The Foreign-Language Effect : Thinking in a Foreign Tongue Reduces Decision Biases

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The Foreign-Language Effect: Thinking in a Foreign Tongue Reduces Decision Biases

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Abstract

Would you make the same decisions in a foreign language as you would in your native tongue? It may be intuitive that people would make the same choices regardless of the language they are using, or that the difficulty of using a foreign language would make decisions less systematic. We discovered, however, that the opposite is true: Using a foreign language reduces decision-making biases. Four experiments show that the framing effect disappears when choices are presented in a foreign tongue. Whereas people were risk averse for gains and risk seeking for losses when choices were presented in their native tongue, they were not influenced by this framing manipulation in a foreign language. Two additional experiments show that using a foreign language reduces loss aversion, increasing the acceptance of both hypothetical and real bets with positive expected value. We propose that these effects arise because a foreign language provides greater cognitive and emotional distance than a native tongue does.

Keywords

bilingualism, decision making, emotions, foreign-language learning, language

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Hundreds of millions of people use more than one language on a daily basis to communicate and to work. People are usually less proficient in their second than in their first language and often acquire their second language in a classroom setting. We investigated if and how the use of a foreign language affects judgment and decision making.

Thinking and reasoning seem to involve the use of two types of processes. One type relies heavily on mental resources and is more analytic, rule governed, and systematic, and the other is intuitive, affective, and heuristic (e.g., Kahneman, 2003; Sloman, 1996; Stanovich & West, 2000). On the one hand, there are good reasons to believe that the use of a foreign language would reduce people's ability to rely on more systematic processes. This is because a foreign language is harder to use, which could increase cognitive load and lead to greater reliance on intuitive and affective processes. If such a *reduced-systematicity* account is true, then the use of a foreign language should exacerbate certain decision biases that arise from heuristics and affective processes.

On the other hand, there are reasons to believe that a foreign language could have the opposite effect, making people rely even more on systematic processes, thereby reducing decision biases. The broad motivation for this hypothesis is the possibility that a foreign language provides a distancing mechanism that moves people from the immediate intuitive system to a more deliberate mode of thinking. A foreign language may provide greater distance because it is less grounded in the emotion system than a native tongue is (e.g., Pavlenko, 2005). Even when people fully comprehend the meaning of taboo words, reprimands, expressions of love, and advertisement slogans, they react to them less emotionally in a foreign language, as demonstrated by subjective ratings as well as electrodermal responses (e.g., Ayçiçeği & Harris, 2004; Dewaele, 2004; Harris, Ayçiçegi, & Gleason, 2003; Puntoni, de Langhe, & van Osselaer, 2009). This reduction in emotional response might diminish the influence of affective processes and allow people to rely more on analytic processes when they make decisions.

A more cognitive source for distancing could be the fact that a foreign language is typically processed less automatically than a native tongue, which could lead to more deliberate processing (Favreau & Segalowitz, 1983). Such a deliberate mode could affect processing in general and result in decisions that are more systematic. Another source of increased analytic reasoning is processing difficulty (Alter, Oppenheimer, Epley, & Eyre, 2007). The reduced fluency in a foreign language could therefore lead to more analytic decision-making processes. In general, then, if such *increased-systematicity* accounts are correct,

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people should be less affected by decision biases when using a foreign language than when using their native language.

We conducted six experiments to evaluate the impact of using a foreign language on decision making. Experiments 1a through 1d tested its impact on the framing effect on risk attitudes (Kahneman & Tversky, 1979). Experiments 2 and 3 tested the impact of using a foreign language on myopic loss aversion.

General Method

Bilinguals may differ from monolinguals in a variety of ways. To avoid any confounds, in each experiment we compared people who spoke the same native and foreign languages. They were randomly assigned to perform a task in one of the two languages. Participants had acquired the foreign language mainly in a classroom setting and did not have a parent who spoke it as a native tongue. After each experiment, we collected demographic data to confirm that the participants qualified. We also collected self-ratings of language proficiency and averaged across reading, writing, speaking, and comprehension ratings to arrive at a language proficiency score for each participant.

Materials, which were originally written in English, were translated and back-translated to ensure comparability (Brislin, 1970). We consulted bilingual native speakers of the languages used in each experiment to ensure that words and phrases conveyed the same intent across languages. Each experimental session was conducted entirely in one language, either the participant's native language or the foreign tongue. To ensure that participants had the minimum level of required proficiency, we had them first read a short story and answer comprehension questions. We made sure participants understood the experiment in the foreign language by having them translate the materials into their native tongue after the experiment was finished. We excluded any participant who did not demonstrate a clear understanding of critical elements.

Experiments 1a Through 1c: Framing Risk

Most people prefer a guaranteed $20 over an even bet that would net them either $40 or $0. Although people show such risk aversion in the domain of gains, they are risk seeking in the domain of losses. Such asymmetry exists even when the same choice is simply framed differently, as a gain or as a loss. Thus, people prefer to save the lives of 200 out of 600 people for sure than to take a chance of saving all of them or none. However, if the choice is framed in terms of lives lost (400 out of 600), they become risk seeking (Kahneman & Tversky, 1979). This reversal in risk preferences is robust and has been demonstrated in many studies (for a review, see Kühberger, 1998). It is particularly important because it violates normative assumptions that the willingness to accept risk should be independent of the description of a situation.

We investigated whether this reversal of risk preferences is affected by the use of a foreign language. If the reduced-systematicity account is correct, then using a foreign tongue would exacerbate this decision-making phenomenon and increase the asymmetry. In contrast, if the increased-systematicity account is correct, then use of a foreign language should reduce the impact of framing on risk preferences.

Method

Participants

Experiment 1a. One hundred twenty-one students from universities in Chicago, Illinois, and Raleigh, North Carolina, participated in this experiment. All were native English speakers who spoke Japanese as a foreign language. Their mean age was 22, and the mean age at which they had begun learning Japanese was 17. Participants rated their language ability on 7-point scales, with 7 indicating full fluency. The mean Japanese proficiency score was 4.2, and the mean English score was 6.9. Participants were randomly assigned to perform the task in English (n = 61) or in Japanese (n = 60).

Experiment 1b. One hundred forty-four students from Chung Nam National University in Daejeon, Korea, participated in this experiment. Their mean age was 23, and the mean age at which they had begun learning English was 12. Participants rated their language ability on 10-point scales, with 10 indicating full fluency. The mean English proficiency score was 4.4, and the mean Korean score was 8.5. Participants were randomly assigned to perform the task either in their native tongue, Korean (n = 66), or in a foreign language, English (n = 78).

Experiment 1c. One hundred three native speakers of English who were studying in Paris, France, participated in this experiment. Their mean age was 22, and the mean age at which they had begun learning French was 16. Average self-reported proficiency in French was 3.8 on 10-point scales (with 10 indicating full fluency). Participants were randomly assigned to perform the experiment in either English (n = 50) or French (n = 53).[1]

Procedure. We presented participants in all three experiments with a modified version of the original "Asian disease" problem (Kahneman & Tversky, 1979). Here is the gain-frame version of the problem as presented in Experiment 1a:

> Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made.
>
> If you choose Medicine A, 200,000 people will be saved.
>
> If you choose Medicine B, there is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will be saved.
>
> Which medicine do you choose?

The loss-frame version was the same, except that for Medicine A, it stated that "400,000 will die," and for Medicine B, it stated that there was a 33.3% chance that "no one will die" and a 66.6% chance that "600,000 people will die." Participants were randomly assigned to either the native- or the foreign-language condition, and to either the gain or the loss frame, and their task was to choose between the two medicines. In Experiments 1b and 1c, we used another variant of the problem, in which the government was trying to avoid the loss of 600,000 jobs. Except for the change in topic, the problems were identical across the three experiments.

Results and discussion

As Figure 1a shows, in Experiment 1a, we replicated the framing effect in the native language, English. Seventy-seven percent of the participants who answered the gain-frame problem preferred the sure option (A), whereas only 47% of the participants who answered the loss-frame problem preferred that option, $\chi^2(1, N = 61) = 6.14$, $p < .03$, $\varphi = .319$. Crucially, this asymmetry disappeared when the decision was made in a foreign language, Japanese, $\chi^2(1, N = 60) = 0.069$, $p > .5$, $\varphi = .034$. These results support the increased-systematicity account. They demonstrate that the use of a foreign language dramatically reduces the gain-loss asymmetry in risk preferences, resulting in a frame-independent choice, which is more in line with standard economic theory.

Experiments 1b and 1c replicated the results of Experiment 1a. In Experiment 1b (Fig. 1b), when the native speakers of Korean made their choice in Korean, they showed the documented asymmetry, $\chi^2(1, N = 66) = 10.88$, $p < .005$, $\varphi = .406$. In Experiment 1c (Fig. 1c), the native speakers of English who chose in English also showed the asymmetry, $\chi^2(1, N = 50) = 5.3$, $p < .03$, $\varphi = .327$. But the asymmetry disappeared both

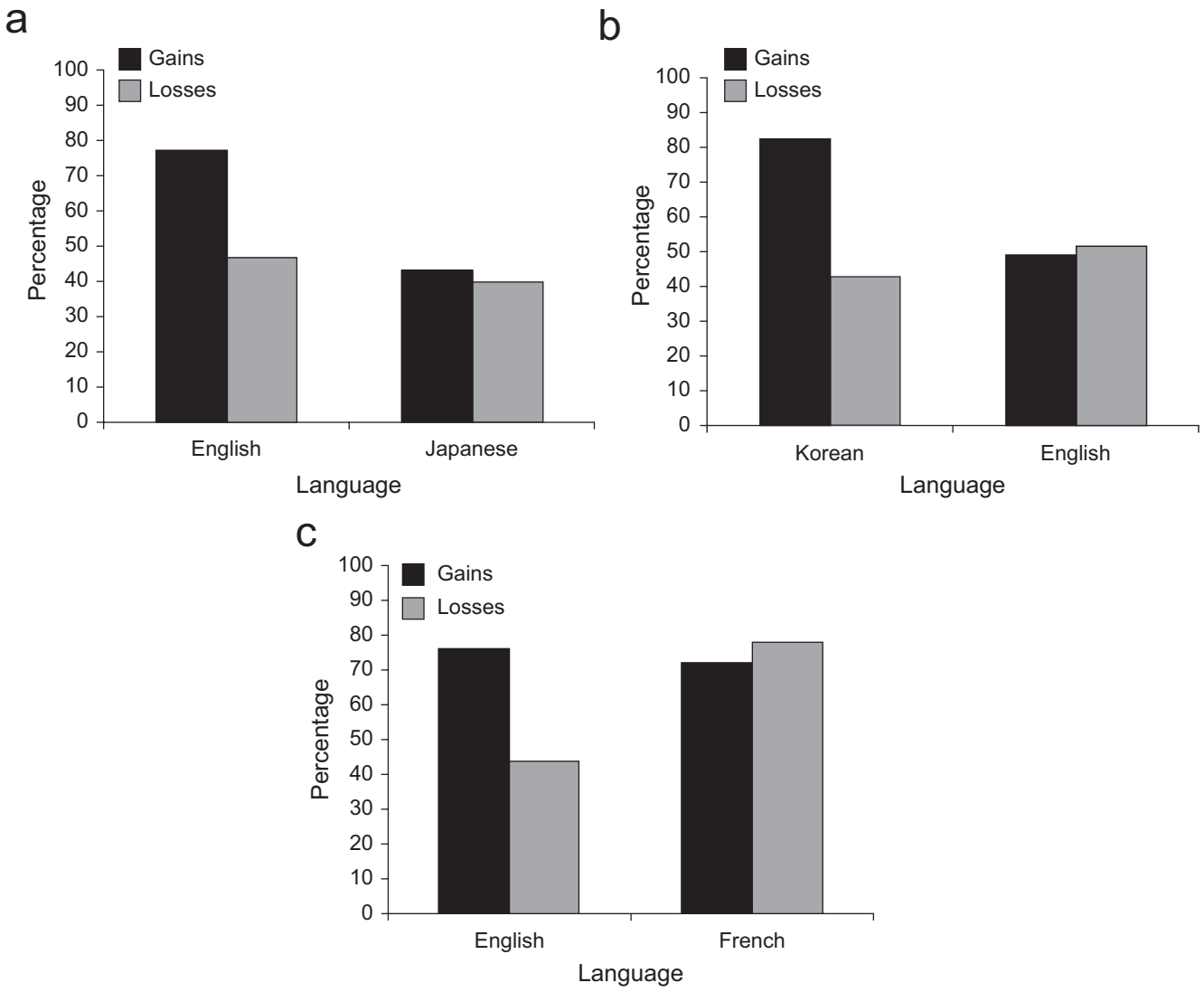

Fig. 1. Percentage of participants in Experiments 1a through 1c who selected the sure option as a function of frame and language. In Experiment 1a (a), English was the native language, and Japanese the foreign language; in Experiment 1b (b), Korean was the native language, and English the foreign language; in Experiment 1c (c), English was the native language, and French the foreign language.

when the Koreans performed the task in English (Experiment 1b), $\chi^2(1, N = 78) = 0.051$, $p > .5$, $\varphi = -.026$, and when the native English speakers performed it in French (Experiment 1c), $\chi^2(1, N = 53) = 0.31$, $p > .5$, $\varphi = -.076$. Analyzing all three experiments together, we found a significant interaction of language and frame, $\chi^2(1, N = 368) = 14.05$, $p < .001$. This interaction did not interact with experiment, $\chi^2(1, N = 368) = 0.80$, $p > .5$; thus, the three samples did not differ significantly in how their choice was affected by language and frame.

There is little evidence that cognitive load directly affects the framing effect, but it does increase the probability of choosing the sure option in general (Whitney, Rinehart, & Hinson, 2008). Results of Experiment 1c are consistent with this evidence, in that a large percentage of participants in the foreign-language condition chose the sure option. Yet even in this experiment, the framing effect disappeared in the foreign-language condition. This pattern of findings suggests that if the cognitive load associated with a foreign language had any effect in our experiments, this effect was independent of the framing effect.

Experiment 1d: Control Study

There is a simpler, alternative explanation to our findings, however. It is possible that participants did not bother to read the materials in the foreign language, and instead chose at random between the risky and the sure options. This strategy would eliminate the effect of frame, and could have yielded the observed pattern of results. Even the responses in the foreign-language condition of Experiment 1c could be explained as due to random choice with a bias toward the first option. We evaluated this alternative with a control study, Experiment 1d. Our account assumes that people read and understood the problem when it was presented in the foreign language, but posits that the framing effect disappeared because using this language reduced the impact of the frame. The alternative explanation is that people responded randomly, with no regard to the content of the problem. In Experiment 1d, we presented the jobs scenario from Experiments 1b and 1c in a foreign language, but in three conditions. Two conditions were the same as before, with the choice framed in terms of either gains or losses. In the third condition, the choice was also framed in terms of gains, but we modified the options so that option B had a higher expected value than option A. If people responded at random, independently of the content of the text, then this condition would show the same pattern of responses as the original gain condition. If our account is correct, however, then people would choose the option with the higher expected value.

Method

Participants were 84 University of Chicago students; all were native English speakers who spoke Spanish as a foreign language. Their mean age was 19 years old, and the mean age at which they had begun learning Spanish was 12. Participants rated their language ability on 10-point scales, with 10 indicating full fluency. The mean Spanish proficiency score was 6.2, and the mean English score was 9.9. Participants were randomly assigned to the gain-frame, loss-frame, or modified gain-frame condition ($n = 28$ in each condition), and all performed the task in Spanish. The procedure was identical to that of Experiments 1a through 1c, and the gain- and loss-frame conditions were the same as in Experiments 1b and 1c. In the modified gain-frame condition, the sure option stated that 1,000 jobs would be saved, which was lower than the expected value of the risky option, which presented a 66.6% chance that all job would be saved and a 33.3% chance that none would be saved.

Results and discussion

The results of Experiments 1a through 1c were replicated: Participants were equally likely to choose the sure option in the gain-frame condition and in the loss-frame condition (75% and 71%, respectively), $\chi^2(1, N = 56) = 0.091$, $p > .5$, $\varphi = .04$. However, they were much less likely to choose the sure option in the modified gain-frame condition (14%), and as a result, there was a significant effect of frame, $\chi^2(2, N = 84) = 26.133$, $p < .001$, $\varphi = .558$. The results of this experiment clearly show that using a foreign language eliminates the framing effect even when people read and understand the text, as the choices in the modified gain-frame condition illustrate.

Taken together, the data of Experiments 1a through 1d strongly suggest that a robust asymmetry of risk preferences disappears when a decision takes place in a foreign language. Using a foreign language diminishes the framing effect, instead of exacerbating the gain-loss asymmetry because of increased cognitive load. These experiments also show that the foreign-language effect does not depend on a particular native language or a particular foreign tongue, as it holds for Korean as a native language, Japanese as a foreign language, French as a foreign language, Spanish as a foreign language, and English as both a native and a foreign language. The experiments also demonstrate that the effect occurs across different contexts. Participants in Experiments 1a and 1b were in their native country, but participants in Experiment 1c were native English speakers studying in Paris, where their foreign language was the native tongue. To evaluate the impact of using a foreign language on a decision phenomenon other than the framing effect, in Experiments 2 and 3 we considered loss aversion.

Experiment 2: Loss Aversion

People are loss averse in the sense that they anticipate that the negative impact of a potential loss would outweigh the positive impact of an identical potential gain (Kahneman & Tversky, 1979). For example, most people would avoid a bet that offers an even chance of winning $12 or losing $10, despite its

positive expected value. The prospect of a larger gain is outweighed by the fear of the loss. This evaluation, combined with a tendency to bracket bets narrowly when multiple bets are offered, leads to myopic loss aversion (Benartzi & Thaler, 1995). There is evidence that myopic loss aversion is driven by an emotional reaction to the prospect of loss, as patients with focal lesions in areas that regulate emotions, compared with non-brain-damaged participants, are less likely to show this effect, and more likely to accept such positive-expected-value bets (Shiv, Loewenstein, Bechara, Damasio, & Damasio, 2005). In Experiment 2, we presented people with a range of equal-odds, positive-expected-value bets that could result in either a gain or a loss. These bets were presented in either participants' native language or a foreign language, and we evaluated whether willingness to take the bets differed between these conditions. There is evidence that increased cognitive load can make people more risk averse (Benjamin, Brown, & Shapiro, 2006). Therefore, the difficulty of using a foreign language might reduce people's willingness to take such bets. In contrast, the increased-systematicity account suggests that people would be less loss averse, and more willing to take such positive-expected-value bets, when the bets are presented in a foreign tongue than when they are presented in the native language.

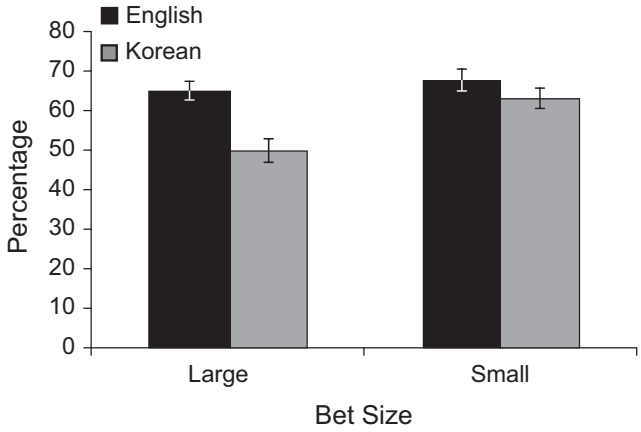

Fig. 2. Percentage of bets accepted in Experiment 2 as a function of the size of the bet and the language in which the bet was presented. In this experiment, Korean was the native language, and English was the foreign language. Error bars represent standard errors.

Method

Participants. One hundred forty-six native Korean speakers participated in this experiment; all were students at Chung Nam National University in Daejeon, Korea. All but 2 of these students[2] also participated in Experiment 1b. They were randomly assigned to perform the task either in Korean (n = 68) or in English (n = 78).

Materials and procedure. We presented each participant with 18 equal-odds bets, all with positive expected value, either in Korean or in a foreign language, English. Half the bets had high stakes (e.g., lose ₩119,000 or win ₩170,000), and half had low stakes (e.g., lose ₩200 or win ₩500; ₩1,000 is roughly equal to $1). People routinely show loss aversion in situations involving large amounts, but there is evidence that they are not loss averse in the case of insignificant amounts (Harinck, Van Dijk, Van Beest, & Mersmann, 2007). Therefore, we expected the language in which the bets were presented to affect decisions mainly in the case of the larger bets.

Bets appeared on a computer monitor in random order, and participants indicated their choices by clicking on one of two icons, labeled in the designated language as "yes" (accept the bet) and "no" (reject it). We had participants read the amounts out loud before they made their choices, in order to ensure attentiveness.

Within each magnitude condition, the bets ranged from an unattractive 9/10 loss-to-gain ratio to a highly attractive 1/10 ratio. This attractiveness variation was important to demonstrate that participants were sensitive to expected value and that they were indeed more likely to take bets that had higher expected value. The crucial question was whether using a foreign language would affect their willingness to take the bets, particularly those with higher stakes.

Results and discussion

On average, participants took more bets in English than in Korean (Ms = 67% and 57%, respectively), $F(1, 144) = 7.126$, $p < .01$, $\eta^2 = .05$; thus, they were less loss averse in a foreign tongue than in their native language. As Figure 2 shows, language affected choice only when the stakes were higher; the interaction between language and bet size was significant, $F(1, 144) = 4.029$, $p < .05$. Figure 3 shows that although participants' willingness to take a large bet increased with the

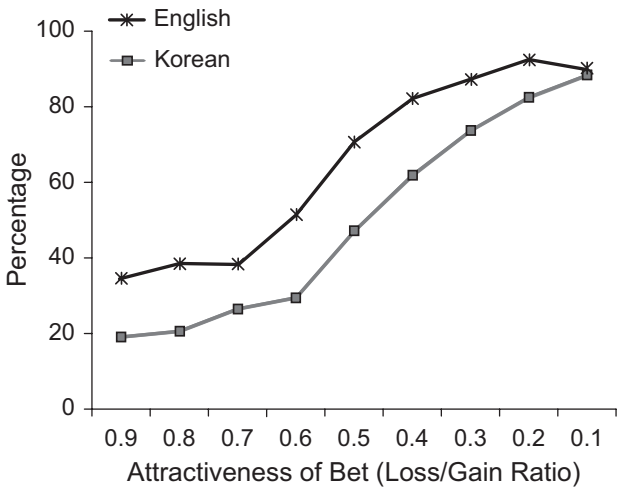

Fig. 3. Percentage of large bets accepted in Experiment 2 as a function of the attractiveness of the bet and the language in which the bet was presented. In this experiment, Korean was the native language, and English was the foreign language.

bet's attractiveness, participants were more willing to bet in English than in Korean at every level of attractiveness. These results support the increased-systematicity account: In a foreign language, loss aversion is reduced, as people are more willing to take a bet with a positive expected value that would maximize their benefit in the long run.

Experiment 2 demonstrates that people are less reluctant to take a series of positive-expected-value bets when using a foreign language than when using their native language. But given that these bets were hypothetical, the results might not reflect the actual impact of a foreign language. In Experiment 3, we had two goals: to test if the same effect holds when people's own money is at stake and to generalize the findings to a different pair of languages.

Experiment 3: Myopic Loss Aversion and Consequential Investment Behavior

This experiment was modeled on the method used by Shiv et al. (2005), with slight modifications. Participants received $15 in $1 bills, to place 15 separate bets. In each round, they could either keep a dollar or risk losing it in an even bet that could gain them $2.50. Unlike in Experiment 2, participants kept the cash they accrued during the experiment. They performed the task either in their native tongue, English, or in a foreign language, Spanish.

Method

Participants. Participants were 54 students at The University of Chicago; all were native speakers of English who knew Spanish as a foreign language, through instruction in a classroom setting. They were randomly assigned to perform the task either in English or in Spanish. Their mean age was 19 years old, and the mean age at which they had begun learning Spanish was 13. Participants rated their language ability on 30-point visual analogue scales, with 30 indicating full fluency. The mean Spanish proficiency score was 19, and the mean English score was 29.

Procedure. Each participant received $15 in cash. In each round, the participant removed one dollar bill from his or her remaining cash and decided whether to use it in a bet. For each bet, the experimenter flipped a coin in plain view while the participant called out "heads/cara" or "tails/cruz." If the participant was correct, he or she kept the dollar and received an extra $1.50. Otherwise, he or she lost the dollar. If the participant declined the bet, he or she kept the dollar and moved on to the next round. In each round, the expected value of taking the bet was $1.25. Participants knew that they would keep the money they accrued.

Results and discussion

Overall, participants who performed the task in Spanish took the bets more often than those who performed it in English (Ms = 71% and 54%, respectively), $t(52) = -2.04$, $p < .05$, $d = -0.55$. This pattern of choice is particularly notable because the participants' own money was at stake in this experiment. The increased willingness to take the bets in Spanish clearly demonstrates that people are not as loss averse in a foreign language as they are in their native tongue. They take more bets in a foreign language because they expect to gain in the long run, and are less affected by the typically exaggerated aversion to losses.

General Discussion

These six experiments strongly demonstrate that people rely more on systematic processes that respect normative rules when making decisions in a foreign language than when making decisions in their native tongue. Experiments 1a through 1c show that risk preferences that routinely violate normative rules by being description dependent disappear when decisions are made in a foreign language (i.e., choice becomes description independent). Experiment 1d demonstrates that this effect is not due to random responding when choices are presented in a foreign language. Experiment 2 shows that loss aversion is reduced in a foreign language, and Experiment 3 shows that this is true even when the decisions involve people's own money.

Given that using a foreign language likely increases cognitive load, our results are particularly surprising, as increased external load could undermine systematic thinking. Gain-versus-loss framing effects seem not to be affected by load, as people show the typical reversal of risk preferences under both high and low load (Whitney et al., 2008). Acute stress exacerbates the asymmetry in risk preferences between gains and losses (Porcelli & Delgado, 2009), and given that the use of a foreign language is often accompanied by increased stress (Caldwell-Harris & Ayçiçeği-Dinn, 2009), a foreign language might be expected to increase the impact of framing on choice. However, our results demonstrate that using a foreign language has the exactly opposite effect. Instead of exacerbating the framing effect, it eliminates it. Similarly, increased cognitive load seems to induce risk aversion (Benjamin et al., 2006). Therefore, if the choice of participants using a foreign language in our loss-aversion studies was due to increased load, they should have been less likely to take the bets than participants using their native language. Yet the opposite was true. Thus, anxiety in the case of the framing tasks, and cognitive load in the case of the loss-aversion tasks, would most likely have undermined the effects we observed, not contributed to them.

Why does using a foreign language affect decision making?

The foreign-language effect on decision making is most likely determined by multiple factors that increase psychological distance and promote deliberation. Perhaps the most important mechanism for our effect is the reduction in emotional

resonance that is associated with using a foreign language. Emotions and affect play an important role in decision making and in considerations of risk (e.g., Loewenstein, Weber, Hsee, & Welch, 2001; Naqvi, Shiv, & Bechara, 2006; Quartz, 2009; Slovic, Finucane, Peters, & MacGregor, 2002). An emotional reaction sometimes induces a less systematic decision. Making a decision in a foreign language could reduce the emotional reaction, thereby reducing bias. There is evidence that the framing effect is associated with increased activation of the amygdala (De Martino, Kumaran, Seymour, & Dolan, 2006), which suggests that it results from a strong emotional attraction to sure gains and a strong aversion to sure losses (Kahneman & Frederick, 2006). Using a foreign language might weaken these emotional reactions, making choices more comparable across gains and losses. Similarly, in Experiments 2 and 3, participants using a foreign tongue might not have felt the typical strong aversion to prospective losses, which in turn might have allowed them to accept more gambles. In general, then, decision biases that are rooted in an emotional reaction should be less manifest with a foreign language than with a native language.

Implications

One might not expect that people's solution of a problem that they understand would vary depending on whether they used their native tongue or a foreign language. But the nature of the language does have a systematic effect. This finding has direct implications for Internet-based research, which is becoming popular (e.g., Paolacci, Chandler, & Ipeirotis, 2010). It would be important to know when participants used a foreign language in order to interpret results accurately.

More generally, given that more and more people use a foreign language on a daily basis, our discovery could have far-reaching implications for individuals and for society. For instance, people who routinely make decisions in a foreign language rather than their native tongue might be less biased in their savings, investment, and retirement decisions, as a result of reduced myopic loss aversion. Over a long time horizon, this might very well be beneficial.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Notes

1. We excluded participants with insufficient foreign-language proficiency (n = 8 in Experiment 1a; n = 4 in Experiment 1b; n = 2 in Experiment 1c). In Experiment 1c, we also excluded participants who reported growing up speaking French (n = 2).
2. Two participants who were excluded from Experiment 1b because they did not adequately translate experimental items were included in Experiment 2 because they provided adequate translations.

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