

# A Study of Linguistic Analysis and Native Speaker's Intuition

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**Abstract – The fundamental data source for generative grammarians has been introspective intuitions about well-formedness. Because of the dependence on this one form of data and the haphazard way it is obtained, the empirical foundation for a lot of syntactic theory is called into question. Native (L1) and nonnative (L2) speaker intuitions concerning single word frequency have dominated research into frequency intuition. Much work has to be done on the intuitive perceptions of collocation (or phrasal) frequency in L1 and L2. It was the goal of this research to close the knowledge gap by providing an answer to the following question: When it comes to subjective evaluations of collocation frequency, how do L2 learners and native speakers stack up against one another and across corpora? We asked native Italian speakers and Italian learners to classify 80 noun-adjective pairs as high, medium, low, or extremely low frequency. For the most part, L1 intuitions correlated with corpora for extremely low frequency pairs, but not L2 intuitions. According to the results of mixed-effects modelling, L2 learners' assessments of the four frequency bands were similar to those of native speakers, although there were some discrepancies as well. The research, when taken as a whole, sheds light on the nature of intuitions concerning phrasal frequency in L1 and L2.**

**Key Words – Collocation Frequency; Intuition; Corpus; Native Speakers; L2 Learners; Italian**

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## INTRODUCTION

Few linguists would argue with the emotion expressed in the statement above's first conjunct. The second conjunct suggests that some opponents want to impose arbitrary methodological constraints on linguistics. The opposite is true, according to our argument, since many linguists fail to adhere to data collecting and analytic norms that are universally accepted in other areas. In generative grammar, intuitions, in particular, have been given a special status. As a consequence, complex theoretical frameworks have been built on top of worryingly flimsy empirical data. Over the last half century, linguistic study has relied heavily on two sorts of intuitions. 'Primary intuitions,' or introspective judgments of a language expression's well-formedness or meaning, are what we shall name the first. There are intuitions concerning why a phrase is well-formed (or not) or has the meaning it does, which we call 'secondary intuitions.

Many languages lack dependable corpora, as reported by Alderson (2007). Existing corpora aren't always utilized in language training, even when they are. Since subjective assessments of lexical item frequency differ from objective frequency counts seen in corpora, it would be interesting to see

whether the two could be compared theoretically and practically (Alderson, 2007). Further theoretical research is needed to see whether long-term language users can display correct intuitions regarding the relative frequency of lexical items. Corpus linguists have mostly questioned native speakers' capacity to discern frequency differences in speech. The relative frequency of words, sentences, and structures may only be discerned in very generic terms, according to Hunston (p. 21). According to Stubbs, it is impossible for native speakers to accurately evaluate the frequency and distribution of distinct lexical elements in a language. Ironically, none of these claims (nor any others of a similar kind) was based on actual evidence, but rather on the researchers' personal intuitions.

Several international conferences have lately included vigorous debates on the topic of language analysis. We've restarted this debate in part due to my critique of the Language and National Origin Group's (2004) 'Guidelines for Use of Language Analysis in Relation to Questions of Nationalism in Refugee Cases,' which we'll call the Guidelines from now on. Since they were first released in 2004, these 'Guidelines' have become the standard for many academic institutions. As Fraser (2009) points

out, my critique was unexpected, and he encourages me to produce a paper on the issues I've brought up in previous presentations. That is exactly what I shall accomplish in this piece of writing.

### Primary intuitions

A major objective of linguistics is to identify and define the speaker's "mind/brain," as Chomsky refers to it. This understanding shows itself in all the many ways we use language and can use it. Conversation is the most frequent way people utilise language, although writing is also prevalent (at least in civilised civilizations). Making introspective judgments on the well-formedness or meaning of statements is another way we might utilise language. Even if non-linguists seldom do so consciously, explaining the job and eliciting such judgments from those with minimal formal education is not difficult.

### Secondary intuitions

All discipline's researchers have a sense of what makes a logical explanation. "Typical of all scientific effort," general principles of sparsity and beauty (sometimes only weakly stated) play an essential role in discovery. It is important to note that secondary data should always take precedence over secondary evidence. But this isn't true in every instance of linguistics.

### Earlier studies on the recognition of speaker origin

There has been a lot of discussion regarding how native speakers aren't as good as they believe they are at judging the ethnicity of others. Studies in this field suggest that listeners are most accurate in distinguishing their own dialect, and that accuracy and familiarity with the accents involved are linked. Accuracy degrades as differences become more finely defined. Non-authentic features may cause a decrease in accuracy. Last but not least, listeners' faith in their own judgments is seldom a good indicator of their ability to make accurate predictions. When it comes to recognizing speakers, the same logic applies.

Fraser (2009:125) concludes that "the reliability of such evidence cannot simply be accepted as a matter of course" and that "all native speaker judgments must be evaluated by an appropriately qualified expert," but these conclusions are not new to any linguist employed by a LADO agency. They are based on years of research. One thing all of the researches in her study have in common is that listeners' accuracy varies widely. According to the results, some listeners are better than others in recognizing language varieties, and there are no characteristics that may predict which listeners would do better than others. Speaker identification research has also reached similar outcomes, with people's

capacity to be recognized by their voices differing from one another.

Underlying all of this research is an intriguing idea: native speakers have the capacity to detect subtle differences in their own language. Non-native linguists can't do it on their own, according to these studies, which all start with that premise. To what end would writers of the guidelines, or at least part of them, assume that a linguist with expertise in the appropriate language (varieties) can execute LADO by himself/herself? Language linguists do not have a distinct advantage over native speakers when it comes to identifying differences across languages. Although the practise of making generalizations about languages without first consulting a native speaker may be acceptable in certain places, it is almost always frowned upon. An alternative foundation must be laid for linguists doing LADO. My theory is that the idea of linguists performing LADO must rest on their ability to analyze language, i.e. to extract relevant features from a given sample and compare them to what is already known through previous studies. I can only theorise because proponents of the 'Guidelines' have never mentioned this.

### LITERATURE REVIEW

Fischer, E., Engelhardt, P.E., Horvath, J. et al. (2018), This work offers new methods for analysing philosophical arguments as well as new factual evidence supporting what philosophers call 'critical' ordinary language philosophy. Contextual defeaters and stereotyped assumptions are common in language comprehension. J.L. Austin's *Sense and Sensibilia* was the first work to suggest that philosophical paradoxes may be overcome by identifying the underlying fallacies that arise from stereotyped conclusions drawn from verbal case descriptions that are contextually incorrect. Psycholinguistic research on salience effects helps us understand when and why even very competent speakers make stereotyped inferences that are unsuitable for the situation. This paper examines a well-known paradox about perception (the "argument from illusion") and shows that it relies on stereotypical inferences from appearance-verbs that are contextually inappropriate. It also shows that the conditions we identified as leading to stereotypical inferences that are contextually inappropriate are met in the formulation. Three tests in English, German, and Japanese employ a forced-choice plausibility-ranking exercise to demonstrate the erroneous conclusions drawn. Using a cross-linguistic approach, we can see whether our findings have broader application. Our results provide up new avenues for experimental philosophy that uses "evidence."

Charles Grisot (2018), In this chapter, there are two major parts and a summary at the conclusion. As a starting point, it looks at how grammar books and

pragmatic studies convey the four varieties of verbal tenses (the simple past tense; imperfect; compound past; and the present tense) in the four languages (English, French, Italian and Romanian). Second, it looks at the semantics of Tense, Aktionsart, and Aspect, the three categories that make up the broad concept of verbal tense.

Johnathan Romero-Trillo (2018), There's been an essay published 10 years ago on the topic of the mutualistic link between Corpus Pragmatics and Second Language (henceforth L2) Pragmatics. This article aims to explore that relationship further. The fundamental premise is that a learner must embrace a new social, cultural, and linguistic identity in order to master a second language, and that the problem arises because the pragmatic elements of the second language do not match those of the first language (henceforth L1). When speakers acquire a second language (L2), they often become pragmatically fossilised, meaning they have near-native grammar and vocabulary but limited pragmatic resources. Using corpora has helped recent studies test pragmatic theories with real data and investigate L2 learners' pragmatics. The current study has three goals: (1) describe the theoretical concepts behind the notion of L2 pragmatics with a critical literature survey; (2) describe how corpus pragmatics has an overarching function in L2 pragmatic development; and (3) analyse some essential data. Future study should be suggested with practical consequences for theoretical and applied linguists in the concluding part.

Researchers Anikin et al (2018), Recent studies on human nonverbal vocalisations have aided our knowledge of how people express their emotions via their voice. This study, however, differs from previous ones in that it has concentrated on the emotional interpretation of these signals rather than animal vocalizations. Listeners linked each call type with a restricted, but in some instances rather extensive, spectrum of emotions. The relationship between call type and perceived emotion was systematic but non-redundant. Call type names predicted inferences about caller mood in real time, indicating that acoustic and emotional categorizations are intertwined. When asked to identify the call type before an emotion, participants chose to do so. A triad categorization exercise (Experiment 2) found that classification by call type was more consistent with nonverbal categorization than by emotion, suggesting that the former was more perceptually salient. (Experiment 2) Because of this, it's important to differentiate between nonverbal signals in their overt form and their interpretive interpretation by the perceiver. The acoustic variance within and between calls may thus be precisely modelled, putting human nonverbal vocalization study in line with animal communication research.

In this study, the authors are McFarlane S, Cipolletti Pérez H, and Weissglass C (2016), Research on acquiring a second language has mostly focused on the advantages of being able to communicate in more than one language. We look at the possible benefits of actively thinking in a foreign language in this research. Using the foreign-language effect as inspiration, we've conducted recent experiments that show actively thinking in a non-native language improves reasoning and decision-making (FLE). Some researchers believe that bilinguals might actively contribute to their own happiness and well-being by strategically using a non-native language in decision-making situations. When the FLE has positive results, we also explore the ethics of utilising it as a nudge. In certain cases, this might be helpful for public policy. People are less likely to object to sustainable farming and eating methods (such as eating insects) when they are actively thinking in a non-native language, according to research. Because active thinking in a non-native language seems to work well in certain contexts but may bring cognitive drawbacks under other conditions, we recommend additional study into the FLE.

## **METHODOLOGY**

All data collection was accomplished by means of a questionnaire given online; for this reason, each participant was supplied with a Web link. Although there was no time constraint to finish the questionnaire, participants were asked not to reference anything or anybody and to complete the questionnaire in one go. It is expected that, on average, participants took roughly 15 minutes to complete the questionnaire. They were instructed that the questionnaire was not a language test and that there were no right or incorrect answers. Detailed instructions were supplied both in Italian and English (the work, however, was totally in Italian) (the task, however, was entirely in Italian). The English version of the instructions is available in Appendix S2 in the Supporting Information online.

## **ANALYSIS AND PREDICTIONS**

Participant ratings were given on a 4-point scale: high, medium, low and extremely low frequency for target collocations as previously described. Following is a breakdown of the four different sorts of ratings used throughout the coding process. As an example, the frequency scale goes from highest to lowest as shown in the table. The "I don't know" rating was given to several questions, thus these results (natives = 1.9 percent, intermediate = 8.9 percent, and advanced = 1.8 percent) were not included in the analyses. Previously, we expected that native and nonnative speakers should have more accurate (i.e. corpora-like) judgements about collocation frequency in the high and extremely low frequency bands than the medium frequency regions based on past studies on frequency

intuition. Second, we anticipated that native speakers would outperform nonnative speakers, whereas advanced L2 learners would outperform intermediate L2 learners.

**RESULTS**

**Mixed-Effects Modeling**

With the use of mixed-effects modelling, we investigated how L2 learners and native speakers perceive collocation frequency (e.g., Baayen, Davidson, & Bates, 2008). lme4 (version 1.0–6; Bates, Maechler, and Bolker, 2012) was used, as were lmerTest (version 2.0–6) and languageR (version 2.0–6) to build the model (version 1.4.1, Baayen 2008). The model has the following predictors: (1) the frequency of collocations (Perugia); (2) the frequency of words/words/words 2 (Perugia); (3) the frequency band of collocations (4 = high, 1 = very low); (4) the dispersion of the collocations, as measured by the deviation of proportions (DP) value; (5) the length of Word 1/Word 2 (in characters); (6) proficiency (1 or 2). We also used revisualization to solve the problem of predictor collinearity. We found highly linked predictor pairs (frequency and frequency band,  $r = .6$ ), as well as moderately correlated predictor pairs (Word 1 frequency and Word 1 length,  $r = .3$ ; Word 2 frequency and Word 2 length,  $r = .3$ ) in our research. After that, we residualized the frequency band by comparing its width to its width, the frequency of Word 1 to the length of Word 1, and the frequency of Word 2 to the length of Word 2. Word length had no influence on residualized Word 1 and 2 frequencies ( $r = -.08$ ), thus we eliminated collinearity from this connection such that there was no correlation between residualized Word 1 and Word 2 frequency ( $r = -.08$ ) and Word 1 and Word 2 length ( $r = .08$ ). It was still necessary to residualize frequency against dispersion even though there was no significant correlation ( $r = -.1$ ), so that we could get the influence of frequency not previously accounted for by dispersion. Table 1 provides an overview of the model's variables.

Using the above predictors as independent variables, native and nonnative speaker judgments of collocation frequency as a dependent variable, and participants and items as random effects, we conducted a step-by-step backward model selection procedure (Manning, 2007), removing nonsignificant predictors and only continuing if the likelihood ratio test was nonsignificant. After that, we included interactions between the variables to further refine the model. For this study, we focused on the interplay between proficiency and many factors (natives, intermediate nonnatives, advanced nonnatives). Only when the model fit was considerably better than the prior model, that is, when the likelihood ratio test was associated with a p value lower than .05, were the interactions between the predictors included. A model with three significant

predictors (frequency band, collocation frequency, and word 1 length) and a significant interaction between proficiency and word length was created by using this technique. Proficiency and frequency band, or proficiency and collocation frequency, didn't interact significantly. There are coefficients and p values for the fixed effects in Table 2.

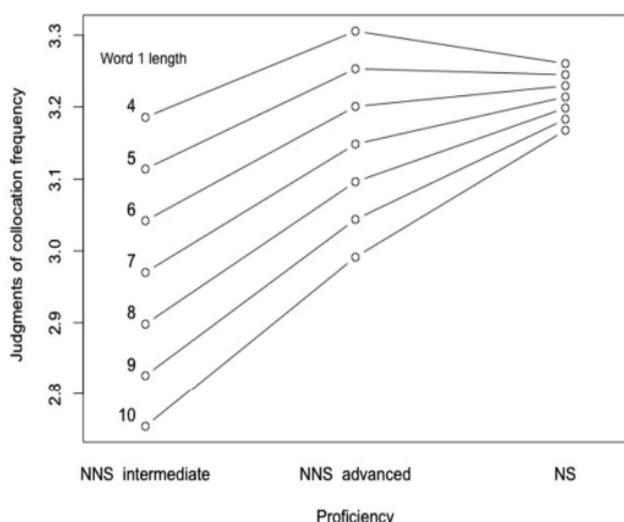
**Table 1 Summary of variables used in mixed-effects modeling, with the adjusted range after residualization shown in parentheses**

Variable	Range (adjusted)	SD	Median
Frequency	0–445 (–70.34–365.62)	84.67	–32.90
Frequency band	1–4 (–2.29–1.23)	0.83	–0.10
Word 1 frequency	16–21783 (–5795–15797)	4751.10	–1463.00
Word 2 frequency	19–11793 (–1704.2–10086.9)	1506.47	–315.40
Dispersion	0.23–0.75	0.14	0.43
Word 1 length	4–10	1.51	6
Word 2 length	4–12	1.99	7

**Table 2 Summary of the model for native and (advanced and intermediate) nonnative speakers' judgments of collocation frequency**

	Estimate	SE	df	t-value	Pr(> t )
(Intercept)	3.414e+00	2.108e-01	1.150e+02	16.200	<2e-16
Frequency band	2.535e-01	7.071e-02	5.600e+01	3.585	0.000709
Frequency Word1 length	2.943e-03	5.418e-04	5.600e+01	5.432	1.26e-06
Proficiency: word 1 length	–7.191e-02	3.119e-02	8.000e+01	–2.306	0.023704
	5.646e-02	1.756e-02	4.796e+03	3.215	0.001311

As a result, the study found that the frequency range of the collocations had a substantial impact on natives' and nonnatives' assessments of collocation frequency. This impact was not attributable to dispersion since the effect of dispersion was somewhat removed from frequency, according to the model. Furthermore, the model indicated that collocation frequency considerably affected native and nonnative participants' perceptions. Figure 1 shows the substantial interaction between proficiency and the length of the first word. This suggests that the length of the first word has a distinct effect on the judgements of natives and nonnatives. It's easy to observe from Figure 1 that native speaker judgements were centred around 3.2, while advanced learners' judgments were spread out (between 3 and 3.3), and intermediate learners' judgments ranged from 2.8 to 3.2. A surprising finding was that Word 1 length did not play a significant role in any of the studies (all ps > 0.05) when the model was performed alone with native speakers, intermediate learners, and advanced speakers (one proficiency group at a time).



**Figure 1** Participants' judgments of collocation frequency as a function Word 1 length (in characters).

Lastly, we were curious in the degree to which the judgements of advanced and intermediate learners were connected with those of nonnative speakers of the language. While both correlations were significant, Spearman tests indicated that advanced L2 judgements had a stronger association with native speaker data ( $r = .89, p.001$ ) than intermediate L2 judgements ( $r = .72, p.001$ ).

**Table 3** Summary of Cohen's  $\kappa$  test statistics examining the agreement between native speakers' (NS) and nonnative speakers' (NNS) judgments and corpora frequency values for the four collocation frequency bands

Frequency band	NS (n = 42)	NNS (n = 42)	NNS intermediate (n = 21)	NNS advanced (n = 21)
High	20	20	18	20
Medium	1	1	3	1
Low	0	0	0	0
Very low	12	1	2	6

Note. The values indicate the total number of target items for which very strong ( $\kappa = .80-1.00$ ), strong ( $\kappa = .60-.79$ ), or moderate agreement ( $\kappa = .40-.59$ ) was found between participants' judgments and corpora frequency bands. Full data are available in Appendix S1 in the Supporting Information online.

## DISCUSSION

By and large, lexicographers and other experts believe that mastery of a term requires much more than just understanding its definition. While certain parts of word knowledge are well understood, others, like intuitions about word frequency or intuitions about collocation frequency, remain a mystery. This is due in part to the fact that intuitions of any type are incredibly difficult to access.

However, there is still much to learn about frequency intuitions from research that has focused on native and nonnative speakers' perceptions of word frequency. This isn't unexpected, given that the most common unit of vocabulary development is a single word. The fact that our mental vocabulary is made up of more than just words have long been recognized by psychologists. American English, according to Jackendoff, has almost the same number of phrasal units as single words, making much of the language we hear every day formulaic.

## Subjective Frequency Judgments

In Richards' (1976) premise of word knowledge, knowing a word also involves knowing the chance of meeting that term in speech or print, as was discussed before in this article. He goes on to say that "for many terms, [we] know the kinds of words most likely to be connected with the word" (p. 79). However, empirical testing of subjective frequency estimates for units bigger than a single word has been done in a surprising amount of ways. However, native and nonnative speaker intuitions concerning collocation (or phrasal) frequency remain mainly studied to date. To close this knowledge gap, researchers looked at people's beliefs about the frequency of collocations in L1 and L2 Italian. Eighty Italian noun-adjective collocations were given to a group of native speakers and (advanced and intermediate) L2 learners, and they were asked to assign a frequency of high, medium, low, or extremely low to each one. Mixed-effects modelling was used to compare the assessments of native speakers with those of nonnative speakers, and judgements of native and nonnative speakers were connected with frequency information generated from corpora.

There was a significant difference between native speakers and nonnatives (advanced and intermediate) when it came to judging the frequency of collocations. Our research found that native and nonnative speakers had similar perceptions of collocation frequency. Individual word frequencies, on the other hand, did not shown to be reliable indicators. A substantial interaction between proficiency and the length of Word 1 (noun) revealed that the three proficiency groups were influenced differentially by the change in Word 1 length, as shown by our findings. For larger and shorter words, the judgements of native speakers seemed unaffected by the length of Word 1. Longer nouns received lower ratings from advanced and intermediate learners, but short nouns received higher ones from advanced and intermediate learners. Neither proficiency nor the length of Word 2 (adjective) interacted significantly.

Despite the fact that mixed-effects modelling indicated similar intuitions regarding collocation frequencies across native and nonnative speakers,

correlation studies revealed some surprising discrepancies. Using corpora of high frequency collocations, we discovered extremely significant correlations between native speaker judgements and nonnative speaker assumptions of collocation frequency. Although intermediate learners had a reduced correlation, it was still very strong. Furthermore, we discovered a lack of agreement between corpus values and the intuitions of medium and low frequency collocations among native and nonnative speakers. Most of the items examined were in moderate to high agreement with past assumptions of collocation frequency only for native speakers when it came to the extremely low frequency range. It follows from this that more experienced language users should outperform those who are less experienced (in comparison to the reference corpus) in this task.

In the extreme frequency ranges, native speakers should display more accurate judgements of collocation frequency than in the two medium frequency bands, we found varying degrees of agreement with the corpora. Our findings imply that only in the two extreme frequency ranges did native speakers have excellent intuitions. The high frequency range was where L2 learners excelled the greatest; their intuitions were on par with those of native speakers. There was considerable agreement in the very low frequency range for six out of 20 items among advanced learners and two out of 20 items among intermediate learners when the L2 group was divided into advanced and intermediate. This means that advanced learners, like native speakers, have the highest accuracy (relatively speaking) in the two extreme frequency bands, who reported that participants had difficulty evaluating the frequency of words in the intermediate frequency range, but were able to reliably evaluate the frequency of words in the very high and very low frequency band. Despite the fact that McCrostie focused on word frequency intuitions while we focused on collocation frequency intuitions, the common pattern of results observed in the two studies is noteworthy and allows us to draw comparisons between the mechanisms involved in subjective word and collocation frequency intuitions.

The findings of this study are not clear-cut, since native speakers showed strong intuitions in the high- and low-frequency bands, but not in the centre. According to Alderson (2007), the frequency with which something is appraised is a critical variable. There is some evidence to support the idea that a language user may find it easier to accurately judge the frequency of something that is extremely common or extremely rare because such items are salient, appearing at opposite ends of the frequency spectrum. Items that are very common or extremely rare may strike a language user as something they've heard countless times or never at all. A middle-of-the-road item is more difficult to assess exactly because it is less prominent and startling

than extremely frequent or rare objects. These ideas hold that speakers' mental representations are controlled by their language use, even if they are speculative. More frequent items have stronger mental representations, whereas less frequent ones have weaker representations. An item's mental representation may be poor because of its rarity.

According to this study's findings, native speakers (and proficient nonnatives) are successful in judging subjective frequencies (and why this might be the case), but quantitative analyses alone cannot answer the question of whether or not this is the case, because their accuracy seems to depend on whether high, low, or medium frequency items are being judged. Perhaps a mix of quantitative and qualitative approaches (such as retrospective interviews) might offer insight on the nature of these selectively correct subjective frequency judgements and the probable tactics used by participants throughout the task (for a similar proposition, see Alderson, 2007). This, on the other hand, will be the subject of more study in the future.

## CONCLUSION

We found that both native and nonnative Italian speakers struggled to judge the frequency of collocations in the two middle categories, based on our research. Conclusion: If the question of whether or not language users have accurate intuitions about collocation frequency can't be answered, it's because the frequency range depends on the frequency range in question, with intuitions about high and low (but not medium and low) frequency items correlating more strongly with corpus data, it appears. A more complex approach to investigating collocation frequency and frequency intuitions has therefore been validated by this research. Though they are not clear-cut, our results should be seen as a start in the right direction toward better understanding subjective frequency estimations. If this study has done anything, it's made a strong argument for why additional study is required in both the context of word knowledge (Schmitt, 1999) and the framework of collocation knowledge (Schmitt & Meara, 1997). After all, if the lexicon includes units higher than the word level, then intuitions about phrasal frequency should be just as important to the study of the mental lexicon as intuitions about word frequency.

## REFERENCES

1. Fischer, E., Engelhardt, P.E., Horvath, J. et al. (2017), Experimental ordinary language philosophy: a cross-linguistic study of defeasible default inferences. *Synthese* 198, pp. 1029–1070. <https://doi.org/10.1007/s11229-019-02081-4>
2. McFarlane S, Cipolletti Perez H and Weissglass C (2016) Thinking in a Non-

- native Language: A New Nudge? *Front. Psychol.* 11:549083. doi: 10.3389/fpsyg.2016.549083
3. Anikin, A., Bååth, R. & Persson, T. (2018), Human Non-linguistic Vocal Repertoire: Call Types and Their Meaning. *J Nonverbal Behav* 42, pp. 53–80. <https://doi.org/10.1007/s10919-017-0267-y>
  4. Romero-Trillo, J. (2018), Corpus Pragmatics and Second Language Pragmatics: A Mutualistic Entente in Theory and Practice. *Corpus Pragmatics* 2, pp. 113–127. <https://doi.org/10.1007/s41701-018-0031-5>
  5. Grisot C. (2018) The Linguistic Expression of Temporal Reference. In: Cohesion, Coherence and Temporal Reference from an Experimental Corpus Pragmatics Perspective. *Yearbook of Corpus Linguistics and Pragmatics*. Springer, Cham. [https://doi.org/10.1007/978-3-319-96752-3\\_1](https://doi.org/10.1007/978-3-319-96752-3_1)
  6. Białek, M., Muda, R., Stewart, K., Niszczoła, P., and Pieńkosz, D. (2019). Thinking in a foreign language distorts allocation of cognitive effort: evidence from reasoning. Preprint 1–51. DOI: 10.31219/osf.io/dnkcz
  7. Díaz-Lago, M., and Matute, H. (2018). Thinking in a foreign language reduces the causality bias. *Q. J. Exp. Psychol.* 72, pp. 41–51. doi: 10.1177/1747021818755326
  8. Gao, S., Zika, O., Rogers, R. D., and Thierry, G. (2015). Second language feedback abolishes the “hot hand” effect during even-probability gambling. *J. Neurosci.* 35, pp. 5983–5989. DOI: 10.1523/JNEUROSCI.3622-14.2015
  9. Geipel, J., Hadjichristidis, C., and Klesse, A.-K. (2018). Barriers to sustainable consumption attenuated by foreign language use. *Nat. Sustain.* 1, pp. 31–33. DOI: 10.1038/s41893-017-0005-9
  10. Geipel, J., Hadjichristidis, C., and Surian, L. (2015a). How foreign language shapes moral judgment. *J. Exp. Soc. Psychol.* 59, pp. 8–17. DOI: 10.1016/j.jesp.2015.02.001
  11. Geipel, J., Hadjichristidis, C., and Surian, L. (2015b). The foreign language effect on moral judgment: the role of emotions and norms. *PLoS One* 10:e0131529. DOI: 10.1371/journal.pone.0131529
  12. Green, D. W. (2011). “Bilingual worlds,” in *Language and Bilingual Cognition*, eds V. Cook, and B. Bassetti, (New York, NY: Psychology Press), pp. 229–240.
  13. Hadjichristidis, C., Geipel, J., and Keysar, B. (2019a). The influence of native language in shaping language and choice. *Prog. Brain Res.* 247, pp. 253–272. DOI: 10.1016/bs.pbr.2019.02.003
  14. Hadjichristidis, C., Geipel, J., and Surian, L. (2019b). Breaking magic: foreign language suppresses superstition. *Q. J. Exp. Psychol.* 72, pp. 18–28. DOI: 10.1080/17470218.2017.1371780
  15. Hayakawa, S., Tannenbaum, D., Costa, A., Corey, J., and Keysar, B. (2017). Thinking more or feeling less? Explaining the foreign-language effect on moral judgment. *Psychol. Sci.* 28, pp. 1387–1397. DOI: 10.1177/0956797617720944

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