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To Put the Plough Before the Cows or To Put the Cart Before the Horse? An Investigation of the Role of Romance Language Knowledge in the Processing of French-Derived Idioms

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LAKE FOREST COLLEGE^[L]_[SEP]

Senior Thesis

To Put the Plough Before the Cows or To Put the Cart Before the Horse?
An Investigation of the Role of Romance Language Knowledge
in the Processing of French-Derived Idioms

by

Maria A. Civitello

April 23, 2020

The report of the investigation undertaken as a
Senior Thesis, to carry two courses of credit in
the Department of Psychology and the Department of Modern Languages

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Abstract

This study investigated whether knowledge of one Romance language facilitates the processing of idioms that have been literally translated into English from another Romance language. There were eleven participants, of whom three were English monolinguals, one was a bilingual speaker of Spanish and English, two were bilingual speakers of English and a Slavic language, and five were English speakers who had studied Spanish. Participants read a list of forty idioms, of which ten were familiar English idioms, ten were less familiar English idioms, ten were literal translations into English of French idioms with a semantic counterpart in English, and ten were literal translations of French idioms with no English counterpart. They then defined each idiom. It was hypothesized that participants with knowledge of Spanish would be better able to guess the meaning of the French idioms than the other participants. Results did not support this hypothesis; however, several promising areas for future study were identified and discussed.

Dedicated to my family

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Over the past several decades, psycholinguists have aimed to explore whether bilinguals and monolinguals demonstrate meaningful differences in their processing of idioms. Additionally, researchers have been interested in whether native speakers differ from non-native speakers in idiom processing. The question of how idiom processing ability might be related to one's linguistic skills, whether as a bilingual, a monolingual, a native speaker, or a non-native speaker, has several important implications for the field of psycholinguistics. For example, by developing a greater understanding of idiom processing in bilinguals and non-native speakers, researchers can learn more about whether different languages are stored in the same area of the brain. They may also attain greater insight into how languages are learned, as well as potential differences between figurative and literal language processing.

Several studies suggest that native speakers may process idioms more efficiently than non-native speakers (Bortfeld, 2003; López, Vaid, Sumeyra, & Chaitra, 2017; Siyanova-Chanturia, Conklin, & Schmitt, 2011). Likewise, several studies have asked participants to process idioms that have been literally translated from one language to another (Blair & Harris, 1981; Carrol & Conklin, 2014; Cieslicka & Heredia, 2017; Pritchett, Vaid, & Tosun, 2016). In these studies, bilingual participants, who are fluent in both the target language and the language from which the idioms were translated, typically show greater performance than monolinguals, who are fluent only in the target language. It should be noted, however, that the results of a 2016 study by Beck and Weber did not provide evidence of significant differences in literally-translated idiom processing between bilinguals and monolinguals.

Taken together, these two groups of studies suggest that native speakers have an advantage over non-native speakers in idiom processing, and that bilinguals may be

better than monolinguals at processing idioms that have been literally translated from another language. These studies lend support to the idea that idiom processing may be positively correlated with one's fluency in the language from which the idiom is derived. However, no major studies have yet examined whether one's knowledge of a particular language can facilitate his or her ability to process idioms that are derived from a closely related language. With that in mind, I designed and carried out a study to assess whether bilinguals who speak English and Spanish, a Romance language, are more likely than bilinguals who speak English and a Slavic language to succeed at guessing the meaning of French-language idioms that have been literally translated into English.

A study by Bortfeld (2003) provides evidence that individuals use a conceptual framework to process idioms; this may provide native speakers, who might be more likely to have a conceptual framework, with an advantage over non-native speakers in processing idioms. The study draws heavily on the work of Gibbs and Nayak (1995), who posited that idioms vary along a continuum of analyzability. According to their theory, "normally-decomposable" idioms are those idioms whose figurative meanings are relatively easily understood from the literal meaning of the phrase. Bortfeld notes that an example of a normally-decomposable idiom might be the expression "to lose one's temper." Abnormally-decomposable" idioms are those idioms whose figurative meanings are metaphorically related to the literal meaning of the phrase; Bortfeld used the idiom "to flip one's lid" as an example of an abnormally-decomposable idiom. Finally, "non-decomposable" idioms are those whose figurative meaning bears little relationship to the literal meaning of the phrase. According to Bortfeld, an example of a non-decomposable idiom might be the phrase "to kick the bucket." Bortfeld aimed to explore the differences in how people process idioms from unfamiliar languages compared to their native

language, in order to understand whether idiom analyzability varies across languages.

In Experiment 1, Bortfeld recruited two graduate students in English literature to categorize a list of 75 English idioms into three groups: normally-decomposable idioms, abnormally-decomposable idioms, and non-decomposable idioms. After that, the study participants, a group of English-language monolinguals, were asked to sort each of these idioms into one of five categories.

Results showed that the normally-decomposable idioms were most often correctly classified, while the participants were fastest at categorizing the abnormally-decomposable idioms. In Experiment 2, two native Latvian speakers categorized 75 Latvian idioms according to the same criteria of analyzability. Another native speaker of Latvian literally translated these idioms into English. Then, a different group of English-language monolinguals sorted the idioms into five categories. Results showed that the normally-decomposable idioms were the quickest to be processed and the most often to be correctly categorized. In Experiment 3, the procedure of Experiment 2 was repeated with speakers of Mandarin. Two native speakers of Mandarin rated the idioms based on their analyzability; then, another native speaker of Mandarin literally translated the idioms into English. A group of English monolinguals then sorted the idioms into five categories. Results were similar to those of Experiment 2; the normally-decomposable idioms were most often correctly sorted and most quickly processed.

Bortfeld concluded that, because English speakers had the most difficulty analyzing non-decomposable idioms in all languages, the results support the notion that people typically try to map figurative language onto a conceptual framework, and when no such framework exists, idiom processing is slowed. Furthermore, Bortfeld argues that her results support the perspective that idiom analyzability occurs along a spectrum. This

study is important to my proposed research because it provides support for the hypothesis that idioms are best understood when they are mapped onto a conceptual framework. It is possible that the presence of a conceptual framework is one of the reasons why native speakers demonstrate an advantage over non-native speakers in idiom processing. My own research will attempt to determine whether knowledge of one Romance language can help individuals to process idioms from another Romance language; if this theory is supported by the evidence, it will be important for me to determine whether the effect was driven by the presence of a conceptual framework for certain idioms across multiple Romance languages.

López et al. (2017) conducted a study that examined whether language brokering experience influences bilinguals' processing of idioms. The researchers define language brokers as individuals who have substantial experience in performing translations for others, generally their close relatives. In the study, researchers recruited 80 Spanish-English bilingual undergraduates and classified them as either "brokers" or "non-brokers." The language brokers were more likely to have Spanish as their native language, more likely to have been born outside the U.S., and more likely to have parents who were born outside the U.S. The participants then read English and Spanish phrases that were either a literal phrase, such as "stinging insect," a metaphorical phrase, such as "stinging insult," or a nonsensical phrase, such as "stinging picnic." Participants then had to rate each phrase according to its plausibility within the context of the sentence in which it appeared.

The researchers hypothesized that both groups of participants would favor literal phrases as the most plausible, but that performance would be more equal across both languages for brokers than for non-brokers.

Results supported this hypothesis, showing that the language brokers performed more equally in both languages, but both types of bilinguals favored literal meanings. The language brokers, who were more likely to be native speakers of Spanish and more likely to be comfortable with the language, performed better on figurative language comprehension than the non-brokers, suggesting that native or highly fluent speakers may have an advantage in idiom processing. One flaw with this experimental design, in my view, is the fact that language brokering experience was a binary choice. This variable may occur along a spectrum: for example, it is possible that some individuals may have had substantial brokering experience early in life, but no longer needs to translate for others. Future studies might aim to compute a “brokering score” for each participant in order to capture these nuances.

Finally, evidence from Siyanova-Chanturia et al. (2011) supports the notion that native speakers process idioms more efficiently than non-native speakers. In this study, 36 native and 36 non-native speakers of English were asked to read a series of stories involving either an idiom used with its figurative meaning, such as “at the end of the day” to mean “eventually,” an idiom used with its literal meaning, such as “at the end of the day” to mean “at night,” or a novel phrase. Their eye movements were monitored as they read the story and answered a question about it. After the study, non-native speakers rated their knowledge of the idioms in order to ensure that all participants knew the target idioms well. Results showed that the native speakers were faster at processing idioms than novel phrases, but non-native speakers processed idioms and novel phrases at an equal rate, even when the context favored a figurative interpretation. Non-native speakers demonstrated slowed processing of idioms before the recognition point, or the point at which it becomes apparent that a phrase is an idiom. The researchers concluded that their

results support previous research which showed that native speakers process idioms more quickly than novel phrases; in addition, they concluded that non-native speakers, even when they are highly skilled bilinguals, require more time to process figurative language than native speakers.

On a related note, several studies show that bilinguals have an advantage over monolinguals in processing idioms that have been literally translated from one language to another. For instance, Blair and Harris (1981) were interested in whether bilinguals use their knowledge of both of their languages while processing information. The experimenters recruited 19 Spanish-English bilingual speakers and 19 English monolinguals with no knowledge of a Romance language. The bilingual participants were tested to ensure that their fluency in Spanish and English was roughly equivalent. All participants then heard several types of sentences: a phrase in standard English, an English phrase that used Spanish grammatical rules for adjective placement, and a Spanish idiom that was literally translated into English. After hearing each sentence, participants were asked to note the phonemes, or discrete linguistic sounds such as /b/ and /t/, that they heard in each sentence. They were then asked to recall the meaning of the sentence. The researchers predicted that, if bilinguals are influenced by both of their languages when they process information, they should be faster than the monolinguals at processing the phonemes in the English phrases with Spanish grammar and the literally translated Spanish idioms.

Results showed that the bilinguals had significantly faster reaction times in processing the phonemes in the translated idioms than the monolinguals. The researchers did not observe significant differences between the groups in processing the standard English phrase and the English phrase with adjective placement typical of the Spanish

language. The researchers concluded that the results supported the notion that bilinguals draw on their knowledge of Spanish to access the meaning of the Spanish idioms literally translated into English. It should be noted, however, that the experimental design has one significant flaw: as the researchers acknowledge, the Spanish language proficiency test administered to the bilinguals before the start of the study may have primed participants to consider the study in the context of their knowledge of Spanish. Future researchers should attempt to replicate this experiment with participants whom they know to be highly proficient in Spanish based on prior information, thus eliminating the need to test bilinguals on their Spanish proficiency before the start of the study. Nevertheless, the study provides valuable evidence that Spanish-English bilinguals use their knowledge of Spanish to process idioms that have been literally translated into English.

More recently, a 2017 study by Cieslicka and Heredia likewise found support for the notion that bilinguals rely on their knowledge of both of their languages during idiom comprehension. In this study, the researchers explored whether bilinguals process idioms more quickly than non-idioms, and if so, whether this effect is influenced by second-language proficiency, idiom transparency, or cross-language similarity. Idiom transparency is the extent to which an idiom's figurative meaning can be guessed from its literal meaning, and cross-language similarity refers to whether there are corresponding idioms in both languages. They predicted that dominant bilinguals, or bilinguals who are more proficient in either English or Spanish, rather than being equally proficient in English and Spanish, would process idioms more quickly than novel phrases. In addition, the researchers hypothesized that similar idioms would be easier to process than different ones.

The Spanish and English bilinguals were asked to read several types of idioms.

Some idioms were able to be taken both literally and figuratively, as in the idiom “to get cold feet,” which can literally mean that one’s feet become cold, and figuratively means that one has changed one’s mind. Other idioms were transparent, or understandable based on their literal meaning, as in the idiom “fell on deaf ears.” The remaining idioms were opaque, or unable to be guessed based on their literal meaning, as in the idiom “bite the dust.” The researchers predicted that the Spanish dominant bilinguals would be more biased towards the literal meaning of the ambiguous phrases such as “to get cold feet,” while the English dominant bilinguals would be more biased toward the figurative meaning of these phrases.

Eye-movement analysis of the participants as they read revealed that the participants processed opaque idioms with more difficulty than transparent idioms, and similar idioms were processed more slowly than different idioms. The researchers concluded that their results support the hypothesis that one’s first language has a strong influence over their processing of figurative language in their second language. This study is useful because it examines several dimensions of idiom processing, including transparency and cross-language similarity, while also taking into account the bilinguals’ proficiency.

In addition, a 2016 study by Pritchett, Vaid, and Tosun explored whether bilinguals store idioms in a language-specific way. Russian-English bilinguals read a list of three types of idioms: idioms that exist in both Russian and English, idioms that exist only in English, and idioms that exist only in Russian. Participants were then asked to recall these idioms. The researchers hypothesized that, if idioms are processed in a manner specific to each language, the participants should recall those idioms that occur in Russian and English best, since those idioms would have dual representation in the brain.

The results supported this hypothesis. The researchers concluded that their results support the hypothesis that items with a dual representation in one's memory are more easily recalled than items with a single representation in memory. This may provide bilingual speakers with an edge over monolingual speakers in processing idioms when the idioms have been literally translated from another language.

However, not all studies have found support for the hypothesis that bilinguals process literally translated idioms differently than monolinguals. Beck and Weber (2016) were interested in understanding whether native speakers and bilinguals process idioms similarly. In the first experiment, German-English bilinguals whose native language was German listened to a series of 64 English language target idioms, as well as 104 English filler sentences that were either literal sentences or non-target idioms. 32 of the target idioms produced an equivalent German idiom when directly translated into German; the other 32 target idioms could not be literally translated into a German idiom, but did correspond to a German idiom with a similar meaning. Participants heard each of the sentences, and then saw either a nonsense word or a target word projected onto a screen; their task was to determine whether the word was a real English word or a nonsense word. There were several types of target words: those that were literally related to the sentence, those that were figuratively related to the sentence, and control words. Results showed that the participants were faster at processing target words that were related to the target idioms than they were at processing unrelated target words. In addition, participants were slower at processing figuratively related targets than they were at processing literally related targets. Whether or not the idioms could be literally translated into a corresponding German idiom did not affect reaction times.

In Experiment 2, Experiment 1 was replicated with native speakers of English,

who had no familiarity with German. Results likewise showed that participants were faster at processing related target words than unrelated target words. While participants did process literally related targets somewhat more quickly than figuratively related targets, this effect was not statistically significant. The researchers concluded that their study supports the hypothesis that bilinguals and native speakers process idioms similarly. One potential flaw with their design was possible fatigue effects. Since participants were required to hear 170 sentences and then assess whether the target that followed them was a true English word, it is possible that, as participants grew weary, their performance on later test items declined. Nevertheless, it is important to keep the results of this study in mind as evidence that idiom processing in bilinguals may differ from idiom processing in native speakers.

Drawing on research which suggests that native speakers possess an advantage over non-native speakers in idiom processing, as well as research which suggests that bilingualism can aid idiom processing, I designed the following study. I tested Spanish-English bilinguals, English monolinguals, and bilinguals who speak English and a Slavic language on their comprehension of French-language idioms that have been literally translated into English. Using these three groups enabled me to investigate whether knowledge of one Romance language can facilitate comprehension of idioms from another Romance language, and whether bilingualism in itself can aid in comprehending idioms from a foreign language.

Hypotheses

1. The Spanish-English bilinguals, due to their fluency in a Romance language, will be more successful than the Slavic-English bilinguals and the English

- monolinguals at guessing the meaning of the French idioms. Thus, there will be a main effect of participant language such that knowledge of Spanish increases participants' accuracy at guessing the meaning of French idioms.
2. Both groups of bilinguals will be more successful at guessing the meanings of all types of French-derived idioms than the monolinguals. Thus, there will be a main effect of bilingualism, such that being bilingual aids in the comprehension of idioms derived from a foreign language.
 3. All groups of participants will exhibit greater performance at guessing the familiar English-language idioms over the unfamiliar English-language idioms. Thus, there will be a main effect of idiom familiarity, such that participants will be more likely to correctly guess the meaning of familiar idioms than non-familiar idioms.
 4. All groups of participants will be more successful at guessing the meanings of the transparent French idioms, defined in this context as idioms with a counterpart in English, than the non-transparent French idioms. Thus, there will be a main effect of idiom transparency, such that participants will be more likely to correctly guess the meaning of transparent idioms than non-transparent idioms.

Method

Participants: I initially focused my recruiting efforts on the Lake Forest College campus. I posted flyers advertising the study in multiple buildings on campus, including the Sports Center, the Lillard Science Center, Carnegie Hall, Young Hall, and the Donnelley and Lee Library. I distributed copies to the Department of Residence Life so that they could have a copy posted in every residence hall on campus. I shared

information about my study with Psychology faculty members so that they could let their students know about it; I also told students about my study in person at the Library.

In addition to my efforts to recruit students on campus, I posted about the study in multiple large Facebook groups, including groups for current Lake Forest College students and groups for alumni of my alma mater, Barrington High School. I also used word-of-mouth recruiting, as I informed friends and family of my project and asked that they pass on my information to others.

As my recruitment efforts went on, I noticed that comparatively few Slavic speakers had volunteered for the study. In an attempt to recruit more Slavic speakers, I reached out to several Polish-American organizations in the Chicago area, such as Polish-language schools and daycares. I also contacted the Polish-American Association, the American Association of Teachers of Slavic and Eastern European Languages, and several teachers of Slavic languages at nearby high schools.

In total, eleven (11) participants completed the study. Of these participants, three (3) were classified as English monolinguals, or speakers of English who indicated that they were not fluent in another language and who had had less than four (4) years of study in any living language. One (1) participant was classified as a bilingual speaker of Spanish and English. Two (2) participants were classified as bilingual speakers of English and a Slavic language.

Finally, due to a high rate of participant attrition, I was required to include an additional group of study subjects: English speakers who had experience with the Spanish language. These participants indicated that they had studied Spanish for four or more years, but did not consider themselves fluent in Spanish; five (5) participants were placed into this group. The inclusion of this group was necessary because only one (1) bilingual

speaker of Spanish and English completed the study; therefore, in order to test my hypotheses, I had to expand my group of Spanish speakers to include those who had studied the language, but were not fluent.

Materials:

The study apparatus consisted of forty (40) idioms. Twenty (20) of these idioms were English-language idioms; the remaining twenty were French idioms that were literally translated into English. Participants' task was to determine the figurative meaning of each idiom. The study took place entirely online, through Google Forms.

Of the English-language idioms, half were idioms that are fairly familiar to native English speakers, while the other half were idioms that are relatively unfamiliar to English speakers. To classify the idioms into the familiar and unfamiliar groups, I used results from previous researchers who tested English-speaking participants' familiarity with various idioms (Schweigert, 1985; Tompkins, Boada, & McGarry, 1992).

Of the French-language idioms, half had an English-language semantic counterpart, while the other half did not. French idioms with a counterpart were those that were structured in a similar manner to an English idiom, had the same figurative meaning, and used similar concepts. For instance, the French idiom *mettre la charrue avant les boeufs*, literally translated as "to put the plough before the cows," was considered to have a counterpart in the English idiom "to put the cart before the horse." This is because they each have the same figurative meaning (to perform a task before having taken necessary preparatory steps); they deal with similar concepts (animals and farm equipment); and they are structured in a similar way grammatically.

I classified French idioms with no English counterpart as those idioms that have no English equivalent in meaning or structure. For example, the French idiom *avoir la*

pêche, literally translated as “to have the peach,” means “to be happy.” In researching English and French idioms, I did not find an English idiom that means “to be happy,” deals with the concept of fruit, and is structured similarly to the French idiom. To find the French idioms, I used popular websites in order to ensure that the idioms I chose are commonly used among French speakers; I then checked with an online dictionary to ensure that the idiom definitions were accurate (Huoy, 2020; FluentU; Wiktionary; Wordreference.org).

Therefore, there were ten (10) more familiar English idioms, ten (10) less familiar English idioms, ten (10) French idioms with an English counterpart, and ten (10) French idioms with no English counterpart.

Procedure:

During the study, participants were asked to provide the figurative meaning of each idiom. Each idiom was presented in the context of a sentence that was carefully worded so as not to provide any clues to the idiom’s meaning; for example, the idiom “to hold one’s tongue” was included in the study materials via the sentence “I decided to hold my tongue.” Before starting on the study items, participants were provided with an example test stimulus, answer and explanation based on the popular idiom “tie the knot” (Appendix A). In this example, participants were told that the meaning of the sentence “Quinn and Alex tied the knot” would be “Quinn and Alex got married,” since the idiom “tie the knot” means “to get married.”

After providing a figurative definition for all items, participants submitted their responses and received a window with a debriefing statement. The statement explained the nature of each type of idiom (familiar English, unfamiliar English, French with an English counterpart, and French with no English counterpart) and laid out my hypotheses.

In the statement, I attempted to alleviate participants' possible frustration with the difficulty of the task by reassuring participants that it can be very challenging to determine the meaning of idioms from another language (Appendix B).

After all participants completed the study, the data was coded by a trained coder who was unaware of the participants' groups. (While I did not inform the coder of my hypotheses, I realized after she submitted her codes that the debriefing statement was included with the survey questions that she coded. I therefore cannot guarantee that the coder was blind to my hypotheses).

After the coder submitted her responses to me, I compared her responses and mine to check for discrepancies. In reviewing her responses, I reconsidered some of my own responses, revising my codes accordingly. Through this process, our responses came to overlap significantly, although some differences in our responses were still present.

Results:

For the purposes of these statistical analyses, two groups (Spanish-English bilinguals and English speakers with Spanish experience) were collapsed, since only one individual belonged to the group of Spanish-English bilinguals.

Responses to each test item were coded in SPSS as follows: 0 indicated that both coders marked the participants' response as incorrect, 1 indicated that the coders disagreed as to whether the response was correct or incorrect, and 3 indicated that both coders marked the response as correct. The mode of most test items was 3, indicating that correct responses were most common for these test items. However, eight test items (Item 8, Item 14, Item 24, Item 26, Item 28, Item 32, Item 36, and Item 40) had a mode of 0, indicating that incorrect responses were the most common for these test items. A

significant majority (six) of these items were classified as French idioms with no English counterpart, while the remaining two were classified as unfamiliar English idioms. This pattern of results demonstrates that participants had increased difficulty in defining the French idioms without an English counterpart. In addition, six of these items (Item 8, Item 14, Item 24, Item 28, Item 36, and Item 40) received no code of 3, meaning that all responses to these items were marked as incorrect by at least one coder. The fact that these eight idioms generated primarily incorrect responses, and that six of these idioms did not produce any responses that were reliably coded as correct, suggests that these idioms were particularly difficult for participants.

After test items were coded and analyzed for the mode, I determined intercoder reliability by comparing my scores for each participants' performance on the English and French idioms with the coders. Cronbach's alpha was 0.867 (Table 8) for the ratings of the English idioms and 0.585 for the ratings of the French idioms (Table 9).

I then computed mean total scores for six variables by averaging together my codes with the coder's. The six variables were all French-language idioms, all English-language idioms, French idioms with a counterpart in English, French idioms without a counterpart in English, familiar English idioms, and unfamiliar English idioms. Scores of up to twenty (20) were possible for the all French-language idioms and all English-language idioms, and scores of up to ten (10) were possible for the other variables.

A paired *t* test showed a significant difference in participants' mean scores on French-language idioms and English-language idioms, $t(10) = 10.056, p < 0.001$. Thus, there was a significant effect of idiom language, such that participants' mean scores were significantly higher on the English-language idioms ($X = 17.091, SD = 1.480$) than on the French-language idioms ($X = 10.864, SD = 1.286$) (Table 7).

However, an independent sample t test did not show a significant difference in mean scores on the French-language and English-language idioms between the English monolinguals and the participants with any degree of Spanish knowledge, $t(3.498) = 0.992, p = 0.385$, with equal variances not assumed. Contrary to my hypothesis that Spanish speakers would outperform English monolinguals on the French-language idioms, the participants with at least some experience with the Spanish language had a lower mean score on the French-language idioms ($M = 10.500, SD = 1.265$) than the English monolinguals ($M = 11.500, SD = 1.500$). However, this effect was not significant (Table 2).

Furthermore, contrary to my hypothesis that the Spanish speakers would perform better on the French idioms than the Slavic speakers would, an independent sample t test did not show a significant difference in mean scores between the two groups in their comprehension of French-language idioms, $t(1.582) = 0.444, p = 0.710$, with equal variances not assumed. Interestingly, the Slavic speakers' mean score on French-language idioms ($M = 11.000, SD = 1.414$) was actually higher than the Spanish speakers' mean score ($M = 10.500, SD = 1.265$), although this effect was not significant (Table 3).

Like the Spanish speakers, the Slavic speakers did not exhibit better performance on the French-language idioms than the English monolinguals did, $t(2.390) = 0.378, p = 0.736$, with equal variances not assumed. In fact, the Slavic speakers actually had a lower mean score ($X = 11.000, SD = 1.414$) on the French idioms than did the English speakers ($X = 11.500, SD = 1.500$), although this effect was not significant. Thus, my hypothesis that there would be a significant effect of bilingualism, such that the Spanish speakers and Slavic speakers would perform better on the French idioms than the English

speakers, was not supported (Table 1).

A paired samples t test showed that participants had higher mean scores on the French idioms with English counterparts ($M = 6.727$, $SD = 2.172$) than on the French idioms with no English counterpart ($M = 4.136$, $SD = 2.111$); this difference approached statistical significance, $t(10) = 2.103$, $p = 0.062$ (Table 5). Given the study's small sample size, it is possible that a significant effect of idiom translatability does exist, but simply could not be detected in the present study. Such an effect would support my hypothesis that there would be a main effect of idiom translatability, where participants would score higher on the French idioms when they had a counterpart in English.

In addition, a paired samples t test showed that participants had significantly higher mean scores on the familiar English idioms ($M = 9.546$, $SD = 0.650$) than on the unfamiliar English idioms ($M = 7.546$, $SD = 1.172$), $t(10) = 5.606$, $p < 0.001$. This result supports my hypothesis that there would be a significant effect of idiom familiarity, such that participants would score higher on more familiar English idioms (Table 6).

Discussion:

The present study showed that English speakers scored significantly higher at defining English-language idioms than at defining French idioms that have been literally translated into English. It also supported my hypothesis that participants would score higher at defining familiar English-language idioms rather than less familiar idioms. In addition, the study provided some evidence that English speakers may process French idioms that have a counterpart in English more easily than French idioms that do not have such a counterpart.

Contrary to my hypotheses, this study did not provide evidence that knowledge of

Spanish can help participants in the processing of French-derived idioms, nor did it provide evidence that bilingualism can aid in the processing of these idioms.

The finding that the Spanish speakers had a lower mean score, both on the French idioms and on the English idioms, than the English monolinguals, is intriguing. It is possible that, contrary to my hypotheses, knowledge of the Spanish language may interfere with, rather than facilitate, the processing of French-derived idioms; future studies with a larger sample size should investigate this possibility. However, this possibility must be regarded with caution, as there was a minimal difference in the mean number of idioms correct between the English monolinguals and those with at least some Spanish knowledge. Furthermore, this interpretation is challenged by my finding that the English monolinguals outperformed the English speakers with Spanish experience on both English idioms and French-derived idioms. This suggests a difference in general idiom processing ability between the two groups, rather than a language-specific difference. Of course, chance variation is also a plausible explanation for the difference between the groups, especially given the small sample size, as well as the difference in group sizes.

Notably, there were five idioms (Idiom 8, Idiom 14, Idiom 28, Idiom 36, and Idiom 40) whose responses were all marked incorrect by at least one coder. All but one of these idioms were French-derived and had no counterpart in the English language. Thus, whereas all of the French idioms with an English counterpart were reliably correctly answered by at least one participant, forty percent of the French idioms with no English counterpart were not correctly defined by any participant. This result suggests that participants may have relied on their knowledge of English idioms in attempting to define the French idioms.

One of the strengths of this study is that the test stimuli were varied and extensive, covering familiar English-language idioms, less familiar English idioms, French-language idioms with a semantic counterpart in English, and French idioms with no such counterpart. These test stimuli allowed me to understand how participants' processing of French-derived idioms varied according to whether comparable idioms exist in English. Another strength of the present research was the clear-cut coding criteria, which employed illustrative examples of correct answers in order to ensure a high degree of intercoder reliability. Future studies should seek to maintain these elements while building on this research using a larger sample.

The study's principal limitation was the lack of a large, representative sample of participants from each group. While there were forty-two (42) initial recruits, the study suffered from a high rate of participant attrition. A few recruits did not qualify for the study based on their linguistic background. Other recruits who signed up for the study never completed it, despite my following up with them to remind them about the study. Thus, only eleven (11) recruits ultimately participated. This significant rate of attrition was likely driven by the outbreak of COVID-19 in the United States, which unfortunately coincided with my data collection.

Thus, my study should be regarded as a pilot study, which can help future researchers investigate my hypotheses with a larger sample. In analyzing my results, I have identified several fruitful avenues for future research.

First, future studies should establish whether there is a significant effect of idiom translatability, such that foreign-language idioms with an English counterpart are more easily processed by English speakers than idioms without an English counterpart. My results showed that participants scored higher on French idioms when they had a

semantic counterpart in English; while this effect did not quite reach significance, this may be due to my small sample size, which reduced my power. Future studies should replicate the study with a larger sample size in order to determine whether this effect is really present. If future researchers find that translatability assists in the processing of foreign-language idioms, they can explore reasons why that may be the case, which can shed light on more general cognitive processes associated with idiom comprehension. In addition, future researchers should replicate my study apparatus as applied to other languages. While I did not find evidence to support the hypothesis that knowledge of the Spanish language can facilitate processing of idioms that have been literally translated into English, it is possible that knowledge of another Romance language can aid in the processing of these idioms. For example, the Italian language is closely related to French; future studies might assess whether knowledge of Italian can give participants an edge in determining the meaning of French-derived idioms.

Finally, future researchers should replicate this study with more homogenous groups. My study participants varied according to their education level and degree of fluency in their second language. Several had had some exposure to the French language (defined as less than four years of French study). In addition, two groups (the English monolinguals and the participants with some Spanish experience) were significantly larger than the third group, Slavic speakers. While these inconsistencies were unavoidable, given the high rate of participant attrition as a likely result of COVID-19, they may have adversely affected the study's internal validity.

Therefore, while this study did not support the hypothesis that bilingualism, and Spanish knowledge more specifically, can facilitate the processing of French-derived idioms, it did raise a number of intriguing possibilities for future study, including the

finding that participants may process idioms that have an English semantic counterpart more easily than those that do not. The study should thus be seen as a pilot study to open up exciting new areas of investigation.

Appendix A: Study Directions and Test Stimuli

Study Directions

In this task, you will be asked to state the meaning of certain idioms. Idioms are phrases that have a figurative, or non-literal, meaning. For example, the phrase “kick the bucket” is an idiom. While this phrase’s literal meaning is “to kick a bucket,” its figurative meaning is “to die.”

For each question, you will be presented with an idiom and asked to give its figurative meaning. (The idiom will appear in bold font, in the context of a sentence; therefore, please define the bolded term for each question). If you do not know the meaning of an idiom, that is all right! Please provide your best guess and move on to the next item. There are forty questions in total.

Example: Please define the idiom in the following sentence: “Quinn and Alex tied the knot.”

People often use the idiom “tie the knot” to mean “to get married.” For example, when someone says, “the couple tied the knot in Hawaii,” they mean, “the couple got married in Hawaii.” Thus, the figurative definition of this idiom is “to get married,” so fill that answer in the space provided.

Again, don’t worry if you do not know the figurative meaning of a given idiom! We only ask that you provide your best guess for idioms you do not know. We highly encourage you to provide a guess for each idiom that you do not know, as this would be very helpful for our research. However, if you cannot provide a guess, you may skip the question without any penalty.

Test Stimuli

Note: For the purposes of this appendix, French-derived idioms are printed in red, and the French idioms that do not have an English counterpart appear with a red asterisk (). The English idioms are printed in black, and the less familiar English idioms appear with a blue asterisk (*).*

1. It's **raining cats and dogs**.
2. The men **chewed the fat**. *
3. **That costs the eyes in your head**.
4. **She arrived like a hair in the soup**. *
5. John's friend told him that **the coast was clear**.
6. Valerie **has a finger in several pies**. *
7. I need to **call a cat a cat**.
8. **I have the peach**. *
9. "That's **a pain in the neck**," said Mike.
10. The trio **upset the applecart**. *
11. We're **cutting hairs in quarters**.
12. Let's **return to our sheep**. *
13. She's **not the only fish in the sea**.
14. Liz has **a few irons in the fire**. *
15. It was **the drop of water that made the vase overflow**.
16. "**Mind your onions**," he said. *
17. I'm **up the creek without a paddle**.
18. Gabriella was **asleep at the switch**. *
19. "**When chickens have teeth**," she replied.
20. Emma has **a blue fear** of heights. *
21. We decided to **hit the road** in the morning.
22. Mark **knows which side his bread is buttered on**. *
23. **The habit does not make the monk**.
24. He **has a hair on his hand**. *
25. Olivia has been feeling **burnt out** lately.
26. "**That's a fine kettle of fish**," her grandmother remarked. *
27. Mr. Smith is **rolling on gold**.
28. He **only sees fire**. *
29. It's **on the tip of my tongue**.
30. You're **a big fish in a small pond**. *
31. My colleague **put the plough before the cows yesterday**.
32. The class **jumped from the rooster to the donkey**. *
33. He **hit the sack** at 11:00.
34. Joe's boss **clipped his wings**. *
35. My cousin eventually **threw the sponge**.

36. Mrs. Jones **fell in the apples** this morning. *
37. The remark **went over her head**.
38. He can **paddle his own canoe**. *
39. John has **a cat in his throat**.
40. Matt **put a rabbit on** Katie. *

Appendix B: Debriefing Statement

Thank you very much for participating in my study! I so appreciate your volunteering your time to assist with my research. The following debriefing statement will explain the purpose of the study and my hypotheses.

As you completed the study, you may have noticed that some of the idioms seemed odd, unfamiliar, or difficult to understand. This is because half of the idioms are French idioms that have been literally translated into English. For instance, the French idiom “poser un lapin à quelqu'un” literally means “to put a rabbit on someone” and figuratively means “to stand someone up.” This idiom was used in the task you completed. Specifically, you were asked to give the meaning of the sentence “Matt put a rabbit on Katie.” The figurative meaning of this sentence would be “Matt stood Katie up.”

I used French-derived idioms such as this one in order to test my hypothesis that knowledge of one Romance language facilitates processing of idioms from another Romance language. Put differently, I wanted to investigate whether people who know a Romance language (like Spanish) would be better able to guess the meaning of French-derived idioms than people who do not know a Romance language.

If you are participating in this study, you fall into one of three groups: either you are bilingual in Spanish and English, you are bilingual in English and a Slavic language, or you speak English and do not speak Spanish or any Slavic language. I hypothesize that Spanish-English bilinguals will, on average, perform better than the Slavic-English bilinguals or the English speakers on this task. This is because Spanish, like French, is a Romance language; I hypothesize that the Spanish speakers' knowledge of one Romance language (Spanish) will aid them in processing idioms from another Romance language (French).

The study questions may have felt difficult at times; that's completely normal! It can be very challenging to guess the meaning of idiomatic expressions from another language. Performance on this task does not in any way reflect on your intelligence or verbal abilities.

Please contact me at civitelloma@mx.lakeforest.edu if you have any further questions or if you would like a summary of my research findings after I've analyzed the data. If you have any concerns about the study, you may also contact Professor Kathryn Dohrmann, Chair, Lake Forest College Human Subjects Review Committee, at dohrmann@mx.lakeforest.edu. Thank you very much again for your participation.

Appendix C: Coding Document

Note: This document presents examples of correct definitions for each test item. The coder was asked to refer to the guidelines in this document as she coded the participants' responses. In general, correct responses should have featured a figurative definition of each idiom rather than another idiomatic phrase (for example, the phrase "it's raining cats and dogs" should have been defined as "it's raining a lot" rather than "it's raining buckets." However, an exception to this rule was made for the French-derived idiom "the drop of water that made the vase overflow." English speakers almost exclusively express this idea by using an idiom of their own (e.g., "the straw that broke the camel's back"), so for this idiom, I instructed the coder that responses taking the form of an idiom would be acceptable.

1. It's **raining cats and dogs**.
 - a. Possible answers might be "it's raining a lot," "it's raining really hard," "it's pouring," or "it's raining so much."
2. The men **chewed the fat**.
 - a. Possible answers might be "the men chatted for a while," "the men had a friendly conversation," or "the men gossiped/talked about old times together." This idiom's meaning ("to chat in a leisurely way, especially at length") is a bit vague, so I would take a range of possible answers that imply a friendly, longer conversation.
3. That **costs the eyes in your head**.
 - a. Possible answers might be "that's really expensive" or "that costs a lot of money;" I would probably accept a response like "that's overpriced" or "that's too expensive" as well.
4. She **arrived like a hair in the soup**.
 - a. Possible answers might be "she came at an inconvenient time," "she arrived at an awkward moment," or even "she was unwelcome when she arrived."
5. John's friend told him that **the coast was clear**.
 - a. Possible answers might be "John's friend told him that it was safe to venture out," "John's friend told him that no one was watching, so it was okay for him to do something that he couldn't do in front of others," or "John's friend told him that there was no danger." This idiom has a slightly less specific meaning than most of the others on this list, so I'd accept a range of responses such as these.
6. Valerie **has a finger in several pies**.
 - a. Possible answers might be "Valerie has a lot going on right now," "Valerie is working on a lot of projects," or "Valerie is involved in a lot of things right now." I would also accept a response like "Valerie has a lot of plans."

7. I need to **call a cat a cat**.
 - a. Possible answers might be “I need to tell it like it is” or “I need to expose something for what it is.” I would also accept a response like “I need to be frank/upfront/honest/blunt.”
8. I **have the peach**.
 - a. Possible answers might be “I feel energized/lively/invigorated/excited” or “I have lots of energy/enthusiasm.” I would also accept a response like “I feel great/wonderful/fantastic.”
9. “That’s **a pain in the neck**,” said Mike.
 - a. Possible answers might be “that’s annoying/irritating/frustrating/inconvenient” or “that’s hard to do.”
10. The trio **upset the applecart**.
 - a. Possible answers might be “the trio ruined something” “the trio made a mistake,” “the trio caused a disruption,” or “the trio disturbed others.” This idiom likewise has a more vague meaning (“to spoil a plan or disturb the status quo”), so a range of answers are possible.
11. We’re **cutting hairs in quarters**.
 - a. Possible answers might be “we’re splitting hairs,” “we’re being picky,” “we’re getting bogged down in minutiae,” “we’re nitpicking,” or “we’re being overly fastidious.”
12. Let’s **return to our sheep**.
 - a. Possible answers might be “let’s get back to what we were talking about before” or “let’s get back to our main subject.”
13. She’s **not the only fish in the sea**.
 - a. Possible answers might be “she’s not the only person out there for you” or “there are other people, besides her, who you might fall for.”
14. Liz has **a few irons in the fire**.
 - a. Possible answers might be “Liz has too many things to do,” “Liz has too much going on,” or “Liz is overbooked/overscheduled.” I would also accept responses like “Liz is overwhelmed.”
15. It was **the drop of water that made the vase overflow**.
 - a. Possible answers might be “it was the straw that broke the camel’s back” or “it was the last straw.” In English, idioms are very commonly used to express this idea, so it is likely that participants will rely on one of these idioms to define this concept. Another way of putting it might be “this incident was intolerable because it was the latest in a series of annoying incidents.”
16. “**Mind your onions**,” he said.
 - a. Possible answers might be “mind your own business” or “worry about your own problems.”
17. I’m **up the creek without a paddle**.
 - a. Possible answers might be “I’m in a difficult situation,” “I’m in a bind,” or

- “I’m in a bad situation and I don’t have a way out.”
18. Gabriella was **asleep at the switch**.
- Possible answers might be “Gabriella wasn’t paying attention,” “Gabriella wasn’t on the ball,” or “Gabriella was unaware/oblivious.”
19. **“When chickens have teeth,”** she replied.
- Possible answers might be “never in a million years,” “under no circumstances,” or “no way.”
20. Emma has a **blue fear** of heights.
- Possible answers might be “Emma is terrified/extremely afraid of heights” or “Emma has an overwhelming fear of heights.”
21. We decided to **hit the road** in the morning.
- Possible answers might be “we decided to leave in the morning,” “we decided to get out in the morning,” or “we decided to get going in the morning.”
22. Mark **knows which side his bread is buttered on**.
- Possible answers might be “Mark knows who is on his side,” “Mark knows what’s to his benefit,” or “Mark knows what actions are best for him to take.”
23. **The habit does not make the monk**.
- Possible answers might be “you can’t judge a book by its cover,” “you shouldn’t judge someone for how they look,” “what’s on the inside matters,” or “you can’t tell whether someone is a good or bad person based on how they look or dress.”
24. He **has a hair on his hand**.
- Possible answers might be “he is lazy” or “he isn’t staying on top of things.” I would also accept an answer like “he is careless.”
25. Olivia has been feeling **burnt out** lately.
- Possible answers might be “Olivia has been feeling stressed/overwhelmed lately” or “Olivia has been feeling depleted/exhausted lately.”
26. **“That’s a fine kettle of fish,”** her grandmother remarked.
- Possible answers are “that’s a mess,” “that’s a sticky situation,” or “that’s tricky.”
27. Mr. Smith is **rolling on gold**.
- Possible answers might be “Mr. Smith is extremely wealthy” or “Mr. Smith has more money than he knows what to do with.”
28. He **only sees fire**.
- Possible answers might be “he’s being tricked,” “he’s being taken advantage of” or “he’s being taken in.”
29. It’s **on the tip of my tongue**.
- Possible answers might be “I’m waiting to say it,” “I’m tempted to say it,” or “I know what I want to say, but can’t get the words out.”

30. You're **a big fish in a small pond**.
- A possible answer might be "you're a big deal among your peers."
31. My colleague **put the plough before the cows yesterday**.
- Possible answers might be "my colleague jumped the gun yesterday," "my colleague acted hastily yesterday" or "my colleague did not take necessary first steps yesterday."
32. The class **jumped from the rooster to the donkey**.
- Possible answers might be "the class jumped from one topic to the next" or "the class kept changing subjects."
33. He **hit the sack** at 11:00.
- Possible answers might be "he went to bed at 11:00," "he turned in at 11:00," or "he went to sleep at 11:00."
34. Joe's boss **clipped his wings**.
- Possible answers might be "Joe's boss limited Joe's authority," "Joe's boss kept tabs on Joe," or "Joe's boss kept him from doing the things he wanted to do."
35. My cousin eventually **threw the sponge**.
- Possible answers might be "my cousin eventually gave up" or "my cousin eventually decided to quit."
36. Mrs. Jones **fell in the apples** this morning.
- Possible answers might be "Mrs. Jones passed out this morning" or "Mrs. Jones fainted this morning."
37. The remark **went over her head**.
- Possible answers might be "she did not understand the remark's meaning" or "the remark did not get through to her."
38. He can **paddle his own canoe**.
- Possible answers might be "he can take care of himself," "he's self-sufficient/independent," or "he can hold his own."
39. John has **a cat in his throat**.
- Possible answers might be "John has a scratchy throat," "John has a frog in his throat," or "John needs to clear his throat."
40. Matt **put a rabbit on** Katie.
- Possible answers might be "Matt stood Katie up" or "Matt broke his promise to meet Katie."

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