



Does language shape the way we think? A review of the Foreign Language Effect across domains.

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Abstract:	<p>Purpose and Research Question This review investigates the influence of the Foreign Language Effect (FLE) on moral decision-making, risk aversion, and causality perception. Recent research indicates that bilinguals employ different decision-making strategies according to the language in use (first vs second language).</p> <p>Methodology Following the PRISMA protocol, we conducted a comprehensive literature review. Our analysis focused on empirical studies, yielding 28 articles that met our inclusion criteria.</p> <p>Findings and conclusions Our findings reveal that participants, when operating in a foreign language context, are more inclined to accept harm for improved outcomes, exhibit reduced risk aversion, and display moderated causal perceptions, particularly in emotionally charged contexts. The variability in study conclusions can be attributed to factors such as age, personality, language proficiency and linguistic characteristics.</p> <p>Significance Our results support previous findings in the FLE, highlight limitations and provide suggestions for future research.</p>

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5 **domains.**
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Abstract

Purpose and Research Question

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Following the PRISMA protocol, we conducted a comprehensive literature review. Our analysis focused on empirical studies, yielding 28 articles that met our inclusion criteria.

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Our findings reveal that participants, when operating in a foreign language context, are more inclined to accept harm for improved outcomes, exhibit reduced risk aversion, and display moderated causal perceptions, particularly in emotionally charged contexts. The variability in study conclusions can be attributed to factors such as age, personality, language proficiency and linguistic characteristics.

Significance

Our results support previous findings in the FLE, highlight limitations and provide suggestions for future research.

Introduction

To what extent can the language in which a problem is expressed be one of the factors that affect our judgements, preferences, morals and decisions? Does presenting information in someone's first language, as opposed to their second language, influence judgement and decision making?

Research on judgement and decision making suggests that two distinct systems are at play in the decision-making process (Stanovich & West, 2000). System 1, often referred to as intuitive decision-making, relies on heuristic shortcuts and provides quick, almost automatic solutions.

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3 In contrast, *System 2*: an analytic, controlled route, a logical and reflexive system which allows
4 us to consider all the different variables of the problem and reach conclusions that go beyond
5 those proposed by our intuition. It is a deliberative system that is slower, more cognitively
6 demanding and costly in terms of mental resources (Kahneman, 2011). Intuitive processes
7 generally support judgements that favour the essential rights of a person (deontological
8 judgements) while rational controlled processes have been seen to support judgements that
9 favour the greater good (utilitarian judgements), regardless of whether or not they violate an
10 individual's rights. (Greene, Nystrom, Engell, Darley & Cohen 2004). The interplay between
11 these systems guides human decision-making, and the balance between intuitive and rational
12 processes can lead to varying types of judgments, whether they are deontological or utilitarian
13 (Bennis, Medin & Bartels, 2010). Emotional reactions to situations can impact the control of
14 intuitive processes, with stronger emotions making control more challenging (Greene,
15 Nystrom, Engell, Darley & Cohen, 2004). It's important to consider how the interplay between
16 the two systems might also influence the emotional responses associated with using a foreign
17 language.

18
19 A foreign language is a language that is not widely spoken or used by the people of a particular
20 place. In other words, it refers to a language that is learned and used outside the environment
21 where the majority of the speakers uses it as a first language (Pavlenko, 2012). Foreign
22 languages are often learnt in particular learning environments with little social use (e.g.,
23 schools, language courses, universities), which are very different from the familiar contexts
24 where first languages are acquired. It has been argued that this could lead to reduced emotional
25 resonance in a person's second language. The use of a second language could imply a reduction
26 in the emotional response in that language, leading to a certain degree of emotional distance
27 (Iacozza, Costa, Duñabeitia, 2017, Costa, Foucart, Arnon, Aparici & Apesteguia, 2014, Costa,
28 Foucart, Hayakawa, Aparici, Apesteguia, **Keysar**, 2014).

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3 Bilinguals themselves report being emotionally affected differently depending on the language
4 they communicate in. (Marian & Kaushanskaya, 2008). But what are bilinguals? Bilingualism
5 has long been regarded as the equal mastery of two languages, the native-like control of them
6 both (Bloomfield, 1935). On the linguistic level, the common myth is that bilinguals have equal
7 and perfect knowledge of their languages (Grosjean, 2010, 2013). However, it is now more and
8 more recognized (Wei, 2020) that a bilingual or multilingual speaker uses different languages
9 for different purposes, in different contexts, with various degrees of proficiency to
10 communicate with other speakers. In this context, Mackey's (2000) suggestion that
11 bilingualism should be considered as something relative gains significance. It is extremely
12 difficult, if not even impossible, as Baker (Baker, 2006) has pointed out, to define precisely
13 who is or is not bilingual. Language ability is typically measured in two active parts, speaking
14 and writing, and two passive parts, listening and reading. While a balanced bilingual or
15 multilingual has very similar abilities in his/her own languages, most bilinguals and
16 multilinguals around the world know and use their languages in varying proportions. Many
17 researchers have categorised bilinguals according to when their foreign language was acquired
18 (e.g., Bialystok & Hakuta, 1999; Birdsong, 1992; Genesee & Nicoladis, 1995; Flege, 1999).
19 *Simultaneous bilingualism* occurs when children are exposed to two languages from a very
20 early age. *Early bilingualism* occurs when a child begins learning a second language after the
21 first language is at least partially established, usually before the age of 12. This type of bilingual
22 speaker usually reaches a native-speaker level of competence in the second language. In the
23 case of *late bilingualism*, people begin learning their second language after they have already
24 completed the acquisition of their first language. They are defined as late bilinguals because
25 second language acquisition usually occurs during adulthood. Although it is generally believed
26 that acquiring a second language early is better than late (e.g., de Houwer, 2005; Fabbro, 2004)
27 it was actually shown that adults can learn a second language more quickly than children
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(Hudson Kam & Newport, 2005). It might be hard to notice the difference between the above types of bilinguals for a casual observer. This is because all types of bilingual people can become fully proficient in a language regardless of the above. Furthermore, there has been controversy in the study of bilingualism (and in regards to the fact that bilingualism may or may not confer an advantage on cognitive development) especially because of all the possible influences that are likely to vary across stages of development from infancy to and through adulthood (Filippi, D'Souza & Bright, Peter, 2017).

Numerous studies have pointed to the existence of the *Foreign Language Effect*, an umbrella term which initially referred to differences in judgements and decision making choices due to the language of instruction, but which has nowadays been extended to more general dissimilarities between first and second language processing in emotionally charged contests (for a review, see Hadjichristidis, Geipel, & Keysar, 2019) The foreign language effect has been explored in three domains.

1) The language in which information is presented can affect people's treatment of losses, gains, and risk. Foreign-language processing can lead to a reduction of loss and risk aversion (Costa, Vives & Corey, 2017). Consistent with this view, foreign language usage has also been seen to affect people's judgments of risks and benefits, reducing the perception of risk and increasing the perception of benefit. Through some experiments on risk aversion (Costa, et al., 2014) it has been shown human beings tend to prefer safer options. The emotional reaction that triggers risk aversion was less intense when the problem was described in the foreign language.

2) Foreign-language contexts can affect the way we make sense of the events we encounter in the world. In particular, foreign-language processing has been seen to reduce illusory correlations and illusions of causality. The illusion of causality is rooted in basic associative processes and the current debate has to do with the nature and underlying mechanisms of the

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3 foreign language effect. Some experiments (Díaz-Lago & Matute, 2019) have aimed to
4 investigate the impact of a foreign language on the causality bias (i.e., the illusion that two
5 events are causally related when they are not) starting from the prediction that using a foreign
6 language could reduce the illusions of causality. In these experiments, participants who
7 performed the task in their first language replicated the illusion of causality effect, whereas
8 those who performed the task in their second language were more accurate in detecting that the
9 two events were causally unrelated. According to the authors, presenting the information in a
10 foreign language could be used as a strategy to debias individuals against causal illusions,
11 facilitating more accurate judgements and decisions.
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25 3) The third domain concerns how language affects people's choices in morality. In particular,
26 foreign-language processing has been seen to prompt more utilitarian choices than first-
27 language processing. Costa (Costa et al., 2014) has proposed that using a foreign language
28 increases utilitarian choices and in general, that a foreign language elicits less intense emotional
29 reactions relative to a native language. According to him, such reduced emotionality promotes
30 a more reasoned, controlled process that leads to a utilitarian choice. Moral judgements in a
31 foreign language would then be less affected by the emotional reactivity elicited by a dilemma.
32 When faced with moral dilemmas in a foreign language, utilitarian judgments should be more
33 common than in the native language. For example, when presented with the well-known
34 footbridge dilemma, in which saving the life of five people involves actively sacrificing the
35 life of another person (Foot, 1978; Thomson, 1986), people are more willing to make this
36 sacrifice if the dilemma is presented in a foreign language (Costa, et al., 2014). This
37 phenomenon has been replicated with several first and foreign languages (Cipolletti,
38 McFarlane, & Weissglass, 2016; Geipel, Hadjichristidis, & Surian, 2015a), showing that
39 it is not restricted to specific languages or cultures (see also Geipel, Hadjichristidis, &
40 Surian, 2016). What has also emerged is that people tend to judge the wrongness of moral
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3 violations (i.e., actions that break moral or social norms but have no tangible
4 consequences) less harshly when the transgressions are presented in a foreign language (Geipel,
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6 et al., 2015b).
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11 As mentioned above, our choices are the product of the interaction between intuitive and
12 deliberative processes and language has been seen to alter this relationship. Research has seen
13 the use of a second language implying a reduction in the emotional response in that language,
14 leading to a certain degree of emotional distance (Iacozza, et al., 2017, Costa, Foucart,
15 Hayakawa, Aparici, Apesteguia, Heafner, Keysar., 2014). This reduced emotional resonance
16 within a particular context often corresponds to increased emotional regulation. For this reason,
17 the use of a foreign language has been observed to alter the emotional impact of conveyed
18 messages (Keysar, Hayakawa & An, 2012; Gross, 2012). For this reason, people might be more
19 rational and logical in a situation involving their second language (e.g., Costa et al., 2014). The
20 use of a foreign language influences the intuitive route (System 1 decision making). It
21 attenuates emotions and softens the activation of moral and socio-cultural norms. It influences
22 moral judgement through a deactivation of moral norms, and it affects the perception of risk
23 and benefit through an attenuation of negative feelings.
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42 This issue has many important social, political and economic implications in our globalised
43 world, as many people make important decisions on a daily basis in both their first, second or
44 additional languages. For instance, immigrants face personal moral dilemmas in their second
45 language every day, sometimes dilemmas with very important possible consequences. Second
46 languages are used daily in international, multilingual forums such as the UN, the EU, large
47 investment firms and international corporations. (Costa et al., 2014). Awareness on the impact
48 of the nativeness of the language on moral dilemmas is fundamental to making more informed
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3 choices. Increasing awareness of the impact of using a foreign language may help us check our
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5 decision making context and make choices that are based on the things that should really matter.
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9 Some evidence suggests that variables may affect this reduction in emotionality associated with
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11 a foreign-language use, such as language proficiency, age of acquisition, and language distance
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13 (i.e. the degree of difference between a first and a second language; Caldwell-Harris, 2014).
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16 According to Caldwell-Harris (2014), individuals with higher language proficiency in a second
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18 language may experience a more detached emotional response. Additionally, the age of
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20 acquisition has been linked to variations in moral decision-making, with those acquiring a
21
22 second language at an early age exhibiting distinct patterns.
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26 In order to clarify the above issues, we chose to systematically review papers that look at the
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28 existing literature on bilingualism, first and second language use, decision making, foreign
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30 language effect, morals, ethics and emotions.
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32 33 **Method and execution**

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37 In the following section we briefly describe our search, selection, thematic coding and analysis
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39 process.
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43 We followed the PRISMA protocol (Page, McKenzie, Bossuyt, Boutron, Hoffmann, Mulrow,
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45 et al, 2020) as it is considered the most appropriate protocol for relatively narrow research
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47 topics. Steps of identification, screening and inclusion are all detailed in the flowchart in Table
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53 - Search strategy
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3 Accurately searching all possible relevant primary empirical studies is the most crucial step in
4 a systematic review. We took the following steps in order to thoroughly search for the relevant
5 studies:
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- 8 1. Extracting major search terms from the research question
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- 10 2. Identifying the relevant terms, synonyms and alternative spellings for the major search
11 terms that are used in published literature
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- 13 3. Constructing a search string from major search terms to be used in online digital
14 libraries for abstract based search
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- 16 4. Selecting a range of online databases, journals and conference proceedings for
17 searching. The search string was customised for different interfaces of digital libraries
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- 19 5. Managing the results
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34 Based on our main research questions, we have identified the four major terms: L2,
35 bilingualism, decision and moral. From the major search terms, we identified the synonyms
36 and alternative terms (see Table 1).
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42 **Table 1 Synonyms and alternative terms for major search terms**

L2	Bilingualism	Decision	Moral
Second language	Dual language	Choice	Wrong
Foreign language			Ethics

Concatenating the terms, we got a search string that was used to search on abstracts of the relevant papers. The string was modified for different online databases as per requirement while keeping the logical order consistent. We applied the search string on two main databases to ensure that we did not miss any relevant studies. The following databases were selected for our searches. (see Table 2).

Table 2 Selected databases and search engines

Database /search engine	Web link
Scopus	www.scopus.com
Web of Science	www.webofscience.com

Our search string for Scopus was:

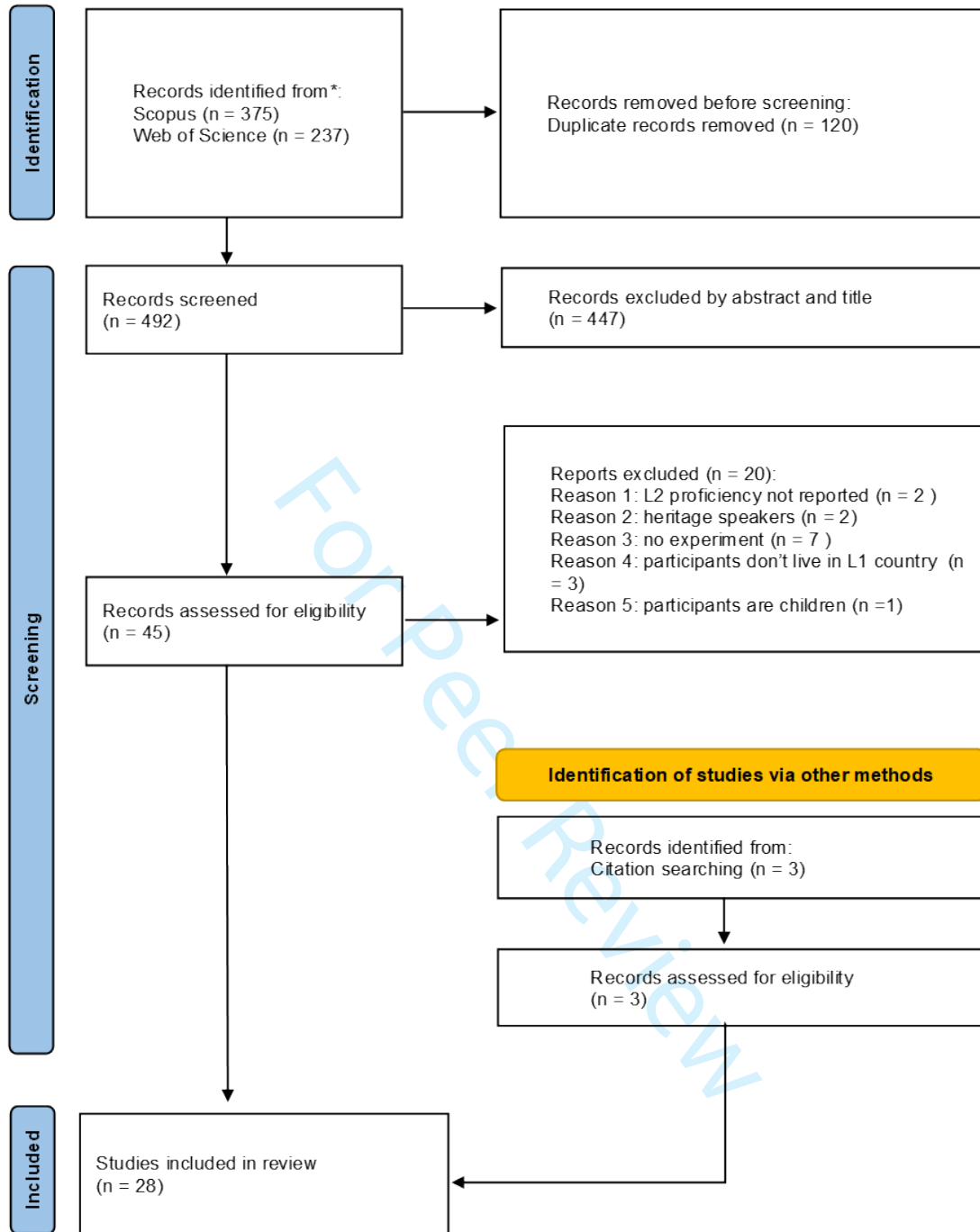
((TITLE-ABS-KEY (moral) OR TITLE-ABS-KEY (wrong) OR TITLE-ABS-KEY (ethic*)) AND (TITLE-ABS-KEY (biling*) OR TITLE-ABS-KEY (l2) OR TITLE-ABS-KEY (second AND language) OR TITLE-ABS-KEY (dual AND language) OR TITLE-ABS-KEY (foreign AND language)) AND (TITLE-ABS-KEY (decision) OR TITLE-ABS-KEY (choice)))

Our search string for Web of Science (WoS) was:

((TS = (moral) OR TS = (wrong) OR TS = (ethic*)) AND (TS = (biling*) OR TS = (l2) OR TS = (second AND language) OR TS = (dual AND language) OR TS = (foreign AND language)) AND (TS = (decision) OR TS = (choice)))

From citation search, we have included 3 more articles.

Figure 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources



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From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>

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Table 3. Papers included in the review.

Authors	Full title	Domain
Driver, MY (2022)	Switching codes and shifting morals: how code-switching and emotion affect moral judgment	Moral decision making
Geipel, J; Hadjichristidis, C; Surian, L (2015)	How foreign language shapes moral judgment	Moral decision making
Čavar F., Tytus A.E. (2018)	Moral judgement and foreign language effect: when the foreign language becomes the second language	Moral decision making
Mills S., Nicoladis E. (2020)	It's easier to kill a baby to save oneself than a fat man to save other people: the effect of moral dilemma and age on Russian-English bilinguals' moral reasoning	Moral decision making
Muda R., Pieńkosz D., Francis K.B., Białek M. (2020)	The moral foreign language effect is stable across presentation modalities	Moral decision making
Shin H.I., Kim J. (2017)	Foreign Language Effect and Psychological Distance	Moral decision making
Corey J.D., Hayakawa S., Foucart A., Aparici M., Botella J., Costa A., Keysar B. (2017)	Our moral choices are foreign to us	Moral decision making
Chan Y.-L., Gu X., Ng J.C.-K., Tse C.-S. (2016)	Effects of dilemma type, language, and emotion arousal on utilitarian vs deontological choice to moral dilemmas in Chinese-English bilinguals	Moral decision making

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4	Brouwer S. (2021)	The interplay between emotion and modality in the Foreign-Language effect on moral decision making	Moral decision making
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10	Brouwer S. (2019)	The auditory foreign-language effect of moral decision making in highly proficient bilinguals	Moral decision making
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17	Costa A., Foucart A., Hayakawa S., Aparici M., Apesteguia J., Heafner J., Keysar B. (2014)	Your morals depend on language	Moral decision making
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25	Romero-Rivas C., López-Benítez R., Rodríguez-Cuadrado S. (2022)	Would You Sacrifice Yourself to Save Five Lives? Processing a Foreign Language Increases the Odds of Self-Sacrifice in Moral Dilemmas	Moral decision making
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32	Geipel J., Hadjichristidis C., Surian L. (2015)	The foreign language effect on moral judgment: The role of emotions and norms	Moral decision making
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39	Geipel J., Hadjichristidis C., Surian L. (2016)	Foreign language affects the contribution of intentions and outcomes to moral judgment	Moral decision making
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45	Maftai A., Holman A.-C., Gancevici O. (2022)	Utilitarian choices in COVID-19 dilemmas depend on whether or not a foreign language is used and type of dilemma	Moral decision making
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51	Hayakawa S., Tannenbaum D., Costa A., Corey J.D., Keysar B. (2017)	Thinking More or Feeling Less? Explaining the Foreign-Language Effect on Moral Judgment	Moral decision making
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4	Białek M., Paruzel-	Foreign language effects on moral dilemma	Moral decision making
5	Czachura M.,	judgments: An analysis using the CNI model	
6	Gawronski B. (2019)		
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10	Bereby-Meyer Y.,	Honesty Speaks a Second Language	Moral decision making
11	Hayakawa S., Shalvi		
12	S., Corey J.D., Costa		
13	A., Keysar B. (2020)		
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18	Costa A., Corey J.D.,	The role of intentions and outcomes in the	Moral decision making
19	Hayakawa S., Aparici	foreign language effect on moral	
20	M., Vives M.-L.,	judgements	
21	Keysar B. (2019)		
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25	Woumans E., Van der	Crime and punishment: Morality judgement	Moral decision making
26	Cruyssen I., Duyck W.	in a foreign language	
27	(2020)		
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32	Caldwell-Harris C.L.,	When using the native language leads to	Moral decision making
33	Ayçiçeği-Dinn A.	more ethical choices: integrating ratings and	
34	(2021)	electrodermal monitoring	
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38	Pan, PP; Patel, C	The Influence of Native Versus Foreign	Risk aversion
39	(2018)	Language on Chinese Subjects' Aggressive	
40		Financial Reporting Judgments	
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44	Vives, ML; Aparici, M;	The limits of the foreign language effect on	Risk aversion
45	Costa, A (2018)	decision-making: The case of the outcome	
46		bias and the representativeness heuristic	
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51	Dylman A.S.,	It's (not) all Greek to me: Boundaries of the	Risk aversion
52	Champoux-Larsson	foreign language effect	
53	M.-F. (2020)		
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57	Hayakawa S., Lau	On the reliability of the foreign language	Risk aversion
58	B.K.Y., Holtzmann S.,	effect on risk-taking	
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4 Costa A., Keysar B.
5 (2019)
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10 Costa A, Foucart A,
11 Arnon I, Aparici M,
12 Apesteguia J (2014)
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Piensa twice: on the foreign language effect
in decision making

Risk aversion

16 Diaz-Lago M, Matute
17 H (2019)
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Thinking in a foreign language reduces the
causality bias

Illusory correlation of
causality

21 Hadjichristidis C,
22 Geipel J, Surian L
23 (2019)
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Breaking Magic: Foreign Language
Suppresses Superstition

Illusory correlation of
causality

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29 - Study selection
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32 Once all the results were obtained from all selected sources, we applied the selection criteria
33 to filter out the irrelevant studies. First, irrelevant papers that were retrieved due to poor
34 performance of search engines were excluded from the results by reading their titles and
35 abstracts. In this group belonged articles on:
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43 - education in general, language teaching and learning strategies, translation and
44 writing skills, language switching and language use;
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48 - religiosity and politics, ethics and morals in domains different to those related to
49 language.
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53 - medicine, medical sciences and business in domains different from those related
54 to language.
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58 - digital world and e-learning.
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- mental imagery
- learning corpora of a FL

Duplicate papers were discarded prior to applying the selection filter. The remaining papers were filtered with the criteria described in table 4.

Table 4 Study selection criteria

Inclusion criteria	Exclusion criteria
Research papers	Book chapters, reviews and meta-analyses
Articles on both 1st/2nd language use and judgement/morals/decision making	Italian dialects and foreign accents
Published in English	Not published in English
Articles published after 2010	Articles published before 2010
Young adults	Elderly population and babies/children
Proficiency levels of participants explicitly reported	Proficiency levels not explicitly reported
Sample of bilinguals living in their L1 country	Heritage speakers, code switching, participants not living in their L1 country

We decided to include research papers, articles on both first and second language use and judgement/morals/decision making, articles that were published in English after 2010, articles

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3 with young adults as participants, articles where the proficiency levels of participants were
4 explicitly reported and articles with samples of bilinguals living in their L1 country.
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8 We decided to exclude book chapters, reviews and meta-analyses, articles that were not
9 published in English, articles published before 2010, articles about elderly population and
10 babies/children, articles about Italian dialects and foreign accents and articles about heritage
11 speakers and code switching.
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19 - Screening
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22 Only articles published in peer-reviewed journals were considered for screening. Through
23 Scopus, n = 375 articles were identified for screening, and through WoS, n = 237 articles were
24 identified. Once duplicates were removed, n = 26 articles were included in the review
25 screening. During a different moment, n = 3 more articles were added through citation search:
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33 - Costa A., Foucart A., Arnon I., Aparici M., Apesteguia J. (2014), Piensa twice: on
34 the foreign language effect in decision making.
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38 - Diaz-Lago M., Matute H. (2019), Thinking in a foreign language reduces the
39 causality bias.
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43 - Hadjichristidis C., Geipel J., Surian L. (2019), Breaking Magic: Foreign Language
44 Suppresses Superstition
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49 **Results**
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52 Results were extracted from n= 28 papers that matched our inclusion/exclusion criteria. These
53 papers ranged from 2010 to 2021 and they all came from peer reviewed journals. We have
54 included research papers, articles on both 1st/2nd language use and judgement/morals/decision
55 making, articles that were published in English after 2010, articles with young adults as
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3 participants, articles where the proficiency levels of participants were explicitly reported and
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5 articles with samples of bilinguals living in their L1 country. We have carried on a qualitative
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7 analysis of the results, as our aim was to depict the current state of the art in a discursive
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9 manner. For clarity reasons, we have divided the results into paragraphs, representing the
10
11 different domains in which foreign language effect has been experimented and some ongoing
12
13 questions and possible explanations. The articles have been grouped into three distinct
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15 domains: Moral decision making, Risk aversion and Illusory correlation of causality (see Table
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17 3). As to Moral decision making, to date, the most widely studied decision making paradigm
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19 used to investigate the FLE are moral dilemmas (e.g., Costa, Foucart, Hayakawa, Aparici,
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21 Apesteguia, Heafner, Keysar, 2014). These refer to scenarios where a participant is required to
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23 choose between two difficult choices, both of which violate some moral principle.
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25 **Additionally, this domain may also encompass scenarios that consider ethical behavior, (e.g.,**
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27 **Bereby-Meyer et al., 2020).** The risk aversion domain deals with decision-making situations
28
29 that involve potential risks, including choices related to financial and health-related matters
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31 (Costa, Foucart, Arnon, Aparici, Apesteguia, 2014). It often delves into individuals' willingness
32
33 to accept harm or take risks in order to maximise outcomes. A risk aversion scenario is a
34
35 situation used to assess how individuals make choices involving risk and potential losses. The
36
37 domain of Illusory Correlation of Causality pertains to instances when people develop the
38
39 belief that there is a causal connection between two events that are actually unrelated (e.g.,
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41 Díaz-Lago & Matute, 2019).

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1. FLE on moral decision making

Recent evidence has suggested that the language (native or foreign) in which moral dilemmas are presented affects subsequent choices. It has been shown that the use of a foreign language, compared to someone's first language, leads to an increase in utilitarian choices in particular

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3 with difficult or emotional scenarios. According to the dual-process theory of moral judgement
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5 (e.g., Greene et al., 2001; 2008), moral judgments result from a competition between two
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7 systems: a fast, intuitive, affective system and a slow, controlled, deliberative system. These
8
9 two systems are linked to two different modes of moral judgement. The intuitive system is
10
11 linked to a deontological mode of moral judgement, which relies on principles such as to avoid
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13 harm intentionally caused to innocent others. The controlled system is linked to a
14
15 consequentialist mode of moral judgement, which involves acting in a manner as to maximise
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17 net benefit. A large body of research on moral decision-making has presented personal and
18
19 impersonal dilemmas to participants. Personal dilemmas can be defined as dilemmas where
20
21 one option includes actively using and sacrificing a human being, in order to save the lives of
22
23 many. It involves some moral violation of another person and causes violation through bodily
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25 harm to someone else directly. In impersonal dilemmas, the option is to more indirectly let
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27 another person die in order to save the lives of many.
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- 34 - Personal dilemmas: the personal dilemmas that have been explored the most in our
35 article selection are the following:
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40 - *Footbridge* (Thomson, 1985): in this dilemma, a runaway trolley is heading down
41
42 the tracks in the direction of five workmen who will be killed if the trolley keeps
43
44 going on its present trajectory. You are on a footbridge over the tracks, in between
45
46 the approaching trolley and the five workmen. Next to you on this footbridge is a
47
48 very fat person. The only way to save the lives of the five workmen is to push this
49
50 stranger off the bridge and onto the tracks below where his body will stop the
51
52 trolley. The stranger will die if you do this, but the five workmen will be saved. Is
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54 it appropriate for you to push the stranger onto the tracks to save the five
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56 workmen?
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- *Crying Baby*: in this dilemma, enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your fellow residents have found refuge in the basement of a house. You can hear the voices of soldiers who are quickly approaching. Your baby begins to cry very loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will attract the attention of the soldiers who will kill you, your child, and the others hiding in the basement. To save yourself and the others you must smother your child to death. Is it appropriate for you to suffocate the child in order to save yourself and the other fellow residents?
 - *Transplant* (Foot, 1967): you are a surgeon and five of your patients need organ transplants. Each of them needs a different organ or they will surely die. You have another patient who is healthy and would be an ideal organ donor. If you transplant his organs (without his will) into the bodies of the other patients, they will live but he will die. Would you perform the transplant?
 - *Vitamins*: you are the leader of a mountain expedition that is stranded in the wilderness. With you, there is a family of six with a genetically caused vitamin deficiency. The other people's kidneys contain large amounts of vitamins. The only way to save the six people is to remove a man's kidney so that the necessary vitamins can be extracted from it. This man will not die, but his health will be seriously compromised. The man doesn't want to do it, but the choice is yours. Is it appropriate for you to remove this man's kidney in order to save the lives of the six vitamin-deficient people?
 - Impersonal dilemmas: the following impersonal dilemmas have also been explored, together with many more:

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- *Trolley - switch*: You are standing near some train tracks and see a runaway trolley quickly approaching a fork in the tracks. On the left of the fork, there is a group of five railway workmen. On the right is a workman who is on his own. If you don't do anything, the trolley will proceed to the left, killing the five workmen. The only way to avoid the deaths of these workmen is to hit a switch that is beside you: this way the trolley will be diverted to the right, killing only one person. Is it appropriate for you to hit the switch in order to save the lives of the five railway workmen?
 - *Lost Wallet*: You are walking down the street when you see a wallet on the ground. You open the wallet and find that it contains several hundred euros in cash as well as the owner's driver's licence. The credit cards and various belongings found in the wallet unmistakably indicate the owner's wealth. Conversely, you have faced financial difficulties recently and could greatly benefit from some extra funds. You consider sending the wallet back to the owner without the cash, keeping the cash for yourself. Is it appropriate for you to keep the money you found in the wallet in order to have more money for yourself?
 - *Fumes*: you are the night guard at the hospital. Due to an accident in the building next door, there are deadly fumes rising up through the hospital. There are three patients in one room and one patient in the other room. The fumes will rise up into the room with three occupants and they will die. The only way to avoid the three patients dying is to hit a certain switch to bypass the fumes into the room with one occupant. This way one patient will die. Is it appropriate for you to hit the switch in order to avoid the death of the three patients?

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3 - Non-moral dilemmas: some non-moral dilemmas have also been explored, mostly in
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5 contraposition with moral dilemmas, here are just some examples:
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9 - *Train or Bus*: You need to travel from one city to another in order to attend a
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11 meeting that starts at a certain time. You can take either the train or the bus. The
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13 train will get you there just in time for your meeting no matter what. The bus is
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15 scheduled to arrive an hour before your meeting, but the bus is occasionally
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17 several hours late due to traffic. It would be nice to have an extra hour before the
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19 meeting, but you cannot afford to be late. Is it appropriate for you to take the train
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21 instead of the bus in order to ensure you are not being late for your meeting?
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26 - *Plant Transport*: You are bringing home many plants from a store that is about 5
27
28 kilometres away from your home. The boot of your car, which you've lined with
29
30 plastic to catch the mud from the plants, will hold most of the plants you've
31
32 purchased. Is it appropriate for you to make two trips home in order to avoid
33
34 ruining the upholstery of your car?
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38 - *Taxes*: you own a small business. One day you find out that you could lower your
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40 taxes by pretending that some of your personal expenses are business expenses. Is
41
42 it appropriate for you to pretend that certain personal expenses are business
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44 expenses in order to lower your taxes?
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48 In all the experiments, some of the above scenarios or similar ones (adapted scenarios) have
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50 been presented to the participants in either their first or second language. Most of the articles
51
52 confirm the presence of a foreign language effect on moral decision making.
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56 The most used scenario was without any doubt the Trolley dilemma, in its personal (*footbridge*)
57
58 and impersonal (*switch*) versions; it has either been used or referred to in all our articles. Costa
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3 et al. (2014, Experiment 1) presented participants in four different countries with the
4 Footbridge problem in various native and foreign languages. They found that those participants
5 who had to answer in their foreign language gave significantly more utilitarian responses than
6 those responding in their native language. In Costa's Experiment 2, the participants were given
7 both the Switch and the Footbridge dilemmas in a native or foreign language. There were two
8 samples: one had English as a native language and Spanish as a foreign language, and the other
9 one had the inverse pattern of languages. The results replicated the effect of language on
10 responses to Footbridge, but found no effect of language for Switch. Cipolletti et al. (2016) and
11 Geipel et al. (2015) replicated these findings. These results reveal that the use of a foreign
12 language leads to increased utilitarianism for particularly conflicting or emotional decisions,
13 but it is not so evident for scenarios that don't evoke such an emotional response. In addition,
14 these findings from diverse and complementary populations allow us to exclude the possibility
15 that the effect is limited to people from certain cultures or with certain native languages.

16
17 One of the first aspects that was quite clear from the experiments that our selected articles
18 brought on, was the high difference in FLE between personal and impersonal moral dilemmas.
19 Previous research suggests that personal dilemmas are experienced differently when compared
20 to impersonal dilemmas (Greene, 2004). When completing personal dilemmas, bilingual
21 participants were more likely to make a utilitarian decision in their second language compared
22 to their first language. In contrast to this, there was no significant difference when completing
23 impersonal dilemmas.

2. FLE on risk aversion

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26 Studies (Circi, Gatti, Russo, & Vecchi, 2021) have shown that the foreign language affects
27 participants' decisions in both the moral decision-making and risk-aversion domains.
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3 Participants in foreign language contexts appeared to be more willing to accept harm in order
4 to maximise the outcomes with a reduction of risk aversion. Foreign language processing seems
5 to lead to a reduction of loss and risk aversion. Consistent with this, foreign language use also
6 affects people's judgments of risks and benefits, reducing the perception of risk and increasing
7 the perception of benefit. Through some experiments on risk aversion (Costa, [et al.](#), 2014), it
8 appears that human beings tend to prefer safer options. When participants were presented with
9 the same experiments in both their native and non native language, they showed less risk
10 aversion and chose the safer option less in the foreign language, eventually choosing the option
11 that was more risky. It seemed that choices made when problems were presented in a foreign
12 language were less subject to intuitive biases. In many published studies (for a review, see
13 [Hadjichristidis, Geipel, & Keysar, 2019](#)) the implications that the FLE could have on political
14 decisions made in those contexts in which most of the people use a lingua franca (i.e., the
15 United Nations or European Parliament) have often been discussed. In order to investigate the
16 boundaries of the foreign language effect on decision making, examining risk aversion in
17 decision making contexts, the most frequently explored situation was the *Asian disease*
18 *problem* (Kahneman & Tversky, 1979). This scenario is one of an epidemic outbreak of an
19 unusual Asian disease that is expected to kill 600,000 people. The government has put out two
20 alternative programs to fight the disease. At this point, the participants are asked to assume
21 some exact scientific estimates of the consequences of the programmes. Here two different
22 versions of the estimates are presented: a gain-frame version and a loss-frame version:
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- 50 - *Gain-frame version*: if programme A is adopted, 200,000 people will be saved. If
51 program B is adopted, there is a one third probability that 600,000 people will be
52 saved and a two thirds probability that no people will be saved. Which program
53 would you favour?
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3 - *Loss-frame version*: if programme A is adopted, 400,000 people will die. If program
4 B is adopted, there is a one-third probability that nobody will die and a two-thirds
5 probability that 600,000 people will die. Which program would you favour?
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11 Research has shown that participants are affected by this wording manipulation when reading
12 the problem in their native language, but not when reading it in their second language (e.g.
13 Keysar et al., 2012). Loss aversion bias appears to be reduced when problems are presented in
14 participants' foreign language. Dylman and Champoux-Larson (2020) have replicated this
15 study with Swedish/English bilinguals (experiment 1a) and Swedish/French bilinguals
16 (experiment 1b) failing to find the reduced effect of framing associated with the foreign
17 language effect when assessing risk in the first group (experiment 1a, Swedish/English
18 bilinguals), likely because the language used has a strong cultural influence in Sweden (Dylman
19 & Champoux-Larson, 2020). The effect was found in the second experiment (experiment 1b).
20 The study was replicated (Costa, et al., 2014) with a slightly different version in which the
21 problem was set in terms of money losses and gains (Study 1). The results were very clear:
22 framing effects were reduced in the foreign language compared to the native language. The
23 loss aversion bias elicited by these problems was reduced when the problem was presented in
24 the foreign language. The conclusion of this study was that foreign language reduced loss
25 aversion.
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45 46 3. FLE and illusory correlations of causality 47 48 49 50

51 Foreign language processing has been shown to reduce illusory correlations and illusions of
52 causality. The illusion of causality occurs when people develop the belief that there is a causal
53 connection between two events that are actually unrelated (Matute, Blanco, Yarritu, Díaz-Lago,
54 Vadillo, Barberia, 2015). Some experiments (Díaz-Lago & Matute, 2019) have explored the
55 impact of a foreign language on the causality bias starting from the prediction that using a
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3 foreign language could reduce the illusions of causality. In these experiments, participants who
4 performed the task in their native tongue replicated the illusion of causality effect, whereas
5 those who performed the task in their foreign language were more accurate in detecting that
6 the two events were causally unrelated. According to the authors, presenting the information
7 in a foreign language could be used as a strategy to debias individuals against causal illusions,
8 facilitating more accurate judgements and decisions. Indeed, the authors posit a thought-
9 provoking implication of their research, suggesting that presenting information in a foreign
10 language might serve as an effective strategy to counteract cognitive biases associated with
11 causal illusions. This linguistic shift appears to act as a recalibration tool, fostering a more
12 objective and accurate evaluation of the relationship between events. By leveraging the
13 cognitive benefits afforded by a foreign language context, individuals could potentially
14 enhance their capacity for sound judgment and decision-making, steering clear of the pitfalls
15 of causal misconceptions.

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34 Furthermore, in three studies (Hadjichristidis, et al., 2019) it was found that reading
35 information in a foreign language can suppress common superstitious beliefs. Participants were
36 asked to imagine they were performing an action under a superstitious circumstance and to rate
37 their emotional response. For instance, participants were asked to imagine that they have an
38 important exam and feel nervous. Before entering the university building, they accidentally
39 walked under a ladder, a circumstance associated with bad luck in Italian culture. The
40 participants were then asked how they would feel about taking the exam under this condition.
41 Similarly, another scenario involved having to submit an important job application on the day
42 your bathroom mirror breaks. This situation is also considered unlucky in Italian culture, and
43 participants were asked to rate how they would feel about submitting their job application under
44 these circumstances. The results of this study revealed that using a foreign language caused
45 participants to experience fewer negative feelings in scenarios associated with bad luck and
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3 fewer positive feelings in scenarios associated with good luck. This provides further support
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5 for the idea that foreign language processing can influence our perceptions and reactions to
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7 various events and beliefs. The findings underscore the malleability of our perceptions and
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9 reactions to cultural superstitions when influenced by the processing nuances of a foreign
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11 language. The observed decrease in negative emotions associated with scenarios traditionally
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13 deemed unlucky in Italian culture, coupled with a reduction in positive feelings linked to
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15 situations considered fortunate, highlights the profound impact that linguistic context can exert
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17 on our emotional responses to various events. In conclusion, the use of a foreign language
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19 emerges as a subtle yet potent tool in the pursuit of clearer, unbiased thinking—a linguistic lens
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21 through which individuals can navigate the complexities of causation with heightened
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23 discernment and precision.
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33 **The role of linguistic proficiency**

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36 One of our exclusion criteria when conducting our literature search in one of the first stages of
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38 the current work, has been linked to language proficiency. We have included only articles
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40 where the proficiency level was explicitly reported. This is because we feel that it is important
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42 to understand if the choices we make in the foreign language can depend to some extent on the
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44 level of proficiency we have in that language. Proficiency levels were in most cases self-
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46 reported. Some experiments have included a quick language quiz and some studies have
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48 requested proof of certification. It has emerged that bilinguals were more likely to make a
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50 utilitarian decision when completing personal dilemmas in their foreign language (compared
51
52 to their native language). Investigating the role of the linguistic proficiency variable, we have
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54 found that participants with a lower proficiency were more likely to give utilitarian responses
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56 (e.g., sacrificing one life to save five) in the foreign language. The effect of language appears
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3 to be moderated by foreign language proficiency (for a review, see Pavlenko, 2017). The higher
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5 proficiency level the participants had in their foreign language, the less likely it has been to
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7 find an effect. It can be assumed that the reason for low proficiency participants making certain
8
9 choices can be associated with a problem of understanding the dilemmas. However, the
10
11 difference in heterogeneity between personal and impersonal dilemmas suggests that, while
12
13 lower linguistic proficiency moderates responding, this pattern is not consistent with lower
14
15 comprehension of the dilemmas. In fact, lower reading proficiency was correlated with the
16
17 percentage of utilitarian choices made in the FL only within personal dilemmas, and not with
18
19 impersonal dilemmas. If comprehension had been the problem, this would not have happened.
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21 As most personal and impersonal dilemmas given to participants have the same cost-benefit
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23 ratio and are very similar in phrasing, lower comprehension would have had similar effects
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25 across both tasks. This is not the case. This suggests an unimportant role of possible
26
27 comprehension issues in the FLE.
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34 ~~One other effect that has been discussed is what happens when we assess participants whose~~
35 ~~first and second language are linguistically similar. According to some authors, no FLE was~~
36 ~~found for moral dilemmas when the language pair was linguistically similar. Dylman and~~
37 ~~Champoux-Larson (2020) have tested Swedish-Norwegian and Norwegian-Swedish bilinguals~~
38 ~~in their Experiment 3. Their results indicate possible boundaries to the FLE and propose that~~
39 ~~factors such as cultural influence and linguistic similarity should be taken into account and that~~
40 ~~these factors might diminish the FLE.~~
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51 **The role of emotion**

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54 According to most of the selected authors, emotion may be a central process within the foreign
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56 language effect. Some suggest that lower proficiency is related to reduced emotionality. We
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58 have found little explanation for this, but previous research suggests that low self-rated (e.g.,
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3 subjective) proficiency may indicate less frequent language use (as suggested by Luk &
4 Bialystok, 2013), less confidence in emotional expression in the foreign language (Dewaele,
5 2008) and therefore, possibly a weaker emotional experience in a foreign language. On the
6
7
8 contrary, frequent use of a foreign language, with many interlocutors, might be linked to higher
9
10 self-reported proficiency and facilitate stronger emotional experience in the foreign language
11
12 (Caldwell-Harris et al., 2011; Dewaele, 2008). A common explanation of the FLE involves the
13
14 reduced emotional impact that words trigger in the foreign language. This is known under the
15
16 name of the *Reduced Emotion Hypothesis* (see Costa et al, 2019 for a review). Bilinguals who
17
18 experience their foreign language as less emotional might be less susceptible to the cognitive
19
20 biases that are associated with System 1 processing. When speaking of moral dilemmas, this
21
22 mechanism is thought to reduce the deontological response, making participants feel less prone
23
24 to sacrificing one person (Hayakawa et al., 2017). One other theory that seems to explain this
25
26 reduced emotional impact in the foreign language is the idea that there is less emotional history
27
28 associated with a foreign language and this results in an emotional distance between the native
29
30 and the foreign language. For this reason, some authors have defined the foreign language as
31
32 “disembodied” (Caldwell-Harris, 2014, Dewaele, 2010, Harris, Gleason & Aycicegi, 2006,
33
34 Pavlenko, 2012). We can assume that, in case the foreign language was learnt outside the
35
36 classroom, in more personal contexts and possibly with some time spent in the country where
37
38 the foreign language is spoken, it is possible that certain types of emotional states might start
39
40 to be associated with the second language. It is possible that this type of emotional effect might
41
42 start to emerge even in native language dominant, unbalanced bilinguals with low proficiency
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44 in the foreign language. Foreign language has been shown to attenuate emotional response to
45
46 words and phrases (for reviews see Caldwell-Harris, 2014; Pavlenko, 2012). It has been found
47
48 that childhood reprimands, such as “Don't do that!”, evoked reduced skin conductance
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50 responses when they were read aloud in a foreign language (Harris, Ayçiçeği, & Gleason, 2003;
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3 Harris, Gleason, & Ayçiçeği, 2006). A study has shown that late bilinguals rated taboo words
4 and swear words as less emotional in a foreign language (Dewaele, 2004; Pavlenko, 2004). It
5
6 has also been suggested that people are more prone to discuss certain topics in their foreign
7
8 language, when they are considered inappropriate in their native language. Bond and Lai (1986)
9
10 demonstrated that Chinese-English bilinguals spoke longer about embarrassing topics such as
11
12 sex, in their foreign language. Dewaele (2010) found that several UK-based multilinguals
13
14 preferred using swear words in a foreign language. Speaking of emotions and risk aversion,
15
16 some of the results we have found are partially consistent with the notion that the foreign
17
18 language effect is only present in decision making contexts in which people's choices are
19
20 driven by an emotional reaction and where emotionality is a key factor (Vives, Aparici, Costa,
21
22 2018). Linguistic contexts (native vs foreign) do not affect people's choices in more
23
24 emotionally neutral scenarios. When problems are emotionally neutral, the involvement of
25
26 heuristic biases in decision making does not seem to be modulated by the language in which
27
28 the problem is presented (Keysar, Hayakawa, & An, 2012). The emotional reaction that triggers
29
30 risk aversion is less intense when the problem is described in the foreign language; thus, foreign
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32 language users tend to prefer more risky options.
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41 The above observations are all consistent with the idea that the FLE arises, at least partially,
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43 as a consequence of a reduction in the emotionality the situation evokes. However, some
44
45 studies have failed to detect an attenuation of emotions (e.g., Ayçiçeği-Dinn, & Caldwell-
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47 Harris, 2009; Eilola, Havelka, & Sharma, 2007; Sutton, Altarriba, Gianico, & Basnight-
48
49 Brown, 2007). In order to sum up the results, it is important to point out that the relative
50
51 emotionality of a foreign language, if compared to the native language, depends on a variety
52
53 of factors (Caldwell-Harris, 2014; Harris et al., 2006) and not only on the emotional context
54
55 in which the foreign language is learned and used . It is also important to say that, within non-
56
57 moral domains, tasks which do not rely on emotion do not reliably show a FLE (e.g.,
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3 Mækela and Pfuhl, 2019, Vives et al., 2018) or show the opposite effect (e.g., Bialek et al.,
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5 2020a).

6 7 8 **Possible explanations of the foreign language effect**

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11 We were able to identify the following possible explanations for the foreign language effect.

12 13 14 15 1. The increased deliberation hypothesis

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20 The existing literature suggests that, because of the metacognitive difficulty that is associated
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22 with completing a task in the foreign language, participants are prone to more deliberative,
23
24 careful thinking (Costa, Corey, Hayakawa, Aparici, Vives, & Keysar, 2019). When bilingual
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26 participants realise that there might be an extra difficulty associated with performing a task in
27
28 their second language, they tend to engage in more deliberative thinking and start System 2
29
30 processes. According to this theory, higher levels of difficulty when reading a text, can result
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32 in more systematic processing of logical reasoning tasks. As processing information in the
33
34 foreign language is usually slower, bilinguals might have to slow down and engage in System
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36 2 processes with a higher utilitarianism as a result.
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42 In conclusion, this hypothesis suggests that the foreign language effect is primarily driven by
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44 an increase in deliberative and careful thinking. When individuals use a foreign language for a
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46 task, they become aware of the added difficulty, leading them to engage in more systematic,
47
48 thoughtful, and slower cognitive processing (System 2 thinking). It is based on the idea that the
49
50 metacognitive challenge associated with using a foreign language prompts individuals to slow
51
52 down and think more deliberately, resulting in more utilitarian decision-making. It posits that
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54 the increased processing difficulty in a foreign language necessitates greater cognitive effort,
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56 which leads to the choice of options with higher utilitarian outcomes.
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2. Controlled processing hypothesis

Foreign language triggers some cognitive and emotional distance, which promotes controlled processes (Costa et al., 2014; Keysar, et al., 2012). This was the result of the experiments on the foreign language effect on the two famous trolley dilemmas (Cipolletti et al., 2016; Costa et al., 2014; Geipel et al., 2014). A very large body of research on moral decision-making has presented two versions of a dilemma to participants. In both dilemmas there is a runaway train that will kill five people unless another person is sacrificed. In the Switch version (Foot, 1978), this can be done by using a lever to switch the train track so that the train will only kill one person. The utilitarian decision requires an inoffensive action, and the death of one person is side damage. In the Footbridge version (Thomson, 1985), the five people can be saved by pushing a heavy man off a bridge, using his body to stop the train. Here the utilitarian option requires a harmful action that involves personal physical contact, and this death is instrumental. Research has shown that people mostly make utilitarian choices in response to the Switch dilemma. However, when presented with the Footbridge version, most people make the deontological choice despite the options being the same. The increase in controlled processing is felt in the footbridge dilemma because this dilemma typically prompts intuitive processing (deontological judgments), but not in the standard trolley dilemma that typically triggers controlled processing (consequentialist judgments).

To sum up, this hypothesis proposes that foreign language use triggers cognitive and emotional distancing, which promotes controlled cognitive processes. It's rooted in the concept that the foreign language creates a psychological separation from the decision at hand. The controlled processing hypothesis is based on research involving moral decision-making dilemmas and it suggests that when individuals use a foreign language, they are more likely to make utilitarian

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3 decisions in dilemmas that typically prompt intuitive, emotionally driven processing. In
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5 contrast, they are less influenced by intuitive processing in dilemmas that typically trigger
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7 controlled, rational processing. This shift towards controlled processing in foreign language
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9 contexts leads to different moral judgments.
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13 3. Abstract mindset hypothesis 14 15 16 17

18 According to this hypothesis, the foreign language triggers an abstract mindset, it influences
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20 moral judgement by affecting mental representation (Costa, et al., 2014; see also Keysar et al.,
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22 2012). A moral situation can be mentally constructed in a more concrete (focusing on how an
23
24 action is performed) or abstract way (focusing on why an action is performed). The use of a
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26 foreign language might influence moral judgement by favouring an abstract mindset (see Costa
27
28 et al., 2014). This hypothesis offers a potential explanation for findings where negative actions
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30 are mitigated by positive contextual circumstances and may also shed light on outcomes in the
31
32 context of classic moral dilemmas like the trolley problem.
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37 4. Intuitive processing hypothesis 38 39 40 41

42 According to this, using a foreign language can distance people from intuition and gut-feelings
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44 (Geipel et al., 2015). The foreign language can influence moral judgements by attenuating the
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46 signals that offensive actions trigger when presented in a native language (see Haidt, 2001).
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48 One of the possible reasons for this might be a reduced mental accessibility of moral and social
49
50 norms (for evidence, see Bond & Lai, 1986; Dewaele, 2012; Gawinkowska, Paradowski, &
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52 Bilewicz, 2013), which are typically learned through social interactions in the native language.
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54 Indeed, memories are language specific and intricately tied to the language in which they were
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56 initially encoded (Marian & Neisser, 2000; Schrauf & Rubin, 2000, 2004). This suggests that
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3 a foreign language may not activate these memories to the same extent as one's native language
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5 does.
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9 Studies on bilingualism and autobiographical memory (e.g., Schrauf & Rubin, 2001, 2004;
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11 Marian & Neisser, 2000; Larsen, Schrauf, Fromholt & Rubin, 2002; Marian & Kaushanskaya,
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13 2007; Schrauf & Durazo-Arvizu, 2006) show that memories are more likely to be retrieved if
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15 they are explored in the language in which the original event was encoded (e.g., Schrauf &
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17 Rubin, 2001, 2004). Normative knowledge is learned by kids early in life through social
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19 interaction (e.g., Shaw & Olson, 2012). In fact, verbal communications about prohibitions and
20
21 obligations (e.g., “Do not scream!”, “Say hi”, “Tidy up”, “Do not push”) are in the native
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23 language and involve the primary caregivers (e.g., Rottman & Young, 2015). As a result, moral
24
25 and social norms may be less activated in a foreign language as compared to one’s first
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27 language. This hypothesis can explain the results of the trolley dilemmas, as well as the
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29 increased lack of severity towards violations of social and moral norms (Geipel et al., 2015).
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31 When presented in a foreign language, intuition sends weaker signals that these actions are
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33 wrong. It can also explain why foreign language decreased confidence in moral evaluations
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35 (Geipel et al., 2015).
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42 5. Language-dependent memory 43 44 45

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47 Some beliefs are typically acquired and used in contexts involving the native language. As a
48
49 result, the native language evokes them more forcefully than a foreign language. Intuitive
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51 thinking is linked to associative memory (Kahneman, 2011; Sloman, 1996) and associative
52
53 memory, in turn, depends on language (Marian & Neisser, 2000; Schrauf & Rubin, 2000).
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55 Marian & Neisser (2000) asked Russian native speakers who later immigrated to the USA to
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57 remember specific life events. When they were interviewed in Russian, they were able to
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59 remember more experiences from the period when they were living in Russia, when they were
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3 interviewed in English, they were able to remember more experiences from the period when
4 they were in the USA. Experiences were strictly linked with the linguistic context where they
5 had happened. For this reason, we can say that the foreign language might elicit memories and
6 emotions less strongly than the native language, in which those emotions had been constructed.
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12 13 **Limitations**

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16 The studies we included in this review are those that met our inclusion and exclusion criterias
17 in order to include comparable studies. We cannot be sure that, with different types of criteria
18 and participants, we would have come to the same conclusions. In the majority of the articles
19 that we have selected, the levels of proficiency in the foreign language were self-reported. It
20 would be important to have articles where more objective proficiency measures are adopted,
21 in order to understand to what extent language proficiency really makes the difference. The
22 context of socialisation where the foreign language has been acquired has rarely been indicated.
23 It would be important to include this aspect in future experiments in order to understand to
24 what extent this is important, especially in relation to emotion. The majority of the studies on
25 moral decision making have only examined the two trolley dilemmas or an adaptation of the
26 dilemmas, which involve severe personal harm and describe a scenario that is distant from the
27 participants' experience (Hare, 1981; Sunstein, 2005) These dilemmas involve a numerical
28 tradeoff (sacrificing one person in order to save more). When answering in the foreign
29 language, having to deal with the extra difficulty, people might have treated the dilemmas as
30 simple maths problems (Bloom, 2011). The results are open to an in-group out-group
31 interpretation (Caldwell-Harris, 2014). When the participants were reading the scenarios in the
32 foreign language, they might have thought that they were reading about people coming from
33 the foreign country where that foreign language is spoken (out-group), whereas who was
34 reading them in the native language might have inferred that they concerned co-nationals (in-
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3 group). Research suggests that feeling socially connected to the characters of a certain scenario
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5 influences moral judgement (e.g., Bloom, 2011; Greene, 2014; Lucas & Livingston, 2014).
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8 9 **Conclusions**

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12 In this paper we have presented the results from the review of the empirical studies of 28 papers
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14 published from 2011 and 2022 that focused on the foreign language effect and moral judgement
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16 and decision making. Our aim has been to provide readers with a broad understanding of this
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18 topic, while emphasising key findings and signalling potential avenues for more in-depth
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20 systematic reviews.
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24 We show that the foreign language affects the domains of moral decision making, risk aversion
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26 and illusion of causality when compared to the native language.
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30 The foreign language made the participants more willing to accept harm in order to maximise
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32 the outcomes, it reduced their risk aversion and moderated their illusion of causality.
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36 The foreign language affected the participants' decisions, inducing them to be more willing to
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38 accept harm in order to maximise their outcomes in the moral decision making domain,
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40 reducing risk aversion in the risk aversion domain and reducing the illusion of causality.
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44 There was some heterogeneity among the conclusion of every article, probably due to several
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46 factors such as age, personality, foreign language proficiency, individual differences, the native
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48 and foreign languages employed.
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52 A moral FLE was more strongly evident in personal dilemmas, if compared to impersonal
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54 dilemmas, especially within the footbridge dilemma. We also observed that the moral FLE is
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56 more strongly evident among bilinguals with lower foreign language proficiency. It has been
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3 discussed how low proficiency can be linked to less frequent language use and hence weaker
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5 emotion in the second language.
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9 There is a shared idea that the FLE should be investigated more in the future, especially outside
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11 the laboratory environment.
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14 In many studies (for a review, see Hadjichristidis et al., 2019) the implications that the FLE
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16 could have on political decisions made in contexts where a certain language (usually English)
17
18 is used as a lingua franca have often been discussed.
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22 It would be interesting to read future work that includes more detailed information about all
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24 the individual differences in bilingualism and language use and immersion. It would be ideal
25
26 to have objective proficiency measures. The context of socialisation is also worth being
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28 analysed.
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