



DEPAUL UNIVERSITY
UNIVERSITY LIBRARIES

Via Sapientiae:

The Institutional Repository at DePaul University

College of Science and Health Theses and
Dissertations

College of Science and Health

8-21-2016

An Investigation of Foreign Language Use as a Protectant against Loss Aversion

Lauren M. Pytel

DePaul University, lpytel@depaul.edu

Recommended Citation

Pytel, Lauren M., "An Investigation of Foreign Language Use as a Protectant against Loss Aversion" (2016). *College of Science and Health Theses and Dissertations*. 192.

https://via.library.depaul.edu/csh_etd/192

This Thesis is brought to you for free and open access by the College of Science and Health at Via Sapientiae. It has been accepted for inclusion in College of Science and Health Theses and Dissertations by an authorized administrator of Via Sapientiae. For more information, please contact wsulliv6@depaul.edu, c.mcclure@depaul.edu.

An Investigation of Foreign Language Use as a Protectant against Loss Aversion

A Thesis

Presented in

Partial Fulfillment of the

Requirements for the Degree of

Master of Arts

By

Lauren Marie Pytel

June, 2016

Department of Psychology

College of Science and Health

DePaul University

Chicago, Illinois

Thesis Committee

Jessica M. Choplin, Ph.D., Chairperson

Pablo Gomez, Ph.D.

Biography

The author was born in Barrington, Illinois, March 10, 1992. She graduated from Carmel Catholic High School in Mundelein, Illinois, in 2010. She received her Bachelor of Arts degree from University of Dayton in 2014, and her Master of Arts degree in Psychological Sciences from DePaul University in 2016.

Table of Contents

Dissertation Committee.....	ii
Biography.....	iii
List of Tables.....	vi
Abstract.....	vii
Introduction.....	7
Study I.....	13
Overview of Study 1.....	13
Study 1 Hypotheses.....	13
Study 1 Method.....	13
Research participants.....	13
Materials and Procedure.....	15
Study 1 Results and Discussion.....	16
Study 2.....	21
Overview of Study 2.....	21
Study 2 Hypotheses.....	21
Study 2 Method.....	21
Research participants.....	21
Materials and Procedure.....	22
Study 2 Results and Discussion.....	23
Study 3.....	26
Overview of Study 3.....	26
Study 3 Method.....	26

Research participants.....	26
Materials and Procedure.....	26
Study 3 Results.....	28
General Discussion.....	28
References.....	38
Appendix A.....	41
Appendix B.....	42
Appendix C.....	43
Appendix D.....	44
Appendix E.....	45
Appendix F.....	46
Appendix G.....	47
Appendix H.....	48

List of Tables

Table 1. Significant Main Effects of Frame for Experiment 1.....	50
Table 2. Significant Main Effects of Frame for Experiment 2.....	51
Table 3. Significant Main Effects of Language for Experiment 1.....	52
Table 4. Significant Main Effects of Language for Experiment 2.....	53
Table 5. Significant Interaction Effect of Frame x Language for Experiment 1...54	

Abstract

Keysar et al. (2012) suggested that bilingual speakers might be less loss averse when interacting in their non-native, rather than native, language. Diminished loss aversion would likely protect homebuyers against predatory lending, as loss aversive tendencies often lead to non-normative decision-making. Thus, it is possible that speaking a foreign language can act as a protective factor for bilingual consumers and potential homebuyers. Two experiments investigated this possibility. Experiment 1 utilized the Asian Disease problem (Kahneman & Tversky, 1979) in a survey to examine whether bilingual participants would choose different values and comparison words to describe gains and losses depending on whether they were interacting in Spanish, their native language, or English, their non-native language. Based on the results of experiment 1, it was hypothesized in experiment 2 that the present interaction of language and frame might be dependent upon the consideration of certain (larger) numeric values. Experiment 2 therefore utilized increased numeric values in its survey questions to address this possibility. Although no significant interaction was found, the results of experiment 2 provide supplementary evidence for the use of English, the present participants' foreign language, as a protective factor for bilingual individuals. Considering the number of bilingual consumers in the United States, many of whom are likely to use English when seeking a home loan, mortgage counseling, or financial planning, these findings have critically important implications.

Introduction

Loss aversion is a robust psychological phenomenon whereby individuals' responses to losses are stronger than their responses to equivalently sized gains (Kahnemmn & Tversky, 1979). In fact, losses have been estimated to have approximately twice as much impact on decisions as do gains (Tversky & Kahneman, 1992). This disparity is demonstrated by Tversky and Kahneman's (1981) Asian Disease problem, a classic example of loss aversion and framing effects. In this experiment, participants first read the following background information:

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

Participants were then randomly assigned to view the gain-frame or loss-frame of the proposed programs, where one half of the participants were presented with the following options (gain-frame):

- A: If this program is adopted, 200 people will be saved.
- B: If this program is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved.

The other half of participants were presented with the following options (loss-frame):

- A: If this program is adopted, 400 people will die.
- B: If this program is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die.

It is important to note that the default differs in the gain-frame and the loss frame condition. In the gain-frame condition, options are phrased using the word "saved", indicating a gain as opposed to a loss. The default in the gain-frame is

that everyone will die. Therefore, if even one less person dies, it is viewed as a gain. Saving 200 people, such as in option A, might then be perceived as a considerable gain. In the loss-frame condition, options are phrased using the word “die”, indicating a loss rather than a gain. The default in the loss frame is that everyone will live. Losing one life, then, is considered a loss, and losing 400 lives, such as in option A, may be perceived as unacceptable.

The two versions of the Asian Disease problem, the gain-frame and loss-frame, are identical in terms of outcomes. However, participants presented with the gain-frame exhibited more risk averse behavior, meaning that they more often chose the safe option, while participants presented with the loss-frame exhibited more risk seeking behavior, meaning that they more often opted for the uncertain option (Kahneman & Frederick, 2007). The term *framing effects* was first used by Tversky and Kahneman (1981) to describe this finding that very simple changes in the wording of decision problems can have enormous effects on decision preferences (Kuhberger et al., 1999). These results (Tversky & Kahneman, 1981) also confirm the certainty effect, or the finding that people tend to favor a sure gain over a probabilistic gain, but prefer a probabilistic loss over a definite loss (Tversky & Kahneman, 1981). That is, participants tended to choose the sure option (option A) more often when the problem was presented in the gain frame, using the word “save”, than when it was presented in the loss frame, using the word “die” (Tversky & Kahneman, 1981). This finding suggests that people are not only loss averse in general, but that their risk preferences change in the face of

loss; people become more willing to take risks when taking those risks means the potential mitigation or complete avoidance of a loss.

Similar to the way that loss aversion affects our risk preferences, the phenomenon also appears to affect our comparison judgments. The comparison words people use to describe losses (e.g., less, deficit, shortfall, shortage) tend to suggest larger differences than do comparison words used to describe equivalent gains (e.g., more, surplus, excess) (Choplin, 2006). People are also less likely to choose to use the comparison term “approximately the same” to describe losses than they would be to describe gains (Choplin, 2006).

The biases associated with loss aversion have, importantly, been shown to affect consumer behavior. In the endowment effect, for example, individuals increasingly value goods once those goods have become part of their ownership or endowment (Thaler, 1980). This perceived increase in value then leads to differences in decision-making, such that individuals tend to act in ways consistent with avoiding the loss of that good or object that they now significantly value. In a classic endowment effect experiment performed by Kahneman, Knetsch, and Thaler (1990), individuals were assigned to either an owner or non-owner condition, where participants in the owner condition were endowed with a ceramic mug. When asked how much they would be willing to sell the mug for, “owners” stated a significantly greater price than “non-owners” stated they would be willing to pay in order to obtain the same mug (Kahneman, et al., 1990). While the median amount owners were willing to accept in exchange for the mug was

\$5.75, the median amount non-owners were willing to pay in order to obtain the mug was only \$2.25 (Kahneman, et al., 1990).

This disparity in valuation directly contradicts what would be expected by traditional economic analysis; the mere possession of an object should not influence its exchange value (Strahilevitz & Loewenstein, 1998). It appears, however, that once the mug became part of the owners' endowment, it became more valuable to them. Because selling the mug represented the loss of something valuable (to the owner), owners set overvalued selling prices in order to either avoid this loss (Barberis, 2012) entirely, or to at least mitigate the negative impact of this loss. As explained by prospect theory, people tend to assign value to gains and losses rather than to final outcomes (Kahneman & Tversky, 1979). The value of gaining an object for an individual who does not possess it, therefore, will be smaller than the value of not losing an object for an individual who does possess it (Strahilevitz & Loewenstein, 1998). Because the value of gaining the mug for non-owners in the Kahneman, Knetsch, and Thaler (1990) experiment was smaller than the value of retaining the mug for the owners, the non-owners' buying prices were lower than owners' selling prices, accounting for the valuation disparity.

One can imagine the negative impact of the endowment effect and loss aversion on real world decisions, such as home buying. Imagine, for example, that a consumer discovers that their home loan is predatory at closing. Despite the risks associated with a disadvantageous home loan, the consumer decides to go through with the closing anyway. While this decision is highly disadvantageous to

the consumer, it is entirely possible that loss aversion, experienced as a result of endowment effects, provides an explanation (Stark & Choplin, 2010). Potential homebuyers have likely spent a significant amount of time viewing a house, imagining themselves and their family in that house, talking to their significant other, family, or realtor about that house, and subsequently may begin to feel as though they *own* that house, even before they have actually purchased it. This sense of endowment has led to an increased perceived value of the house in that consumer's mind. Because circumstances changing and a deal with that house falling through would represent a severe loss (Stark & Choplin, 2010), the consumer may be more likely to take risks (Stark & Choplin, 2010), perhaps in willingness to accept a predatory loan, willingness to accept an overpriced offer on a home, or unwillingness to comparison shop for other loans.

Although the effects of loss aversion appear to be both powerful and prevalent, recent research has shown that the use of a foreign language by bilingual speakers can significantly reduce loss aversion (Keysar et al., 2012). More specifically, bilingual individuals interacting in their non-native language tended not to exhibit the same framing effects and gain/loss asymmetries typical of loss aversion effects for those speaking in their native language when presented with the Asian Disease problem (Keysar et al., 2012). In accordance with the original findings of Tversky and Kahneman (1981), participants in the Keysar et al. (2012) experiment who read the Asian Disease problem in their native language were more risk averse for gains and more risk seeking for losses. However, when the Asian Disease problem was presented to participants assigned

to the non-native language condition, participants' choices were no longer affected by the framing of the problem. That is, participants in the non-native language condition were equally as likely to choose the sure option, option A, regardless of whether they were assigned to the gain-frame or loss-frame (Keysar et al., 2012). Furthermore, the use of a foreign language was also shown to increase the acceptance of real and hypothetical bets with positive expected values (Keysar et al., 2012).

These results have important implications for bilingual individuals. Bilingual consumers who make financial, saving, and retirement decisions in their foreign language may actually be less biased than those who make decisions in their native language (Keysar et al., 2012). In the case of bilingual homebuyers specifically, these results suggest that speaking in a foreign language may provide some protection against the risky and disadvantageous home loan decision-making associated with loss aversion. As the number of bilingual consumers in the United States continues to increase, many of whom likely interact in their non-native language throughout the home buying process, it is crucial to investigate the impact of language on buying behavior. If indeed the use of a foreign language can protect bilingual homebuyers against loss aversion and other decision-making biases, the implications for bilingual consumers, lenders, financial counselors, and policy-makers would be highly relevant.

Two experiments attempting to expand on the findings of Keysar et al. (2012) by generalizing the potential protectiveness of foreign-language use to bilingual consumers and specifically, homebuyers, will be presented. A

description of the findings, their relevant implications, limitations, and ideas for future research will then be discussed in turn.

Experiment 1

Experiment 1 investigated loss aversion in bilingual individuals through a survey containing questions about the Asian Disease problem (Kahneman & Tversky, 1979), and questions pertaining to the evaluation of interest rates. Native Spanish speaking participants were randomly assigned to complete the survey in either Spanish (their native language) or English (their non-native language), and to view either the gain-frame or loss-frame version of the problem and questions. Hypothesis I. There will be an interaction effect of frame and language for all questions. Participants assigned to the Spanish (native) language condition are predicted to choose different numeric values and comparison words to describe the similarity of two values depending on the framing of the question. Framing effects are predicted to disappear, however, for participants assigned to the English (non-native language) condition, such that the numeric values and words chosen to compare two values are not expected to differ depending on the frame of the question.

Method

Participants

A total of 428 participants were recruited through Amazon Mechanical Turk. Participants self-identified themselves as native or non-native Spanish speakers and then classified their Spanish and English speaking and listening proficiencies on a 7-point scale (ranging from *beginner* to *super fluency*) adapted

from the language proficiency scale and classification rule used by Paap and Greenberg (2013):

1. Beginner: Know some words and basic grammar.
2. Advanced Beginner: Can converse with a native speaker only on some topics and with a bit of difficulty.
3. Intermediate: Can converse with a native speaker on most everyday topics, but with some difficulty.
4. Advanced Intermediate: Can converse with little difficulty with a native speaker on most everyday topics, but with less fluency than a native speaker.
5. Near Fluency: Almost as good as a typical native speaker on both everyday topics and specialized topics I know about.
6. Fluent: As good as a typical native speaker
7. Super Fluency: Better than a typical native speaker.

Following Paap and Greenberg (2013), only those participants who identified themselves as a native Spanish speaker and who rated their speaking and listening proficiency in both Spanish and English as a “4” or higher were used in subsequent analyses.

After eliminating those participants who did not identify themselves as native Spanish speakers, did not rate their proficiency in both Spanish and English as a “4” or higher, or who incorrectly responded to survey questions (responded with “0”, “200”, or “400” when asked to report numbers greater than “0”, “200”, or “400”), 199 participants remained to be used for analysis. Of these 199 participants, 112 self-identified as female, and 87 self-identified as male. All participants were over the age of 18 years. Participants reported having an average of 31.6 years of age, 15.5 years of education, and an annual income of \$34,700. All participants received \$0.20 compensation for participation.

Materials and Procedure

All participants were asked to complete a survey with questions pertaining to Kahneman and Tversky's (1979) Asian Disease problem, and to the evaluation of various interest rates. Participants were randomly assigned to view the problem and questions in the gain-frame (n=98) or loss-frame (n=101), and in either Spanish (their native language) (n = 102), or English (their non-native language) (n = 97). Following Brislin (1970), all materials were first written in English, translated into Spanish, and then back-translated by a native Spanish speaker to ensure compatibility.

All participants first read the same background information (Kahneman & Tversky, 1979):

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease that is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

Participants assigned to the gain-frame were then asked the following questions (see Appendix A): "Imagine you were told that, 'more than 0 (200, 400) people will be saved.' How many do you imagine will be saved?", "Is 200 (400, 600) people saved 'approximately the same as,' 'a few more,' 'much more,' or 'much, much more' than 0 (200, 400) people saved?", "You heard that you could save money on a new loan compared to your current loan. Your current loan has an interest rate of 4%. What do you imagine the interest rate of that new loan might be?", and "Is an interest rate of 4% 'approximately the same as,' 'slightly less,' 'much less,' or 'much, much less' than 4.3%?".

Participants assigned to the loss-frame were asked (see Appendix B): "Imagine you were told that, 'more than 0 (200, 400) people will die.' How many

do you imagine will die?”, “Is 200 (400, 600) people dying ‘approximately the same as,’ ‘a few more,’ ‘much more,’ or ‘much, much more’ than 0 (200, 400) people dying?”, “You heard that you are losing money on your current loan compared to a new loan. Your current loan has an interest rate of 4%. What do you imagine the interest rate of that new loan might be?”, and “Is an interest rate of 4.3% ‘approximately the same as,’ ‘slightly more,’ ‘much more,’ or ‘much, much more’ than 4%?”.

Comparison word choices, such as those provided in questions 4-6 and question 8, were coded as numeric values for analysis. Therefore, in questions 4-6, a response for “approximately the same as” was coded as 1, “a few more” was coded as 2, “much more” was coded as 3, and “much, much more” was coded as 4. In question 8, “approximately the same as” was coded as 1, “slightly more (less)” was coded as 2, “much more (less)” was coded as 3, and “much, much more (less)” was coded as 4.

Results and Discussion

Based on the results of Keysar et al. (2012), we predicted an interaction of language and frame for all questions in experiment 1. Participants interacting in Spanish, their native language, were expected to choose different numeric values and comparison words depending on the frame condition they were assigned to, while participants interacting in English, their non-native language, were not. A 2(Language: Spanish, English) x 2(Frame: gain, loss) between-subjects Analysis of Variance (ANOVA) was conducted in order to test this prediction. Using this statistical technique, we were able to compare whether responses from

participants assigned to either the English or Spanish condition, and to either the gain-frame or loss-frame condition varied on any of the questions.

Framing effects, as defined by Tversky and Kahneman (1981), would be demonstrated if the slight change in wording between the gain-frame and loss-frame conditions used here led to different responses by participants. Loss aversion would further predict that these framing effects occur in a specific direction; specifically, loss aversion would predict that when participants view loss-framed questions, they would imagine larger values and comparative differences from a default than when they viewed a gain-frame. Consistent with these predictions, a significant main effect of frame was found in questions 2, $F(1, 195) = 8.871, p = .003$ and question 3, $F(1, 195) = 7.747, p = .006$ of experiment 1. Regardless of their assigned language condition, participants who viewed the loss-frame in question 2 and 3, “Imagine you were told that ‘more than 200 (400) people will *die*. How many people do you imagine will *die*?” imagined larger numbers (question 2: $M = 336.650, SE = 12.079$, question 3: $M = 579.421, SE = 27.415$) than did the participants who viewed the gain-frame in question 2 and 3, “Imagine you were told that ‘more than 200 (400) people will *be saved*. How many people do you imagine will *be saved*?” (question 2: $M = 285.362, SE = 12.272$, question 3: $M = 470.641, SE = 27.853$).

A main effect of frame also emerged in question 6, $F(1, 195) = 21.286, p < .001$, and question 7, $F(1, 195) = 3.913, p = .049$, but in opposite directionality. For question 6 (“Is 600 people saved (dying) ‘approximately the same as’, ‘a few more’, ‘much more’, or ‘much, much more’ than 400 people saved (dying)?”),

participants who viewed the *gain* frame actually chose comparison words that reflected greater differences ($M = 3.002$, $SE = .088$) than did participants who viewed the loss frame ($M = 2.431$, $SE = .087$). This result is inconsistent with both the general predictions of loss aversion and the specific framing effects found in questions 2 and 3. In question 7, participants who viewed the loss frame imagined their new interest rate to be significantly higher ($M = 3.462$, $SE = .141$) than participants who viewed the gain frame of the question imagined their new interest rate to be ($M = 3.064$, $SE = .144$). However, because participants were choosing imagined new rates as compared to a *current* rate of 4.0%, the higher new interest rates imagined by participants assigned to the loss-frame actually indicated a smaller difference between the two values ($M = 3.642\%$ vs. 4.0%) than the difference reported by participants assigned to the gain-frame ($M = 3.064\%$ vs. 4.0%).

In addition to the main effects of frame described above, a significant main effect of language also emerged in question 2, $F(1, 195) = 7.705$, $p = .006$, and question 6, $F(1, 195) = 21.228$, $p < .001$, while a marginally significant main effect of language was found in question 8, $F(1, 195) = 3.601$, $p = .059$. Here, a main effect of language would indicate that the language in which participants were interacting (either Spanish or English) alone had some effect on their responses regardless of whether they viewed the gain-frame or the loss-frame. In experiment 1, participants interacting in English tended to imagine significantly larger numeric values (question 2), chose comparison words that reflected

significantly larger differences (question 6), and imagined significantly higher new interest rates (question 8) than did participants interacting in Spanish.

In question 2, participants were asked, “Imagine you were told that ‘more than 200 people will be saved/will die.’ How many people do you imagine will be saved/will die?”. Regardless of the frame they were shown, participants interacting in English (their non-native language) chose greater numeric values ($M = 334.905$, $SE = 12.331$) than did participants interacting in Spanish (their native language) ($M = 287.108$, $SE = 12.019$). Similarly, in question 6 where participants were asked “Is 600 people saved/dying ‘approximately the same as’, ‘a few more’, ‘much more’, or ‘much, much more’ than 400 people saved/dying?”, participants interacting in English chose comparison words that reflected greater differences ($M = 3.001$, $SE = .089$) than did those participants interacting in Spanish ($M = 2.431$, $SE = .086$).

While the main effect of language found in question 8 was only marginally significant, $F(1, 195) = 3.601$, $p = .059$, the pattern is consistent with that seen in questions 2 and 6. Participants interacting in English chose comparison words that reflected slightly greater differences between two interest rates ($M = 1.956$, $SE = .054$) than did participants interacting in Spanish ($M = 1.814$, $SE = .052$). This is a particularly important finding because it suggests that the present language effect may likely also generalize to the consideration of important loan attributes. Although no original predictions were made regarding a main effect of language, this pattern of results suggests that the use of English

(the present participants' non-native language) alone might influence participants' numeric value and comparison word choices.

In an omnibus analysis of all survey questions, language alone, $F(1, 195) = 5.865$, $p = .016$, and frame alone, $F(1, 195) = 7.514$, $p = .007$, were statistically significant, but the interaction of language and frame was only marginally significant, $F(1, 195) = 2.815$, $p = .095$. After performing a between-subjects ANOVA however, a significant interaction effect of framing and language emerged on question 6, $F(1, 195) = 15.573$, $p < .001$ (see Figure 3). Post-hoc analysis showed that this interaction occurred within the Spanish (native language) condition, and was driven by a significant difference between the gain ($M = 2.961$, $SE = .122$) and loss conditions ($M = 1.902$, $SE = .122$). This interaction suggests that the comparison words chosen by participants assigned to the Spanish (native language) condition on question 6 differed significantly depending on whether they were assigned to the gain-frame or loss-frame. The comparison words chosen by participants speaking English, their non-native language, however, did not differ depending on the framing of the question. This result is in direct accordance with the findings of Keysar et al. (2012), and provides preliminary support for the use of a foreign language, here, English, as a protectant against framing effects and loss aversion.

Although this interaction effect was originally predicted to appear in all seven survey questions, it was only observed in one. One possibility is that the interaction appeared only in question 6 because of the large numbers that were utilized (i.e., 600 vs. 400 people being saved or dying). Keysar and colleagues

(2012) used incredibly large numeric values (i.e., 200,000, 400,000, and 600,000 lives) in their experiment, especially as compared to the amounts used in the present experiment. It is then plausible to assume, particularly when considering human lives, that a foreign language effect may only become evident when more substantial values are used. Further research utilizing increased values in the same context of lives being saved or being lost should be conducted in order to examine this hypothesis, as is done in experiment 2.

Experiment 2

Experiment 2 was conducted as a follow up study based on the interaction effect found in experiment 1. Increased numeric values (i.e., 200, 600, 1200) replaced the original numeric values used in questions 1-3 for experiment 1 (i.e., 0, 200, 400), and other interest rates (i.e., 0.4%, 8.0%) were assessed within subjects in addition to the original interest rate used in question 7 for experiment 1 (i.e., 4.0%).

Hypothesis I. There will be an interaction effect of language and frame for all questions. Bilingual participants assigned to the Spanish (native language) condition are predicted to be affected by the framing of questions and exhibit loss aversion, while framing effects are expected to disappear for participants assigned to the English (non-native language) condition.

Method

Participants

A total of 203 participants were recruited for study 2 through Amazon Mechanical Turk. Of these 203 participants, 92 completed the survey on the

MTURK site directly, and 111 participants completed the survey using a survey link connected to Qualtrics. There were no significant differences found between the two populations on any of the six questions, with the largest F value being on question 5, $F(1, 195) = 3.473$, $p = .064$, and thus data from the two populations were combined for analysis. Of these 203 participants, 87 self-identified as female, and 116 self-identified as male. All participants were over the age of 18 years. Participants reported having an average of 31.4 years of age, 15.3 years of education, and an annual income of \$37,800.

All participants identified themselves as native or non-native Spanish speakers and reported their proficiency in both Spanish and English using the same procedure as utilized in Experiment 1. All participants received \$0.25 compensation for their participation.

Materials and Procedure

The procedure for Experiment 2 was identical to that of Experiment 1. All participants first read the same background information (Kahneman & Tversky, 1979), and then answered several questions about the problem and the evaluation of various interest rates. Participants were randomly assigned to complete the survey in Spanish, their native language ($n = 101$), or English, their non-native language ($n = 102$), and to view the problem and questions posed in the gain-frame ($n = 98$), or loss-frame ($n = 105$).

Participants assigned to the gain-frame were asked the following questions (see Appendix C): “Imagine you were told that, ‘more than 200 (600, 1200) people will be saved.’ How many do you imagine will be saved?”, and “You

heard that you could save money on a new loan compared to your current loan. You see a new loan advertised with an interest rate of .04% (4.0%, 8.0%). What do you imagine that the interest rate of your current loan is?”.

Participants assigned to the loss-frame were asked (see Appendix D): “Imagine you were told that, ‘more than 200 (600, 1200) people will die.’ How many do you imagine will die?”, and, “You heard that you are losing money on your current loan as compared to a new loan. You see a new loan advertised with an interest rate of .04% (4.0%, 8.0%). What do you imagine that the interest rate of your current loan is?”.

Results and Discussion

Experiment 2 was designed to assess whether the foreign language effect (Keysar et al., 2012) might be dependent upon the consideration of more substantial values; for example, the saving or loss of 600 and 400 lives (experiment 2) versus that of 0 and 200 lives (experiment 1), or interest rates of 4.0% and 8.0% (experiment 2) versus 4.0% and 4.3% (experiment 1). In the original Asian Disease problem (Kahneman & Tversky, 1979) and the experiment conducted by Keysar et al. (2012), values of 200,000, 400,000, and 600,000 lives were used. Considering this and the more substantial numeric values used in question 6 where the interaction effect was found in experiment 1, it was reasonable to assume that the largeness of the numbers being considered may play some role in the foreign language effect. Experiment 2 was designed to address this possibility. A 2(Frame: gain, loss) x 2(Language: Spanish, English) between-subjects ANOVA was conducted to examine whether the responses from

participants assigned to either the English or Spanish condition, and to either the gain-frame or loss-frame condition, would vary significantly on any of the survey questions.

Contrary to original predictions, no significant interaction of frame and language was found anywhere in experiment 2, despite the use of increased numeric values. This finding suggests that the use of more substantial numbers alone does not necessarily increase the salience of loss aversion or the foreign language effect. Additional research would be useful in determining other potential explanations for the interaction effect found in experiment 1, and some ideas for future directions are described in the General Discussion section below.

Although no interaction effect was found, main effects of both frame and language that were consistent with the findings of experiment 1 also emerged in experiment 2. A significant main effect of frame existed in question 1, $F(1, 199) = 11.303, p = .001$) and question 2, $F(1, 199) = 22.315, p < .001$). In these questions, participants who viewed the loss frame (“Imagine you were told that ‘more than 200 (400) people will *die*.’ How many people do you imagine will *die*?”) imagined significantly greater numbers of people (question 1: $M = 319.513, SE = 10.363$, question 2: $M = 798.675, SE = 15.456$) than did participants who viewed the gain frame (“Imagine you were told that ‘more than 200 (400) people will *be saved*.’ How many people do you imagine will *be saved*?” (question 1: $M = 269.363, SE = 10.729$, question 2: $M = 693.584, SE = 16.001$). This finding is consistent with what would be predicted by loss aversion (i.e., losses loom larger than gains), as well as with our findings from experiment

1, where participants who viewed the loss-frame imagined both larger numeric values, and comparison words that reflected greater differences, than did participants who viewed the gain-frame.

Also consistent with the results from experiment 1 was the emergence of a significant main effect of language on question 5, $F(1, 199) = 6.392, p = .012$, and question 6, $F(1, 199) = 7.068, p = .008$. In questions 5 and 6, participants were asked, “You heard that you are losing (could save) money on your current loan (a new loan) as compared to a new loan (your current loan). You see a new loan advertised with an interest rate of 4.0%. What do you imagine that the interest rate of your current loan is?”. Regardless of whether they viewed the gain-frame or loss-frame of the question, participants interacting in English imagined significantly higher interest rates (question 5: $M = 6.499, SE = .242$, question 6: $M = 10.872, SE = .318$) than did participants interacting in Spanish (question 5: $M = 5.631, SE = .244$, question 6: $M = 9.673, SE = .320$). This finding is particularly relevant because it, again, suggests that the language effect found in experiment 1 can almost certainly be generalized from questions pertaining specifically to the Asian Disease problem to more applied contexts including home loan attribute considerations.

The present findings pertaining to language suggest that the use of English may be protective for bilingual homebuyers who would be making decisions regarding various home loan attributes, including interest rates. If individuals interacting in English (their non-native language) conceptualize their “own” interest rates as higher than they may actually be, or as significantly higher than a

competitive rate, they may be more likely and more motivated to make a change. These individuals may be more likely to comparison shop for home loans with lower interest rates or less likely to accept predatory loans with high interest rates. However, as discussed in greater detail in the General Discussion section, the present findings might also indicate that English use could harm bilingual consumers. If imagining larger values leads to imagining greater savings for example, the use of English could make consumers more susceptible to disadvantageous buying behavior and even predatory lending.

Experiment 3

An experiment investigating loss aversion, foreign language (English) use, and the endowment effect was intended to be conducted as a third, additional experiment. However, after a failed initial manipulation check, the experiment was eliminated from the present paper.

Method

Participants

A total of 100 participants were recruited from MTURK, and a total of 66 undergraduate participants were recruited from DePaul University's Introductory Psychology course.

All participants were over the age of 18. MTURK participants were compensated \$0.20 for participation, and undergraduate participants received a 1-hour course credit for participation.

Materials and Procedure

All participants were shown a series of images of a house that was said to be “for sale”, with descriptive sentences below each of the images. Participants were randomly assigned to the owner condition (n = 50 for MTURK participants and n = 33 for undergraduate participants) or non-owner condition (n = 50 for MTURK participants and n = 33 for undergraduate participants).

Images in the owner condition were presented with sentences describing each area of the house using phrases such as “you” and “your family.” For example, an image of the front yard in the owner condition was labeled as, “Your front yard where your children can make snow angels in the winter.” Similarly, the image of the dining room was labeled as, “Your dining room where you can host Thanksgiving dinner.” Between each of the slides containing an image of the house, a task slide asking participants to “imagine other activities that you can do in this space” was added to ensure that participants had thought about themselves in that space.

Participants in the non-owner condition viewed the same images as did participants in the owner condition, but the labels describing non-owner images were in the context of others (i.e., “the Garcia’s,”) as the previous owners of that house. For example, the image of the front yard in the non-owner condition was labeled as, “The front yard where the Garcia children made snow angels in the winter,” and the dining room was labeled as “The dining room where the Garcia’s hosted Thanksgiving dinner.” Immediately following each slide containing an image, a task slide instructing participants to “imagine other activities that the

Garcia's did in this space" was added to ensure that participants had thought about others in that space.

Immediately following the presentation of images, all participants rated on a 5-point scale (1 = *not at all* and 5 = *very much so*) the degree to which they felt as though they owned this house.

Results and Discussion

MTURK Participants

There were no significant differences between the ratings of perceived ownership for participants in the owner ($M = 3.735$) or non-owner ($M = 3.7$) condition, $p > .05$. This means that our manipulation failed; participants assigned to the owner condition (i.e., participants who viewed images and descriptions of various rooms in a house as their own, and who were asked to imagine other activities that they and their family would have done in those spaces) did not report feeling as though they "owned the house" to any greater degree than did participants assigned to the non-owner condition (i.e., participants who viewed images and descriptions of various rooms in a house as the Garcia's, and who were asked to imagine other activities that the Garcia family would have done in those spaces).

Undergraduate Participants

There were no significant differences between the ratings of perceived ownership for participants in the owner ($M = 2.94$) or non-owner ($M = 3.03$) condition, $p > .05$.

General Discussion

We ran two experiments examining how framing, loss aversion, and the use of a non-native language (i.e., English) interact. Based on the results of Keysar et al. (2012), we expected to find an interaction of frame and language, such that individuals speaking their native language (Spanish) would exhibit the typical gain/loss asymmetries associated with loss aversion, while individuals speaking their non-native language (English) would not exhibit these framing effects. Unfortunately, this predicted interaction was found only in one question. Somewhat unexpectedly however, a consistent pattern of language emerged across the two experiments, such that the use of English resulted in larger imagined numeric values and comparisons by participants. That is, participants interacting in English across experiments 1 and 2 imagined larger numbers of people, chose comparison words that reflected larger differences, and imagined larger interest rates, than did participants interacting in Spanish. These findings suggest that when individuals speak English, their evaluation and estimation of values differ as compared to when they speak Spanish. Perhaps more importantly however, these results suggest that speaking English might be particularly advantageous to bilingual consumers when considering the purchase of a home.

Keysar and colleagues (2012) found that the use of a foreign language can significantly reduce the effects of loss aversion in bilingual individuals. Participants assigned to interact in their native language exhibited the gain/loss-frame asymmetries typical of loss aversion, while participants interacting in a non-native language were unaffected by framing of questions (Keysar et al., 2012). These findings suggested that speaking a non-native language might lead

to less biased decision-making and purchasing behavior. The two experiments described here attempted to expand on these findings by generalizing the potential protectiveness of foreign language use to bilingual consumers and potential homebuyers.

The predicted interaction of language and frame was significant only for question 6 in experiment 1, where consistent with Keysar et al. (2012), the responses of participants assigned to the Spanish (native language) condition differed significantly depending on whether they were assigned to the gain-frame or loss-frame, but these gain/loss asymmetries disappeared for those participants assigned to the English (non-native language) condition. Two important realizations about this interaction effect led to the hypothesis of experiment 2; first, question 6 utilized the largest numeric value comparisons (i.e., 600 vs. 400 lives) of any question in experiment 1, and second, the numeric values used by both Tversky and Kahneman (1981) and Keysar et al. (2012) in the Asian Disease problem were enormous compared to those used in experiment 1 (i.e., 200,000, 400,000, and 600,000 lives). These observations suggested that the foreign language effect (Keysar et al., 2012) might be dependent upon the consideration of larger, more substantial values; the hypothesis tested in experiment 2. In contrast to this prediction and despite the use of larger numeric values, however, experiment 2 did not produce any significant interaction effects.

Across experiments 1 and 2, there were significant main effects of both frame and language separately. An effect of frame appeared in numerous questions across the experiments (question 2 and question 3 in experiment 1, and

question 1 and 2 in experiment 2) such that regardless of their assigned language condition, participants who viewed questions posed in the loss-frame imagined significantly greater numbers of lives lost than did participants assigned to view the gain frame imagine being saved. This finding is consistent with typical framing effects and loss aversion in general (Tversky & Kahneman, 1981; Keysar et al., 2012).

Also emerging across experiments 1 and 2 was a pattern regarding English language use, such that participants interacting in English (their non-native language) tended to report larger numbers, choose comparison words that reflected larger differences, and imagined higher interest rates than did participants interacting in Spanish (their native language). In experiment 1, regardless of whether they viewed the gain-frame or loss-frame of questions, participants interacting in English imagined larger numbers of people dying and being saved (question 2) and chose comparison words that reflected larger differences between two values of people dying or being saved (question 6) than did participants interacting in Spanish. Importantly, this language pattern also extended past responses to questions pertaining specifically to the Asian Disease problem, and generalized to questions pertaining to the evaluation of interest rates. In experiment 1, a marginally significant effect of language was found in question 8 where participants were asked to compare two interest rates. Despite the framing of the question, participants interacting in English chose comparison words that reflected slightly greater differences than did participants interacting in Spanish. In experiment 2, there was a significant main effect of language on both

questions involving the evaluation of interest rates, questions 5 and 6, such that participants interacting in English imagined significantly higher current interest rates than did participants interacting in Spanish.

Taken together, this pattern of language results is quite relevant as it suggests that the use of the English language alone may affect an individual's susceptibility to framing, evaluation of options, and weighting of values. If indeed use of the English language can influence the degree with which people evaluate values and rates, it may serve as a protective factor for bilingual consumers and homebuyers.

Implications

As the number of bilingual consumers in the United States continues to increase, many of whom are likely to complete the home-buying process in English, their non-native language, it is imperative to investigate the effect of language on decision-making. The present results suggest that the use of English may serve as a protective factor for bilingual consumers and potential homebuyers. Participants who interacted in English in experiments 1 and 2 consistently imagined larger numbers of people, chose comparison words that reflected larger differences, and imagined larger interest rates, than did participants who interacted in Spanish.

A tendency to imagine larger values or larger comparisons when evaluating prices might be particularly advantageous to consumers, such that it may lead to more intentional purchasing behavior. If consumers were to imagine larger expenses, they might be less likely to purchase impulsively, or to purchase

items outside of their intended spending range. This idea is also consistent with the conclusion of Keysar et al. (2012) that bilingual individuals interacting in their non-native language may be less biased in their savings, investment, and retirement decisions. For potential homebuyers specifically, imagining larger numbers and particularly higher interest rates, may serve as a protective factor against predatory lenders and loans. If individuals imagine that their current interest rate is significantly higher than a new advertised rate, they may be more motivated to make a change. These individuals may be more likely to seek out lower interest rates, comparison shop when looking for a home loan, or reject predatory loans with high rates.

It is critical, however, to not only consider when a foreign language may be protective, but when it may be disadvantageous. The present findings suggest that using English leads to imagining greater values for native Spanish speakers. While if imagining larger values leads people to imagine they are *losing* more than they actually are, English use could increase motivation to comparison shop for other loans or to reject a predatory loan. However, if imagining larger values leads people to imagine they are *saving* more than they actually are, English use could decrease motivation to comparison shop, or even increase the likelihood of disadvantageous financial decision-making. For example, imagining larger values might also mean imagining larger savings than what would actually be saved on a certain sale or discount deal. This miscalculation could lead to disadvantageous purchasing behavior. Similarly, if consumers evaluating a loan in English imagine larger savings associated with a certain interest rate for example, they may be

losing more than they think, and thus be unmotivated to comparison shop. Thus, the present results do not necessarily advocate for the use of English over Spanish, but rather suggest that speaking English *could* be advantageous for native Spanish speakers throughout the home-buying process. Future research investigating the direct effect of language on decision-making is suggested in the future directions section below.

Limitations

While the present results provide encouraging support for the concept of foreign language use as a protective factor for bilingual individuals, several important limitations exist. First, it is important to note that these two experiments utilized only English as a non-native language, and only Spanish as a native language. Thus, at present, it cannot be concluded that speaking a non-native language itself produces any effect, but rather that speaking English specifically appears to have an influence on our estimations and evaluations. Future directions addressing this limitation are described below.

Second, the present results were not entirely consistent across questions and experiments. In experiment 1 for example, a main effect of language was found in question 2 but not question 1 or 3, and for question 6 but not question 4 or 5. These questions (i.e., question 1, 2, 3, and question 4, 5, 6) were identical to each other, except for the numeric value that was assessed. Similarly, there was no main effect of language found in questions 1, 2, or 3 of experiment 2, despite their identical format to questions 1, 2, and 3 of experiment 1. Based on our experiment 2 hypothesis, a main effect of frame would have been predicted to

appear on question 3 in experiment 2, where the largest numeric value (i.e., 1200 people) was used. Instead, a main effect of frame was found only in questions 1 and 2.

Third, the interaction effect of frame and language, originally predicted to appear on all questions, only existed on question 6 in experiment 1. Although this effect was highly significant ($p < .001$), question 6 (along with questions 4 and 5) utilized comparison word responses that were coded subsequently for analysis. It is possible, therefore, that the coding of responses may have been responsible for the interaction effect, although this is unlikely considering that no interaction effect was found in questions 4 or 5. While it was hypothesized in experiment 2 that the interaction effect found in experiment 1 may have been due to the consideration of more substantial numeric values on question 6, the lack of significant interactions found in experiment 2 suggests that this was not the case. However, because the values utilized by Keysar and colleagues (2012) were 200,000 (400,000) lives and 600,000 lives were significantly greater than even the greatest values used in experiment 2 (1200 lives), it is still possible that the substantiality of the values used by Keysar et al. (2012) had some effect.

Fourth and finally, the length of time that participants had spent living in the United States, and the number of years that participants had been speaking English in addition to their native language, Spanish, was not controlled for in either experiment 1 nor 2. These variables were not controlled for here because the population of bilingual consumers and potential homebuyers in the United States that this set of experiments attempted to capture, have likely lived in the

United States for an extended period of time, and have learned English outside of exclusively a classroom setting. It is possible, however, that the predicted interaction effect was not found because the participants had been speaking English for nearly as long as they had been speaking Spanish. Thus, the effect of speaking English, their “non-native language”, may not have been as strong for participants in this study as it was for those participants used by Keysar et al. (2012), who had acquired their foreign language mainly in a classroom setting and who did not have a parent who spoke it as a native tongue.

Future Directions

The language effect suggested by the present findings has the potential to be highly relevant for bilingual consumers, mortgage counselors, and policy makers. Future experiments should first aim to examine the effect of the English language itself on the present results. Participants assigned to the English (non-native language) condition were shown to choose larger numeric values and choose comparison words that reflected larger differences than did participants assigned to the Spanish (native language) condition. Thus, a target population of native English speakers who speak Spanish as a foreign language should be used. If native English speakers assigned to speak English (their native language) also demonstrate a bias for choosing larger numbers and comparison words than do native English speakers assigned to speak Spanish (their non-native language), this would suggest something influential about the English language itself.

Future research should also attempt to examine whether the present findings directly influence decision-making. Participants in future experiments

should be asked to rate how willing they would be to accept certain home loan attributes, and how likely they would be to pursue a new, different rate (i.e., interest rate or monthly payment). If indeed the use of English not only leads to imagining larger values and comparisons, as was found in experiment 1 and 2, but also directly affects an individual's evaluation of rates and willingness to seek alternative options, the implications for consumers and potential homebuyers would be highly relevant.

References

- Barberis, N. C. (2013). Thirty years of prospect theory in economics: A review and assessment. *Journal of Economic Perspectives*, 27(1), 173-196.
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1, 185-216.
- Choplin, J. M. (2006). Toward a comparison-induced distortion theory of judgment and decision making. In J. A. Elsworth (Ed.), *Psychology of Decision Making in Education* (pp. 55-86). Hauppauge, NY: Nova Science Publishers, Inc.
- Kahneman, D., & Frederick, S. (2007). Frames and brains: Elicitation and control of response tendencies. *Trends in Cognitive Sciences*, 11, 45-46.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-291.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1990). Experimental tests of the endowment effect and the coase theorem. *Journal of Political Economy*, 98(6), 1325-1348.
- Keysar, B., Hayakawa, S. L., & Gyu An, S. (2012). The foreign-language effect: Thinking in a foreign tongue reduces decision biases. *Psychological Science*, 23(6), 661-668.
- Paap, K. R., & Greenberg, Z. I. (2013). There is no coherent evidence for a bilingual advantage in executive processing. *Cognitive Psychology*, 66, 232-258.
- Stark, D., & Choplin, J. M. (2010). A cognitive and social psychological analysis

of disclosure laws and call for mortgage counseling to prevent predatory lending. *Psychology, Public Policy, and Law*, 16(1), 85-131.

Strahilevitz, M. A., & Loewenstein, G. (1998). The effect of ownership history on the valuation of objects. *Journal of Consumer Research*, 25, 276-289.

Thaler, R. H. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization*, 1, 39-60.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453-458.

Appendix A

Experiment 1 Survey Questions (gain-frame) (English)

1. Imagine you were told that, “more than 0 people will be saved.” How many do you imagine will be saved?
2. Imagine you were told that, “more than 200 people will be saved.” How many do you imagine will be saved?
3. Imagine you were told that, “more than 400 people will be saved.” How many do you imagine will be saved?
4. Is 200 people saved “approximately the same as,” “a few more,” “much more,” or “much, much more” than 0 people saved?
5. Is 400 people saved “approximately the same as,” “a few more,” “much more,” or “much, much more” than 200 people saved?
6. Is 600 people saved “approximately the same as,” “a few more,” “much more,” or “much, much more” than 400 people saved?
7. You heard that you could save money on a new loan compared to your current loan. Your current loan has an interest rate of 4%. What do you imagine the interest rate of that new loan might be?
8. Is an interest rate of 4% “approximately the same as,” “slightly less,” “much less,” or “much, much less” than 4.3%?

Appendix B

Experiment 1 Survey Questions (gain-frame) (Spanish)

1. Imagínase que le dijeron que "más de 0 personas serían salvadas."
¿Cuántas personas se imagina que serían salvadas?
2. Imagínase que le dijeron que "más de 200 personas serían salvadas."
¿Cuántas personas se imagina que serían salvadas?
3. Imagínase que le dijeron que "más de 400 personas serían salvadas."
¿Cuántas personas se imagina que serían salvadas?
4. ¿200 personas salvadas son "aproximadamente las mismas," "un poco más," "mucho más," o "mucho, mucho más" que 0 personas salvadas?
5. ¿400 personas salvadas son "aproximadamente las mismas," "un poco más," "mucho más," o "mucho, mucho más" que 200 personas salvadas?
6. ¿600 personas salvadas son "aproximadamente las mismas," "un poco más," "mucho más," o "mucho, mucho más" que 400 personas salvadas?
7. Oyó que puede ahorrar dinero con un préstamo nuevo en comparación con tu préstamo actual. Su préstamo actual tiene una tasa de interés de 4%.
¿Que se imagina que sería la tasa de interés del préstamo nuevo?
8. ¿Una tasa de interés de 4.0% es "aproximadamente lo mismo," "un poco menos," "mucho menos," o "mucho, mucho menos" que 4.3%?

Appendix C

Experiment 1 Survey Questions (loss-frame) (English)

1. Imagine you were told that, “more than 0 people will die.” How many do you imagine will die?
2. Imagine you were told that, “more than 200 people will die.” How many do you imagine will die?
3. Imagine you were told that, “more than 400 people will die.” How many do you imagine will die?
4. Is 200 people dying “approximately the same as,” “a few more,” “much more,” or “much, much more” than 0 people dying?
5. Is 400 people dying “approximately the same as,” “a few more,” “much more,” or “much, much more” than 200 people dying?
6. Is 600 people dying “approximately the same as,” “a few more,” “much more,” or “much, much more” than 400 people dying?
7. You heard that you are losing money on your current loan compared to a new loan. Your current loan has an interest rate of 4%. What do you imagine the interest rate of that new loan might be?
8. Is an interest rate of 4.3% “approximately the same as,” “slightly more,” “much more,” or “much, much more” than 4%?

Appendix D

Experiment 1 Survey Questions (loss-frame) (Spanish)

1. Imagínese que le dijeron que "más de 0 personas morirán." ¿Cuántos se imagina que morirán?
2. Imagínese que le dijeron que "más de 200 personas morirán." ¿Cuántos se imagina que morirán?
3. Imagínese que le dijeron que "más de 400 personas morirán." ¿Cuántos se imagina que morirán?
4. 200 personas muertas son "aproximadamente los mismos," "un poco más," "mucho más," o "mucho, mucho más" que 0 personas muriendo?
5. 400 personas muertas son "aproximadamente los mismos," "un poco más," "mucho más," o "mucho, mucho más" que 200 personas muriendo?
6. 200 personas muertas son "aproximadamente los mismos," "un poco más," "mucho más," o "mucho, mucho más" que 0 personas muriendo?
7. Oyó que esta perdiendo dinero en su préstamo actual en comparación con un préstamo nuevo. Su préstamo actual tiene una tasa de interés de 4%.
¿Que se imagina que sería la tasa de interés del préstamo nuevo?
8. ¿Una tasa de interés de 4.3% es "aproximadamente lo mismo," "un poco más," "mucho más," o "mucho, mucho más" que 4.0%?

Appendix E

Experiment 2 Survey Questions (gain-frame) (English)

1. Imagine you were told that, “more than 200 people will be saved.” How many do you imagine will be saved?
2. Imagine you were told that, “more than 600 people will be saved.” How many do you imagine will be saved?
3. Imagine you were told that, “more than 1200 people will be saved.” How many do you imagine will be saved?
4. You heard that you could save money on a new loan compared to your current loan. You see a new loan advertised with an interest rate of .04%. What do you imagine that the interest rate of your current loan is?
5. You heard that you could save money on a new loan compared to your current loan. You see a new loan advertised with an interest rate of 4.0%. What do you imagine that the interest rate of your current loan is?
6. You heard that you could save money on a new loan compared to your current loan. You see a new loan advertised with an interest rate of 8.0%. What do you imagine that the interest rate of your current loan is?

Appendix F

Experiment 2 Survey Questions (gain-frame) (Spanish)

1. Imagínese que le han dicho que "más de 200 personas serán salvadas."
¿Cuántas personas se imagina que serán salvadas?
2. Imagínese que le han dicho que "más de 600 personas serán salvadas."
¿Cuántas personas se imagina que serán salvadas?
3. Imagínese que le han dicho que "más de 1200 personas serán salvadas."
¿Cuántas personas se imagina que serán salvadas?
4. Le han dicho que puede ahorrar dinero con un préstamo nuevo en comparación con tu préstamo actual. Usted ve un nuevo préstamo anunciado con un tipo de interés del 0.04%. ¿Cual se imaginas que el tipo de interés de su préstamo actual es?
5. Le han dicho que puede ahorrar dinero con un préstamo nuevo en comparación con tu préstamo actual. Usted ve un nuevo préstamo anunciado con un tipo de interés del 4.0%. ¿Cual se imaginas que el tipo de interés de su préstamo actual es?
6. Le han dicho que puede ahorrar dinero con un préstamo nuevo en comparación con tu préstamo actual. Usted ve un nuevo préstamo anunciado con un tipo de interés del 8.0%. ¿Cual se imaginas que el tipo de interés de su préstamo actual es?

Appendix G

Experiment 2 Survey Questions (loss-frame) (English)

1. Imagine you were told that, “more than 200 people will die.” How many do you imagine will die?
2. Imagine you were told that, “more than 600 people will die.” How many do you imagine will die?
3. Imagine you were told that, “more than 1200 people will die.” How many do you imagine will die?
4. You heard that you are losing money on your current loan as compared to a new loan. You see a new loan advertised with an interest rate of .04%.
What do you imagine that the interest rate of your current loan is?
5. You heard that you are losing money on your current loan as compared to a new loan. You see a new loan advertised with an interest rate of 4.0%.
What do you imagine that the interest rate of your current loan is?
6. You heard that you are losing money on your current loan as compared to a new loan. You see a new loan advertised with an interest rate of 8.0%.
What do you imagine that the interest rate of your current loan is?

Appendix H

Experiment 2 Survey Questions (loss-frame) (Spanish)

1. Imagínese que le han dicho que "más de 200 personas morirán." ¿Cuántas personas se imagina que morirán?
2. Imagínese que le han dicho que "más de 600 personas morirán." ¿Cuántas personas se imagina que morirán?
3. Imagínese que le han dicho que "más de 1200 personas morirán." ¿Cuántas personas se imagina que morirán?
4. Le han dicho que esta perdiendo dinero en su préstamo actual en comparación con un préstamo nuevo. Usted ve un nuevo préstamo anunciado con un tipo de interés del 0.04%. ¿Cual se imaginas que el tipo de interés de su préstamo actual es?
5. Le han dicho que esta perdiendo dinero en su préstamo actual en comparación con un préstamo nuevo. Usted ve un nuevo préstamo anunciado con un tipo de interés del 4.0%. ¿Cual se imaginas que el tipo de interés de su préstamo actual es?
6. Le han dicho que esta perdiendo dinero en su préstamo actual en comparación con un préstamo nuevo. Usted ve un nuevo préstamo anunciado con un tipo de interés del 8.0%. ¿Cual se imaginas que el tipo de interés de su préstamo actual es?

Table 1

Significant Main Effect of Frame in Experiment 1

Question	Mean	Std. Error	<i>F</i>	<i>p</i>	η^2
Q2					
<i>Gain-frame</i>	285.362	12.272	8.871	.003	.044
<i>Loss-frame</i>	336.650	12.079			
Q3					
<i>Gain-frame</i>	470.641	27.853	7.746	.006	.038
<i>Loss-frame</i>	579.421	27.853			
Q6					
<i>Gain-frame</i>	3.002	.088	21.286	.000	.098
<i>Loss-frame</i>	2.431	.087			
Q7					
<i>Gain-frame</i>	3.064	.144	3.913	.049	.020
<i>Loss-frame</i>	3.462	.141			

Table 2

Significant Main Effect of Frame in Experiment 2

Question	Mean	Std. Error	<i>F</i>	<i>p</i>
Q1				
<i>Gain-Frame</i>	269.363	10.729	11.303	.001
<i>Loss-Frame</i>	319.513	10.363		
Q2				
<i>Gain-Frame</i>	693.584	16.001	21.228	.000
<i>Loss-Frame</i>	798.675	15.456		

Table 3

Significant Main Effect of Language in Experiment 1

Question	Mean	Std. Error	<i>F</i>	<i>p</i>	η^2
Q2					
<i>Native</i>	287.108	12.019	7.705	.006	.038
<i>Non-Native</i>	334.905	12.331			
Q6					
<i>Native</i>	2.431	.086	21.228	.000	.098
<i>Non-Native</i>	3.001	.089			

Table 4

Significant Main Effect of Language in Experiment 2

Question	Mean	Std. Error	<i>F</i>	<i>p</i>
Q5				
<i>Native</i>	5.631	.244	6.392	.012
<i>Non-Native</i>	6.499	.242		
Q6				
<i>Native</i>	9.673	.320	21.228	.008
<i>Non-Native</i>	10.872	.318		

Table 5

Significant Interaction Effect of Frame x Language in Experiment 1

Question	Mean	Std. Error	<i>F</i>	<i>p</i>	η^2
Q6					
<i>Native gain</i>	2.961	.122	15.573	.000	.074
<i>Native loss</i>	1.902	.122			
<i>Non-Native gain</i>	3.043	.127			
<i>Non-Native loss</i>	2.960	.123			