The effect of foreign language processing on moral decision-making

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To my Dad, for giving me the ability to finish the one thing he could not: a PhD.

It is only in our decisions that we are important.
– Jean-Paul Sartre

Do what you feel in your heart to be right – for you'll be criticized anyway.

– Eleanor Roosevelt

Beati quelli il cui atteggiamento verso la realtà è dettato da immutabili ragioni interiori!
– Italo Calvino, *Un'amara serenità*

If you want to overcome the whole world, overcome yourself.
– Fyodor Dostoyevsky, *Demons*

No sé de que se trata, pero me opongo.
– Don Miguel de Unamuno

When all else fails, laugh.
-- Joanna Darrow Corey, age 10

And so it goes…
– Kurt Vonnegut, *Slaughterhouse V*

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Abstract

Millions of people learn a foreign language and some of these people, such as those who work in international organizations, use this language daily as the vehicle of communication, making judgments and choices based on information received in this foreign language. What effect might the vehicle of communication (a foreign language) have on the resulting decisions?

The aim of this dissertation is to deepen our knowledge of the effect of foreign language processing, versus native language processing, on moral decision-making. Specifically, this dissertation investigates the so-called moral foreign language effect's reliability (e.g., choices made for oneself in moral dilemmas), its scope and, most importantly, its potential origins. To do so, behavioral data was collected from thousands of participants and analyzed according to whether or not language had an effect on people's reported moral choices and judgments. The majority of the participants are native speakers of Spanish/Catalan and university students who have studied English as a foreign language, although when possible other language combinations have been included.

The findings suggest that the moral foreign language effect as originally found e.g., choices made for oneself in moral dilemmas, is robust and not attributable to cultural factors. However, the effect is less reliable when participants are asked to judge another's choice. Finally, the effect does not apply to all kinds of moral judgments, e.g., of another's transgressions that do not involve a calculated trade-off. Together, the findings suggest that a) the effect is most likely to appear when one is

asked to make a decision for oneself versus judging another's choice and b) the effect is more likely when there is a calculated trade-off involved in the scenario. Regarding the origins of the phenomenon, this suggests that c) the effect is largely attributable to an increase in psychological distance and a decrease in emotional reactivity typically associated with foreign language processing compared to native language processing. This affects the interplay of intuitive and analytical processes that drive our decisions (most likely by reducing the former). Thus, the effect of language is most likely to apply to decisions that involve a conflict between intuitive and analytical processes.

Resumen

Millones de personas aprenden una lengua extranjera, y algunas de estas personas, como las que trabajan en organizaciones internacionales, la usan a diario como vehículo de comunicación, llevando a cabo juicios y decisiones basándose en información recibida en una lengua extranjera. ¿Qué efecto puede tener el vehículo de la comunicación (lengua extranjera) un efecto sobre las decisiones que toman?

El objetivo de esta tesis es profundizar en nuestro conocimiento sobre el efecto del procesamiento de una lengua extranjera, en comparación con el procesamiento de una nativa, en la toma de decisiones morales. Específicamente, esta tesis investiga la fiabilidad del llamado efecto moral de una lengua extranjera (ej., decisiones tomadas por uno mismo en dilemas morales), su alcance, y lo más importante, sus potenciales orígenes potenciales. Para ello, se recogieron los datos conductuales de miles de participantes, y se analizaron en cuanto a si la lengua tenía un efecto sobre las elecciones y juicios morales realizados. La mayoría de los participantes son estudiantes universitarios nativos de español/catalán que han estudiado el inglés como lengua extranjera, aunque, en la medida de lo posible, se han incluido otras combinaciones lingüísticas.

Los resultados sugieren que el efecto moral de la lengua extranjera, tal y como se descubrió originalmente, ej., elecciones por parte uno mismo en dilemas morales, es robusto y no es atribuible a factores culturales. No obstante, este efecto es menos fiable cuando se les pide a los participantes que juzguen la elección de otra persona. Finalmente, el efecto no se aplica a todos los juicios morales, ej., sobre las transgresiones por parte

de otra persona que no involucra una compensación calculada. En conjunto, los resultados sugieren que a) el efecto es probable que se dé cuando uno debe realizar una elección por si mismo que cuando juzga la elección de otra persona, b) el efecto es más probable cuando hay una compensación calculada en el escenario. Respecto a los orígenes del fenómeno, esto sugiere que c) en gran parte el efecto se puede atribuir a un incremento en la distancia psicológica y una reducción en la reactividad emocional, los cuales se asocian típicamente con el procesamiento de una lengua extranjera en comparación con el procesamiento de una lengua nativa. Esto afecta a la interacción de procesos intuitivos y analíticos que conducen a nuestras decisiones (más probablemente partir de la reducción del primer tipo de procesos). Por lo tanto, el efecto de la lengua se aplica más probablemente a las decisiones que involucran un conflicto entre los procesos intuitivos y analíticos.

Preface

Millions if not billions of people learn a foreign language. Indeed, in many countries like Spain, it is a mandatory part of education. Moreover, in the EU, 59% of people learn two foreign languages, with English being studied by 96%[1]. Furthermore, people use their foreign language(s) for travel, business, personal relationships, etc., and some even live in the foreign language context(s), like I do. How might the language of use affect the decisions people face in this context?

The potential effects of processing information in a foreign language, compared to a native one, on cognitive processes such as reasoning and judgment are not immediately obvious. However, various differences between native and foreign language processing may impact decision-making, which could, in turn, affect social interactions. Therefore, this question is not only of theoretical interest, but also of great practical interest for those of us who use or interact with people using a foreign language (e.g., the members of this thesis defense committee), and also for policy-makers who may make important decisions under such conditions.

There are various differences between native and foreign language processing that can account for the resulting differences in judgments found in this dissertation. Most relevantly, in a foreign language context

[1] http://ec.europa.eu/eurostat/statistics-explained/index.php/Foreign_language_learning_statistics#Main_statistical_findings)

relative to a native one, psychological distance is increased, as can be cognitive load; brain areas engaged in controlled processing are more engaged; emotional reactivity and cognitive fluency are decreased. These factors associated with foreign language use have been found to affect moral judgments in native language contexts. In sum, the majority of research on moral psychology has been conducted in the native language of the participants (particularly in the United States, see Arnett, 2008). Thus, these factors associated with foreign language processing, compared to native language processing, might be able to account at least partiall, for the existence of foreign language effects (differences in decisions depending on whether one is using a native or foreign language).

Therefore, the main aims of this dissertation are:

- To determine the reliability of the original moral foreign language effect (Costa et al., 2014a) in which those using a foreign language, compared to those using a native language, are twice as likely to choose to sacrifice one life to save five lives. Also, to investigate which factors (structure and content of the dilemmas and their questions) affect the presence or magnitude of the effect in order to better isolate its potential origins.

- To assess if the moral foreign language effect also applies to judgments of another's choices in the same moral dilemmas. This will help us to assess whether the effect is largely attributable to increased psychological distance and decreased emotional reactivity.

- To examine if foreign language use alters the importance given to different factors in the decision-making process: Specifically, whether this leads to a decrease in the weight of intentions and/or an increase in the weight of outcomes when making judgments of another's moral behavior. This is to further understand the potential origins of the phenomenon.

Before presenting the Experimental Section of this dissertation, some aspects of moral psychology and foreign language processing will be discussed in the content of the current evidence on moral foreign language effects in the Introduction.

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1. INTRODUCTION

We are constantly faced with moral decisions, choices and judgments. Importantly, the vehicle of this information is often language. There is an old adage, "Its not what you say but how you say it", meaning that pragmatics is what determines how what you say is perceived or judged. This principle could also be applied to the question of language context: When it comes to (moral) decision-making, the way you judge information contained in linguistic input may be a question of whether you are in a native or foreign language context. What effect does foreign language processing have on moral decision-making, when and why? These are the general questions addressed in this dissertation.

In the first Chapter the relevant theories regarding moral decision-making (Section 1.1), moral foreign language effects (Section 1.2), pertinent differences between native and foreign language processing that likely contribute to these phenomena (Section 1.3), and the potential origins of the effects will be outlined (Section 1.4). Finally, the specific aims of this dissertation and the ways in which they are investigated will be outlined in the second Chapter (Section 1.5).

1.1 Moral decision-making

Moral decision-making is often explained in terms of the complex interplay of dual processes (e.g., Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). Some describe these in terms of automatic, intuitive,

affective processes (System 1), and controlled, deliberate and analytical processes (System 2) (e.g., Kahneman, 2011; Sloman, 1996). Others posit that moral decision-making involves various evaluations: The evaluation of actions and their intentions and also the evaluation of causes (Kohlberg, 1969), or the evaluation of actions and their intentions and the evaluation of outcomes (e.g., Cushman, 2013; Railton, 2016). This will now be explained in the context of the three types of moral scenarios used in the Experimental section.

The contexts of interest in this dissertation are moral dilemmas, and moral transgressions that are either intentional or accidental. In certain moral dilemmas or scenarios, conflict between two kinds of processes or evaluations must be resolved in order to make a decision. Two famous moral dilemmas, and those that appear most frequently in this dissertation (see Sections 2.2, 2.3) are the Switch dilemma (Foot, 1978) and the Footbridge dilemma (Thomson, 1985). While the options are the same in both, sacrifice one life to save many lives or not, people make very different choices in these two dilemmas with most (about 80%) choosing to take action in Switch but with a minority making the same choice in Footbridge (about 20%). This is because of various contextual factors. On the one hand, in Switch, the action does not involve personal contact or force but a mundane action (pulling a lever), the locus of intervention is a train (inanimate object), and the sacrifice of one person is a side-effect of taking action. On the other hand, in Footbridge, the action involves personal contact and force e.g., is inherently violent, the locus of intervention is a person, and the sacrifice of that person is an instrumental murder (means to an end; see the Doctrine of Double Effect; Foot, 1967).

Thus, the difference in response tendencies for these two dilemmas is attributed to these contextual differences. In other words, Switch elicits less emotion, less conflict, and makes the choice easier to justify (for example, being guilty of homicide is not immediately obvious), whereas Footbridge elicits more emotion (e.g., potential consequences for the self) and therefore more conflict resolution or deliberative processing is required to override this automatic, affective response (unless this response is reduced such as in patients with damage in brain regions that deal with emotional processing e.g., Ciaramelli, Muccioli, Làdavas, & Di Pellegrino, 2007). *Fmri* studies investigating choices in moral dilemmas support the claim that a reduction in System 1 processing or an increase in System 2 processing lead to choosing to sacrifice one to save many (e.g., Greene et al., 2001; Greene, Nystrom, Engell, Darley & Cohen, 2004). Furthermore, this same choice is intuitive in Switch and counterintuitive in Footbridge (Kahane et al., 2012).

Moreover, there are certain psychological factors that increase the likelihood to make the aversive, but value-maximizing choice in Footbridge (but not necessarily Switch). For example, increased psychological distance (Aguilar, Brussino, & Fernández-Dols, 2013), need for cognition or (Conway & Gawronski, 2013; Weich et al., 2013), reduced empathy (e.g., Choe & Min, 2011; Duke & Bègue, 2015), and reduced self-relevant emotions (e.g., Ciaramelli et al., 2007; Moretto, Làdavas, Fattioli, & Di Pellegrino, 2010). These factors, such as a reduction in empathy, would arguably result in more outcome-based judgments. For example, outcomes tend to have more weight in moral judgments when brain regions involved in theory of mind (e.g., the

evaluation of beliefs or intentions) are compromised (e.g., Young, Camprodon, Hauser, Pascual-Leone, & Saxe, 2010) or under-developed (see Cushman, Sheketoff, Wharton, & Carey, 2013).

The original moral foreign language effect was the finding that when the dilemmas are presented in a foreign language, versus a native one, people are twice as likely to choose to sacrifice one life to save many lives in Footbridge, but not Switch (Costa et al., 2014a). The effect has been found for various language combinations and replicated by other labs (Cipolletti, McFarlane, & Weissglass, 2016; Geipel, Hadjichristidis, & Surian, 2015a).

The second context of interest also involves moral dilemmas, but from a different perspective: moral judgments regarding another's choice (as opposed to choosing for oneself). The way we judge the choice to sacrifice one life to save many when made by another person is somewhat different: To a certain extent, decision-making is a question of perspective. The research suggests that from a more distant vantage point, we are more likely to accept these kinds of decisions e.g., a difficult trade-off for the greater good (e.g., Gold, Pulford & Colman, 2015). This is most likely because of the increased psychological distance (from first to third person), which has been associated with more pragmatic (and less empathetic) judgments (Uhlman, Zhu & Tannenbaum, 2013) and because, according to *fmri* data, judgments about another's moral choices elicit less emotion that judgments about our own (Berthoz, Grezes, Armony, Passingham & Dolan, 2006). This is

likely because these judgments don't involve self-relevant emotions (no long-term consequences for the self).

This builds a bridge to the final kind of moral scenarios included in the Experimental section (Section 2.4), which are more similar to the kinds of judgments we might encounter in real life, involving judging another's moral transgression, not a calculated trade-off. When judging another's moral behavior, we evaluate the action and the intentions behind it, the cause, and extent of the consequences. Certain moral judgments rely more on one kind of process or another. For example, when asking about moral correctness, permissibility, appropriateness, acceptability, or wrongness, the intentions (the stated or inferred beliefs) behind the action are what drive this kind of judgment. Indeed, accidental harms are considered less morally wrong, more permissible, etc., than intentional harms (e.g., Cushman, 2008; Young & Saxe, 2008). After all, intent is the difference between murder and manslaughter: Accidentally killing someone is not morally wrong, but you may still be held responsible for it and even deemed fit for punishment. These different measures (e.g., acceptability or wrongness, responsibility, deserved punishment) rely to different extents on the various processes or evaluations involved in the decision-making process. Indeed, thus far most accounts for foreign language effects have appealed to foreign language processing modulating the interplay between these two kinds of processes, and the effect being present when these two conflict. Thus, we expect that the foreign language effect is most likely to appear in scenarios that elicit conflict between different processes or evaluations.

1.2 Moral foreign language effects on decision-making

As mentioned above, the original moral foreign language effect was found for choices in the Footbridge dilemma but not Switch, and the effect is robust and generalizable (Cipolletti et al., 2016; Costa et al., 2014a; Geipel et al., 2015a). Other findings include a foreign language context leading to less harsh wrongness judgments of moral transgressions that have no tangible negative consequences, such as consensual, non-procreational incest (Geipel, Hadjichristidis, & Surian, 2015b). This suggests that the moral foreign language effect also applies to judgments of another's moral transgressions in certain contexts. Some of the same authors have found that foreign language use reduces the perception of risk and increases the perception of benefit (Hadjichristidis, Geipel, & Savadori, 2015). If this is true, then it may help explain the effect in particular as it is found in contexts that involve trade-offs (e.g., dilemmas) as the benefits (gains) may be judged as outweighing the risks (losses). Relatedly, this is consistent with the findings regarding the foreign language effect in behavioral economic contexts, showing that foreign language use leads to a reduction in risk, loss and uncertainty aversion (Costa, Foucart, Arnon, Aparici, & Apesteguia, 2014; Keysar, Hayakawa, & An, 2012). Finally, in a foreign language context compared to a native one, people appear to give more weight to outcomes than intentions when these mismatch (a well-intended act leads to a negative outcome and vice versa) when making judgments of moral goodness (Geipel, Hadjichristidis, & Surian, 2016). This is consistent with the argument that foreign language use may alter the weight given to intentions and outcomes during moral judgment.

However, there are reasons to believe that the effect may apply to some contexts and not to others (e.g., the Footbridge versus the Switch dilemma). The foreign language effect is most likely to be present when the situational context of the decision elicits conflict between different processes or evaluations. As will be discussed below, this is because differences between native and foreign language processing have been argued to account for the phenomenon. Thus, when the context of the scenario makes it such that these processing differences between languages are reduced, a foreign language effect on decision-making is less likely to be present.

1.3 Foreign language processing

We argue that differences between native and foreign language processing may account for at least the original moral foreign language effect on choice in dilemmas. Appealing to dual process models, these differences would lead to a decrease in System 1 processes (automaticity, affect) and/or an increase in System 2 processes (controlled processes, deliberation). A decrease in System 1 processes and/or an increase in System 2 processes lead(s) to an increase in choices to sacrifice one to save many in Footbridge (e.g., see Greene and colleagues). In terms of the evaluation of the intentions behind the action and the evaluation of the outcome, these same differences between native and foreign language processing may decrease the weight of the intentions and/or increase the weight of the outcomes. This is because an increase in psychological distance and a decrease in emotional reactivity would lead to lesser weight given to the intentions behind the action (which requires empathy

and intuitive processes). This is in part because evaluations of actions are thought to be based on previous experience (Cushman, 2013); in other words, if an action, regardless of its consequences, elicits a negative emotional reaction (increasing System 1 processing) such as pushing a man (even if this does not lead to his death), then this leads to people being less likely to take such an action (e.g., Cushman, Gray, Gaffey, & Mendes, 2012; Miller & Cushman, 2013). In other words, it is not a lack of understanding or wanting the benefits of an action (saving lives) that prohibits people from making this choice, but the action itself. Using a foreign language may make people less sensitive to this action for a variety of reasons (less emotion or access to social norms, for example, as we will see below), which may make them more sensitive to the desired outcomes.

We will begin with the factors that are most relevant for this dissertation. First, foreign language processing is associated with increased psychological distance. For example, people are more comfortable talking about controversial topics in their foreign language arguably because of emotional detachment (e.g., Marcos, 1976). In addition, the results of a self-bias task show that self-relevant emotions are less salient in a foreign language context (Im Shin & Kim, 2017; Ivaz, Costa & Duñabeitia, 2016). Second, there is a body of evidence involving behavioral (self-reported rating; e.g., Dewaele, 2008), psychophysiology (skin conductance; e.g., Harris, Gleason, & Aycicegi, 2006) and *fmri* measures (e.g., Wu & Thierry, 2012), suggesting that negative affect is reduced in a foreign language. Third, there is some *fmri* evidence showing that controlled processes are more engaged during foreign

compared to native language processing (Branzi, Della Rossa, Canini, Costa, & Abutalebi, 2016). These three factors (increased psychological distance, decrease emotional reactivity and more controlled processing) would lead to a decrease in System 1 processing and/or an increase in System 2 processing. Either way, this would lead to an increase in choices to sacrifice one to save many in Footbridge as previously mentioned.

Finally, there are other differences between native and foreign language processing that may contribute to its effects on decision-making, such as cognitive fluency (the ease with which something is processed) and cognitive load (amount of mental effort required), but these are not investigated in this dissertation. We decided to focus on the differences that are most likely to account for the current findings on the foreign language effect. However, they are introduced in the review article (see Section 2.1; also, Hayakawa, Costa, Foucart & Keysar, 2016).

1.4 Potential origins of moral foreign language effects

Foreign language effects in moral contexts most likely are attributable to a variety of factors that depend on the situation (context is paramount, after all). For example, we have argued that the original foreign language effect on choice in moral dilemmas is most likely attributable to an increase in psychological distance and a decrease in emotional reactivity (see Costa et al, 2014a). This is consistent with other findings suggesting that a modulation of emotion (a reduction of negative and an increment of positive emotion) contributes to the foreign language effect for

perceptions of risk and benefit (e.g., Hadjichristidis, et al., 2015; see also Hadjichristidis, Geipel & Surian 2017a). In other words, it may be more about a reduction in intuitive, affective processes than an increase in controlled, deliberate ones.

There are two more considerations regarding the potential origins of moral foreign language effects. The first, as has been previously mentioned, is cognitive load, and the second is language-dependent memory. Cognitive load has been found to be increased in foreign language contexts (e.g., Duñabeitia & Costa, 2015). However, this does not necessarily lead to differences in moral decisions. Indeed, cognitive load has been found to decrease choices to sacrifice one life to save many (Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008; Trémolière, De Neys, & Bonnefon, 2012) and therefore would work against the original moral foreign language effect. However, there is contradictory evidence regarding cognitive load operationalized as foreign language proficiency; in Section 2.2 we find that lower proficiency in a foreign language (higher cognitive load) increases the magnitude of willingness to sacrifice one life to save many, but the Appendix suggests that lower proficiency reduces this same tendency.

The final hypothesis put forward is that foreign language effects are due to language-dependent memory (for an explanation of this concept see Marian & Fausey, 2006): Given that we learn social and moral norms in a native language context, these norms may be less accessible in foreign language ones (Geipel, et al., 2015b; for a review see Hadjichristidis, Geipel & Surian, 2017b). The foreign language effect for wrongness

judgments of ostensibly harmless moral transgressions has been attributed to the same mechanism (Geipel et al., 2015b) as has the effect of foreign language use reducing superstition (Hadjichristidis et al., 2017a).

In sum, the factors associated with foreign language processing that differ from native language processing (increased psychological distance and controlled processing, decreased emotional reactivity) should be able to account for the effects on moral decision-making as these factors would affect the interplay between dual processes. In certain contexts this would lead to an impact of language and in others, not, depending on whether the options elicited conflict from the two kinds of processes. Therefore, we selected scenarios that aid in the assessment of the reliability of the effect, its scope and to assess some of its potential origins. Together, the current findings suggest that the effect is most likely to appear not only when the decision-making context elicits conflict, but also in new situations, ones people have not had to face before. Indeed, it seems unreasonable to think that foreign language use would affect decisions one makes on a routine basis.

1.5 Current work

Millions of people use a foreign language or interact with someone who is doing so; furthermore, people in international organizations such as the United Nations and the European Union make decisions that affect millions, some having received the relevant information in a foreign language. Therefore, it is important to know the contextual factors that

affect the presence, magnitude and reliability of the moral foreign language effect (Section 2.2), its scope (Sections 2.3, 2.4) and why it occurs (Sections 2.2, 2.3, 2.4). In addition, a review article is included in the beginning of the Experimental section (Section 2.1) to give an overview on the ways in which foreign language processing impacts decision-making. Finally, the Appendix includes a published article that advances the knowledge obtained from the first experimental article (Section 2.2) and regarding the direction of the effect of foreign language on the interplay of dual processes.

2. EXPERIMIENTAL SECTION

The aim of this dissertation is to advance our knowledge of the reliability, scope and potential origins of the moral foreign language effect on decision-making.

To that end, a series conducted of behavioral studies were conducted. Firstly, the reliability of the original moral foreign language effect on choice in dilemmas was investigated in a series of 9 experiments (Section 2.2). These vary the contextual factors of the dilemmas, allowing us to assess some of the potential origins of the effect. Secondly, the extension of the moral foreign language effect to judgments of another's choices in the same dilemmas was assessed (Section 2.3). This was to expand our understanding of the scope and the potential origins of the effect. Thirdly, the extension of the moral foreign language effect to various measures regarding the judgment of another's moral transgression was investigated (Section 2.4). The intentions and outcomes were manipulated in order to determine whether or not foreign language processing leads to a differential weighting of the contributions of intentions and consequences in moral judgments. Finally, there is a review article at the beginning of the chapter regarding the effects of foreign language processing on decision-making in various contexts (Section 2.1) as a general introduction to the foreign language effect.

This Chapter is compiled of two published articles of original research in internationally recognized, peer-reviewed and indexed scientific journals (Sections 2.2, 2.4; also see Appendix), one published article in an

internationally recognized, peer-reviewed and indexed journal of the review variety (Section 2.1), and one article in preparation (Section 2.3).

2.1 On language processing shaping decision making

Costa, A., Vives, M-L, & Corey, J.D. Language processing shaping decision-making. *Current Directions in Psychological Science*, *26* (2), 146-151. https://doi.org/10.1177/0963721416680263

Costa A, Vives ML, Corey JD. On language processing shaping decision-making. Curr Dir Psychol Sci, 2007; 26(2):146-151. https://doi.org/10.1177/0963721416680263

2.2 Our moral choices are foreign to us

Corey, J. D., Hayakawa, S., Foucart, A., Aparici, M., Botella, J., Costa, A., & Keysar, B. (2017). Our moral choices are foreign to us. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *43*(7), 1109-1128. https://doi.org/10.1037/xlm0000356

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2.3 The foreign language effect on moral judgment: A Matter of perspective

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The foreign language effect on moral judgment: A matter of perspective

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Abstract

Does using a native versus foreign language affect how we judge other's people's choices? We report three studies investigating the role of language (native versus foreign) in judgments of another person's moral behavior. There is evidence showing an effect of language on choice for oneself such that those using a foreign language are twice as likely to choose to sacrifice one life to save many in moral dilemmas (e.g., Corey et al., 2017; Costa et al., 2014a). The question we ask is whether the foreign language effect is present when judging another person's choice to a sacrifice one life to save many. If the phenomenon is mainly attributable to an increase in psychological distance and a decrease in emotional reactivity, then it should be reduced or absent when these factors are more similar across language conditions (native or foreign). Indeed, we find that the foreign language effect is less robust or even absent under these conditions. This not only is informative regarding the origin of the effect, but also has practical implications for many of us as we interact with people who are using their foreign language.

Abstract Word Count: 187

Keywords

Foreign language, bilingualism, moral psychology, decision-making

The foreign language effect on moral judgment: A matter of perspective

We constantly judge one another and ourselves. Furthermore, our judgments are a matter of perspective: The way in which we judge others' choices and our own is often different. For example, imagine the case of a group of mountain climbers who must decide whether or not to cut one of their members loose (letting this person fall to their death) in order to save the rest of the group. In these situations, we ourselves may not be willing to make the aversive choice, but we would understand another person's willingness to take such action. In other words, perhaps thinking about making the choice for oneself provokes such a negative emotional reaction (e.g., living with the consequences) that we would not be able to make the sacrifice. However, reasoning about the options in a detached manner (e.g., from a distant perspective), would lead us to accept this value-maximizing decision if it were made by another person (see Gold, Pulford & Colman, 2015; Tassy, Oullier, Mancini & Wicker, 2013; Uhlman, Zhu & Tannenbaum, 2013, but also Nadelhoffer & Feltz, 2008). Indeed, this appears to be the case: There is an increased emotional reaction when choosing for oneself in contrast to judging another as indicated by amygdala activation (Berthoz, Grezes, Armony, Passingham & Dolan, 2006). It seems to be the case that our own choices elicit more affective reactivity than the judgment of others' because the emotions involved in our own are two-fold: self-relevant emotions (e.g., living with the consequences) and empathy (e.g., sensitivity to another's feelings or state). This is in part why negative affect is thought to play

such a large role in why individuals often refuse to sacrifice one life to save many.

Importantly, choice and judgment often involve language, as it is the vehicle through which we comprehend and share information. There is evidence that language affects decision-making in various domains such as behavioral economics, with those using a foreign language showing a reduction in aversion to risk, loss, and uncertainty compared to those using a native language (Keysar, Hayakawa & An, 2012; Costa, Foucart, Arnon, Aparici, & Apesteguia, 2014b; see Costa, Vives, & Corey, 2017 and Hayakawa, Costa, Foucart, & Keysar, 2016 for reviews). Moreover, there is ample evidence that language affects the moral domain, with potentially important implications for social interactions. People are twice as likely to choose to sacrifice one life to save many in moral dilemmas when using a foreign language compared to a native one (Cipolletti, McFarlane, & Weissglass, 2016; Corey et al., 2017; Costa et al., 2014a; Geipel, Hadjichristidis & Surian, 2015a). Given that language affects the moral judgments we make for ourselves, it may also affect our moral judgments of others, but there is reason to believe that it may not, as we discuss below. Therefore, the question we ask is whether or not our judgments of others' moral choices are affected by language. The answer may have potentially important consequences for the millions of individuals who associate with foreign language speakers or speak foreign languages themselves. Furthermore, elucidating the effect of language on judgments may shed some light on the mechanisms underlying previously documented effects of language on choice.

Potential explanations for the moral foreign language effect

Choices in moral dilemmas are often explained in terms of dual process models (e.g., Greene, Sommerville, Nystrom, Darley, & Cohen, 2001) that include automatic, affective, intuitive processes (System 1) and controlled, deliberative and analytical ones (System 2). According to these models, a reduction in affective, intuitive processes and/or an increase in controlled, deliberative ones leads to an increase in choosing to sacrifice one life to save many in moral dilemmas (e.g., Greene et al., 2001; Greene, Morelli, Lowenberg, Nystrom & Cohen, 2008; Greene, Nystrom, Engell, Darley & Cohen, 2004; Kahane et al., 2012). This has been drawn upon to explain the foreign language effect in this context: Foreign language processing tends to be associated with a reduction in automatic, affective processing and an increase in deliberative, controlled processing. This includes a reduction in negative affect (e.g., Harris, Aycicegi, & Gleason, 2003; see Pavlenko, 2017 for a review), an increase in psychological distance (e.g., Ivaz, Costa & Duñabeitia, 2016; Shin & Kim, 2917; see Corey et al., 2017 for discussion) and an increase in controlled processing (e.g., Branzi, Della Rosa, Canini, Costa, & Abutalebi, 2016). This parallels research showing that these factors have been associated with an increased willingness to sacrifice one to save a larger group in native language contexts. This value-maximizing choice has been associated with reduced empathy, e.g., negative affect regarding another person (see Conway & Gawronski, 2013; Duke & Begue, 2015; Gleichgerrcht & Young, 2013), increased psychological distance (Aguilar, Brussino & Fernández-Dols, 2013) and increased need for cognition e.g., use of a rational thinking style (Conway & Gawronski, 2013).

Current Research

Given the potential involvement of psychological distance in the foreign language effect, here we ask the question of whether the effect of using a foreign language persists beyond psychologically proximal decisions for oneself to more psychologically distant judgments of another. In other words, does perspective matter? On the one hand, there is already some evidence suggesting that the foreign language effect persists for judgments of another's moral behavior. For example, people give less harsh wrongness judgments of actors who commit harmless moral transgressions when using a foreign language compared to a native one (Geipel, Hadjichristidis & Surian, 2015b). The same authors conducted one study (Geipel, Hadjichristidis & Surian, 2015a; Study 2) in which they asked participants if sacrificing one life to save five lives in moral dilemmas was appropriate on a 1 (forbidden) to 7 (obligatory) Likert-scale, and found that the effect of language persisted. Thus, it seems the phenomenon may be present when using a scale about the appropriateness of choices in moral dilemmas in addition to yes/no questions; this notwithstanding, we still do not know whether the effect holds when participants are asked to judge another person's choices, instead of an abstract question about the appropriateness of an action. Finally, there is evidence suggesting that foreign language use reduces empathetic concern when making choices in moral dilemmas (Hayakawa, Tannenbaum, Costa, Corey & Keysar, 2017). Given that empathy is involved in both the choice for oneself and judgment of another's choice, this may prompt the foreign language effect to persist. Together, these findings suggest that the effect of using a foreign language may persist for judgments of others. However, there is reason to think the effect

should be weaker. By asking about another's choice instead of choosing for oneself, the task should increase psychological distance and decrease emotional reactivity for both native and foreign language speakers, potentially making the two groups more comparable. This would stack the deck against the foreign language effect being present if increased psychological distance and reduced emotional reactivity associated with foreign language use largely account for the phenomenon.

Therefore, the question we ask is whether or not our judgments of others' moral choices are affected by language. In addition to being informative regarding the origins of the phenomenon, the answer to this question has important implications for those of us who routinely interact with people using their foreign language. Thus, we conducted three studies that differed in the native and foreign language of the participants, and in the daily linguistic context of the participants (native or foreign language). This was to ensure that the results were replicable and not attributable to cultural factors.

Methods

Given that the methods were highly similar across the studies, they will be described together here.

Participants

In Study 1a, the participants were native Spanish speakers living in Barcelona, Spain, who had studied English as a foreign language. In Study 1b, the participants were native English speakers living in Chicago, USA, who had studied Spanish as a foreign language. In Study 1c, the participants were native English speakers studying abroad in Barcelona, Spain. All participants were university students. Within each study,

participants had comparable characteristics across language conditions (percentage of females, age and percentage of understanding in the foreign language condition; see Table 1).

Procedure

The data in Study 1a was collected in university classrooms such as education, economics, engineering, etc. The experimenter used only the assigned language, gave the instructions and remained in the classroom for the duration of the study. In Study 1b, the students had various majors and the data was collected online using Qualtrics. In Study 1c the data was collected in CIEE, a center for Americans studying abroad, and the procedure was the same as in Study 1a; an important difference here is that these students were in foreign language classrooms. We aimed for 100 participants per language condition as in our previous studies (e.g., Corey et al., 2017). In Study 1a, we had a larger final sample than expected due to a) fewer participants needing to be excluded than usual and b) the fact that we collected the data from all students in a given classroom and on occasion there were more students than foreseen. In Study 1b, we had a smaller final sample than expected due to exclusions. In Study 1c, the sample was smaller than Study 1a given the number of students to which we had access.

In all studies participants were randomly assigned to one language condition or another (native or foreign), and presented with the Switch and Footbridge dilemmas (see *Materials*) in a counterbalanced order. All interactions with the experimenter or the online system occurred in the assigned language. In addition, after responding to the dilemmas, those in the foreign language condition gave information regarding the foreign language in all studies: age of acquisition, months lived in the target

language (except for Study 1b), the percentage of the text understood, and self-assessment of proficiency in the four skills (reading, writing, speaking, listening) on a scale of 1 (low) to 7 (high). See Table 1 for this information.

Participants were excluded if they did not follow instructions, have the appropriate native language, were under 18 years of age, spent more than 12 months living in the foreign language context (Studies 1a and 1c) or if they had poor comprehension of the materials, e.g., if they reported understanding less than 50% of the texts (as per our previous work, e.g., Costa et al., 2014a; Corey et al., 2017) or were unable to correctly respond to the comprehension questions in Study 1b, a measure included given that the data was collected online. This lead to a total of 82 exclusions (see Table 2). Thus, a total of seven hundred and forty-nine participants were included in the final analyses across the 3 studies.

Materials

The dilemmas used are the same that have been used in the previous work on the moral foreign language effect (e.g., Cipolletti et al., 2016; Corey et al., 2017; Costa et al., 2014; Geipel et al., 2015): the Switch (Foot, 1978) and Footbridge (Thomson, 1985) dilemmas. While we only expected an effect of language for Footbridge and not Switch, as previously found, we included the latter dilemma as a control measure in part to exclude the possibility that a foreign language effect in Footbridge is due to lack of comprehension. All materials were translated from English into Spanish, approved by multiple native speakers of Spanish, and back-translated for comparability (Brislin, 1970).

Switch Dilemma

A train is going down a track very fast towards five people. The train has a problem and cannot be stopped. Five people will die if the train stays on this track. There is another track that can be used to divert the train. At the end of this track there is one man that will die if the train changes track. A man who works in the train station decides to change the track, killing one person to save five.

Is this decision acceptable?

Write a number between 1-10

1(totally unacceptable) - 10 (totally acceptable)

Footbridge Dilemma

A train is going down a track very fast towards five people. The train has a problem and cannot be stopped, unless a heavy weight is dropped on the track. There is a very fat man standing next to the track - the only way to stop the train is to push him onto the track, killing him to save five people. A man who works in the train station decides to push the fat man onto the track, killing one person to save five.

Is this decision acceptable?

Write a number between 1-10

1 (totally unacceptable) - 10 (totally acceptable)

Study 1a: Native Spanish speakers

This study investigated if the foreign language effect is present when judging another person's choice to sacrifice one life to save many. If the effect is largely attributable to increased psychological distance and reduced emotional reactivity, then it should be reduced or absent when

judging another's actions. This is because psychological distance should be increased for both language groups, thereby minimizing the differences between them.

Four hundred and thirty-nine participants were included in the final sample: 223 in the native language (Spanish) and 216 in the foreign language condition (English). For an overview of the results, see Figure 1.

Results

The results of the mixed ANOVA (between subject factor: Language; within subject factor: Dilemma) showed that there was a main effect of Dilemma such that the decision in Switch was rated as more acceptable than that in Footbridge ($F(1, 437)=169.45$, $p<.001$), as well as an interaction between Language and Dilemma ($F(1, 437)=7.71$, $p=.006$). We conducted t-tests to determine the direction of the interaction and the results were as expected: There was a significant effect of language on Footbridge ($t(437)=3.12$, $p=.002$), such that those using the foreign language judged pushing the man more acceptable (M=4.5, SD=2.5) than those using the native language (M=3.8, SD=2.4), but there was no effect of language on judgment in Switch ($t(437)=0.58$, $p=.57$). This is consistent with the findings regarding the effect of language on choice.[2]

Study 1b: Native English speakers

This study served to replicate the first. To ensure generalizability, it was conducted on a population that had the inverse language pattern (native English speakers who had studied Spanish as a foreign language).

[2] We also ran the same analyses using more stringent comprehension criterion with 80% comprehension as the cut-off, and the results did not differ.

One hundred and forty-one participants were included in the final sample: 76 in the native language and 65 in the foreign language condition. For an overview of the results, see Figure 1.

Results

The results of the mixed ANOVA (between subject factor: Language; within subject factor: Dilemma) showed that there was a main effect of Dilemma such that the decision in Switch was rated as more acceptable than that in Footbridge ($F(1, 139)=53.15$, $p<.001$); however, there was no significant interaction between Language and Dilemma ($F(1, 139)=1.45$, $p=.23$). While those using the foreign language gave higher acceptability ratings (M=5.2, SD=2.5) than those using their native language (M=4.7, SD=2.6), here this difference did not reach significance.[3]

Combined Analyses for Studies 1a & 1b

We ran additional analyses in order to more thoroughly examine the data and determine if there is a difference between the effects of foreign language use across studies, given the similarity of the difference in numeric terms (.7 for Study 1a and .5 for Study 1b). We ran a mixed ANOVA as before with the added between-subjects variable of Sample (Study 1a or Study 1b). The results showed that there was a main effect of Dilemma such that the decision in Switch was rated as more acceptable than that in Footbridge ($F(1,578)=163.32$, $p<.001$) and a significant interaction between Language and Dilemma ($F(1, 578)=5.85$, $p=.016$). Given that the sample from Study 1a is larger than that of Study

[3] We also ran the same analyses using more stringent comprehension criterion with 80% comprehension as the cut-off, and the results did not differ.

1b, this significant interaction may be driven by the former. Therefore, the comparison of interest is the three-way interaction Dilemma x Language x Sample, which was not significant ($F(1, 578)=0.10$, $p=.76$). This suggests that the foreign language effect found in Study 1a does not significantly differ from that in Study 1b, even when the latter alone does not reach significance. Finally, of note, there was a significant main effect of Sample: $F(1, 578)=14.19$, $p>.001$), but the interaction between Sample and Language was not significant ($F(1,578)=0.19$, $p=.66$).

Study 1c: Native English speakers living in Spanish language context

This study served to further explore the generalizability of the effect of foreign language use on judgments of another person's moral choices by investigating whether or not the daily linguistic context of the participants affects the presence of the effect. Learning a foreign language by immersion, and being immersed in that context at the time of data collection should alter various factors that are thought to contribute to the foreign language effect. For example, a foreign language is often perceived or processed as less emotional than a native one in part due to the context of its acquisition, which is often a classroom in the native language environment and not during social interaction that may involve bodily and affective states (for the *contexts of acquisition hypothesis* see Harris, Gleason & Aycicegi, 2006). This may also lead to the foreign language processing, negative affect in particular, being less embodied (e.g., Foroni, 2015; see Pavlenko, 2012). This may further reduce the differences between language conditions in terms of psychological distance and emotional reactivity, which, in turn, would limit the potential effect of language. Therefore, we hypothesized that by testing

participants immersed in the foreign language context, the phenomenon would be absent.

One hundred and sixty-nine participants were included in the final sample: 90 in the native language and 79 in the foreign language condition.

Results

The results of the mixed ANOVA (between subject factor: Language; within subject factor: Dilemma) showed that there was a main effect of Dilemma such that the decision in Switch was rated as more acceptable than that in Footbridge ($F(1, 167)=73.23$, $p<.001$). There was no significant interaction between Language and Dilemma ($F(1, 167)=0.32$, $p=.57$). As can be appreciated in Figure 1, there are no differences for acceptability ratings between language conditions in this study.[4]

[4] We also ran the same analyses using more stringent comprehension criterion with 80% comprehension as the cut-off, and the results did not differ.

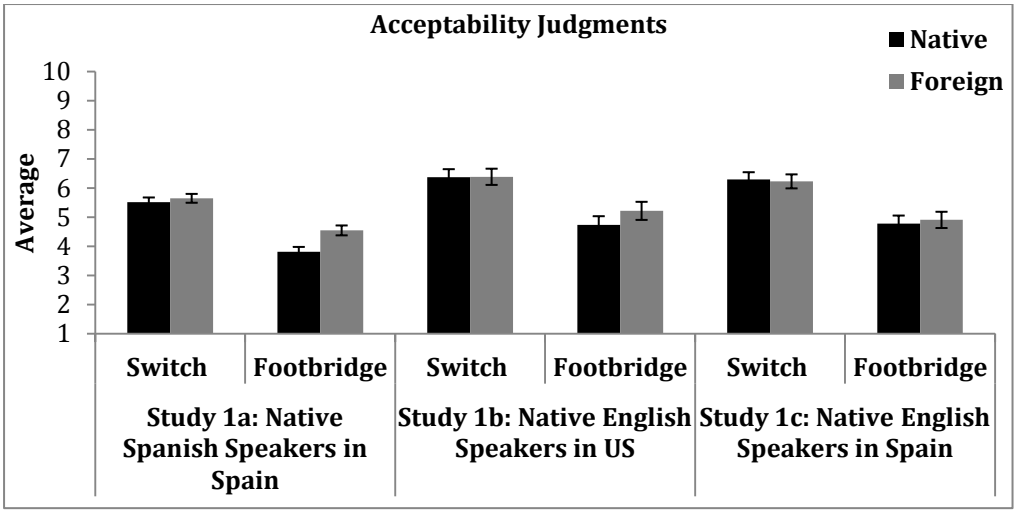

Figure 1: The average acceptability judgments per dilemma and language in Studies 1a, 1b and 1c. Errors bars are standard errors.

Discussion

The current work investigated whether or not the foreign language effect applies to judgments of another person's choice to sacrifice one life to save many. Taken together, the current findings suggest that the effect is less robust and reliable than when making the choice for onself and that this depends on two factors (as we will discuss below). The results of Study 1a show that for native Spanish speakers living in Spain, the effect of language persists: Participants found the value-maximizing choice in Footbridge more acceptable when using a foreign compared to a native language. In Study 1b, this difference was not significant. Nevertheless, when the data was analyzed together, the foreign language effect was present and did not significantly differ between studies. Thus, it appears that the foreign language effect applies to judgments of another person's

choice to sacrifice one to save many; however, it is not as reliable as when making the choice for oneself. Indeed, in Study 1c, in which the participants were immersed in the foreign language environment, the effect of language was absent. This may be for two reasons: because of the particular linguistic context (which may reduce the potential differences between how the two languages are processed) or because Spaniards judge the choice to sacrifice one life to save many as significantly less acceptable than Americans do (for a comparison of the Studies, see Figure 1). A caveat, however, is that a few of the existing studies on the moral foreign language effect included participants of a similar profile (living in a foreign language context; e.g., Costa et al., 2014a). Regardless, the context of acquisition of, or immersion in a foreign language could affect judgments of another person's choices and not choices for oneself. Finally, there was no effect for Switch in any study, which is consistent with previous findings on choice. What can we conclude from these findings?

These results support previous claims we have made that the foreign language effect is largely attributable to increased psychological distance and reduced emotional reactivity (e.g., Corey et al., 2017). When judging another's choices compared to when making the choice for oneself, these two factors should be more similar in native and foreign language contexts. Indeed, we find that under these conditions, the foreign language effect is less robust. Furthermore, these two factors may be increasingly similar across languages when participants are immersed in the foreign language context, conditions under which the effect is absent. This also helps to explain why in all reported research (see Corey et al., 2017 for a review) there is an effect of language for Footbridge,

which is up close and personal, but not Switch, which already involves a greater degree of psychological distance and a lower degree of emotional reactivity. These findings indicate that the presence of the foreign language effect on moral judgments may be, to a certain extent, a matter of perspective.

These findings have important implications for those of us who live and work with people using their foreign language. They may judge us differently than people using their native language. This would be of particular relevance when being judged by a jury of one's peers, policy makers in international organizations, or medical professionals. However, further research is required to determine the impact of being immersed in a foreign language context and that of cultural differences on judgments of another person's moral choices.

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Tables

Table 1. Demographic information (averages) for Studies 1a, 1b and 1c by language conditions.

Study	Language	% Female	Age	Age of Acquisition	Months Abroad	% Understood	Reading	Writing	Speaking	Listening
1a	Native	74.4	21.0							
	Foreign	77.8	20.0	5.9	<1	87.2	5.2	4.6	4.2	5.3
1b	Native	63.2	21.6							
	Foreign	58.5	21.5	12.0	NA	88.2	5.4	4.9	4.2	4.9
1c	Native	53.3	20.5							
	Foreign	55.7	20.3	11.9	3.0	87.8	5.0	4.8	4.4	5.1

Table 2. Number of participants excluded in Studies 1a, 1b and 1c by language condition and motive.

Study	Language	Poor Comprehension	Native Language	Under 18	Months Abroad	Didn't Follow Instructions	Total
1a	Native	NA	2	0	NA	6	8
	Foreign	9	2	3	2	1	17
1b	Native	NA	7	0	NA	0	7
	Foreign	21	16	0	NA	0	37
1c	Native	NA	3	0	0	0	3
	Foreign	0	8	1	1	0	10

2.4 The role of intentions and outcomes on the foreign language effect on moral judgments

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3. DISCUSSION

The general aim of this dissertation was to advance knowledge regarding the effect of foreign language processing on moral decision-making. In particular, we investigated the robustness of the original moral foreign language effect, its scope and potential origins. More specifically, this dissertation examined: (1) the contextual factors that may affect the magnitude and presence of the foreign language effect in moral dilemmas when choosing for oneself; (2) if this effect of language is reduced when judging another's choice in the same moral dilemmas; and (3) whether foreign language use leads to a reduction in the weight of intentions and/or an increase in the weight of outcomes when judging another's moral behavior. This allowed the assessment of the contributions of increased psychological distance and decreased emotional reactivity to the effect of foreign language processing on moral decision-making, in addition to excluding other potential explanations.

To do this, we conducted a total of fourteen studies (9 in 2.2; 3 in 2.3; 2 in 2.4) including behavioral responses from more than 4,000 participants.

3.1 General summary of the findings

The experimental studies included in Section 2.2 show the robustness and generalizability of the original foreign language effect on choice for oneself moral dilemmas by directly and conceptually replicating it (Studies 1a and 1b, respectively). In addition, the results of Study 1a, and

the meta-analyses regarding the effect of proficiency exclude the effect resulting from a lack of comprehension. Study 2a excludes the account that language switching (switching from the native language, used in the classroom, to the foreign language, used in the studies) increases cognitive control. Furthermore, Study 2b excludes the possibility that the effect is attributable to different social inferences about the hypothetical victims.

Having excluded explanations that are collateral effects of foreign language use (instead of foreign language processing per se), the action, questions and consequences were manipulated to assess other potential origins of the effect. Study 3a assessed whether if reducing aversion to the action modulates the magnitude of the effect, showing it to be smaller but not significantly different. This suggests reduced aversion to the action involved in the dilemma may play a role in the phenomenon, but cannot fully account for it. Studies 3b and 3c investigated if changing not the content of the dilemma but the question modulates the effect by focusing participants on different aspects of the dilemma. The results of Study 3b show that effect is still present when participants are asked about the consequences of inaction, further suggesting that the effect is not fully attributable to a reduction in aversion to the action, whereas those of Study 3c show that the effect is negated when the trade-off between the means the consequences is explicitly highlighted in the question. This suggests that perhaps foreign language processing prompts more focus on the consequences or outcomes given that the effect is absent when the trade-off of made highly explicit. Studies 3d and 3e assessed the effect of varying the degree of harm, e.g., the extent of the

outcomes, on the presence of the phenomena. The results of Study 3d show that the moral foreign language effect is still present when the man is permanently disabled instead of killed, but the results of Study 3e show that the effect is absent when the man is merely injured.

Additional analyses carried out on Studies 1a, 3d & 3e in Section 2.2 show that those using a foreign language are insensitive to the degree of harm, whereas this is not the case for those using the native language. This suggests that foreign language use may prompt more focus on saving the five people than the details required to achieve it. However, the results from the six studies in the Appendix suggest that it may be a reduction in focus on the details of the means (losses; e.g. reduced empathy for the victim), not necessarily an increase in focus on the gains (positive outcomes e.g., lives saved). Regardless, the findings are consistent with an increase in psychological distance and a decrease in emotional reactivity.

The experimental studies included in Section 2.3 find disparate results regarding the presence of the moral foreign language effect. The results from the Spanish sample in Study 1 suggest that the effect is still present when judging another's choice to sacrifice one to save five in Footbridge, but the results of the American sample alone do not support this. However, joint analyses suggest the effect may be present, albeit of a smaller magnitude. Furthermore, the results of Study 2 suggest that the effect is absent when those in the foreign language condition are immersed in the foreign language context (e.g., study abroad students). Together, these results suggest that the more similar native and foreign

language contexts are in terms of psychological distance and emotional reactivity, the less likely the effect on judgment is to be present, suggesting these factors may largely account for the effect.

Finally, the experimental studies included in Section 2.4 show the limitations of the scope of the effect of foreign language processing on moral decision-making. Study 1 assessed whether foreign language use reduces the weight of intentions when making moral judgments of another's behavior. The interaction of interest (between language and intention) is only marginally present for the measure of punishment (not for the measures of damage, responsibility or moral wrongness). Language does not affect judgments of moral wrongness nor the effect of intention on these judgments, which is crucial, as it suggests that foreign language use does not affect measures that are largely based on intentions, meaning that they are still being taking into account during the decision-making process. However, when the evaluation of the cause and the consequences are also taken into account, there may be an effect of language: for the measure of punishment. Specifically, it seems that judgments of intentional harms are not affected by language, but rather that those using the foreign language discount less in the accidental condition than those using the native language. Although this is not the case for Study 2 alone, the interaction between language and intention becomes significant when the two studies are analyzed together. This further suggests the foreign language effect may be attributable to automatic, intuitive affective processes (e.g., empathy).

Additionally, the results from Study 2, where both the intentions and the outcomes were manipulated, show that there is a marginal interaction between language and consequence for the measure of damage such that those using the foreign language gave more importance to the extent of the damages. Importantly, as in Study 1, we found no effect of language (nor interactions) for the measure of moral wrongness. Together, the findings from Section 2.4 show that foreign language use does not have a large impact on the weight of intentions or outcomes in moral judgments of another's behavior except for when the evaluations of these two factors conflict: for judgments of punishments of accidental harms.

In the next section these findings are discussed in more detail in the context of other literature on the moral foreign language effect of decision-making.

3.2 On the scope and origins of the moral foreign language effect

The findings of this dissertation contribute to a larger body of work on the moral foreign language effect on decision-making. As such, the ways in which these findings fit (or not) with the current literature will be discussed – in particular, with regard to the potential scope and origins of the effect.

The results of Section 2.2 show a very robust effect of language on choice for oneself in certain moral dilemmas, which is consistent with the

previous literature (e.g., Cipolletti et al., 2016; Costa et al., 2014a; Geipel et al., 2016). They also allow us to rule out explanations for the phenomenon that are collateral effects of foreign language use, which had not been previously explored (with the exception of Oganian et al., 2016, but in a different decision-making context e.g., behavioral economics). The presence of the effect for Studies 3a and 3b suggest that the effect is not fully attributable to aversion to the action, or as other authors put it, language-dependent memory. That is, it has been argued that the violation of the social and moral norm of "do not push" is less accessible in a foreign language context given that it was acquired in a native language context (Geipel et al., 2015a; Geipel et al., 2015b; Hadjichristidis et al., 2017a). According to these authors, this is what drives increased willingness to push the man in a foreign language context. As argued in Section 2.2 and elsewhere, we argue that the moral foreign language effect is most likely attributable to an increase in psychological distance and a decrease in emotional reactivity.

Reduced negative affect has been found to account for moral foreign language effects elsewhere such as in judgments of risk and benefit, and magical thinking (Hadjichristidis et al., 2015; Hadjichristidis et al., 2017a, respectively). These findings also appear in contexts that involve conflict: Judgments of risk and benefit are negatively correlated with one another and we know our superstitions to be irrational. The authors of these articles attribute these phenomena to a lack of (emotional) autobiographical memory in a foreign language as mentioned above. If this is true, it is consistent that the argument that we would not find the moral foreign language effect for those living in the foreign language

context (Study 2, Section 2.3) – these individuals would have more embodied foreign language processing, having frequent social interactions in this language that coincide with physiological and affective states. This would, arguably, increase emotional reactivity and decrease psychological distance in a foreign language context, making the processing of the native and foreign language more similar. After all, the context and frequency of acquisition and use are largely what determine if there are emotional differences in a foreign language (see Caldwell-Harris, 2014; Caldwell-Harris, 2015). For example, we would not expect any language effect on decision-making for Catalan-Spanish bilinguals regardless of how dominant they feel in one language.

This further suggests that when psychological distance and emotional reactivity are more similar across languages, the effect is less likely to be present, as suggested by the results of Section 2.3. Moral foreign language effects have been found for judgments of another's behavior such as in ostensibly harmless moral transgressions (Geipel et al., 2015b). There is a trade-off of sorts involved in these transgressions, but they directly benefit the agent (and no one else), which is not the case in moral dilemmas (that benefits others, not the agent). This likely affects how people judge these scenarios. Thus, the results of Geipel et al., 2015b may not be entirely comparable to those of the studies included in Section 2.3.

The same authors (Geipel et al., 2016) found an effect of language when intentions and outcomes mismatched, showing that using a foreign language prompted a greater weighting of outcomes than intentions when

judging moral goodness. This appears to conflict with the findings from Section 2.4. However, we ask about various measures, the most relevant of which for the purpose of comparison is moral wrongness. This may make the studies unsuitable for comparison given that the frame of "goodness" or "wrongness" could increase focus on the outcome or intentions, respectively (e.g., Pizarro et al., 2003). However, we do find a tendency for an effect of language on intention for punishment judgments of accidental harm. This suggests that when different process or evaluations conflict — for accidental and not intentional harms, for a measure that is driven both by evaluations of intentions and outcomes, not mainly by one of these – the foreign language effect is more likely to be present, which is consistent with certain aspects of Geipel et al. 2015b and Geipel et al, 2016's findings. As mentioned, in the 2016 article intentions and outcomes mismatch, and in the 2015b article the agent's intentions may have been bad in an abstract moral sense, but there were no real negative consequences, which leads to a conflict between the evaluations of intentions and outcomes.

Regarding cognitive load, the findings from the meta-analyses of the choices made for oneself in variations of the Footbridge dilemma in Section 2.2 and those from Geipel 2015a suggest that the effect of language is larger when cognitive load is increased in a foreign language context (when proficiency is lower) (see also Hadjichristidis et al., 2017b). However, the results from the Appendix suggest that increased cognitive load (lower foreign language proficiency) decreases value-maximizing tendencies in decision-making, which would predict a decrease in willingness to sacrifice one life to save many. This is

consistent with research on moral judgment in the native language; e.g., Greene et al., 2008; Trémolière et al., 2012). A caveat is that the studies from the Appendix are analyzes using a Process Dissociation approach (e.g., Conway & Gawronski, 2013), while the other studies have binary or scalar response options.

Finally, there is converging findings that people are less likely to cheat for personal financial gain in a foreign language context compared to a native one (Bereby-Meyer et al., 2017; Alempaki, Doğan, & Yang, 2017). This is consistent with the effect of language being present when making choices for the self but also is congruent with the argument that foreign language use reduces automatic, intuitive, affective processing as it has been argued that the urge to cheat is automatic (e.g., Bereby-Meyer et al., 2017; Shalvi, Eldar, & Bereby-Meyer, 2012).

In summary, the various results suggest that the moral foreign language effect is most likely attributable to a reduction in automatic, intuitive, affective processes. This is likely due to an increase in psychological distance and reduced emotional reactivity. Relatedly, the results suggest the effect is most likely to be present when the decision-making context is emotional and personal or elicits a conflict.

3.3 Limitations and Future Directions

This dissertation mainly contains data from people who are living in their native country (native language context) and of a certain age and

socioeconomic backgrouns (university students). A more complete sample would include somewhat older people and those who live in the foreign language context (e.g., immigrants). This is because the context of acquisition and use of the foreign language would affect whether or not its processing would have an effect on decision-making. In other words, for people who have lived in the foreign language context for a decade, or have a long-term partner with whom they use a foreign language, are unlikely to be subject to be subject to language effects. This is because they would have accrued the proficiency, automaticity, frequency of use, embodiment and autobiographical memory necessary to limit or negate the differences between the processing of the native and foreign languages (see Caldwell-Harris, 2014; 2015). A related limitation is that these data were collected in classrooms and reflect a kind of decision-making that might differ in a real world context. Thus, future directions include a different kind of sample to investigate the effects of the age and contexts of acquisition and use on the presence of the moral foreign language effect. They would also include field studies of a more realistic nature.

This dissertation investigated certain potential origins of the phenomenon but not all. Employing a different sample would address one of the potential causes we have not investigated in depth (language-dependent memory). Further work should also manipulate cognitive load and fluency to determine their potential contributions to the presence of the moral foreign language effect.

3.4 Concluding remarks

Our present data allow us to state that the original moral foreign language effect is real and modulated by the contextual factors of the dilemmas. It appears that foreign language processing leads to less focus on the action than on the outcomes in moral dilemmas, which is consistent with an increase in psychological distance and a reduction in emotional reactivity. This would reduce automatic, intuitive and affective processes. When these two factors (psychological distance and emotional reactivity) are more similar across language contexts, e.g., when judging another's choice in a moral dilemma instead of making it for oneself, the effect of foreign language processing on judgment is less reliable. There is no foreign language effect for most measures of judgment of another's moral transgression (financial, not violent). A caveat is when the various processes or evaluations conflict: Accidental harms are judged to be more publishable in a foreign language context compared to a native one. The intentions (good) conflict with the outcome (bad), and the particular measure (punishment) takes into account both the evaluation of intentions and that of outcomes. Thus, foreign language processing affects the interplay of the various processes and evaluations involved in the decision-making process, and are most likely to be present when these conflict.

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Appendix

Thinking more or feeling less? Explaining the foreign-language effect on moral judgments

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