

On language processing shaping decision-making

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## **Abstract**

Recent research reveals that people's preferences, choices, and judgments are affected by whether information is presented in a foreign or a native language. Here, we review this evidence focusing on various decision-making domains and advancing a variety of potential explanations for this foreign language effect on decision-making. We interpret the findings in the context of dual-system theories of decision-making, entertaining the possibility that foreign language processing reduces the impact of intuition and/or increases the impact of deliberation on people's choices. In closing, we suggest future directions to progress in our understanding of how language and decision-making interact when guiding people's decisions.

**Keywords:** Foreign language processing, decision-making, judgment

## **Decision-making machines with talking heads**

We are constantly making decisions, from mundane ones—what to eat or wear—to more relevant ones—undergoing a surgical procedure or enrolling in a retirement plan. In effect, we are decision-making machines. But humans are also talking heads, since we love to tell others about our feelings and ideas. Thus, we are decision-making machines with talking heads. Consequently, we make decisions based on information that is largely communicated linguistically. How do language and decision-making interact when guiding our decisions? We assess this issue exploring how using a foreign or a native language affects our revealed preferences, choices, and judgments. Understanding how our talking heads affect our decisions is fundamental in promoting better and wiser decisions.

In principle, provided that a given message is understood, the language in which information is presented should not be a major factor affecting our decisions. Consider for example that you have to decide between having surgery and going for a more conservative treatment. You are presented with the available information and carefully evaluate the risks and benefits, considering also your preferences. In this context, your decision should be independent of whether you are interacting with a doctor in your native or foreign language. However, this is not the case.

## **Using a foreign language modifies decision-making tendencies**

Our decisions are driven by different forces. One is automatic, intuitive, and cost-free, and the other is more controlled and deliberative (see Evans, 2008 for a review). These processes are constantly at play when we make decisions and do not always favor the same responses or have the same weight on our choices (Kahneman, 2003). Put simply, in some occasions we go with our gut feeling and in others we slow down, thinking twice about the situation and the options at stake. Our reliance on each of these processes depends on several factors such as our mood at a given moment, or how demanding and familiar the situation is (Shiv & Fedorikhin, 1999; see Kahneman, 2011 for a review). Using a foreign language affects the contributions of intuition and deliberation to our decisions—the foreign language effect. This effect has been explored in three domains.

First, the language in which information is presented affects people's treatment of losses, gains, and risk. *Foreign language processing leads to a reduction of loss and risk aversion.* For example, in a foreign language context, people are less sensitive to whether options are presented in terms of gains or losses—they are less affected by the way the problem is framed, showing more consistent preferences. Also, people are more willing to take risks in foreign language contexts, at least for positive expected outcomes. For example, most people prefer a sure outcome of 1€ to gambling with an even chance of winning 2.50€ or nothing. This goes against normative behavior since accepting the gamble has a higher expected value (1.25€) than the sure outcome. Using a foreign language reduces this tendency (see Costa, Foucart, Arnon, Aparici, & Apesteguia, 2014a; Keysar, Hayakawa, & An, 2012). Consistent with this, foreign

language use also affects people's judgments of risks and benefits—reducing the perception of risk and increasing the perception of benefit (Hadjichristidis, Geipel, & Savadori, 2015).

Second, foreign language contexts affect the way we make sense of the events we encounter in the world. In particular, *foreign language processing reduces illusory correlations*. Consider, for example, the Hot Hand fallacy: the tendency to expect a positive outcome after a series of prior positive outcomes, even when the events are independent. Using a foreign language reduces this fallacy effect (Gao, Zika, Rogers & Thierry, 2015). Similarly, foreign language use can also reduce the illusion of causality, where people tend to perceive a causal link between two successive independent events (Díaz-Lago & Matute, 2014).

The third, and perhaps most striking domain in which language affects people's choices, is morality. In particular, *foreign language processing prompts more utilitarian choices than native language processing*. For example, when presented with the well-known footbridge dilemma, in which saving the life of five people involves actively sacrificing the life of another person (Foot, 1978; Thomson, 1985), people are more willing to make this sacrifice when the dilemma is presented in a foreign language (Costa, Foucart, Hayakawa, Aparici, & Apesteguia, 2014b). This phenomenon has been replicated with several native and foreign languages (Cipolletti, McFarlane, & Weissglass, 2015; Geipel, Hadjichristidis, & Surian, 2015a), showing that it is not restricted to specific languages or cultures (see also Geipel, Hadjichristidis, and Surian, 2016). Consistent with this effect, people tend to judge the wrongness of moral transgressions—actions that break moral or social norms but which have no tangible consequences—less harshly when using their foreign language (Geipel, Hadjichristidis, & Surian, 2015b).

To the extent that our choices in these contexts are the product of the interaction between intuitive and deliberative processes, language status seems to alter this relationship. This raises the question of why and how this effect arises.

### **On the origin of the foreign language effect**

The foreign language effect has been interpreted in the context of dual-theories of decision-making. But, how are the contributions of intuitive and deliberative processes affected by language status? Does foreign language use reduce the impact of intuition and/or increase the impact of deliberation? There are reasons to believe that both might be true.

Reading, writing, listening, and speaking in a foreign language are more costly and largely less fluent activities than the corresponding ones in a native language (see Costa & Sebastián-Gallés, 2014 for a review). Although there is still debate about the effects of processing difficulty on decision-making, some authors have suggested that processing difficulty is used as a signal to engage in more thoughtful and deliberative processing, which reduces the effects of intuition (Alter, Oppenheimer, Epley, & Eyre, 2007; Gervais, & Norenzayan, 2012; Oppenheimer, 2008; but see Meyer et al., 2015,

for contrasting evidence). Put simply, situations that involve processing difficulties are less subject to the impact of intuition and prompt more deliberation.

In fact, independent research reveals that foreign language processing recruits brain areas related to control processes to a greater extent than native language processing—the inferior prefrontal and dorso-anterior cingulate cortices (Branzi, Della Rosa, Canini, & Costa, 2015; see Abutalebi & Green, 2016 for a recent review on the relationship between language control and executive control)—areas that may be involved in the decision-making contexts above (Greene, Nystrom, Engell, Darley, & Cohen, 2004; Tom, Fox, Trepel, & Poldrack, 2007). Hence, according to this view, the foreign language effect could be the result of a decrease in processing fluency that prompts people to slow down and think more carefully about the decision-making situation.

Emotion is another factor associated with foreign language processing that can alter the interaction between intuition and deliberation. Messages processed in a foreign language usually elicit a milder emotional response compared to those processed in a native language (see Pavlenko, 2012; and Caldwell-Harris, 2015 for reviews)<sup>i</sup>. Interestingly, people often use their emotional reaction to a given problem to guide their decisions, instead of engaging in more deliberative reasoning (Loewenstein, Weber, Hsee, & Welch, 2001; Slovic, Finucane, Peters, & MacGregor, 2007). In other words, we go with our feelings regarding what is good or bad, rather than considering the options in a thoughtful manner. Indeed, foreign language use lowers emotional reactivity as, for example, shown by reduced electrodermal responses to swear words and childhood reprimands (Harris, Aycicegi, & Gleason, 2003; see Dewaele, 2004 for similar behavioral evidence). Moreover, reading emotionally charged passages in a foreign language elicits less activation in brain areas related to emotional processing—the amygdala (Hsu, Jacobs, & Conrad, 2015). Interestingly, this brain structure has been shown to be relevant in decision-making contexts involving gains and losses (De Martino, Kumaran, Seymour, & Dolan, 2006). Hence, according to this view, the foreign language effect could result from a reduction in the emotional reactivity elicited by the decision-making scenario. This, in turn, could reduce the impact of affective states on people's decisions, therefore allowing the possibility for more deliberative processing.

Processing difficulty and emotionality may have collateral effects on the way people relate to and construe a given situation (Alter & Oppenheimer, 2008; Van Boven, Kane, McGraw, & Dale, 2010). In particular, foreign language use may lead to an increase in psychological distance; it may aid in taking a more objective perspective of the situation and construing the options in a more global/abstract way (Trope & Liberman, 2010). Interestingly, psychological distance can affect people's decisions in a similar manner as a foreign language does (Aguilar, Brussino, & Fernández-Dols, 2013; Lerner, Streicher, Sachs, Raue, & Frey, 2015; Raue, Streicher, Lerner, & Frey, 2015). Indeed, foreign language use has been shown to lead to a detachment effect, such that people are able to discuss certain topics that they would otherwise find too aversive (e.g., Bond & Lai, 1986; Halberstadt, 1994; Marcos, 1976; see also Ivaz, Costa, & Duñabeitia, 2015). Thus, according to this view, the foreign language effect could result

from an increase in psychological distance, which would affect the contributions of intuition and deliberation to people's choices. Note, however, that the way in which psychological distance affects people's judgments is still debated, especially in the context of moral choice (Eyal, Liberman, & Trope, 2008; but see also Gong & Medin, 2012; Zezelj & Jokic, 2014).

These three explanations are not mutually exclusive and are probably complementary and related to each other to some extent. However, all of them stress that the foreign language effect stems from changes in the weights that intuitive and deliberative processes have in the course of decision-making.

### **Future Directions**

The foreign language effect on decision-making is a very recent discovery, with most studies on the topic published in the last three years. Consequently, we are still far from having a good description of the phenomenon itself. We need to advance our knowledge of its generalizability and boundaries. *Which decision-making contexts are sensitive to the language of presentation and which ones are not?* For example, up to now the foreign language effect has mostly been tested in contexts that involve a certain emotional connotation. Hence, we do not yet know whether foreign language use affects people's response tendencies in domains that do not carry emotionally arousing information. This can be assessed by looking, for example, at the effect of language on certain emotionally-neutral biases such as anchoring, hindsight bias, and conjunction fallacy. In relation to the boundaries of the phenomenon, it is also critical to assess *how foreign language proficiency modulates the presence and magnitude of the phenomenon*. It is reasonable to predict that when language proficiency approaches native-like levels, language status would have a minimal effect—although this may depend on the context of learning and use. On the other hand, much lower levels of language proficiency may pose too heavy a burden on processing, reducing the availability of the resources needed to engage in deliberation. Hence, the current observations, arguably from participants with medium-high levels of foreign language proficiency, should be complemented with studies exploring the role of language proficiency in the interaction between intuition and deliberation.

This information would allow us to design more controlled experiments assessing the origin of the phenomenon and to determine more precisely the contributions of intuition and deliberative processing. *Does using a foreign language both reduce intuitive processing and promote deliberative processing? If so, in which way are these processes affected?* For example, foreign language use may not prompt more deliberation per se, but rather, it may shape the cues used by intuitive processes. Indeed, advancing in these explanations would require exploring the role of cognitive fluency, cognitive load, emotional reactivity, and their interactions with foreign language processing. This enterprise would benefit from a multidisciplinary approach, in which psychophysical (e.g., facial electromyographic responses, electrodermal activity, pupil dilation) and brain imaging techniques would provide fundamental information. Furthermore, this research could also constrain current models of decision-

making in general, since it is not obvious how these models can capture the complexities of the phenomenon. Indeed, it is possible that the various models make different predictions about how language status affects our choices in different contexts.

Perhaps the greatest challenge would be the exploration of the foreign language effect in the context of real-life decisions. *Can we use language status as a lever to promote better decisions, at least in certain decision-making contexts?* If indeed, foreign language use can help people engage in a colder, dispassionate, deliberative thinking style, then this might help promote self-control and avoiding temptation. For example, one could think that language can be used as a nudge to promote better choices such as what to eat or how to evaluate the options for a clinical treatment (for preliminary evidence, see Klesse, Levav, & Goukens, 2015). This will be important for many choices that involve long-term beneficial outcomes but require current sacrifices. Finally, it is crucial to study the role of language in interactive contexts, such as interpersonal conflict and negotiation. At present, all the available evidence comes from studies in which people are presented with individual decision-making contexts and we do not know whether the phenomenon will extend to interactive scenarios. And indeed, the answer to this question is not obvious; while foreign language use can prompt a deliberative thinking mode, the cognitive load and anxiety often elicited when interacting in a foreign language may end up leading to more automatic and less thoughtful decisions.

We reviewed how foreign language use affects people's choices. In several contexts, foreign and native language processing differ in the recruitment of intuition and deliberation, with foreign language processing prompting a more deliberative approach. But, do not be mistaken, this evidence does not imply that people's choices would always be better in foreign language contexts. Indeed, sometimes it is good to go with our gut and other times it is better to think twice and consider the options in a more thoughtful manner. Hence, finding out how our talking heads affect the likelihood of using one approach or the other is fundamental to understanding the decision-making machines that we are.

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<sup>i</sup> There is some controversy about the variables that may affect this reduction in emotionality associated with a foreign language use, such as language proficiency, age of acquisition and language distance. Hence, this phenomenon is not always present (e.g., Eilola & Havelka, 2011; Ferré, García, Fraga, Sánchez-Casas, & Molero, 2010).