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FOREIGN LANGUAGE EFFECT ON MORAL DECISION-MAKING AND SEMANTIC PROCESSING: The Case of Bilingual Algerian University Students.

Dissertation submitted to the department of foreign languages as a partial fulfilment of the requirements for the degree of Master in Linguistics

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Dedication

To my beloved parents and dear brother and sisters; to whom everything comes second.

Acknowledgment

I am deeply grateful to my parents and siblings for their unwavering support and belief in me. I would especially like to thank Zeyneb, a soul I feel I have known long before existence.

I would like to express my sincere gratitude to my esteemed supervisor, Mrs. Belaid Bekhta for her invaluable guidance and feedback.

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Abstract

Languages are powerful and this is no secret, but are they powerful enough to influence moral decision-making and semantic processing? Can the simple act of using a foreign language instead of the native one have consequences directly affecting our moral judgements or our abilities at detecting semantic anomalies? The possibility that moral decision-making and semantic processing could be affected by the linguistic context in which they occur has implications for bilinguals and multilinguals all over the world, who constantly make decisions based on information received in the different languages they speak. Prior research found the use of a foreign language to diminish a number of cognitive biases that affect decision-making. The current study investigated the effect the use of a foreign language has on moral decision-making with the use of a modified version of the footbridge dilemma intended to causes a framing effect that leads to more acceptance of sacrificial harm. The Moses illusion was used to examine semantic anomaly detection. Participants received a questionnaire in either their native language or the English language and their decision-making tendencies were compared. In line with previous findings, foreign language effect led to more utilitarian decisions in the foreign language condition and did not reduce the asymmetry between decision types (did not reduce the framing effect). It also failed at reducing the Moses illusion. These findings shed light upon the generalisability of the foreign language effect to a new linguistic context/culture and help gain a holistic understanding of the multidimensionality of bilingual cognitive processing.

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List of Abbreviations and Acronyms

FLE: Foreign Language Effect

SPSS: Statistical Package for the Social Sciences

General Introduction

Using more than one language on a regular basis is deemed to be the norm in today's globalized society. People use foreign languages for communication, work, commerce, studying and travel. In these activities, people constantly make decisions using their native tongues and the foreign languages they speak. Decision-making is a highly complex cognitive ability that is shaped and characterized by individual differences such as personality and experience. The ultimate goal of this process is to come up with objective and rational judgments that would lead to optimal decisions; the only problem is that human reasoning is not always capable of objectively interpreting reality because of the effects of cognitive biases. While making a decision, people like to think that they use common sense and always come up with clear and measured judgments; but what they fail to acknowledge is that human beings don't have the time, the capacity nor the resources to account for all possible outcomes and investigate each and every piece of information they have in order to determine the best possible decision they could ever make in a particular situation. Instead, people use heuristics, which are mental shortcuts, filters and systematic ways of reasoning that might not reflect reality. Heuristics are deviations in rationality caused by the personal experiences and preferences of the decision-maker. This is a limitation of the human brain that could exert both, a positive and a negative influence. This filtering operation allows human beings to process and interpret the unbelievably vast amount of information in a matter of seconds, but it can also cloud their judgments and cause them to make poor decisions.

While most theories of moral judgment and decision-making assume language-independency concerning these cognitive abilities, the possibility that the language in which information is presented could be a decisive factor in such cognitive processes (aside from leading to misunderstandings) is high. The key question is, therefore, whether the linguistic context of these situations is relevant. It might seem logical to think that the choices we make are independent of the languages in which we make them; yet, several studies have shown that language - besides being a tool used to communicate people's decisions – plays a role in shaping these decisions. The effect

of a foreign language, hence *foreign language effect*, on moral judgment and decision-making has been investigated and found to be a relevant factor that influences people's choices, decisions and preferences in a native versus foreign language context (Costa, Foucart, Arnon, Aparici, & Apesteguia, 2014; Keysar, Hayakawa, & An, 2012; Corey et al., 2017), as many studies have found that when people think in a foreign language, the effect of these biases diminishes and the patterns of decisions and choices of people differ.

Other than moral judgement, cognitive biases affect semantic processing as well. When asked "how many animals of each kind did Moses take on the ark", most people tend to ignore the distortion of the question and decide to answer "two", even though they know that it was the prophet Noah who took the animals on the ark, not the prophet Moses. In 1981, Erickson and Mattson investigated semantic anomaly detection and coined the term "Moses illusion" for when people fail to detect semantic anomalies. Research into the Moses illusion investigated the mechanisms behind language processing in an attempt to explain how and why humans are susceptible to semantic illusions. Researchers in this area have also tried to figure out ways to weaken the strength of the Moses illusion, and the foreign language effect (although only few studies exist on its effect on the Moses illusion bias) might be one of these ways.

Languages are usually thought of as tools to convey meaning, and in our case, to express the decisions we make. The fact that you speak one language or more, and whether you make decisions thinking in your native language or another foreign language you speak, should not be relevant to the quality of such decisions. This has been the belief for a long time, until recently. It has been confirmed by several studies that the languages which people use considerably impact the decisions they make (Cipolletti et al., 2016; Langensee & Mårtensson, 2019). It is now widely believed that the use of a foreign language reduces decision-making biases, "Recent studies show that people exhibit a reduced decision bias in a foreign language relative to their native language." (Zheng, Mobbs, Yu, 2020). The use of a foreign language has been proven to reduce a number of decision biases such as the risky-choice framing (Keysar et al., 2012), hot

hand fallacy (Gao, Zika, Rogers, & Thierry, 2015), and the illusion of causality bias (Díaz-Lago, Matute, 2018).

In moral contexts, the use of a foreign language seems to leads to more utilitarian decisions and one of the proposed explanations for this is reduced emotionality when thinking in a foreign language (Costa A, Foucart A, Hayakawa S, Aparici M, Apesteguia J, Heafner J, et al. , 2014; Geipel et al., 2015). This reduction in emotionality is believed to lead to more analytical reasoning.

Positive framing has been investigated in moral contexts with the use of moral dilemmas such as the trolley and the footbridge dilemmas, where conceptually identical choices were framed either positively (highlighting the lives saved) or negatively (highlighting the lives lost). A study by Cao and colleagues (2017) found that people made more utilitarian decisions in the positively framed moral dilemmas, as compared to negatively framed versions in which most choices were more deontological. A previous study by Petrinovich & O'Neill in 1996 also found people to be more accepting of sacrificial harm in positively framed versions of moral dilemmas as opposed to the negatively framed ones. Since framing is, by definition, a cognitive bias and although positive framing of the outcomes (saved vs. lost lives) has been proven to lead to more utilitarian decisions, which the foreign language also succeeds at, what would the effect of foreign language use on positive framing in moral dilemmas be? Would the foreign language effect (if proven to exist) reduce this bias or would the framing effect and the foreign language effect work together and lead to more utilitarian decisions when using a foreign language, in the Algerian linguistic context?

Moses illusion is another interesting cognitive bias that causes people to overlook semantic distortions when critical terms are replaced with semantically relevant ones. The foreign language effect on this cognitive bias is rarely the focus of study, especially in the Algerian context.

Nevertheless, most research studies about the foreign language effect are generally concerned with emotional cognitive biases (mainly the framing effect) and dealt with very few languages. The nature of this phenomenon is still a matter of debate; the causes of such an effect, its modus operandi and the different heuristics it

might affect remain speculative. There is a paucity of research examining emotionally neutral heuristics and no study, to the best of my knowledge, reports any findings concerning the Algerian linguistic context. Thus, this research attempts to explore this uncharted area by assessing the generalisability of the Foreign Language Effect to a new linguistic setting, which is in this case the Algerian linguistic context. Another problem the research aims to address is whether FLE influences the emotional (framing effect in particular) and the emotionally neutral (specifically the semantic illusion) cognitive biases.

In this research and based on relevant studies, the researcher will attempt to replicate previous findings in a new linguistic context apropos of two cognitive biases. The research questions for this study are:

1) Will thinking in a foreign language reduce the framing effect (positive vs. Negative framing) in an Algerian linguistic context?

2) Will thinking in a foreign language weaken the strength of the semantic illusion bias in the Algerian linguistic context?

There is evidence to suggest the following hypotheses:

1) Thinking in a foreign language will reduce the framing effect in the Algerian linguistic context.

2) Thinking in a foreign language will not reduce the semantic illusion bias in the Algerian linguistic context.

This study has two purposes: The first one is to assess the generalisability of the foreign language effect to the Algerian linguistic context in which Arabic is the native language of the country and English is considered a foreign language; the second one is to determine whether the foreign language effect, or in other words, whether thinking in a foreign language influences, in this particular context, both emotional (framing effect) and emotionally neutral (the semantic illusion) cognitive biases.

A common misunderstanding was the belief that bilingualism is a rare phenomenon. Today, bilingual speakers outnumber monolingual speakers. Furthermore, it is generally believed that more than half of the world's population are bilingual (Grosjean, 2010).Thus, the findings of this study are of paramount importance to these individuals who routinely use both of the languages they speak to make crucial decisions in regards to their professional careers and personal lives which, without a doubt, would affect their social interactions. The findings are also of practical interest to policy-makers and people who have the authority to make crucial decisions that would affect society as a whole. This data will also be helpful to international corporations of all kinds whose members speak a range of different languages. The results of this investigation will help assess the generalisability of the foreign language effect to a new country/culture and to an emotionally neutral cognitive bias, which has been rarely explored in such a context. In sum, this research will help understand the mechanisms that underlie bilingual cognitive processing and the power of a foreign language.

The present dissertation is made up of two main chapters. The first chapter provides a theoretical context for the phenomenon under investigation. It serves to introduce the subject of the research. Ethical decision-making, theories of moral judgement, moral decision-making biases, semantic processing and the foreign language effect are discussed in this part of the dissertation. The second chapter constitutes the core of the study. This chapter describes in detail the research method used and the study design (a randomized experiment in the form of a 2x2 between-subjects factorial design). A Thorough description of participant characteristics, the materials used in the study, the experiment procedures (online completion of the questionnaire) and the data analysis procedures will be followed by the results and their interpretation. The chapter ends with a brief conclusion, the limitations of the study and some suggestions for further research.

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1.1 Introduction

This chapter is divided into three sections; the first section concerns moral decision-making. Moral decision-making and theories of moral judgement and relevant moral decision-making biases will be discussed in this section. Semantic processing will be discussed in the second section. The third section will present relevant background information concerning the foreign language effect.

1.2 Section One: Moral Decision-Making

1.2.1 Moral Decision-Making

Moral decision-making can be defined as "a process by which individuals use their moral base to determine whether a certain issue is right or wrong" (Carlson et al., 2009). When a problem concerns 'right' and 'wrong', it is considered a moral issue in which the behaviour of the individual will have consequences that affect other people. This individual that acts in a morally charged situation according to their morality in order to resolve an ethical dilemma is referred to as a moral agent. To morally judge an action (or inaction) is to evaluate the moral quality of the action (or inaction) and then decide whether it is right or wrong based on standards of rightness or goodness. Moral judgments judge voluntary and habitual actions of a rational being and are judgements of value, of what "ought to be" rather than of "what is". Decision-making is a deliberate cognitive process that, according to Schultz (1997), can be identified as "a formal or informal procedure used by an individual or group of individuals to analyze a problem, identify objectives and goals, develop alternatives, and determine consequences for each alternative". When making a decision in a situation with moral content, decision-making becomes moral decision-making, and the deliberate choices and decisions have to conform to moral ideals. But how do people decide what is "good" and what is "bad"? Do humans consciously judge actions, inactions, situations or motives as moral or non-moral, or is this process unconscious? Could it be both, conscious and unconscious? Are our decisions rational or are they affected by seemingly irrelevant factors?

1.2.2 Theories of Moral Judgement

1.2.2.1 Rationalism

Ted Honderich, in his *The Oxford Companion to Philosophy* defined *rationality* as follows:

> The feature of cognitive agents that they exhibit when they adopt beliefs on the basis of appropriate reasons. […] The adjective 'rational' is used to characterize both agents and specific beliefs. In both cases rationality can be contrasted with either non-rationality or irrationality. […] A being who is capable of being rational but who regularly violates the principles of rational assessment is irrational. […] Beliefs that are contrary to the dictates of reason are irrational. […] When dealing with empirical matters, rational beliefs are arrived at by accumulating relevant evidence; a rational individual will suspend belief until an adequate body of evidence has been accumulated and evaluated. Rational belief is established in mathematics by providing a formal proof. There has been an intense debate throughout the history of philosophy on the question whether matters of value are subject to rational assessment (Brown, 1988; Cherniak, 1986; Rescher, 1988).

Any view emphasizing the role of reason can be considered a rationalist view. While extreme rationalism claims all knowledge is based on reason alone, moderate rationalism acknowledges sensory experiences though it emphasized the role of reason in some of our knowledge.

For decades, researchers have been debating the psychology behind moral judgement and decision-making. For rationalists, morality is rational and when making moral judgements, one should consult their reason as it will successfully generate the appropriate moral action needed. Moral judgement for rationalists is based on a rational analysis of the rightness or goodness of the action (Kant, 1780); thus, moral judgements are believed to be controlled primarily by reason. According to Michael Smith (CDP:587):

Both Plato and Kant thought that a priori moral knowledge could have an impact on what we do quite independently of any desire that we happen to have. This motivational view is also ordinarily associated with moral rationalism. … Moral knowledge consists in a belief that is capable of rationally producing a distinct desire.

1.2.2.1.1 Kohlberg's Rationalist Theory

Kohlberg (1969) was a rationalist who believed conscious moral reasoning was the primary origin of morality. Inspired by Piaget's work (1965), Kohlberg investigated moral competencies by presenting hypothetical moral dilemmas (such as Heinz dilemma) to his subjects (mostly children). Kohlberg's rationalist theory explains how moral development takes place in humans and it holds that moral reasoning develops through six stages grouped into three levels: the pre-conventional, the conventional and the post-conventional level, each level better suited to dealing with moral dilemmas than the one before it and each stage "can be defined independently of the specific content of particular moral decisions or actions" (Kohlberg, 1981).

Kohlberg described the stages predicated on stated motivations for obeying moral rules. The following is an excerpt from "Indoctrination versus Relativity in Value Education" Zygon 6(1971) 285-310p:

"I. PRECONVENTIONAL LEVEL

Stage 1: Punishment and Obedience Orientation

"Obey rules to avoid punishment" (297).

"The value of human life is confused with the value of physical objects and is based on the social status of physical attributes of the possessor." (298)

Stage 2: Instrumental Relativist Orientation.

"Conform to obtain rewards, have favors returned, and so on."(298)

"The value of human life is seen as instrumental to the satisfaction of the needs of its possessor or of other persons."(298)

II. CONVENTIONAL LEVEL.

Stage 3: Interpersonal Concordance or "Good Boy–Nice Girl" Orientation

"Conform to avoid disapproval, dislike by others." (298)

"The value of human life is based on the empathy and affection of the needs of its possessor or of other persons." (298)

Stage 4: The "Law-and-Order" Orientation.

"Conform to avoid censure by legitimate authorities and resultant guilt." (298)

"Life is conceived as sacred in terms of its place in a categorical moral or religious order of rights and duties." (298)

III. POSTCONVENTIONAL, AUTONOMOUS, OR PRINCIPLED LEVEL.

Stage 5: The Social Contract Legalistic Orientation (social utility)

"Conform to maintain the respect of the impartial spectator judging in terms of community welfare.." (298)

"Life is valued both in terms of its relation to community welfare and in terms of life being a universal human right." (298).

Stage 6: The Universal Ethical Principle Orientation - "Right is defined by the decision of conscience in accord with self-chosen ethical principles appealing to logical comprehensiveness, universality, and consistency. These principles are abstract and ethical (the Golden Rule, the categorical imperative [Kant]); they are not concrete moral rules like the Ten Commandments (297)."

"Conform to avoid self-condemnation." (298)

"Belief in sacredness of human life as representing a universal human value of respect for the individual." (298)”

- "Under each stage, the motive given for rule obedience is first and the value of human life is second."

1.2.2.2 Sentimentalism

Sentimentalists emphasize the role of emotions in producing moral judgements and how one should consult their emotions when attempting to make moral judgements, as emotions are (and should be) sufficient to prompt the appropriate moral action needed. The origins of these moral judgements are believed to be emotions, intuitions and sensory experiences (Hume, 1738), thus, moral judgements consist in sentiments and are thought to be driven primarily by emotions i.e., moral thoughts are fundamentally sentimental and emotions are of great importance to the anatomy of morality. According to Shaftesbury, The "affection" or motivation underpinning the behaviour is the fundamental object of moral judgment. Focusing on such emotions, they can become the object of second-order affection:

In a Creature capable of forming general Notions of Things, not only the outward Beings which offer themselves to the Sense, are the Objects of the Affection; but the very Actions themselves, and the Affections of Pity, Kindness, Gratitude, and their Contrarys, being brought into the Mind by Reflection, become Objects. So that, by means of this reflected Sense, there arises another kind of Affection towards those very Affections themselves, which have been already felt, and are now become the Subject of a new Liking or Dislike. (Shaftesbury 1699–1714: 16). Most scientific evidence supports the views of sentimentalism (Craigie, 2011).

1.2.2.2.1 Haidt's Social Intuitionist Model

Moral intuitionists contend that, in contrast to rationalist theories of moral decision-making, human evaluations of moral permissibility are the product of quick and emotionally motivated intuition; though this approach does not entirely exclude reasoning from a causal function it still claims decision-makers have little if any awareness of the process of making judgements. Haidt (2001), a social psychologist inspired by Hume, describes moral judgements as "evaluations (good vs. bad) of the actions or character of a person that are made with respect to a set of virtues held to be obligatory by a culture or subculture". Haidt contends that decision-makers initially respond to moral dilemmas intuitively and seek to employ reason only after a decision has been taken in order to justify said decisions or modify them.

Haidt distinguishes between reasoning and intuition. According to him, reasoning is a conscious activity that goes through several steps while intuition is an unconscious and automatic activity that is "the sudden appearance in consciousness of a moral judgment, including an affective valence (good-bad, like-dislike), without any conscious awareness of having gone through steps of searching, weighing evidence, or inferring a conclusion". Haidt's model consists of four primary processes or "links".

1. The intuitive judgement link: Based on this model, moral judgements emerge in consciousness naturally and effortlessly as a result of moral intuitions.
2. The post hoc reasoning link: According to the model, moral reasoning is an effortful activity undertaken after a moral judgment has been formed, in which a person seeks for arguments to justify an already-made judgement.
3. The reasoned persuasion link: According to the concept, moral reasoning is generated and communicated verbally in order to defend one's already-made moral judgment to others. Such reasoning can occasionally influence others. Because moral views always have an emotional component, it is believed that reasoned persuasion works by activating new affectively

valenced intuitions in the listener rather than giving logically persuasive reasons.

4. The social persuasion link: Because people are very sensitive to the formation of group norms, the concept suggests that the sheer fact that friends, allies, and acquaintances have formed a moral judgment has a direct impact on others, even if no reasoned argumentation is deployed.

5. The reasoned judgment link: People can sometimes rationalize their way to a decision through reasoning alone, overcoming their existing intuition. In such circumstances, logic is really causative. Such reasoning, however, is thought to be unusual, happening only in instances when initial intuition is limited and processing capacity is significant.

6. The private reflection link: The ultimate judgment can be reached by following one's strongest intuition or by enabling reason to pick from options based on the deliberate application of a rule or principle.

1.2.2.3 Dual-Process Theory

Recent multisystem theories of moral judgement acknowledge the roles of both cognitive processes, conscious reasoning and emotion-based intuition (Greene, 2001, 2004, 2008), though they disagree on the importance of the role of each system (Greene, 2007; Haidt, 2001). According to this theory, judgments in sacrificial dilemmas that are utilitarian in nature (e.g. approving of the killing of one person in order to save several others) are the result of controlled cognitive processes. Such processes tend to maximize welfare. On the other hand, judgements that are deontological in nature (e.g. disapproving of the killing of a person in order to save several others) are driven by automatic emotional responses. These claims are supported by the findings of Greene and colleagues' experiment in which they used functional measurement resonance imaging (fMRI) to measure the subjects' neural activities while they responded to moral dilemmas. The findings were interpreted and found to be in favour of the dual-process theory, in which it is stated that deontological

decisions are the result of intuitive processing, while consequentialist/utilitarian decisions are driven by controlled processing.

1.2.2.3.1 Utilitarianism

Utilitarianism is one of the most compelling and appealing conceptual frameworks in moral philosophy. Its basic premise is that whether actions are morally permissible or not is determined by their repercussions. More precisely, the only significant impacts of actions are the good and terrible outcomes that they generate. The utilitarian principle of choice can be best explained by Hruschka (1991):

In comparing the moral qualities of actions…we are led by our moral sense of virtue to judge thus; that in *equal degrees* of happiness, expected to proceed from the action, the virtue is in proportion to the *number* of persons to whom the happiness shall extend (and here the *dignity*, or *moral importance* of persons, may compensate numbers); and, in equal *numbers*, the virtue is the *quantity* of the happiness, or natural good; or that the virtue is in a compound ratio of the *quantity* of good, and *number* of enjoyers….so that *that action* is *best*, which procures the *greatest happiness* for the *greatest numbers*; and that *worst*, which, in *like manner*, occasions *misery*.

1.2.2.3.2 Deontology

Deontology is an ethical philosophy that utilizes rules to differentiate between what is acceptable and what is improper. Immanuel Kant, a German philosopher, is most primarily associated with this ethical philosophy and the founder of Deontology (1724-1804). This approach corresponds to our natural understanding about what is and isn't ethical. Unlike consequentialism, which assesses acts depending on their outcomes, deontology does not necessitate assessing the costs and advantages of a circumstance. Kant argued that the essential importance of a choice resides in

identifying the moral motive of that choice or action itself, rather than focusing on the ultimate outcome of the choice/action, as he claimed "…every rational being, exists as an end in himself, not merely as a means."

1.2.2.4 Bounded Rationality

The American social scientist Herbert Simon challenges the notion of human rationality and asserts it is bounded by the lack of knowledge; behaviours can violate rationality or fail to conform to rationality ideals and thus, human behaviour cannot be described as rational but at the same time, cannot be believed to be irrational. Decision- makers strive to be rational but the limits of human cognition prevents them achieving ultimate rationality with their decisions.

Simon considered the different cognitive limitations of decision-makers and claims rationality is bounded because our thinking capacities, the available information and time are limited (Simon, 1982). According to Simon (1955):

We must be prepared to accept the possibility that what we call "the environment" may lie, in part, within the skin of the biological organisms. That is, some of the constraints that must be taken as givens in an optimization problem may be physiological and psychological limitations of the organism (biologically defined) itself. For example, the maximum speed at which an organism can move establishes a boundary on the set of its available behaviour alternatives. Similarly, limits on computational capacity may be important constraints entering into the definition of rational choice under particular circumstances.

1.2.3 Moral Decision-Making Biases

It is generally recognized that human decision-making is far from rational, despite the fact that this is the ultimate objective of such decisions because the human mind is flawed in its reasoning abilities. The multidimensionality of ethical decisions makes the latter even more complicated as these decisions are affected by different biases that impair human judgement resulting in sub-optimality. Cognitive biases are errors in reasoning and a systematic diversion from rationality caused by unconscious cognitive processes which lead to thought processing errors. Cognitive biases (which result from the use of heuristics which are simple mental shortcuts that facilitate information processing by using prior knowledge) are not to be considered logical fallacies, as the latter are errors in logical reasoning while the former are built-in erroneous patterns of thinking, processing and interpreting reality.

Moral decision-making, the process by which we decide what is morally acceptable and what is not, requires the capacity to respond to an ethical dilemma in a fair and appropriate manner according to ethical codes, but just like every other decision and because human being are not completely rational (Gigerenzer & Selten, 2002; Tversky & Kahneman, 1989), ethical decisions are susceptible to cognitive biases. In an attempt to assess the reliability of moral judgements and decision-making, researchers have had the long tradition of presenting their subjects with moral dilemmas (Christensen & Gomila, 2012), which can be defined as "a situation in which the agent morally ought to do A and morally ought to do B, in which he cannot do A as well as B" (Haan, 2001). Sacrificial moral dilemmas are hypothetical moral situation such as the footbridge dilemma which has been widely used in different experiments. The footbridge dilemma is a fictitious situation in which one has to decide whether to sacrifice one person in order to save several others or whether to refrain from such an action which will eventually lead to the other persons dying (Foot, 1978, Thomson, 1985). These situations have no satisfactory solution as choosing to save a person or choosing to save the others result in the same outcome, at

least one person will die no matter the decision made, and this leads to conflicting principles and tragically difficult choices.

1.2.3.1 The Framing Effect

In the realm of moral decision-making, the framing effect (which is defined as "the significant difference observed in subjects' responses to F+ and F-." (Piñon & Gambara, 2005)) has been extensively researched since Tversky and Kahneman's famous experiments in 1981 wherein they explored and investigated how a mere difference in the wording of information influences participants' answers in hypothetical moral dilemmas, depending on whether an option's consequences are reported as gains or losses. In Tversky and Kahneman's experiment using the Asian disease problem, when the outcomes of the participants' actions were presented as gains, people were risk averse as they avoided risky choices and decided to choose the option that ensures a gain rather than that which only provides a probable gain. Decision patters changes as the information was presented as losses, for participants in this situation were risk seeking, preferring a probable loss over a certain one of the same value.

This is particularly interesting because according to descriptive invariance, describing a decision problem by distinct but conceptually and logically equivalent statements should result in the same choices. It is only rational that distinct linguistic descriptions of identical options lead to consistent choices. Kahneman and Tversky's 1980s work violates the axiom of descriptive invariance and proves that seemingly irrelevant factors such as how information is worded and presented can lead to a change in decision-making patterns (Peng et al., 2013).

Framing effect was also detected in Petrinovich & O'Neill's 1996 experiment, in which they presented two versions of the footbridge dilemma. The subjects had to choose between sacrificing a man to save five others and refusing to sacrifice a man which will ultimately lead to the death of the other men. In one version, the

researchers highlighted the lives “saved” by the actions of the participants creating a positive frame, and in the other version they highlighted the lives “lost” due to the actions of the participants and thus presented a negative frame of the same moral dilemma. Participants were found to be susceptible to framing effects as they were more accepting of sacrificial harm (utilitarian decision) in the positive frame than they were in the negative frame, in which most participants refused sacrificing the man (thus making a deontological decision)(Cao et al., 2017; Petrinovich & O’Neill, 1996).

1.2.3.1.1 Types of Framing Effect

As maintained by Levin, Schneider, and Gaeth (1998), there are three main types of framing effect:

1. Attribute framing: in which a characteristic of an object or situation is highlighted as positive or negative. A popular example is how a pound of beef can either be described as “80% lean” or “20% fat”
2. Risky-choice framing: involves several options presented as either gains or losses. The Asian disease problem is a great example of this effect.
3. Goal framing: According to Piñon & Gambara (2005), “Given a certain message M+ set out from a positive frame (opportunity to make a gain or avoid a loss), and given the same message set out from a negative frame (opportunity to make no gain or suffer a loss), denoted by M- , we define goal framing effect as the difference in persuasive impact between M+ and M- for achieving a certain behaviour”.

1.3 Section Two: Semantic Processing

1.3.1 Semantic Processing

Philosophy of language is the area of research concerned with the nature, origin and the use of language. It investigates the syntactic properties and attributes of linguistic expressions. Principles of semantic compositionality claim that the meaning of linguistic expressions is determined by the individual meanings of the constituents (that are joined by syntactic rules) of said linguistic expressions. Partee (1984) holds that "the meaning of an expression is a function of the meanings of its parts and of the way they are syntactically combined". Syntactic and semantic processing, which are both analytical processes that are part of language processing and linguistic comprehension in particular are believed to be "generally completed fully and relatively automatically, and if this were not the case, the eventual interpretation derived from an underspecified linguistic representation would be suspect" (Christianson, K, Williams, CC, Zacks, RT and Ferreira, F, 2006) but sometimes, these processes malfunction and succumb to semantic anomalies in which shallow semantic processing results in a failure to detect linguistic inconsistencies and a general tendency to ignore the latter, because not every single word's meaning is processes when processing whole sentences (Erickson & Mattson, 1981; Reder & Kusbit, 1991) .

1.3.1.1 Moses Illusion

Detecting semantic anomalies is tricky even when people are warned about the possibility that there could be some distortions in the text. Investigating language processing and semantic anomaly detection with the use of semantic illusions has become a tradition in this area of research. Failing to detect obvious distortions in questions (even while knowing what the correct form of the question should be) or the tendency of humans to explicitly overlook these distortions is a cognitive illusion. This phenomenon is not due to logical fallacies but to knowledge neglect and to the

limitations of human cognitive processing and the reliance on heuristics to judge truth(as opposed to directly accessing information from memory) which causes contradictions with stored knowledge to go unnoticed. The US psychologists Erickson and Mattson were the first to introduce the illusion in their article published in 1981 in the Journal of Verbal Learning and Verbal Behavior. They referred to the cognitive illusion as the Moses illusion. In their experiment, participants were asked "how many animals of each kind did Moses take on the ark?" to which most people responded "two", failing to notice the distortion in the question even while knowing the correct prophet is Noah and even though in some versions of the experiments, they were warned about possible distortions in the question, all the while being given unlimited time to respond. When people fail to detect semantic anomalies in statements or questions where the correct and "critical" term was replaced by another semantically relevant but incorrect (distorted) term, they fall victims to the Moses illusion.

Most studies of the Moses illusion have investigated the mechanisms behind this failure to detect semantic errors and the different factors that might influence this illusion that causes people to fall prey to this cognitive illusion.

1.3.1.1.1 Conversational Cooperative Hypothesis

Cooperation Hypothesis explains this phenomenon of overlooking the distortion as being an act of cooperation with the speaker. It is considered rude to try to correct everything said by the speaker and so, people try to cooperate with each other during conversations and try to overlook mistakes in order for the conversation to flow. Grice (1975) asserts that people do notice the errors during a conversation but out of a belief that they know what the speaker originally wanted to say, they choose to explicitly overlook the mistakes and answer based on what should have been said. Grice referred to this as conversational postulate. According to the Conversational Cooperative Theory, in the Moses illusion experiments people do notice the semantic error, but out

of a belief that they know what the researcher meant and out of a desire to cooperate with the researcher, they choose to answer “two” to a distorted question.

1.3.1.1.2 Imperfect Coding Hypothesis

The Imperfect Coding Hypothesis explains participants’ failure to detect semantic anomalies as a result of a failure to encode the distorted part of the question, because participants might have skipped the distorted part after reading the very first part of the question, thinking they already know what the question must be and thus they answer based on what they expect the question to be. A failure to encode information leads to that information not being processed at all and thus not being used in decision-making. As participants expect to read/hear the word “Noah” in a question beginning as “how many animals of each kind....” they just skip over the rest of that question and answer based on what they expect the question to be about.

1.3.1.1.3 Inadequate Retrieval Hypothesis

The Inadequate Retrieval Hypothesis claims people do encode the distorted question but might fail to retrieve the necessary information that would permit them to uncover semantic anomalies. As maintained by this hypothesis, participants falling for the Moses illusion do not retrieve information concerning who it was that took the animals on the ark, they only succeed at retrieving information about how many animals were taken on the ark, totally neglecting information regarding the person responsible for taking the animals on the ark.

1.3.1.1.4 Partial-Match Hypothesis

As for the Partial-Match Hypothesis, which is the most scientifically supported hypothesis, Reder and Kusbit (1991) claim that “people often do incomplete matches between a complete representation of the question and a complete representation of the stored proposition that contains the answer”, in other words, they explain this phenomenon in terms of an imperfect matching of queries to memory. As questions are read, the presented terms are being matched to memory in order to generate an answer, but not every word gets matched to its exact memory representation. It a term succeeds at passing some criteria, it will be matched even though it’s not the exact term but it is sufficiently relevant in a way that guarantees comprehension. In the Moses illusion, the question will only be regarded as distorted or “incorrect” if the critical term (which is Moses) fails to reach a degree of match. Since Moses and Noah are both Islamic figures and are semantically related, the question is nevertheless comprehensible and so people provide an answer. Had the question been “how many animals of each kind did Dostoevsky take on the ark” most people would have detected the error because the word “Dostoevsky” doesn’t hold the required degree of match for comprehension. Distortions will only go unnoticed when the features of the distortion fail to overlap with the features of the original correct terms.

1.4 Section Three: Foreign Language Effect

1.4.1 Moral Foreign Language Effect

When people think of language, they think of this communicative tool that facilitates their social interactions and allows them to express themselves; it is what sets humans apart from all other beings. But generally, the belief is that, that's all that language does; it only conveys and transmits ideas and messages. Most people would think of the belief that language could possibly affect decision-making to be ridiculous, as decision-making is thought to be independent of the linguistic context in which it occurs, especially if the language is foreign to the decision-makers (generally learned in classroom settings and is not widely used in the native country of the person). How can a system of symbols and rules, that is not even native to the person, affect the high-level cognitive process that is decision- making? The mechanisms behind that are still not completely understood, but the fact that the use of a foreign language affects decision-making, especially in the moral domain, has been backed up by scientific research (Cipolletti et al., 2016), as people exhibit different decision-making tendencies when they make their decision in a foreign language as opposed to their native languages (Costa et al., 2014). Bilinguals are seen as less impulsive and more analytical when thinking in a foreign language as opposed to their native tongue.

Moral decision-making is frequently described with reference to the dual-process theory (Kahneman & Frederick, 2002; Sloman, 1996) which claims moral judgements and the decisions made in morally-charged situations are the result of the interaction of two cognitive processes, which are susceptible to the foreign language effect. Keysar et al. (2012) presented their participants with two versions of the Asian disease task (first introduced by Tversky and Kahneman in 1981), one in the native language of the participants and the other in a foreign language. The Asian disease task is a hypothetical moral dilemma in which participants are asked to choose between two morally-challenging options framed in two different ways (positive vs. Negative) in which one highlights the "saved lives" while the other highlights "lost lives", but the two versions have an identical outcome. In the task, participants were

asked to “Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people”. Participants were then presented with two different cures to choose from. In the first version (gain frame), the first cure will certainly save 200 people out of the 600 while the second cure had a “1/3 probability that 600 people will be saved, and a 2/3 probability that no people will be saved". In the second version (loss frame), however, participants were told that the first cure will cost the lives of 400 people while the second cure had a “1/3 probability that nobody will die, and a 2/3 probability that 600 people will die”. Since the outcomes were identical in both versions, it is only logical to expect the same decision-making tendencies, but that was not the case in this experiment. Participants were biased towards a risky choice when the situation was described in terms of losses, but not when it was described in terms of gains. What Keysar and colleagues (2012) did was present the dilemma in the native language of the participants to one group, while the other group received an identical version in terms of content; the only difference is that the second group received that version in a foreign language. The results showed a clear effect of the foreign language as framing effect (bias) was diminished and the asymmetry in responses was weakened in the case of the participants who received the foreign language version, while the framing effect was still persistent in the native language condition.

In another experiment by Costa and colleagues (2014), the use of a foreign language when responding to moral dilemmas was investigated. The researchers presented their subjects with the trolley and the footbridge dilemmas in both languages, the native language of the participants and another foreign language they speak. In the trolley dilemma, the participants have to decide whether to push a switch to divert an out of control trolley that’s about to kill five people stuck on the train track. If they do push the switch, the trolley will divert to another track in which one person is stuck, and thus their actions will cause the death of this person. In this dilemma, they’re choosing between: 1) killing one person to save another five and 2) allowing the death of five persons and refusing to sacrifice another to save them. In the footbridge scenario, the difference is that they’re asked to push an innocent large man standing next to them in order to save the five persons stuck on the train track.

The trolley dilemma is impersonal because the participants are not directly involved in causing harm. The death of the one person is viewed as a side effect of the action of saving the five persons, and the locus of intervention is a train. If they choose to save the five persons, they only have to push a lever, nothing more. The footbridge version, conversely, is more personal because their actions directly cause harm. The locus of intervention is a human being and the action that's required of them to save the five persons is extremely violent and a direct cause of the person's death.

Each participant received the dilemmas in only one single language. Similar to Keysar and colleagues' results, the findings showed that the use of a foreign language increased the number of utilitarian responses, proving a clear preference in choices and a different pattern of responses in the foreign language conditions to that of the native language condition. In this experiment, in the native language condition, most participants made deontological decisions; they refused to sacrifice an innocent person to save others. In the foreign language condition, however, and just as expected and similar to previous findings, most participants made utilitarian responses; they accepted sacrificial harm more compared to the participants of the native language condition. Costa and colleagues concluded that the foreign language effect leads to more utilitarian decisions.

1.4.1.1 Reduced Emotionality Hypothesis

As stated by the dual-process theory (Stanovich & West, 2000), two systems interfere and affect moral decision-making. System 1 is responsible for automatic, intuitive and unconscious mental processes while system 2 is responsible for slow, analytical and controlled mental processes. Deontological decisions are the result of system 1 while utilitarian decisions are the result of system 2. The differences in response tendencies between the native language condition and the foreign language condition are the result of either an increase of the mental processes of system 2 and/or a decrease in the mental processes of system 1 (Greene and colleagues). The increase

of utilitarian responses in the foreign language condition could be understood in the light of the reduced emotionality hypothesis, as it is believed the use of a foreign language provides a psychological distance and decreases emotional activities, which causes an increase in rational language processing and thus leads to a consequentialist type of judgement in which outcomes are more important than intentions and the ultimate goal of a decision is to maximize welfare (Geipel et al., 2015), but as Hayakawa (2017) contends, "People are more utilitarian when using a foreign language not because they think more, but because they feel less.".

1.4.1.2 Cognitive Enhancement Hypothesis

The cognitive enhancement theory posits that the use of a foreign language leads to more deliberate thinking which consequentially leads to less reasoning errors (Costa et al., 2014a; Hayakawa et al., 2017), since cognitive load increases when using a foreign language (Duñabeitia & Costa, 2015). According to this theory, it is not reduced emotionality that leads to utilitarian responses but the cognitive load that comes with a foreign language and the fact that tasks in a foreign language are more cognitively demanding, which ultimately slows down system 1's intuitive mental processes and diverts the attention to the more analytical system that is system 2, which results in utilitarian responses (Keysar et al. 2012).

1.4.1.3 Social and Moral Norms Accessibility

Geipel and colleagues (2015) proposed another explanation for the moral foreign language effect which, although acknowledges the effects of reduced emotionality, it highlights the role of social and moral norms accessibility. They stated: "we expected that the use of a foreign language might impair intuitive processing by reducing the activation of social and moral norms. We also expected that the use of a foreign language would deplete cognitive resources, because

processing information in a foreign language is more difficult and less automatic than processing one's native language (see Volk, Köhler, & Pudelnko, 2014)."

Geipel and colleagues explain the foreign language effect in terms of social and moral norms deactivation. Social and moral norms are acquired in the native language of the person, so when thinking/speaking in a foreign language, these norms are less accessible and the inability to access them causes the reduced emotionality which in turn causes an increase in utilitarian responses. As opposed to the native language, violating these norms would result in highly emotional reactions, but since these norms are less accessible in a foreign language, people tend to be more analytical and make consequentialist decisions more often than they do in their native languages.

1.4.2 Foreign Language Effect and the Moses Illusion

Only few studies exist on the foreign language effect on the Moses illusion, one of them is Geipel and colleagues' in 2015. Participants were asked "How many animals of each kind did Moses take on the ark". The correct answer is "can't say" or "none" because it was the prophet Noah that took the animals on the ark and not the prophet Moses, but most people feel a need to answer "two" (Alter, 2013). The use of a foreign language, which is believed to lead to more analytical reasoning, should weaken the strength of the illusion and lead to more correct answers. In Geipel and colleagues' experiment, more correct answers were given in the native language condition compared to the foreign one. The foreign language failed at weakening the semantic illusion. These researchers claim "that the foreign language effect might be confined to problems that have an emotional component."

1.5 Conclusion

This chapter provided the theoretical background for the phenomenon under investigation. Moral decision-making was discussed and a number of moral judgement explanatory theories were highlighted in an attempt to get a holistic understanding of this highly complex and extremely important cognitive process that is decision-making. Emphasis was places on moral decision-making as it is the subject of the study. The moral decision-making biases mentioned in this section are the biases assessed in this experimental study. Important aspects of semantic processing and relevant theories that explain its mechanisms were also discussed in this chapter. The third and last section was dedicated to the foreign language effect; the moral foreign language effect and the foreign language effect on semantic illusion were both discussed.

Chapter Two: Research Methodology, Data Analysis and Interpretation

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2.3.2.1 Arabic Condition Results

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2.3.3 Limitations of the Study

2.4 Conclusion

2.1 Introduction

This chapter is divided into two sections; the first section will describe the general research method, the study design, the participants, the materials used, the experiment procedures and the data analysis procedures. The findings will be analysed and discussed in the second section along with the limitations of the study.

2.2 Section One: Methods and Study Design

2.2.1 General Method

The aim of this study was to explore the generalisability of the foreign language effect on moral decision-making and semantic processing to the Algerian linguistic context. To conduct this research study, primary data had to be collected by the researcher, as no secondary data on FLE in the Algerian setting was found. For this purpose, a sample of bilingual Algerian university students was recruited and the experiment was carried out entirely online.

2.2.2 Study Design

In order to test the researcher's hypotheses, a randomised experiment was completed online in the form of a 2 (Language: Arabic vs. English) x 2 (Frame: Positive vs. Negative) between-subjects factorial design, resulting in four conditions in which the language of each condition was the independent variable and the asymmetry of the utilitarian vs. deontological responses in each frame was the dependent variable. The task assessing the semantic illusion was included in the same questionnaires and it was presented in the same language as the other questions. The entirety of the questionnaire, consisting of both tasks and follow-up questions, was presented in one single language.

2.2.3 Participants

So as to estimate an appropriate sample size for this study, an a-priori power analysis for a 2 × 2 $\chi 2$ test was conducted using G*power (Faul, Erdfelder, Lang, & Buchner, 2007) to ensure this research achieves empirical validity. The following settings were chosen for the test based on conventional guidelines: statistical power = .80, effect size w = .3 (Cohen, 1988), p = .05, Degrees of freedom = 1. Although the analysis indicated a minimum sample size of 88, more people volunteered to participate in the study.

A total of 194 university students completed the experiment. Participation was anonymous and voluntary. Note that several participants were excluded from the analysis for not meeting eligibility criteria. 24 participants were excluded for not providing enough information to determine whether they're eligible for this study or not (ex: did not indicate whether Arabic was their native language or not), and 7 were excluded for indicating Arabic was not their native language. 5 participants were eliminated for indicating they lived in an English speaking country for over a year and 4 were excluded for indicating both or either of their parents' native language is English. 2 participants were excluded as they indicated they did not understand the survey's questions and 1 participant was excluded for providing only their personal information and not responding to the footbridge dilemma task and the semantic illusion task. 3 more participants were eliminated for rating their English language skills as extremely poor (1/7). The reason behind excluding participants who: 1) have lived in an English speaking country for over a year or, 2) indicated both or either of their parents' native language was English is that these participants may have learnt English in an emotional and natural context, unlike most Algerians who would've learnt English in classroom settings where the language is truly foreign and unemotional.

After excluding 46 participants from the analysis, 148 remained of which 71 were males and 76 were females. 1 participant failed to report their gender. 137

students indicated their age ranged from 17 to 30 (mean age: 22.84) while the remaining 11 participants indicated they were over 30 years old. The mean age of English language acquisition for participants was 11.84 years old. They reported a mean English proficiency of 5.41/7. Language proficiency was self-assessed. As for the context of foreign language acquisition, 47.3% of the participants reported learning English in school; the remaining participants reported either learning it at home, through using the internet or by watching TV. Some of them reported a combination of these contexts. Participants were recruited online; the link for the questionnaire was posted in Algerian Facebook groups intended for English language learning. Some participants interacted directly with the posts and some were contacted via private messages because the public posts in the groups were getting little interaction. All participants were bilingual Algerians who were university students from different educational levels and streams.

Table 2.1 Numbers of Excluded Participants and the Reasons for Their Exclusion

Reason for exclusion	Number of excluded participants
Not enough information	24
Other native language	7
Lived in an English speaking country for over 1 year	5
Parents' native language is English	4
Did not understand the questions	2
Very low English language skills	3
Did not answer the footbridge dilemma and Moses illusion task	1

2.2.4 Materials

There were four versions of the questionnaire. The two versions in Arabic consisted of 10 questions and the two versions in English consisted of 11 questions. To ensure the participants understood what was being asked from them in the English versions, the 11th question was added for them to rate (on a scale from 1 to 10) their understanding of the questions. Participants who indicated an understanding below 5 were excluded.

Table 2.2 The Four Versions of the Questionnaire

Version	Language	Frame
1	Arabic	Positive
2	Arabic	Negative
3	English	Positive
4	English	Negative

All participants across all versions were first presented with the footbridge dilemma (Foot, 1978; Thomson, 1985) that was modified to test the framing effect; a positively framed version which highlighted the lives saved by the actions of the participant, and a negatively framed version which highlighted the lives lost due to the participant's actions.The original text of the footbridge dilemma was in English and was translated into Arabic by the researcher herself (being bilingual) and was also back-translated (Brislin, 1970) for comparability. The translation was controlled and approved by the researcher's supervisor (who is also bilingual).After the footbridge dilemma task, the participants were then presented with the Moses illusion task. There was only 1 neutral version (Erickson, T. D., & Mattson, M. E., 1981) presented in both English versions and was translated into Arabic, then back-translated for comparability

and presented in both Arabic versions as well. Participants were not made aware of the possibility that the question could be distorted, because in this study the researcher wanted to investigate whether foreign language use would lead to participants noticing the distortion in the question more in the foreign language condition than in the native language condition without giving them any warning about a possible distortion.

Several follow-up questions were asked after the footbridge dilemma and the Moses illusion tasks to determine the participants' gender, age group, their native language, their English language acquisition age and context, whether they lived in an English speaking country for over a year and whether either or both of their parents' native language was English. The questions regarding their acquisition age/setting, living in an English speaking country and whether English was their parent/s native language were asked to assess foreign language emotionality. This research intended to investigate the effect of a foreign language acquired in an emotionally neutral setting (as is usual in Algeria). Having any emotional ties to the foreign language might lead to different results so all participant who might have learned the languages in an emotional context were excluded. Participants were also asked to rate their English language proficiency.

Table 2.3 The Four Versions of the Footbridge Dilemma Task

Footbridge Dilemma	
Arabic	
Positive	**Negative**
تخيل أن عربة ترولي خارجة عن السيطرة تتجه نحو مجموعة من خمسة أشخاص. سوف يُقتلون إذا لم يتم اتخاذ أي إجراء. أنت تقف على جسر للمشاة في الأعلى بجانب رجل ضخم . سينجو الرجل الضخم إذا لم تدفعه. سينجو 5 عمال إذا دفعت الرجل الضخم. جميع أفعالك قانونية ومفهومة. هل ستدفع الرجل الضخم؟	تخيل أن عربة ترولي خارجة عن السيطرة تتجه نحو مجموعة من خمسة أشخاص. سوف يُقتلون إذا لم يتم اتخاذ أي إجراء. أنت تقف على جسر للمشاة في الأعلى بجانب رجل ضخم . سيموت الرجل الضخم إذا دفعته. سيقتل 5 عمال إذا لم تدفع الرجل الضخم. جميع أفعالك قانونية ومفهومة. هل ستدفع الرجل الضخم؟
English	
Positive	**Negative**
Imagine that an out-of-control trolley is speeding towards a group of five people. They will be killed if no actions are taken. You are standing on a footbridge above, next to a large man. 5 workers will be saved if you push the large man; the large man will be saved if you do not push him. All your actions are legal and understandable.	Imagine that an out-of-control trolley is speeding towards a group of five people. They will be killed if no actions are taken. You are standing on a footbridge above, next to a large man. The large man will die if you push him. 5 workers will be killed if you do not push the large man. All your actions are legal and understandable. Will you push

Will you push the large man?	the large man?

2.2.5 Procedure

Due to Covid-19 restrictions, the experiment was conducted entirely online using the SoSci Survey software (Leiner, 2019) (free of charge for scholarly projects) and made available to the participants on www.soscisurvey.com. Participants were assigned their version of the questionnaire randomly which was presented entirely in one single language. An introduction explained the topic of the questionnaire, stated the participation was voluntary and anonymous and that data would be handled with great confidentiality. The questions were displayed on one single page with unlimited response time.

Concerning the Moses illusion task, out of fear someone would comment on the public posts in the different Facebook groups where the link of the questionnaire was posted, saying there was a "mistake" in the second question (the Moses illusion task), commenting was completely turned off on every post. No one was able to comment and thus the researcher ensured no participant started the questionnaire knowing there was a distortion in the one question because the point of this question was to test the influence of foreign language use on the strength of this illusion and whether more people would notice the distortion when thinking in a foreign language. Turning comments off was particularly important as many participants contacted the researcher privately on Facebook alerting the researcher to this intentional distortion of the question, thinking it was a mistake the researcher wasn't aware of and asking for it to be corrected before more participants complete the questionnaire.

2.2.6 Data Analysis Procedure

Microsoft Excel was used to filter the data and encode the responses for subsequent analysis. Both descriptive and statistical analyses were performed, the latter using SPSS. For the framing effect, the participants' answers were encoded as either utilitarian (pushing the large man) or deontological (not pushing the large man). The statistical analyses and procedures that were used in this research are the same as multiple similar studies (see Geipel et al., 2015).

As for the Moses illusion task, the answers were coded as either correct (can't say) or incorrect (all 3 remaining choices).

2.3 Section two: Analysis and Discussion of the Findings

2.3.1 Framing Effect Results and Discussion

The researcher predicted the foreign language effect would reduce the utilitarian-deontological asymmetry in the foreign language condition.

2.3.1.1 Descriptive Statistics

2.3.1.1.1 The Negative-Arabic Version

A total of 31 participants were assigned this version. 10 participants chose the utilitarian option while 21 chose the deontological option.

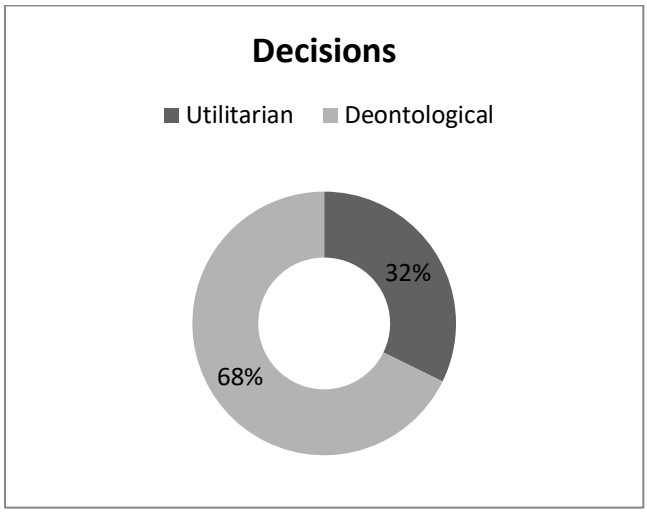


Figure 2.1 Results of the Footbridge Dilemma Task in the Negative-Arabic Version of the Questionnaire.

2.3.1.1.2 The Positive-Arabic Version

A total of 46 participants were assigned this version. 18 participants chose the utilitarian option while 28 chose the deontological option.

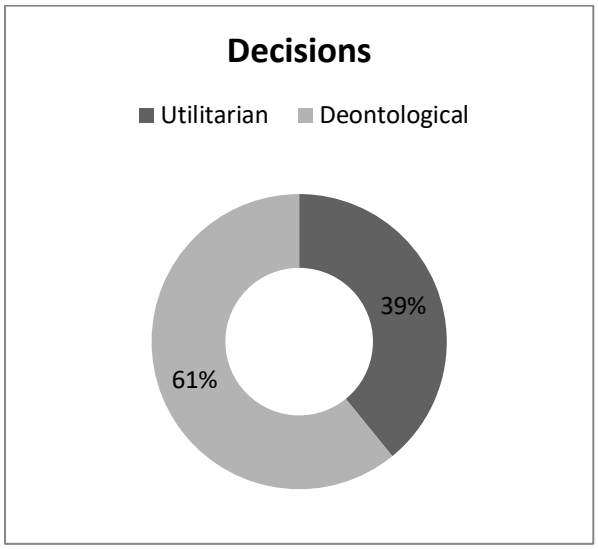


Figure 2.2 Results of the Footbridge Dilemma Task in the Positive-Arabic Version of the Questionnaire.

2.3.1.1.3 The Negative-English Version

A total of 31 participants were assigned this version. 12 participants chose the utilitarian option while 19 chose the deontological option.

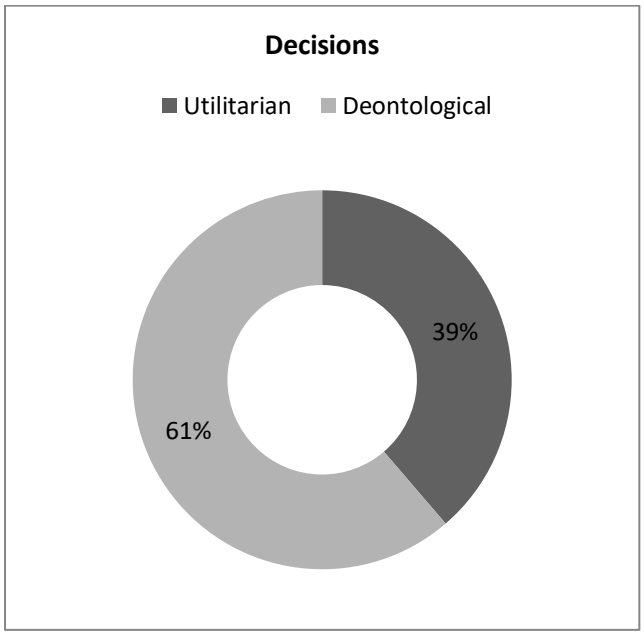


Figure 2.3 Results of the Footbridge Dilemma Task in the Negative-English Version of the Questionnaire.

2.3.1.1.4 The Positive English Version

A total of 37 participants were assigned this version. 19 participants chose the utilitarian option while 18 chose the deontological option.

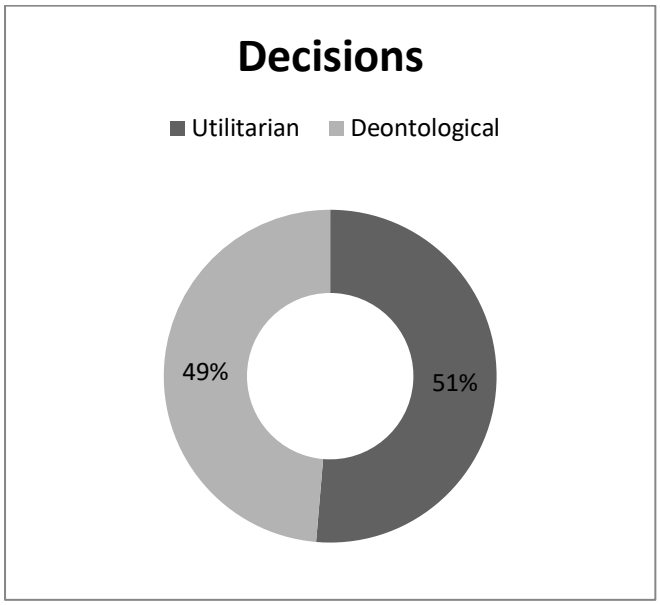


Figure 2.4 Results of the Footbridge Dilemma Task in the Positive-English Version of the Questionnaire.

2.3.1.1.5 Framing Effect in Both Conditions

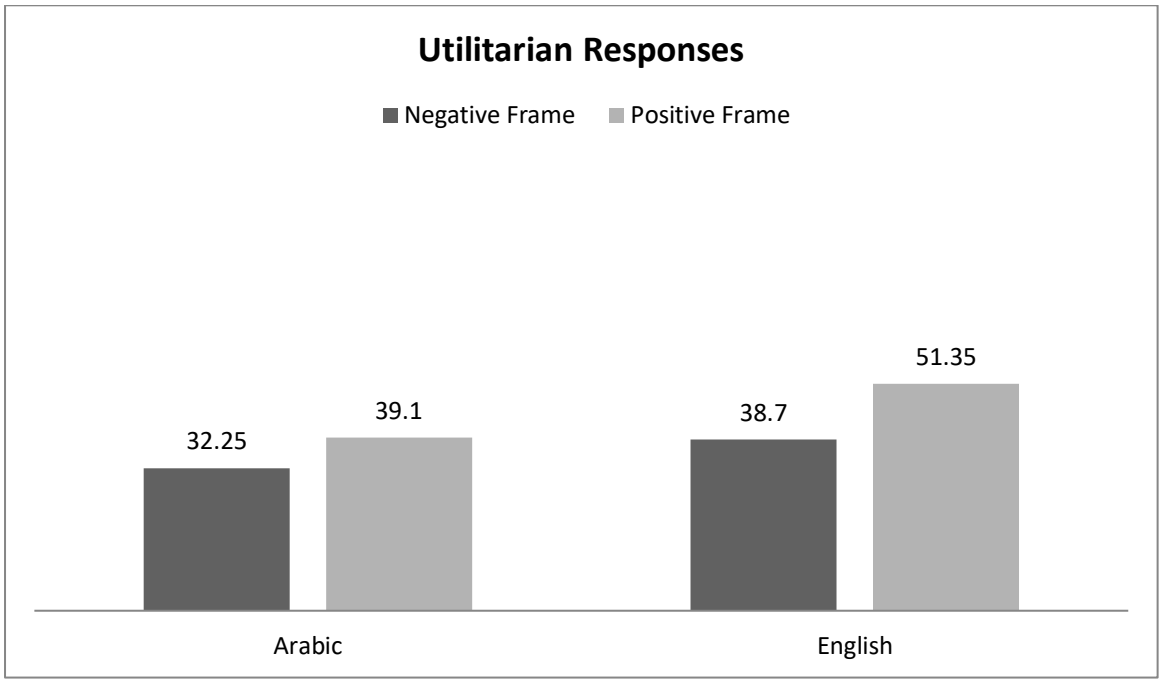


Figure 2.5 Utilitarian Responses Comparison in All Four Versions.

2.3.1.2 Discussion of Descriptive Statistics

Starting with the native language condition, in the negative framing version, most people (67.75%) refused to sacrifice the large man and opted for a deontological decision, with only 32.25% accepting sacrificial harm, thus making a utilitarian decision. Positive framing in the positive Arabic version seems to have affected the pattern of responses, with a 6.85% increase in utilitarian decisions, making the rate of sacrificial harm acceptance 39.1% and that of deontological decisions 60.9%.

In the negative English version, only 38.70% made utilitarian decisions while the remaining 61.30% chose not to push the man, thus making a deontological decision. The positive framing in the second English version caused a 12.65% increase in utilitarian decisions, as 51.35% chose to push the man while 48.65% made deontological decisions.

Comparing the Arabic versions, positive framing led to a 6.85% increase in utilitarian responses. In the English versions, on the other hand, it led to a 12.65% increase in utilitarian responses. It is clear there was a framing effect in both language conditions but participants were more susceptible to framing in the foreign language condition.

The hypothesis predicted that the use of a foreign language would reduce decision biases (Keysar et al., 2012). Thus, in this particular study, the positive framing effect should have been less significant in the foreign language condition compared to the native one, which is not the case with this sample. The results are the total opposite of what was hypothesized. Participants in the native language were not as affected by framing as they were expected to be, with an increase of only 6.85% in sacrificial harm acceptance. In the foreign language condition, however, the rate of increase was almost doubled. Possible explanations will be discussed following inferential statistics.

2.3.1.3 Inferential Statistics

In order to test the statistical significance of the differences in the response patterns in the native vs. foreign language condition, a chi-square test was used. According to the hypothesis, in the case there is a foreign language effect that succeeds at reducing bias (positive framing in this case), the test should indicate statistical significance of the framing effect in the native language condition and the absence of statistical significance of the framing effect in the foreign language condition, thus eliminating the cognitive bias.

For the native language condition, $\chi 2(1, N = 77) = 0.378$, $p=.5 > .05$, $\phi = - .07$.

For the foreign language condition, $\chi 2(1, N = 68) = 1.087$, $p=0.3 > .05$, $\phi = - .13$

2.3.1.4 Discussion of Inferential Statistics and Why the Findings Are Still Important

The results in both conditions show no statistical significance of positive framing, meaning the presence of a framing effect can't be proven statistically and thus, a statistical conclusion about the significance of the findings of the study cannot be generated. The null hypothesis cannot be rejected based on the null hypothesis significance testing. The lack of statistical significance can be sue to the following:

- The framing effect is too small in the sample that it couldn't be statistically detected (a possible explanation will be provided).
- The sample size was only estimated and this estimation was based on conventional parameters that would probably not work for the field of applied psycholinguistics. The sample size could be the reason no statistical significance was detected since the p-value is dependent on the sample size and even extremely small effects could be detected using larger sample sizes. If this

is truly the case, the study could be underpowered because the parameters used to estimate the sample size were not appropriate for this study.

An insignificant p-value doesn't mean the effect does not exist nor does it mean the findings have no importance. Indeed, the results have no statistical significance and the presence of a framing effect in this sample cannot be statistically proven, but the percentages show a shift in response patterns and this surely has some practical significance. The p-value is a measurement of the statistical incompatibility of the data with the null hypothesis and it should not (alone) decide the importance of the findings. According to Shrikant Bangdiwala, a professor at McMaster University, Hamilton, Canada and the Director of Statistics in the Population Health Research Institute, some of the limitations of p-value are:

- "A p-value, or statistical significance, does not measure the size of an effect or the importance of a result".
- "By itself, a p-value does not provide a good measure of evidence regarding a model or hypothesis".

Ron Wasserstein, the executive director of the American Statistical Association (ASA) said in a press release: "The p-value was never intended to be a substitute for scientific reasoning", "P-values do not measure the probability that the studied hypothesis is true, or the probability that the data were produced by random chance alone." Christie Aschwanden commented on Wasserstein's statements saying "If there's one takeaway from the ASA statement, it's that p-values are not badges of truth and $p < 0.05$ is not a line that separates real results from false ones. They're simply one piece of a puzzle that should be considered in the context of other evidence."

After finding statistically insignificant results, most researchers stop the study and no further investigation would be carried out nor will insignificant results be published (Fanelli, 2012; Kühberger, Fritz, & Scherndl, 2014). Scientific literature is influenced by positive-outcome bias, where the system discourages negative results which could be of great importance. Out of the researcher's belief that even non-statistically significant results could be beneficial, the results were further analysed.

2.3.1.5 Why Was Framing Statistically Insignificant?

After failing to statistically prove the presence of the framing effect, the researcher contacted some of the participants in order to understand the reasons behind making their decisions and why they were not significantly affected by positive framing. Most of the participants explained their decisions were religiously based. They explained that killing an innocent person (the large man) is prohibited in their religion. It seems the decision taken in the footbridge dilemma was dealt with from a religious perspective rather than just a moral one. If this is the case with most participants, the footbridge dilemma was considered in terms of religious morality (established on the idea of sin and based on the rules of the holy book of that religion) rather than secular morality (which is based on the idea of harm but separate from any religious background). If the dilemma was truly considered in terms of religious morality, a possible explanation for the statistical insignificance of the framing effect is that the decisions that are made based on religiously held beliefs could be harder to frame and are probably less susceptible to cognitive biases in general. That could be a reason why the utilitarian-deontological patterns of responses in the two language conditions were statistically insignificant, and especially in the native language where participants could have felt more connected to their religious beliefs.

2.3.1.6 Effect Size of the Findings

A possible explanation for the insignificant results could be a combination of the small size of the sample and the way participants dealt with the moral dilemma (religious vs. secular morality). But as discussed above, statistical significance does not equate practical significance. The p-value does not indicate a lack of an effect nor does it indicate the size of that effect if it existed, it only indicates the extent to which

the results are incompatible with the null hypothesis and it is highly dependent on the sample size.

The effect size is a measurement of the magnitude of the effect. In this case, it's a measurement of the magnitude of the difference between the utilitarian and deontological responses, in other words, the magnitude of the framing effect. Many researchers now believe the p-value provides very limited information about the data and that it is widely misused. The effect size, conversely, is gaining popularity and more researchers now recommend using it to estimate the correlation between the study's variable, "reporting the effect size is much more informative than a statement on statistical significance. " (Dunkler D, Haller M, Oberbauer R, Heinze G, 2020).

According to Jenifer Larson-Hall, Associate Professor of Applied Linguistics at Kitakyushu University, "Cohen (1988) gives w as an effect size for chi-square. In cases of 2×2 tables, w = ϕ(phi) (Howell, 2002) ". Cohen's conventions are the following:

- w = 0.10 (small)
- w = 0.3 (medium)
- w = 0.5 (large)

According to these conventions, the effect size of the framing effect in the native language condition is negligible, while it is small in the foreign language condition. These parameters are conventional and are probably not appropriate for the field of applied psycholinguistics. Unfortunately, studies in language research in general rarely report the effect size of their findings, so a comparison with different studies in the same field is unattainable currently and thus, a more appropriate interpretation of effect sizes in the field of applied psycholinguistics is not possible currently.

2.3.1.7 Main Discussion

The hypothesis of the study stated the foreign language effect would reduce the asymmetry of the utilitarian-deontological responses in the foreign language condition. A chi-square test was used to detect the statistical significance of the framing effect in both language conditions. For the hypothesis to be correct; the utilitarian-deontological asymmetry in the native language condition should be weakened in the foreign language condition. In other words, framing should not lead to an increase in sacrificial harm acceptance (utilitarian decisions) in the foreign language condition. After conducting a statistical test, the framing effect was found to be statistically insignificant for both conditions and as a result, a comparison between the native vs. foreign language condition could not be performed through statistical significance. Thus, the researcher will compare the two conditions by comparing the percentages of the differences between the utilitarian-deontological asymmetry in both language conditions.

In the native language condition, positive framing led to a 6.85% increase in sacrificial harm acceptance while it led to a 12.65% increase in sacrificial harm acceptance in the foreign language condition. These results are consistent with previous studies in which positive framing always increased the rate of sacrificial harm acceptance (Petrinovich et al., 1996; Broeders et al., 2011; Cao et al., 2017)

For the researcher's hypothesis to be correct, and based on previous studies that found the use of a foreign language to reduce decision-making biases (Keysar, B., Hayakawa, S. L., & An, S. G., 2012), the percentage of increase in sacrificial harm acceptance in the foreign language condition should have been smaller than that in the native language condition, thus the asymmetry of responses should have been weakened and the positive framing shouldn't have lead to wider acceptance of sacrificial harm, which is not the case in this study. Utilitarian responses in the foreign language condition have almost doubled in percentage, indicating a clear foreign language effect but with an impact that's the total opposite of what was hypothesized. Foreign language use has led to a larger asymmetry instead of reducing it. The foreign

language effect, in this study, failed at eliminating bias but these findings are consistent with previous research and support the theory that states foreign language use leads to more utilitarian decisions. The generalization in the statement "foreign language use leads to more unbiased decisions" could be considered misleading for this particular sample as in this study, the combination of foreign language use and the positive framing effect, that is already believed to lead to more utilitarian reasoning (Costa, Foucart, Hayakawa, et al., 2014; Keysar et al., 2012; Volk et al., 2014; Geipel, Hadjichristidis, & Surian, 2015b) - which tends to favour the greater good rather than adhere to absolute moral rules that do not take the final consequences into consideration and do not change based on the situation (Greene, 2007b)-, led to stronger positive framing (more sacrificial harm acceptance), thus, stronger bias in the foreign language condition.

Although statistical significance couldn't be achieved, descriptive statistics prove there is a foreign language effect in this sample; it didn't reduce the bias, but rather made it stronger. So to say that the use of a foreign language automatically debiases decision-making would be incorrect. It depends on the cognitive bias, if it works in the same way the foreign language effect does, like the positive framing effect which already leads to more utilitarian decisions, then the bias would become stronger.

The lack of statistical significance prevents us from generalizing the findings to the whole population, but a Phi coefficient (a measure of association for two binary variables) comparison between the two language conditions shows the association between language and framing is stronger in the foreign language condition than it is in the native one (0.07 for the native language condition and 0.13 for the foreign language condition).

2.3.2 Semantic Illusion Results and Discussion

The researcher predicted the foreign language effect will not reduce the strength of the semantic illusion in the foreign language condition. Participants' responses were grouped into two categories, correct and incorrect answers.

2.3.2.1 Arabic Condition Results

A total of 78 participants received the questionnaire in Arabic, of which 14 answered the question correctly. (One participant was excluded for not providing any answer).

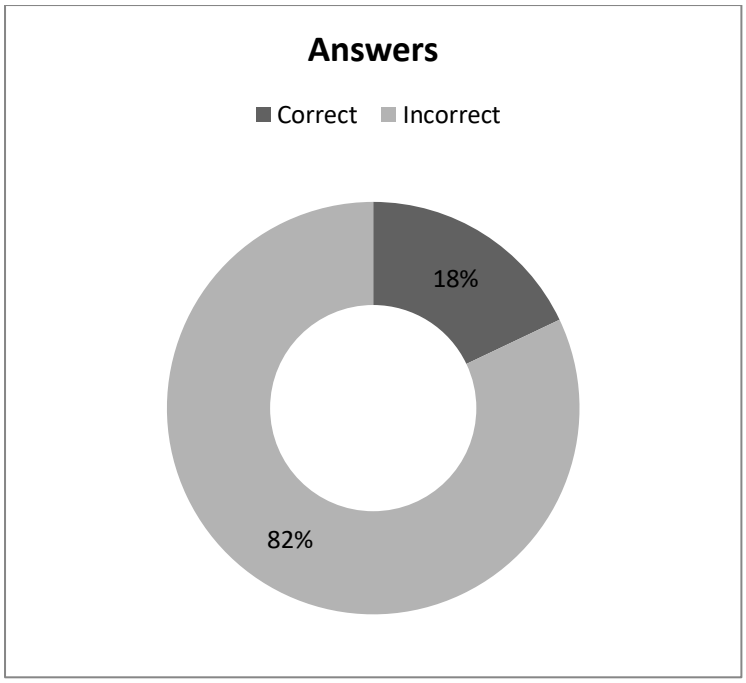


Figure 2.6 Semantic Illusion Task Answers in the Arabic Versions.

2.3.2.2 English Condition Results

A total of 69 participants received the English questionnaire, of which 9 answered correctly.

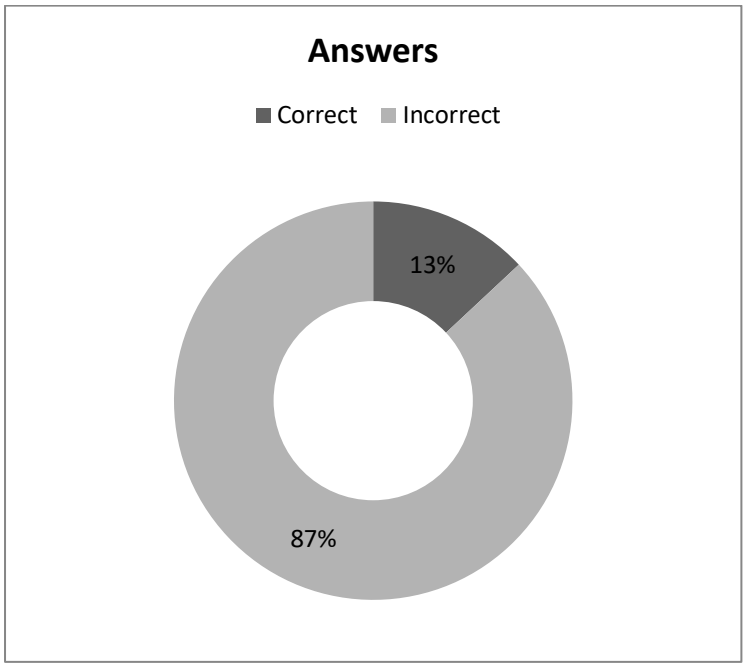


Figure 2.7 Semantic Illusion Task Answers in the English Versions.

2.3.2.3 Discussion

The hypothesis of the study predicted that the use of a foreign language would not weaken the strength of the Moses illusion. A chi-square test was conducted for each language condition and the results were then compared. Statistically significant results in the native language condition and statistically insignificant results in the foreign language condition would indicate the presence of a foreign language effect.

For the Arabic language condition, a significant Moses illusion was detected.

$\chi 2(1, N = 78) = 32.051, p < .00001$

For the English language condition, a significant Moses illusion was detected.

$\chi 2(1, N = 69) = 37.696, p < .00001$

The Moses illusion was significant in both conditions but was stronger in the foreign language condition than it was in the native one. While 18% answered correctly in the native language condition, the percentage of correct answers was only 13% in the foreign language condition. The use of a foreign language did not result in more people answering correctly; it did not weaken the strength of the semantic illusion, which confirms the study's second hypothesis.

The results show no statistically significant difference between the two conditions. The semantic illusion was present in both language conditions but was weaker in the native language condition than it was in the foreign language condition. A possible explanation is that in the native language, participants felt more connected to the Quranic story when the question was asked in their native language, which is also the language of the Quran in which the story about the prophet was explained. More people chose the "can't say" option, deeming the question to be unanswerable. It is still possible more people noticed the distortion in the question and simply chose to ignore it.

In this study, the number of people that noticed the distortion in the question and still chose an incorrect answer ignoring this deliberate mistake cannot be known, as the results only reflect the number of people that chose the correct answer which is "can't say" in comparison to those who chose any of the remaining options. This is important to note as the researcher was contacted on Facebook by several participants asking for the questionnaire to be modified and corrected, as the correct prophet is Noah and not Moses, but some of these participants chose to answer "two" despite noticing the deliberate mistake.

2.3.3 Limitations of the Study

The study aimed at replicating previous findings to explore the generalisability of the foreign language effect to the Algerian linguistic context. The study failed at generating any statistical inferences for moral decision-making but the results are still important. The study design and the methods used in this research have been used in other studies which resulted in significant findings, so the reason for insignificance could be the sample of the study rather than the research design. However, some limitations should be noted. Firstly, the sample size was estimated based on criteria that might not be appropriate for the field of applied psycholinguistics and this study in particular, thus, this might have caused the study to be underpowered and the sample size to be insufficient for statistical measurement. Secondly, the chosen sample (university students) might not have reflected the whole population. Finally, participants' self-assessment of their English language proficiency might not have reflected their real capacities, and in the case language proficiency influences the results, an interpretation relating to that aspect cannot be generated from these results.

2.4 Conclusion

This chapter provided a detailed description of the methods and the research design used in this study. A thorough description of the participants, the materials and the different procedures of both, the experiment and data analysis were provided in this chapter. Thus, this part of the dissertation outlined the research methodology implemented in this research study. The results were presented and followed by an in-depth analysis which concluded by rejecting the first hypothesis of the research and proving the second one to be correct. This chapter end with a general conclusion, the limitations of the study and some suggestions for further research.

General Conclusion

The purpose of the study was to explore the generalisability of the foreign language effect to the Algerian linguistic context. This FLE theory stems from the belief that people's decision-making tendencies change as the language they use to make these decisions changes (Pavlenko, 2012). This applies to moral decision-making (Keysar, Hayakawa, & An, 2012; Hadjichristidis, Geipel, & Savadori, 2015; Costa, Foucart, Arnon, Aparici, & Apesteguia, 2014;). The effect is usually explained by the dual-process theory (Costa, Vives, & Corey, 2017; Geipel et al., 2016) in which FLE reduces the biases that affect the decision-making process, and thus lead to more rational decisions. Two cognitive biases that affect moral judgement and decision-making were chosen for this study, which are the classical emotionally-based framing effect and the lesser investigated semantic illusion.

Although no statistical significance was detected in the moral decision-making experiment, the results are still beneficial. No framing effect was statistically significant enough and so the effect of using a foreign language in the experiments is statistically inconclusive. The use of a foreign language did cause a shift in the pattern of responses, as it increased the rate of sacrificial harm acceptance. It did not, as was theorized, reduce the bias as the latter was stronger in foreign language condition. This can be understood in the light of research that proves the use of a foreign language leads to more utilitarian decisions (Costa, Foucart, Hayakawa, et al., 2014; Keysar et al., 2012; Volk et al., 2014; Geipel, Hadjichristidis, & Surian, 2015b). The conflict between the foreign language effect and the framing effect did not lead to the elimination of the latter, but to an increased acceptance of sacrificial harm, which both effects are known to cause separately. No results could be generalized but for this sample, the foreign language effect failed at reducing the framing effect. The combination of positive framing that by default leads to more utilitarian decisions, together with the possibility that foreign language effects truly leads to more utilitarian decisions could explain why the positive framing bias was stronger in the foreign language condition. In sum, the foreign language effect extends to the Algerian linguistic context, and it leads to more utilitarian decisions.

As for the semantic illusion, The Moses illusion was significant in both language conditions and the use of a foreign language did not lead to more correct answers, as the rate for the latter was higher in the native language condition. A possible explanation for these results could be that participants felt more connected to the Quranic story in their native language which happens to be the language of the Quran, and thus were able to detect the distortion more easily. The foreign language effect failed at reducing both biases, as answers were less framed and less affected by the semantic illusion in the native language condition.

Although the study's statistical findings are inconclusive and the results are ungeneralizable, the findings are still important for future FLE research in general and especially concerning the Algerian linguistic context. In future research concerned with the framing effect, it would be interesting to have participants from different backgrounds and not only university students. A large sample size would be required in order to get results that could represent the whole population and could be statistically measured. The relationship between the foreign language effect and different cognitive biases might be further investigated. An inquiry into the possibility that the foreign language effect doesn't reduce all biases but tends to strengthen some, just like it did with this particular sample, would be of paramount importance in order to better understand the mechanisms of the foreign language effect . There are also several areas for further development, like how this phenomenon affects existing held beliefs, especially religious ones. An investigation into whether age, gender or foreign language proficiency influence foreign language effect would also give a better understanding on how these personal differences affect the foreign language effect. As for the semantic illusion, it would be worthwhile to give the participants the possibility to comment on the experiment and find out how many of them provided the wrong answer despite them noticing the mistake, compared to those who didn't notice it at all, in both language conditions. These largely non-statistically significant results presented in this study could be used by other researchers in the field and with better methods, better results could be generated.

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Appendices

Appendix A: Positive-English Version of the Questionnaire

Dear Respondent,

Thank you for taking the time to participate in this study which is being carried out as part of my Master's thesis. Your contribution would be very valuable for my research. It should take about five minutes of your time.

The purpose of this study is to explore the effect of foreign languages on moral judgment and decision-making. Please note that your participation in this research study is voluntary and that you may withdraw from participation at any point in time. Your responses will be anonymous and will be treated with strict confidentiality.

Thanks in advance!

1st task:

Imagine that an out-of-control trolley is speeding towards a group of five people. They will be killed if no actions are taken. You are standing on a footbridge above, next to a large man. 5workers will be saved if you push the large man; the large man will be saved if you do not push him. All your actions are legal and understandable. Will you push the large man?

Yes/No

2nd task:

How many animals of each kind didthe prophet Moses –peace be upon him- take on the ark?

a) 2 b) 7 c) can't say d) don't know

Personal information:

1. Gender:

Male / Female

2. Choose your age group:

a) 17-21 b) 22-25 c) 26-30 d) 30+

3. Is Arabic your native language?

   Yes /No

4. How old were you when you started learning English?
5. Where did you start learning English? (School, home, internet, TV…)
6. Have you lived in an English speaking country for over a year?
7. On a scale of 1 to 7, how would you rate your English language skills?
8. Does one or both of your parents speak English as a native language?
9. على مقياس من 1 إلى 10: كم تقدر نسبة فهمك للأسئلة التي طرحت عليك؟

Appendix B: Negative-English Version of the Questionnaire

Dear Respondent,

Thank you for taking the time to participate in this study which is being carried out as part of my Master's thesis. Your contribution would be very valuable for my research. It should take about five minutes of your time.

The purpose of this study is to explore the effect of foreign languages on moral judgment and decision-making. Please note that your participation in this research study is voluntary and that you may withdraw from participation at any point in time. Your responses will be anonymous and will be treated with strict confidentiality.

Thanks in advance!

1st task:

Imagine that an out-of-control trolley is speeding towards a group of five people. They will be killed if no actions are taken. You are standing on a footbridge above, next to a large man. The large man will die if you push him. 5 workers will be killed if you do not push the large man. All your actions are legal and understandable. Will you push the large man?

Yes/No

2nd task:

How many animals of each kind didthe prophet Moses –peace be upon him- take on the ark?

2 7 can't say don't know

Personal information:

1. Gender:

Male / Female

2. Choose your age group:

b) 17-21 b) 22-25 c) 26-30 d) 30+

3. Is Arabic your native language?

Yes /No

4. How old were you when you started learning English?
5. Where did you start learning English? (School, home, internet, TV…)
6. Have you lived in an English speaking country for over a year?
7. On a scale of 1 to 7, how would you rate your English language skills?
8. Does one or both of your parents speak English as a native language?
9. على مقياس من 1 إلى 10: كم تقدر نسبة فهمك للأسئلة التي طرحت عليك؟

Appendix C: Negative-Arabic Version of the Questionnaire

السلام عليكم ورحمة الله وبركاته.

شكرا لأخذك الوقت للمشاركة في هذه الدراسة التي أجريها كجزء من مذكرة التخرج لنيل شهادة الماستر. مساهمتك ستكون قيّمة جداً لأبحاثي. ستستغرق حوالي خمس دقائق للإجابة على أسئلتي.

الغرض من هذه الدراسة هو استكشاف أثر اللغات الأجنبية على الأحكام الأخلاقية واتخاذ القرارات. مشاركتك في هذه الدراسة مشاركة اختيارية وتطوعية ويمكنك أن تنسحب في أي وقت. ستُحجب هويتك وستُعامل إجاباتك بسرية تامة.

شكرا مسبقا!

السؤال الأول:

تخيل أن عربة ترولي خارجة عن السيطرة تتجه نحو مجموعة من خمسة أشخاص. سوف يُقتلون إذا لم يتم اتخاذ أي إجراء. أنت تقف على جسر للمشاة في الأعلى بجانب رجل ضخم . سيموت الرجل الضخم إذا دفعته. سيقتل 5 عمال إذا لم تدفع الرجل الضخم. جميع أفعالك قانونية ومفهومة. هل ستدفع الرجل الضخم؟

نعم/لا

السؤال الثاني:

كم عدد الحيوانات التي جمعها سيدنا موسى عليه السلام من كل نوع على متن سفينته؟

- حيوانان من كل نوع
- سبع حيوانات من كل نوع
- لا أستطيع الإجابة
- ليس لدي علم حول هذا الموضوع

معلومات شخصية:

1. الجنس:

ذكر أنثى

2. اختر الفئة العمرية التي تنتمي إليها:

17-21/ 22-25/ 26-30/ 30+

3. هل اللغة العربية هي لغتك الأم؟

نعم/لا

4. كم كان عمرك عندما بدأت تعلم اللغة الانجليزية؟
5. أين بدأت تعلم اللغة الانجليزية (المدرسة, المنزل, الانترنيت, أصدقائك...)؟
6. هل عشت في بلد اللغة الرسمية فيه هي الانجليزية ، لمدة تفوق السنة؟
7. هل يتحدث احد والديك اللغة الانجليزية كلغة أم؟
8. على مقياس من واحد إلى سبعة، قيم مستواك في اللغة الانجليزية:

Appendix D: Positive-Arabic Version of the Questionnaire

السلام عليكم ورحمة الله وبركاته

شكرا لأخذك الوقت للمشاركة في هذه الدراسة التي أجريها كجزء من مذكرة التخرج لنيل شهادة الماستر.
مساهمتك ستكون قيّمة جداً لأبحاثي. ستستغرق حوالي خمس دقائق للإجابة على أسئلتي

الغرض من هذه الدراسة هو استكشاف أثر اللغات الأجنبية على الأحكام الأخلاقية واتخاذ القرارات. مشاركتك في هذه الدراسة مشاركة اختيارية وتطوعية ويمكنك أن تنسحب في أي وقت. ستحجب هويتك وستعامل إجاباتك بسرية تامة.

شكرا مسبقا!

السؤال الأول:

تخيل أن عربة ترولي خارجة عن السيطرة تتجه نحو مجموعة من خمسة أشخاص. سوف يُقتلون إذا لم يتم اتخاذ أي إجراء. أنت تقف على جسر للمشاة في الأعلى بجانب رجل ضخم . سينجو الرجل الضخم إذا لم تدفعه. سينجو 5 عمال إذا دفعت الرجل الضخم. جميع أفعالك قانونية ومفهومة. هل ستدفع الرجل الضخم؟

نعم/لا

السؤال الثانى:

كم عدد الحيوانات التي جمعها سيدنا موسى عليه السلام من كل نوع على متن سفينته؟

- حيوانان من كل نوع
- سبع حيوانات من كل نوع
- لا أستطيع الاجابة
- ليس لدي علم حول هذا الموضوع

معلومات شخصية:

1. الجنس:

ذكر أنثى

2. اختر الفئة العمرية التي تنتمي إليها:

17-21/ 22-25/ 26-30/ 30+

3. هل اللغة العربية هي لغتك الأم؟

نعم/لا

4. كم كان عمرك عندما بدأت تعلم اللغة الانجليزية؟
5. أين بدأت تعلم اللغة الانجليزية (المدرسة, المنزل, الانترنيت, أصدقائك...)؟
6. هل عشت في بلد اللغة الرسمية فيه هي الانجليزية ، لمدة تفوق السنة؟
7. هل يتحدث احد والديك اللغة الانجليزية كلغة أم؟
8. على مقياس من واحد إلى سبعة، قيم مستواك في اللغة الانجليزية:

Appendix E: Chi-square Test Results in SPSS/Moral Dilemma, Foreign Language Condition

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
type_decision * framing_version	68	100,0%	0	0,0%	68	100,0%

type_decision * framing_version Crosstabulation

		framing_version		
		negative	positive	Total
type_decision	Utilitarian	12	19	31
	deontological	19	18	37
Total		31	37	68

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,087[a]	1	,297		
Continuity Correction[b]	,637	1	,425		
Likelihood Ratio	1,091	1	,296		
Fisher's Exact Test				,336	,213
Linear-by-Linear Association	1,071	1	,301		
N of Valid Cases	68				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 14,13.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-,126	,297
	Cramer's V	,126	,297
N of Valid Cases		68	

Appendix F: Chi-square Test Results in SPSS/Moral Dilemma, Native Language Condition

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
type_decision * framing_version	77	100,0%	0	0,0%	77	100,0%

type_decision * framing_version Crosstabulation

		framing_version		
		negative	positive	Total
type_decision	Utilitarian	10	18	28
	deontological	21	28	49
Total		31	46	77

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,378[a]	1	,539		
Continuity Correction[b]	,139	1	,709		
Likelihood Ratio	,380	1	,537		
Fisher's Exact Test				,632	,356
Linear-by-Linear Association	,373	1	,541		
N of Valid Cases	77				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 11,27.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-,070	,539
	Cramer's V	,070	,539
N of Valid Cases		77	

Appendix G: Chi-square Test Results in SPSS/Moses Illusion, Foreign Language Condition

Chi-Square Test

Frequencies

type_answer

	Observed N	Expected N	Residual
correct	9	34,5	-25,5
incorrect	60	34,5	25,5
Total	69		

Test Statistics

	type_answer
Chi-Square	37,696[a]
df	1
Asymp. Sig.	<,001

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 34,5.

Appendix H: Chi-square Test Results in SPSS/Moses Illusion, Native Language Condition

Chi-Square Test

Frequencies

type_answer

	Observed N	Expected N	Residual
correct	14	39,0	-25,0
incorrect	64	39,0	25,0
Total	78		

Test Statistics

	type_answer
Chi-Square	32,051[a]
df	1
Asymp. Sig.	<,001

a. 0 cells (,0%) have expected frequencies less than 5. The minimum expected cell frequency is 39,0.