialectal and non-diaelctal synonyms may be methodological differences. Unlike most investigations of translation equivalent effects, Dylman and Barry did not include a semantic competitor condition in their experiments. Conceivably, this might modulate participant performance across the whole experiment, as omitting the semantically related conditions increases the proportion of trials in which the target and distractor convey the same meaning. Hantsch, Jescheniak, and Schriefers (2009) found that, when presenting distractors visually, the proportion of ‘congruent’ trials in an experiment effected the distractor effects. Specifically, they only observed

facilitation from visually presented semantically congruent distractor words (e.g., Target = flower, distractor = daisy) when additional conditions, e.g., phonologically-related, were included (Exp 3) but not when they were excluded from the experiment (Exp 4)[4]. Indeed, when Melinger increased the proportion of congruent trials by omitting the semantically-related condition, the same-meaning interference effect was weakened. Therefore, it is critical to ensure that methodological sources do not account for the discrepancy in results.

Therefore, in Experiment 3 we test the distracting effect of synonymous distractor words within the same experimental design as used in Experiment 1 above. If the proportion of congruent trials impacts the modality of the same-meaning distractor effect, then we should observe interference from synonymous distractors. But, if the proportion of congruent trials is not behind the discrepant findings, then we should replicate Dylman and Barry's results, observing facilitation or no observable effect from synonymous distractors.

4.1. Methods

4.1.1. Participants

Thirty participants were recruited to take part in this study. All were monolingual native British English speakers. Due to technical issues, the data from three participants was lost. The experimental procedure was approved by the Dundee University's Psychology Ethics Committees, and participants gave written informed consent prior to testing.

[4] Note that an additional difference between these two experiments was the inclusion of only 1 (Exp 4) or 2 (Exp 3) exemplars of each basic level category in the experiment, including both a daisy and a rose. Including 2 exemplars is necessary for the construction of the semantically-related condition. This is also a difference between the present design and that used by Dylman and Barry.

4.1.2. Materials and procedures

Pretest. To select the stimuli for this experiment, two pre-tests were conducted. The first was to assess synonymy ratings for word pairs and the second was to assess the appropriateness of the picture stimuli to both labels. First, 59 synonymous word pairs were identified and presented to 15 native speakers of British English for synonymy ratings. All word pairs were phonologically distinct, not collocations (e.g., bunny rabbit) and sociolinguistically neutral[5] (e.g., coat vs. jacket; backbone vs. spine). For each word pair, participants were asked to rate whether the two words mean the same thing using a 7 pt scale -- low scores indicate the words mean different things while high scores indicate interchangeability in meaning. From this data, 37 word pairs with average synonym ratings greater than 4 were identified for further pretesting. However, because the experimental design requires two pairs of synonyms from each semantic category, additional pairs were added for the second pretest, increasing the set to 42 pairs.

In a second pretest, pictures were found that matched both meanings of the 42 near-synonymous word pairs. For example, while *street* and *road* may not mean exactly the same thing, there is overlap in their semantic extensions and pictures were selected to depict that semantic overlap, as seen in Figure 2.

[5] Melinger (2018) demonstrated that same meaning distractor words that differed from the target by register (e.g., house – gaff) also interfered with picture naming. For this reason, no register alternatives were included in the present experiment.

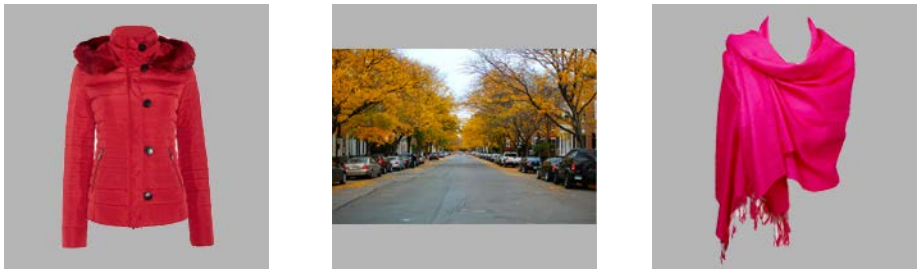

Figure 2. Example images for the synonyms coat/jacket, road/street, and shawl/pashmina.

To test the effectiveness of picture selection, pictures were presented together with their two possible labels at either end of a 7pt likert scale. For each picture, participants were asked to rate how well the words fit the picture. A response of 1 or 7 indicated that only one of the two labels was appropriate for the picture. A response of 4 indicated that both words were an equally good match for the picture. Other responses reflected a preference for one word or the other, while recognizing that the alternative label was acceptable but less preferred. Thirty British participants completed this second pretest.

The results of the second pretest were used to identify the 24 pictures with the most balanced acceptability scores for both labels, bearing in mind that two pictures 2 pictures were selected from each semantic category. The average acceptability score for the final 24 stimuli was 3.87 with a range from 1.5 to 5.56. Recall that a score of 4 indicates that both labels are equally appropriate to describe the picture. Two items with low acceptability scores for one label and three additional items that did not undergo the pretesting procedure were included to complete the experimental design. For each picture, the preferred and dispreferred labels were identified using the preferences expressed in the pretest. Additionally, word frequencies (Zipf) for target and synonym labels were extracted from the Subtlex database (Heuven, et al., 2014). The preferred label was slightly more frequent (M=3.74, *SD* = .83) than the same

meaning competitor (M=3.37, *SD* = 1.07), and the difference was significant (*t*(23) = 2.1, *p* = .048).

Having finalized the selection of stimuli, each picture was paired with six distractor words: two same meaning distractors, two same category distractors, and two different meaning distractors. Distractor words were either the preferred picture label or the dispreferred label. Thus, we had a 3 (distractor relatedness) x 2 (preference) design. In the same meaning conditions, target pictures were either paired with their preferred name (e.g., target = JACKET, distractor = jacket) or their dispreferred but synonymous alternative (e.g., target = JACKET, distractor = coat). In the same category condition, pictures were presented together with distractors drawn from the same semantic category, either the preferred (e.g., target = JACKET, distractor = shawl) or dispreferred (e.g., target = JACKET, distractor = pashmina) label. In the unrelated condition, these same preferred and dispreferred distractor words were paired with unrelated pictures (e.g., target = JACKET, distractor = forest or woods). Care was taken when pairing unrelated distractor words with target pictures to prevent any spurious semantic, associative, phonological or orthographic relationship between the distractor word and the target picture name. However, given the strict constraints on item selection and the need to have items grouped into semantic quartets, it was impossible to avoid phonological overlap between the target and semantic competitors in all cases (e.g., Belly – Backbone and Stomach – Spine). Given that semantic competition is predicted to slow naming times while phonological overlap should speed it, this feature of the stimuli should serve to weaken predicted effects rather than strengthen them. A full set of experimental stimuli can be found in Appendix B.

Pictures were scaled to fit within a 3.5cm square and always appeared centred on the computer screen. Distractors were presented auditorily over headphones at an SOA of -150ms (Damian & Martin, 1999). Distractors were recorded by a Scottish male and were pronounced with a Standard Scottish English accent. Each individual sound file was edited to include 200ms of silence before each word onset and a cue was embedded in the sound file at 350ms (150ms post-speech onset), which triggered the presentation of the target picture.

Stimuli were presented in 2 blocks consisting of 144 trials each, with the order of trials in each block varying across participants. Each picture appeared twice in each condition, once in each block. The block trials were pseudo-randomized with the restriction that the same picture, the same distractor word, the beginning phoneme of picture names, and the picture category did not repeat in consecutive trials. There was also the restriction that stimuli from the same experimental condition could appear in no more than three consecutive trials. A further control was that the distractor word in trial *n* could not be the name of the picture in trial *n+1*.

The procedure was identical to Experiment 1 in all respects expect one. Prior to testing, participants were presented with each picture for a free-naming response. Following this, the picture booklet with pictures and target labels was provided, as in Experiments 1&2. This additional step was included to ensure we had correctly identified the preferred picture label for our sample. Testing lasted approximately 45 minutes.

4.2. Results

The free naming responses were analysed to ensure that the target label was indeed the preferred label by participants. Of the total 648 free naming trials, target labels

were the most frequent response (N = 241) while the alternative picture label was less frequent (N=77). In the remaining free naming trials, participants either failed to respond in the allotted time (N=133), misidentified the target object (e.g., said *clown* for the picture of a jester; N=64), or produced a valid picture description that was neither the target or the intended competitor (e.g., said *joker* for the picture of a jester; N=133).

For experimental trials, mean response times (RTs) and standard deviations for correct trials in the experimental conditions are presented in Table 3. Trials in which the participant produced the wrong word, stuttered, hesitated or failed to respond were classified as errors and discarded from the RT analysis (N=692). Voice key failures were corrected using CheckVocal (Protopapas, 2007). Additionally, any trial which was 2.5 standard deviations from a participant's condition mean was treated as an outlier (N=218). In total, 6897 trials were included in the analysis.

Table 3: Mean response times (RTs) for correct trials, standard deviations and mean percentage of errors in the experimental conditions.

	Synonym			
	Preferred		Dispreferred	
Distractor Conditions	RT (%errs)	*SD*	RT (%errs)	SD
Same meaning	742 (7.8)	107	790 (8.6)	103
Same category	804 (8.5)	97	821 (8.6)	105
Unrelated	774 (8.5)	98	787 (9.0)	111
Identity effect (unrelated – same meaning)	32		-3	
Categorical Interference (unrelated – same category)	-30		-34	

Mean reaction times were subjected to a 2-way within subjects ANOVA, with Label (Preferred, Dispreferred) and Distractor Relatedness (Same meaning, Related meaning, Unrelated) as within-subjects factors. Separate analyses were conducted with participants *(F_1)* and items *(F_2)* as random variables. The analysis revealed a significant effect of distractor relatedness, $F_1(2, 52) = 29.42$, $p<.001$, $\eta^2p = .531$; $F_2(2, 46) = 12.0$, $p < .000$, $\eta^2p = .344$, driven by faster naming times on average in the same meaning conditions and slower naming times in the related meaning condition. The main effect of Label, $F_1(1, 26) = 24.6$, $p < .001$, $\eta^2p = .486$; $F_2(1, 23) = 21.3$, $p <$

.000, η^2p = .481, was also significant, with faster naming with preferred label distractors than dispreferred label distractors. The interaction between Distractor Relatedness and Label was also significant in the by-subjects analysis, $F_1(2, 52)$ = 5.4, p = .007, η^2p = .172, but not by items $F_2(2, 46)$ = 1.8, p = .172, η^2p = .07.

Paired-sample t-tests were conducted to interpret this interaction. These comparisons revealed that picture naming times were significantly faster in the same meaning condition compared to the unrelated condition when distractors were preferred labels, t_1 (26) = -3.3, p = .003, t_2 (23) = -2.6, p = .015, but when distractor words were dispreferred labels, naming times in the same meaning condition and the unrelated condition did not differ, t_s <1. For traditional semantic interference, naming times were slowed down in the related compared to the unrelated conditions similarly for preferred, t_1 (26) = 4.3, p < .00, t_2 (23) = 2.5, p = .02, and dispreferred distractor words, t_1 (26) = 4.7, p < .000, t_2 (23) = 2.3, p < .03.

Because error rates were higher in this experiment, they were similarly subjected to a 2-way within subjects ANOVA, with Label (Preferred, Dispreferred) and Distractor Relatedness (Same meaning, Related meaning, Unrelated) as within-subjects factors. Separate analyses were conducted with participants *(F_1)* and items *(F_2)* as random variables. Neither the main effect of distractor relatedness and label nor the interaction approached significance, all Fs < 1.

4.3 Discussion

Experiment 3, which examined the semantic context effects of synonymous distractor words, reveals a very different pattern of results to those reported in Exps 1&2. Whereas the latter consistently found slower naming times from same meaning distractors from a distinct dialect, the former found no reliable effect on naming times from same

meaning distractors from the same dialect as the target. In terms of traditional semantic interference effects, results were reliable and consistent with those found in other between-language and between-dialect comparisons. This finding validates the materials construction; despite needing to relax some of the constraints against phonological relations in the semantic related condition, semantic interference effects were nevertheless robustly observed.

The design of Experiment 3 was identical to that of Experiment 1 and to the experiments reported in Melinger (2018), yet the crucial result pertaining to the same meaning distractors were different. The design differed from that used in Dylman and Barry (2018), yet despite these differences, the critical result was comparable. We have therefore supported the conclusion that synonymous distractor words do not exert observable effects on picture naming times, in contrast to what is observed for translation equivalent dialectal distractors. The two are not processed in the same way.

5. General Discussion

The aim of this study was to replicate and extend previous observations of dialectal translation equivalent interference effects previously reported for Scottish-English dialectal variants (Melinger, 2018). Specifically, we tested for dialectal translation equivalent interference between British and American dialectal alternatives and for non-dialectal synonym interference. In two experiments, we observed that American alternative picture labels slowed the production of British picture labels relative to dialect-matched unrelated distractors. In a third experiment, synonymous picture labels that were not sociolinguistically-marked had no impact on the production of preferred picture names.

In Experiments 1&2, we observed significant dialectal translation-equivalent interference when British speakers named pictures using British labels in the context of appropriate American picture labels, replicating previous findings investigating Scottish-English dialectal processing (Melinger, 2018). These translation equivalent interference effects were comparable in magnitude to semantic interference observed from categorically-related distractor words. Furthermore, in line with previous work from both dialectal and bilingual studies, we observed reliable semantic interference from both within-dialect and between-dialect categorically related distractors. These interference effects were not modulated by dialect. Finally, and most importantly, translation equivalent interference was not dependent on distractor modality or the accent of the speaker -- interference was obtained when distractors were presented auditorily in a British accent, auditorily in an American accent and visually, although they were weaker in the visual modality.

Testing the effect of American picture labels on British picture naming allowed us to address some of the methodological challenges reported in prior work. Because Scots is primarily spoken and not widely written or standardized, Melinger (2018) used auditory distractor words. However, previous investigations of cross-language translation equivalent effects used written distractors and some studies have reported more robust interference effects with auditory distractors (Hantsch et al, 2005). Thus, it was important to establish that the cross-dialectal translation interference effect was not an artefact of the distractor modality but indeed a characteristic of dialectal lexical selection. The observation of translation equivalent interference from written American distractor words in Experiment 2 successfully assuages this concern.

While the participants in Melinger (2018) were active users of the Scots dialect (to varying degrees), the participants in the current story are better characterized as

having passive knowledge of the American dialect. Previous studies have shown that lexical organization and language independence can depend on language proficiency and active use (e.g., Geukes & Zwitserlood, 2016; Potter, So, von Eckardt, & Feldman, 1984; Sumner & Samuels, 2009). However, the present results suggest that between-dialect translation equivalent interference is not dependent on active dialect use; even passive knowledge of dialectal alternatives is enough to slow picture naming times. Methodologically, this may suggest that future investigations into dialectal processing using the PWI paradigm need not be hampered by challenges presented by variation in dialect proficiency or use. However, caution must be taken here; clearly this suggestion cannot be generalized to other paradigms, as active usage has been identified as an important factor in studies using other paradigms (Kirk, et al, 2018; Sumner & Samuels, 2009). Furthermore, the present findings do not rule out the possibility that, if dialect usage were stronger and more consistent across the sample, a different pattern of results would be obtained.

In Experiment 3, we found a different pattern of results. Using the same experimental design and procedure as in Exps 1&2, we replicated the pattern of results reported by Dylman and Barry (2018) for preferred picture names. Synonymous picture labels, specifically picture labels that were neither associated with a specific geographical origin or socially-marked as part of an alternative register, did not interfere with the production of the preferred picture label. The social-neutrality of the stimuli is seemingly critical to the facilitation effect, as Melinger (2018, exp 5) found that informal picture labels, presented as distractors that differed in register to the target word (e.g., alcohol – booze, house – gaff), interfered with picture naming times just as dialects did. It therefore seems that synonym facilitation is restricted to ‘neutral’ or ‘near’ synonyms and does not extend to socially-marked alternatives. This replication

has important consequences for the interpretation of the cross-dialect interference effect.

Melinger (2018) argued that the between-language translation equivalent facilitation effect marked a unique feature of bilingual lexical selection. Costa and colleagues (1999) had interpreted their facilitation effect as evidence for a mechanism that prevents non-target language candidates from interfering with selection from the target language, such as a language membership tag (de Bot, 1992; de Bot & Schreuder, 1993; Green, 1986, 1993, 1998; Poulisse & Bongaerts, 1994). Building on this view, Melinger interpreted her results as evidence against an analogous *dialect membership tag*. Instead, she suggested that dialectal alternatives are represented as *within-language* alternatives, like synonyms.

This interpretation is challenged by the results from Dylman and Barry (2018), which were confirmed by the present study. As within-language synonymous distractors produce a different pattern of effects from dialectal translation equivalents, the contention that dialectal and register alternatives are stored like synonyms needs updating. What, then, distinguishes within-language synonyms from dialectal and register alternatives?

5.1 The trade-off between conceptual facilitation and lexical competition.

Models of monolingual lexical selection acknowledge that lexical selection times are determined by the combined net effects of conceptual and lexical processes. Conceptual processes are primarily facilitative, as semantically related representations mutually enhance each other's activation levels (Abdel Rahman & Melinger, 2009; 2019; Jescheniak et al, 2020). Lexical processes are competitive or inhibitory, as only one can be ultimately selected for further processing (but see Mahon et al, 2007 for an

alternative explanation for semantic interference in the PWI paradigm that does not depend on lexical competition). These opposing effects combine to produce observed semantic facilitation or interference. When conceptual effects outweigh lexical effects, a net effect of facilitation is observed; when lexical effects outweigh conceptual facilitation, a net effect of interference is obtained.

Language membership tags have the function of inhibiting non-target language representations, allowing conceptual facilitation from the translation equivalent distractor to dominate. Melinger (2018) proposed that dialects are representationally distinct from languages in that dialectal or register membership is denoted at the conceptual level by conceptual features, following a proposal by La Heij (2005). Conceptual features can be shared across representations, enhancing the activation of related words, but they cannot inhibit representations the way language tags can. As a result, dialectal or register competitors will be strongly activated at the lexical level and hence will compete for selection, slowing naming times.

However, this explanation, which is built on prior research into semantic context effects and bilingual lexical selection, cannot account for synonym facilitation. Specifically, without a language membership tag, the synonymous distractor will remain active at the lexical level and should also slow target selection times. But that is not what was observed. To explain this finding, a finer-grained examination of the semantic-to-lexical mapping is required.

Predicting the outcome of the trade-off between conceptual and lexical effects is not straightforward; semantic contexts can produce facilitative effects as well as interfering effects (see Abdel Rahman & Melinger, 2009; 2019 for reviews). To explain the distribution of these respective effects within the semantic context literature, Abdel Rahman and Melinger argued that competitive effects dominate

when competition is one-to-many, meaning that the target word is competing for selection against a set, or cohort, of highly active alternatives; facilitation wins out when the target only competes with only one highly active alternative.

This argument was put forward, in part, to explain why semantic coordinates produce interference effects while semantic associates typically produce facilitation or no observable distractor effects in the Picture-Word interference task (e.g., Alario, Segui, & Ferrand, 2000; Kuipers, La Heij, & Costa, 2006; Melinger & Abdel Rahman, 2013; Sailor, Brooks, Bruening, Seiger-Gardner, and Guterman, 2009). However, it may also provide an explanation for the contrasting effects observed in the present study. Specifically, if synonyms have identical and perfectly overlapping conceptual representations, as depicted in Figure 3a below, then the activation introduced by the distractor word will overlap with the activation from the target picture, rather than extending beyond the shared representation, as has been argued for semantic coordinates. Instead, the single conceptual representation will be strengthened, leading to just 2 strong lexical competitors – one-to-one competition. In contrast, if dialectal and register alternatives differ in their conceptual representation by some sociolinguistic feature, as depicted in Figure 3b below, then two dialectal translation equivalents will not have isomorphic conceptual representations. The activation from the translation equivalent distractor word will strengthen the representation of the target but will also spread beyond the shared semantic space. As a result, the target word will compete with more active lexical alternatives, what Abdel Rahman and Melinger refer to as a *lexical cohort*. In sum, one explanation for why sociolinguistically-marked synonymous distractors lead to interference while true synonyms do not may reside in representational differences at the conceptual level.

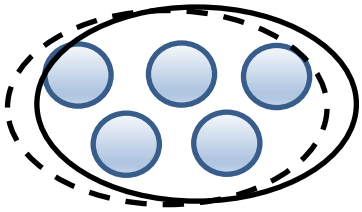

Figure 3a: Conceptual features for Sofa (solid line) and Couch (dashed line)

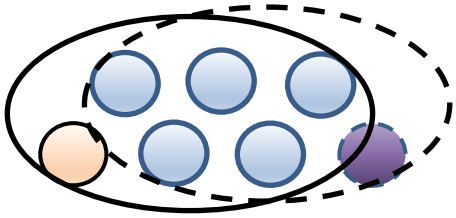

Figure 3b. Conceptual features for Lift (solid line) and Elevator (dashed line)

In contrast, Dylman and Barry (2018) explained the synonym facilitation effect by positing direct facilitative lexical links (rather than conceptual links) between synonymous lexical items, both within- and between-languages. When a synonymous distractor words is presented, activation from its lexical representation spreads directly to its translation equivalent, thereby speeding lexical selection relative to the unrelated condition. The strength of their proposal is that it provides a unified account of bilingual translation equivalent and synonym facilitation. However, direct facilitative lexical links are not widely supported by independent evidence in the literature (but see Ibrahim, Cowell, & Varley, 2017 for a similar proposal to account for translation times between low frequency (L2) and high frequency (L1) alternatives and synonyms). Furthermore, and critically, it is not clear how their explanation could be extended to account for the interference observed for dialectal alternatives. If direct lexical links between dialectal equivalents were posited, then similar facilitative effects would be predicted, contrary to the present observations.

Both above proposals have strengths and weaknesses. Dylman and Barry's proposal provides a unified account for two facilitation effects. However, their account requires a new representational mechanism and offers no explanation for interference from sociolinguistically-marked distractors. In contrast, Melinger's account situates all

effects within the extant literature on monolingual and bilingual lexical selection, but attributes translation equivalent facilitation and synonym facilitation to two distinct processes. However, unless an explanation for dialectal translation equivalent interference effects can be incorporated into Dylman and Barry's broader model, the current proposal is to be preferred, as it offers greater explanatory breadth.

5.2 Distractor modality.

One important methodological contribution of the present study is the demonstration that dialectal translation equivalent interference is not a methodological by-product of using auditory, rather than written, distractor words. Because previous demonstrations of translation equivalent facilitation were obtained using written distractor words (Costa et al, 1999; Costa & Caramazza, 1999; Dylman & Barry, 2018; Hermans, 2004), it was important to demonstrate that the interference effects previously reported for Scottish dialectal translation equivalents were not due to the modality of the distractors. The results from Experiment 2 demonstrate that dialectal translation equivalent interference is obtained with written distractors. This is an important test for the future of this paradigm and its ability to assess the representational status of other dialects. Dialects, as well as informal registers, are often predominately oral forms of language and many, including Scots dialect, do not have a standard written form. Hence, demonstrating that the same interference effect can be obtained with written distractors opens this paradigm to assess other oral dialects across the globe, creating a valuable tool for discriminating between languages and dialects.

5.3 Distractor familiarity

Another concern raised in Melinger (2018) was that individual familiarity with the Scottish vocabulary was varied. While all participants reported that they were familiar

with a Scots dialect, they were not all from the same specific region of Scotland and so had varying familiarity with some of the stimuli. Indeed, idiosyncratic dialectal experience is pervasive in Scotland (McLeod & Smith, 2007). As a result, it was important to demonstrate that the observation of interference was not due to limited or uneven familiarity with the dialectal distractors. Indeed, Geukes and Zwitserlood (2016) observed translation equivalent interference for between-language distractors when those distractors were newly learned words. Testing native German speakers who were trained on a set of newly learned French words, participant's German responses were significantly slower when the distractor word was the newly learned translation equivalent compared to a newly learned unrelated distractor word. They interpreted this finding as evidence that newly learned words are not yet associated with an L2 language tag. However, given this finding, it was also important to demonstrate that dialectal translation equivalent interference would be observed with dialectal alternatives that are more commonly known with less between-speaker variability. Finding a similar interference effect for American dialectal alternatives, which are widely known by British young people, undermines the proposal that dialectal translation interference was obtained for Scottish dialectal translation distractors only because they are not sufficiently known by the tested sample.

5.4 Summary

While interest in dialectal processing has grown over recent decades (e.g., Antoniou, Grohmann, Kambanaros, & Katsos, 2016; Floccia, Goslin, Girard, Konopczynski, 2006; Kirk, et al, 2016; Vangsnes, Söderlund, & Blekesaune, 2017; Martin et al., 2016; Woutersen et al., 1994), key representational issues remain. Melinger (2018) argued that dialects are processed like synonyms, but this proposal was challenged by the findings from Dylman and Barry (2018). So, is there anything special about

dialects? The present findings suggest there is – they are not like languages but also not like synonyms.

This study provides a clear replication of previous observations of dialectal translation equivalent interference. It also extends these important findings by addressing some methodological challenges faced in prior work. The polarity of translation equivalent effects is not reducible to the modality of the distractor word, the congruency between the dialect membership of the word and the accent in which it is produced, or the familiarity or usage of the dialect under investigation. The results here, reported for a well-known but not actively used dialect, are similar in nature to those originally reported by Melinger (2018) for Scots dialect. The study also replicated previous demonstrations of synonym facilitation using the experimental design that directly parallels experiments demonstrating dialectal interference. This replication confirms that synonyms are not processed in the same way as dialectal translation equivalents, further illuminating the properties of the semantics-to-lexical mapping and the dynamics of lexical competition. Taken together, the study validates the method as a valuable approach to distinguishing dialects from languages.

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Appendix A. Stimuli used in Experiment 1&2

Target	Same meaning		Related meaning		Unrelated	
	British	American	British	American	British	American
Aubergine	Aubergine	Eggplant	Courgette	Zucchini	Plaster	Band-aid
Bin	Bin	Trashcan	Skip	Dumpster	Funfair	Carnival
Biscuit	Biscuit	Cookie	Prawn	Shrimp	Tights	Pantyhose
Bonnet	Bonnet	Hood	Indicator	Turn Signal	Rubber	Eraser
Braces	Braces	Suspenders	Tights	Pantyhose	Indicator	Turn Signal
Cooker	Cooker	Stove	Tap	Faucet	Garden	Yard
Courgette	Courgette	Zucchini	Aubergine	Eggplant	Gearbox	Transmission
Drawing Pin	Drawing Pin	Thumbtack	Rubber	Eraser	Courgette	Zucchini
Exhaust	Exhaust	Muffler	Gearbox	Transmission	Table Tennis	Ping Pong
Football	Football	Soccer	Table Tennis	Ping Pong	Aubergine	Eggplant
Funfair	Funfair	Carnival	Holiday	Vacation	Bonnet	Hood
Garden	Garden	Yard	Pavement	Sidewalk	Pram	Stroller
Gearbox	Gearbox	Transmission	Exhaust	Muffler	Football	Soccer
Holiday	Holiday	Vacation	Funfair	Carnival	Trolley	Cart
Indicator	Indicator	Turn Signal	Bonnet	Hood	Jug	Pitcher
Injection	Injection	Shot	Plaster	Band-aid	Tarmac	Asphalt
Jug	Jug	Pitcher	Tin	Can	Torch	Flashlight
Pavement	Pavement	Sidewalk	Garden	Yard	Tap	Faucet
Petrol	Petrol	Gasoline	Tarmac	Asphalt	Holiday	Vacation
Plaster	Plaster	Band-aid	Injection	Shot	Exhaust	Muffler
Pram	Pram	Stroller	Trolley	Cart	Tin	Can
Prawn	Prawn	Shrimp	Biscuit	Cookie	Drawing Pin	Thumbtack
Rubber	Rubber	Eraser	Drawing Pin	Thumbtack	Bin	Trashcan
Skip	Skip	Dumpster	Bin	Trashcan	Petrol	Gasoline
Spanner	Spanner	Wrench	Torch	Flashlight	Biscuit	Cookie
Table Tennis	Table Tennis	Ping Pong	Football	Soccer	Cooker	Stove

Tap	Tap	Faucet	Cooker	Stove	Injection	Shot
Tarmac	Tarmac	Asphalt	Petrol	Gasoline	Braces	Suspenders
Tights	Tights	Pantyhose	Braces	Suspenders	Skip	Dumpster
Tin	Tin	Can	Jug	Pitcher	Pavement	Sidewalk
Torch	Torch	Flashlight	Spanner	Wrench	Prawn	Shrimp
Trolley	Trolley	Cart	Pram	Stroller	Spanner	Wrench

Appendix B Stimuli used in Experiment 3

Target	Same meaning		Related meaning		Unrelated	
	Preferred	Dispreferred	Preferred	Dispreferred	Preferred	Dispreferred
Vineyard	Vineyard	Winery	Forest	Woods	Oven	Cooker
Lobby	Lobby	Foyer	Hallway	Corridor	Sink	Basin
Devil	Devil	Satan	Ghost	Poltergeist	Sweeties	Candy
Belly	Belly	Stomach	Spine	Backbone	Corridor	Hallway
Chips	Chips	Fries	Sweeties	Candies	Spine	Backbone
Street	Street	Road	Junction	Crossroad	Cogs	Gears
Jacket	Jacket	Coat	Shawl	Pashmina	Forest	Woods
Sink	Sink	Basin	Oven	Cooker	Ghost	Poltergeist
Burglar	Burglar	Thief	Jester	Fool	Violin	Fiddle
Cogs	Cogs	Gears	Vice	Clamp	Devil	Satan
Accordion	Accordion	Squeezebox	Violin	Fiddle	Junction	Crossroad
Rooster	Rooster	Cockerel	Insect	Bug	Jester	Fool
Forest	Forest	Woods	Vineyard	Winery	Belly	Stomach
Hallway	Hallway	Corridor	Lobby	Foyer	Shawl	Pashmina
Ghost	Ghost	Poltergeist	Devil	Satan	Jacket	Coat
Spine	Spine	Backbone	Belly	Stomach	Chips	Fries
Sweeties	Sweeties	Candies	Chips	Fries	Lobby	Foyer
Junction	Junction	Crossroad	Street	Road	Burglar	Thief
Shawl	Shawl	Pashmina	Jacket	Coat	Insect	Bug
Oven	Oven	Cooker	Sink	Basin	Accordion	Squeezebox
Jester	Jester	Fool	Burglar	Thief	Vineyard	Winery
Vice	Vice	Clamp	Cogs	Gears	Rooster	Cockerel
Violin	Violin	Fiddle	Accordion	Squeezebox	Street	Road
Insect	Insect	Bug	Rooster	Cockerel	Vice	Clamp