

Cross-linguistic Influence Among Dutch-English Bilinguals' Associations to False Cognates

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ABSTRACT

Research among 39 Dutch students of English shows influence of both their languages on each other when performing a word association task involving false cognates. For the task, twelve words were selected that showed both orthographic and phonemic similarity in English and Dutch, but differed in meaning. When performing the experiment in either an exclusively English or Dutch setting, bilingual respondents' associations to these words showed influence from the non-experiment (or "other") language. The same experiment was also conducted among two control groups. While the English controls ($n=27$) showed no or negligible evidence of Dutch influence on their English, the Dutch controls ($n=37$), who were also exposed to English on a daily basis, also showed substantial evidence of English in their associations.

Keywords

bilingualism, dual language activation, cross-language influence, BIA+ model, false cognates.

INTRODUCTION

Scientific investigation in the last twenty years has shed more light on the complexity of co-existing human language systems in the brain. Many studies have shown that both bilinguals' languages are active during any language task (see [1] for a discussion). Such simultaneous activation, or dual activation, naturally results in both language systems affecting each other [2]. The current study investigates how such bilingual language systems influence each other in the domain of false cognates.

BACKGROUND

Past research in the area of false cognates seems to demonstrate conflicting results. Previous investigation has found false cognates can both facilitate respondents' ease in processing words and impede this process depending on the experiment design [3]. These effects can be related to the language context within the experiment. Dijkstra, Van Jaarsveld & Ten Brinke [4] found that Dutch-English bilinguals reacted more slowly to interlingual homographs (words that are spelled

identically between languages) when they had to perform a lexical decision task on these words, and both Dutch and English words were present in the experiment. When only English words were included in the experiment, no such effects were found.

Further research by Elston-Güttler (cited in [5]) and Elston-Güttler, Gunter and Kotz [5] concerning interlingual homographs used priming. German participants with a knowledge of English were presented with English-German homographs. These words functioned as primes either to English target words related to the primes' German language meaning, or to English control words. When the words were presented without a sentence context, participants reacted to following, related targets (linked to the words' German meaning) at faster speeds than to controls. When an English sentence context was included, however, this was not the case. Additionally, a twenty minute German movie before the experiment overrode effects of the English sentence context. After participants watched the movie, homographic words presented within this context would still prime words related to their German meaning. Interestingly, the influence of the movie lasted only for the first fifteen minutes of the experiment [5]. This research suggests that semantic representations from both languages are linked to false cognates, and linguistic context information may mediate the extent to which these representations become active.

The Bilingual Interactive Activation Revised model [6], or BIA+, may further account for how false cognates are processed in the bilingual brain. This model is a model for reading which assumes language non-selective access, i.e. that bilinguals can simultaneously access words from both languages. According to the BIA+ model, words have language tags or labels, but these are activated too "late to affect the word selection process" ([6], p. 186). Therefore, when a person is reading, words with similar forms from both languages are activated until the reader chooses the correct form. When different orthographic representations are activated, they also start to activate their associated phonological and semantic representations, both in the L1 and the L2. Eventually, the whole word is processed, and a decision is made about which word it represents [6].

Factors which influence the strength of which different forms are activated include word frequency and language context. Dijkstra and Van Heuven, the creators of the model, state that more frequently used representations of

words will be activated more strongly. Thus, they postulate that in bilinguals, cross-linguistic effects of the L1 on L2 words will be larger than vice versa, as L1 lexemes have been used more often during an unequal bilingual's lifetime. Moreover, the BIA+ also suggests that sentence context and other contexts may limit which language representations of a word are activated. Dijkstra and Van Heuven hypothesise this may occur in a similar way to how semantic and syntactic information in a sentence limits certain lexical representations from surfacing in a purely monolingual context [6].

Research Question & Rationale

In my experiment, I aimed to further investigate how false cognates and their meanings are stored in the bilingual brain. Previous research by Elston-Güttler [5] suggests that semantic representations from both their languages becomes active when bilinguals are presented with a false cognate in isolation. However, such representations may be activated only subconsciously. My research investigated whether such representations were also activated at a conscious level, and influenced participants' responses in a lexical association task. The question I sought to answer was the following: *Do bilinguals share associations across false cognates that are both homophonic (similar in sound) and homographic (similar in spelling) across languages?*

METHOD

Participants

Two control groups and two groups of bilingual Dutch-English students participated in a short, 8-minute web-based survey. The Dutch controls also had a knowledge of English; the English controls spoke no other language on a daily basis. Dutch controls were admitted for participation if they did not use another language, whether actively or passively, for more than an hour a day. Twenty-seven English-speaking participants (controls), 37 Dutch-speaking participants (controls), and 39 Dutch students of English, further specified here as "bilinguals", participated. The English control group performed the experiment in English, and the Dutch group did so in Dutch. The bilinguals were further differentiated by group, based on whether they did the experiment in English or Dutch. Twenty of them did so in English; 19 did the experiment in Dutch.

Design & Materials

The experiment consisted of two parts, a short, one-minute YouTube movie, and an association test consisting of twelve words. I included a YouTube clip as Elston-Güttler et al. [5] found the language preceding the experiment could affect the extent to which both language representations of the interlingual homographs were activated. Therefore, participants watched a movie in the experiment task language before completing the main part of the experiment, to put them in the correct language mode. The clips I selected had the same subject matter, though the language used in them differed per experiment.

I also selected twelve false cognates for use in a lexical association task. The twelve words included in the experiment were monosyllabic in length, and had a comparable pronunciation across languages. They were also of a similar syntactic class in both languages, or shared at least one syntactic class across languages. The words were taken from previous researches performed in this domain [4] [7] [8] [9] [10], as well as a website that dealt with false cognates [11]. The per million frequencies of the words were extracted using the CELEX database [12]. The words were the twelve listed below. English per million frequencies followed by Dutch per million frequencies of the lemmas are in brackets: *drop* (175; 2), *list* (113; 6), *pink* (48; 6), *stout* (10; 9), *pet* (21; 19), *peer* (39; 10), *pond* (19; 15), *slim* (14; 26), *den* (10; 7), *slot* (8; 72), *stem* (30; 307), and *trek* (4; 58).

Procedure

The survey was preceded by a question to see if respondents met the criteria necessary to participate in the experiment. The participants were then presented with a short, one-minute YouTube clip, as mentioned earlier. After this, each of the twelve words was presented individually. Respondents were asked to write down the first three words they thought of in English or in Dutch for each of these items, depending on the language of the survey. They were asked to provide these associations even if they seemed strange. Further instructions regarding the association task were not specified. After filling in the survey, participants were also asked if they thought of words in English while doing the Dutch experiment, or words in Dutch while doing the English experiment.¹ They were also asked what strategy they employed when they submitted such words - whether they simply ignored them and omitted these words, whether they translated them, or whether they did something else, specified as "other", which they could explain themselves.

Hypothesis & predictions

I expected the following outcomes. Firstly, I hypothesised that the participants would demonstrate some, though limited, influence from the non-experiment language (or "other language") on their associations to false cognates. According to previous research from Elston-Güttler [5] and using the Bilingual Interactive Activation Revised (BIA+) model [6], it would be expected that other-language associations would surface when respondents were associating with false cognates presented in their isolation. However, the experiment was done in one language context, and preceded by a YouTube movie in the same language, and previous research has shown language context within the experiment may also affect the extent to which these associations surface [4] [5] [10]. I therefore expected the amount of other-language associations to be limited.

Furthermore, I expected asymmetrical L1 and L2 other-language influence, which is supported by the BIA+

¹ Monolingual English speakers were asked if they thought of words from another language while doing the experiment. Dutch would have no specific relevance for them.

model [6]. In agreement with the BIA+, I also hypothesised that there would be a difference between the amount of other-language influence among the bilinguals and that of the controls, as the bilinguals used another language more frequently.

Analysis

Coding

After completing the experiment, the results across the groups and languages were compared and scored as follows. I engaged two scorers who were strongly proficient in both English and Dutch to score the words. They were given an Excel sheet with the relevant data, containing two sheets, a sheet with the data from the Dutch experiments, and one with the data from the English experiments². The associations on the sheets were sorted by the twelve stimulus words they belonged to.

The scorers were told to first look at dictionary definitions of the twelve stimulus words. Then, for each association, they had to decide if it proceeded from the other language, relying mostly on their own judgement. An other-language association was specified as an association that came from the meaning of the word in the non-experiment language, or could be predominantly traced to that meaning. They made those words they judged other-language bold. Afterwards, I looked at the words they had rated. If there was a disagreement between them (i.e. one scorer had made the word bold, and one had not) I made a final judgement.

Further Analysis

Subsequently, the amount of other-language influence per participant was counted per word and per group. A percentage score was given, where the amount of other language associations was divided by the amount of total possible associations (3 for each word, and 36 in total)³. In order to see if the differences across group scores were significant, participants' scores across groups were compared using t-tests.

RESULTS

Table 1 shows the group other-language association scores among the four groups, and the standard deviations from these scores between the participants of these groups.

Table 1

Experiment language	Controls	Bilinguals
English (Dutch Assoc.)	1% (0.020)	33% (0.183)
Dutch (English Assoc.)	8% (0.072)	16% (0.120)

² Monolingual English data was also judged for control purposes.

³ I also calculated the amount of other-language influence per word, looking at each individual group. I related this other-language influence to the frequencies of the words in English and Dutch. However, the results of this analysis is less interesting, and due to space constraints I have not included it.

Part of the data, namely that of the Dutch and English controls, could not be established as normally distributed. However, three t-tests were conducted, even though their reliability may be somewhat impeded. These tests showed that other-language associations (Assoc.) for bilinguals in English were higher for the participants doing the survey in English as opposed to those doing the survey in Dutch ($t = 3.514, p = .001$). They also demonstrated that the Dutch bilinguals' had increased other-language associations in comparison to the Dutch controls ($t = 2.503, p = .019$). Lastly, but not surprisingly, a t-test showed a significant difference between the other-language associations of the bilinguals in English and the monolinguals in the same language ($t = 7.865, p < .001$).

All groups, except one, namely the English monolinguals, said they thought of words from another language (either English or Dutch) while doing the experiment. 87% of the Dutch controls did so, and 97% of the bilinguals did so. The prevalence of other-language interference among the respondents can be shown by the following examples. When the bilinguals and controls provided associations to the word *pink* in Dutch, which means "little finger", they also produced associations related to its English sense. For example, their associations included the word "roze" (*the colour pink*) as well as "kleur" (*colour*). In addition, when associating to the English word *slot*, many of the Dutch bilingual respondents produced the words "lock", or "castle", which relate to the Dutch meanings of the term.

When the respondents thought of words from another language, they employed a variety of strategies. Many (66%) translated the words, or in some cases, submitted them in their original form. Others excluded these words from their response entirely (21%). Respondents also combined translating and excluding the words (6%) and some respondents used other strategies (7%), which were often unclear.

DISCUSSION

In this study, I wanted to see if participants consciously produced language associations from another language when doing an experiment in one main language setting. I found that participants did indeed produce such associations, and were strongly aware of these other-language representations in their minds. The experiment therefore supports dual language activation, and linked bilingual false cognate representations in the brain. In addition, this study demonstrates that influence from the L1 on the L2 is greater with respect to false cognates, and influence from the L2 on the L1 is higher among advanced bilinguals than among controls. These findings support the BIA+ model.

The results show a marked influence of the other language in an experimental context when one language is active, which was more than was initially expected. It is interesting that this not only applies to the Dutch students of English, who are strongly bilingual, but also to the Dutch controls. Moreover, the participants showed strong effects of language intermixing, with the majority

of participants showing evidence of both English-language and Dutch-language associations for one word. For example, when associating with drop in Dutch, one participant produced the words “snoepje” (*sweet*), “laten vallen” (*fall*) and “nederland” (*The Netherlands*) in succession. The second word which means fall, obviously proceeds from the English meaning of the word, while the first and the third relates to its Dutch meaning. (Drop means licorice in Dutch).

Such mingling may shed more light on how the meanings of false cognates are stored in the bilingual brain. In light of these results, it seems probable that instead of storing false cognate meanings separately, bilinguals attach meanings from both languages to single word representations. Thus false cognate representations in the brain may be linked in a similar way as those of cognates (see e.g. [3] concerning links with cognates). Then, as the BIA+ model explains, syntactic and semantic meaning from the sentence context would help participants to select meaning of words, in a similar manner as monolinguals select meanings from homophones in their own language [6]. Thus, context, rather than language labels, may keep these meanings separate.

While the study demonstrated interesting results, it did have some limitations. As mentioned earlier, not all participants submitted words they thought of from the other language when filling in the survey. This could be attributed to unclear experiment instructions in this area. Additionally, after the experiment was conducted, some of the words were found to have some meaning overlap after all. The words with (potential) meaning overlap were the following: *drop*, *trek*, *stout*, *peer*, and *slot*.

CONCLUSION

In spite of its limitations, the study shows strong evidence that both meanings from a cognate surface consciously in bilinguals' brains when these words are presented in their isolation, and may further elucidate why false cognates are a problematic area for second language acquisition. Teachers should be aware of this, as well as the tendency of language learners to appropriate the meanings of L1 cognates, false or otherwise, into the L2 [13], and this may be an area where specific instruction is necessary. However, this research also demonstrates the L2 may affect the L1 in this domain, even among those who do not study a second language at an advanced level. More research is required to fully comprehend how bilinguals' representations of false cognates are structured in the brain, and how meaning representations to them are stored.

ROLE OF THE STUDENT

While I was supervised by Dr. Van Hout, the idea for the study and the method performed were my own, though of course based on previous research. The method by which other-language influence was counted was suggested by Dr. Verspoor, and t-tests were suggested by Dr. Van Hout. While I conducted and evaluated the results of the study, I also engaged two scorers to help me score the words for other-language influence.

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