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Risk Perception as a Function of the Language Structure of Numbers

By

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Abstract

Magnitude perception is the intuitive response to numerical stimuli, influencing an individual's risk perception when decisions rely on numerical data. This study investigates the potential impact of language on this process, focusing on structural differences in German and English number words and the native versus foreign language effect.

Different languages that use the same number systems may have different structures for their verbal notation of numbers. For instance, German uses inverted verbal notation ("one and twenty") compared to English ("twenty-one"). It is uncertain whether numerical inversion affects individuals' perception of a number's magnitude. This study examines if there is a linguistic difference in the perception of numerical magnitude and risk perception among German-English bilinguals. Part 1 of the study investigates the influence of inverted verbal notation using numbers with larger tens digits and smaller ones digits, hypothesizing three potential effects of inversion: primacy, recency, or summation. Part 2 explores the foreign versus native language effect by examining the numbers 89 and 91, focusing on how the transition between tens digits may amplify linguistic effects.

The findings have implications for industries such as healthcare, finance, and marketing, where professionals present statistics to individuals making critical decisions. These individuals include patients evaluating medical risks, investors assessing financial opportunities, and consumers considering marketing information. Understanding how numerical data is perceived across languages is crucial for ensuring that decisions are as informed as possible.

Risk Perception as a Function of the Language Structure of Numbers

Magnitude perception is the direct response to a numerical stimulus in which the individual intuitively decides how large or significant the stimulus is. This perceived magnitude directly impacts an individual's risk perception when decision making is relying primarily on numerical stimuli. The use of numerical stimuli to convey risk is often seen in industries including but not limited to healthcare, finance, weather, etc. These are scenarios that while common, can have significant impact on the individual faced with accepting or rejecting a decision based on this number. This being said, an individual's magnitude perception of number plays a pivotal role in their everyday life. This magnitude perception, however, may not be the same across languages. Different languages that use the same number systems may have different structures for their verbal notation of a number, meaning the actual words used to represent a numerical value. Whether this structural difference in a persons' native language influences their perception of the magnitude of a number is unknown.

An example of languages with different structures for the verbal notation of number is German and English. In English, the verbal notation follows the same format as the numerical notation. The tens digit is stated first followed by the ones digit. Like much of the English language, there is an exception. The teen numbers do not follow this structure and are inverted. It is the ones digit stated first followed by "teen," representing the tens digit. This means we say "fourteen" rather than "ten and four". This can be called an inverted number structure. An inverted number structure is what is used for the verbal notation of all numbers in the German language. All numbers in the German language are said with the ones digit first and the tens digit second. An example is the word "dreiundachtzig" which translates directly to "three and eighty" as opposed to "eighty-three" seen in the non-inverted English language.

This has been shown to affect performance on number processing tasks depending on the language that one speaks (Miller & Stigler, 1987). The verbal depiction of the Arabic number system can lead one to complete a number processing task quicker if it does not have any inverted numerical structure (Miller & Stigler, 1987). Chinese specifically is one of those languages without any numerical inversion (e.g., 12 = “ten two”). Taiwanese (Chinese-speaking) children have outperformed English-speaking children in number processing tasks at an increased level where English has that inverted verbal notation in the teen numbers (Miller, Stigler 1987). This shows that there is an effect of numerical inversion that influences the number processing of individuals who are native to this sort of structuring.

This effect of numerical inversion on number processing can be generalized to other languages than just Chinese and English based on the work done in other similar studies. Helmreich et al. (2011) investigated the effect of inverted verbal notation in native Italian (no inversion) and German (inversion) speakers. This study focused on the development of a mental number line in first graders that spoke either Italian or German. It was previously assumed that this task was language independent, but this has since been challenged by the presence or lack of numerical inversion in the verbal notation of numbers. This study confirmed that mastery of the base-10 concept is language-independent and not affected by numerical inversion. However, it found that numerical inversion does affect performance on a number line estimation task. They found the Italian children to be more accurate at the number line estimation task than the Austrian children, particularly when the inversion could lead to larger estimation errors (Helmreich et al. 2011). A similar result was found in French (no inversion) and Dutch (inversion) children as well (Brysbaert et al. 1998).

There are some inconsistencies, however, over whether this effect can be observed in numerical notation that is both presented orally as well as written. The languages discussed all share the same Arabic number system, so for example, both the English “twenty-four” and German “vierundzwanzig” or “four and twenty” are numerically represented “24”. It is the linguistic representation that differs. In an addition task, Brysbaert et al. (1998) found the expected differences between French and Dutch speakers only when the participants were asked to give their answers orally rather than written. The difference disappears when participants simply wrote their answers, suggesting that the observed differences were due to input or output processes (Brysbaert et al. 1998). This would suggest that the effect of inverted numbers is more likely to present itself orally and less likely to emerge when written. However, this does not entirely negate the effect of inverted numbers in the written modality. Nurek et al. (2005) finds that there is an observed inversion effect in Arabic representations of number in German and English speakers tasked with magnitude comparison. The stimulus of this task was two written numbers in their numerical form and the participant output was judging which number had a greater magnitude. This task did not require an oral output, providing evidence against the claim that the effect may only be observed in the oral modality. These findings highlight the uncertainty over which conditions an inversion effect takes place due to it being observed in a non-verbal format.

The literature discussed so far has focused on the participants’ output for a given task and has not focused on participants’ perceptions and attitudes. The tasks described all have objectively correct outcomes, but it is not clear if language may have an effect on tasks that do not have a correct answer and are rather reliant on the individual’s subjective opinions. These scenarios that rely on subjective opinion are the sort being investigated in this study. This

includes a weather forecast that will guide your decision to go for a hike, a success rate for a fitness program that would persuade you to recommend it to others, and more. There are hard statistics given to the individual, but the decision to move forth with the scenario ultimately relies on the attitude of the individual as a result of their perception of the statistic.

Most of the studies in the literature investigate younger children as well. A focus on the individual's attitudes towards the number size as opposed to their ability to complete a task in a timely and accurate manner would show their perception of the magnitude of a number. While we do not know if language can affect magnitude perception, we do know it can affect other attitudes that have been investigated in previous literature.

One attitude that is affected by one's language is a person's perceptions of gender as well as product pricing. Beginning with perception of gender, Sera et al. (1994) show that languages with gendered nouns like Spanish influence the speakers' perceptions of the nouns themselves. Spanish speakers were shown to classify objects according to their grammatical gender despite objects lacking natural gender (Sera et al. 1994). This study by Sera et al. (1994) conducts a second experiment in order to drive the Spanish-speaking participants away from thinking explicitly of the grammatical gender of a noun by removing the words feminine and masculine from the instructions and prompting participants to decide if the inanimate object should be voiced by a man or a woman in a theoretical movie. This is done to promote the claim of a universal gender concept in which natural objects are more often thought of as feminine while artificial objects are more often thought of as masculine (Mullen, 1990; Ortner, 1972). While the results of this experiment do tend in this direction for both languages, the Spanish participants continue to categorize based off of grammatical gender more frequently. This solidifies the effect of language on arbitrary categorical perceptions.

Moving on to language effects on product pricing perception, the position and order of numbers have been observed to influence magnitude perception. Bagchi & Davis (2012) demonstrate how the evaluation of a package of product's price can be affected by the order of presentation of price and package size. This is mediated by both package size and the difficulty in determining the price per item. While this does not investigate a cross-linguistic difference, it demonstrates that the ordering of numbers can affect consumer attitudes. In addition, under specific conditions a price ending in 99 may be perceived as smaller than if it were one cent larger and therefore the next dollar amount (Thomas & Morwitz, 2005). We know that independently of one another number inversion, language, and numerical positioning have all been shown to impact an individual's perception and attitude. We do not know, however, what interaction there is between the risk perception of a statistic and its invertedness or non-invertedness.

Current Study

It is not clear if numerical inversion may influence individuals to perceive the magnitude of a number as larger or smaller. It is also possible that we will observe an effect of foreign versus native language. This could have implications for industries presenting statistics to individuals with a desired outcome in mind. Could the percentage presented to two different populations be perceived as larger or smaller in one population than the other due to this inversion effect? Will individuals be more perceptive to smaller differences between numbers in their native language compared to their foreign language? We break this down into two parts within our experiment to test these questions.

Part 1 examines numbers with larger tens digits and smaller ones digits. It hypothesizes three potential effects of inversion on individuals: primacy, recency, or summation. The primacy

effect suggests German speakers focus on the first chunk of numerical information received (e.g., 82% German: two and eighty > English: eighty-two). The recency effect posits that they focus on the last unit presented (e.g., German: two and eighty < English: eighty-two). The summation hypothesis proposes that native German speakers sum the two numbers due to the "and" linking the digits (German: two and eighty > English: eighty-two). Data from Part 1 will test these hypotheses. If German items with a smaller ones digit are rated higher than English items, it supports the primacy effect, indicating participants focus on the larger ones digit. Conversely, if German items are rated lower, it supports the recency effect, suggesting focus on the tens digit. The summation hypothesis is supported if all German items are rated higher, indicating participants add the two digits, disproving the primacy and recency hypotheses.

Part 2 examines an edge case scenario involving the numbers 89 and 91. Here, "edge case" refers to how these numbers lie on either side of 90, transitioning from one tens digit to the next, rather than indicating rarity. These numbers exhibit a small difference, but 89 has a higher tens digit (8) than ones digit (9), while 91 has a lower tens digit (9) than ones digit (1). I hypothesize that in German, these two items will have significantly different ratings whereas in English, the ratings will be more similar between the two items. The reasoning behind this hypothesis is because of numerical inversion in German presenting the ones digit first. Since there is a larger contrast between these numbers than in Part 1, I think it will lead the numbers to be perceived as significantly more different in German than in English. Another explanation for this hypothesis does not have to do with the inversion effect, but simply with the fact that the German condition utilizes the participant’s native language, thus leading them to be potentially more attentive to numerical differences compared to English, their foreign language.

By linking the insights from Part 1 to the unique scenario explored in Part 2, we aim to deepen our understanding of how numerical inversion affects perception. While Part 1 establishes the foundational effects of inversion on numerical perception through three distinct hypotheses, Part 2 extends this investigation to a critical threshold where the transition between tens digits may amplify these effects. This exploration not only tests the robustness of the inversion impact but also considers the potential influence of language familiarity on numerical interpretation, offering a comprehensive analysis of how inversion and language interplay in shaping numerical perception.

This study utilized a population of bilingual adults proficient in both German and English to emphasize the effect of language on risk perception. Using a monolingual population would make it difficult to isolate language as a variable due to variations between separate populations of English and German speakers. By using bilingual participants, we can control for participant variables, keeping them constant except for the language, which alternates between English and German.

Methods

Participants

Participants were 220 bilingual adults (104 female, 109 male, 6 non-binary, 1 unidentified, M_{Age} = 33 years, age range: 19 to 73) whose native language is German and foreign language is English. Fourteen participants were excluded in total. Eight were due to failing the attention check and six did not meet the language requirements, leaving 206 participants for analysis. Demographic information such as gender, age, education, and employment were collected, although they were not expected to influence the effect. Both recruitment and data collection were conducted online. The online experiment was developed on Qualtrics and

distributed on Prolific (www.prolific.com). The study being conducted via Prolific allowed for a larger international population of German-English bilinguals than possible with in-person recruitment as well as simpler, more accurate data management.

Procedure

Participants were presented with different risk scenarios depending on the experiment and the condition. Each risk scenario contained a percentage chance that the participant used to evaluate their likelihood to go through with the risk scenario. A 6-point Likert scale was used for participants to select their inclination to go forward with the scenario presented to them (1 = *Very low* to 6 = *Very high*). The percentages themselves were selected intentionally so that any difference between English and German responses will be made evident. This study did not utilize any percentages from 1-20 as these are either single digit (no inversion possible), unique in English (e.g., “eleven”), or inverted in English as well (e.g., “fourteen” rather than “ten and four”). Examples of stimuli given in both parts of the experiment are provided below in Table 1 and the full set of experiment items are provided in the appendix.

Methods Part 1

Participants were presented with several scenarios in both their native (German) and foreign (English) language in which they were told there is a certain percentage chance of something happening/being effective/etc. They were then prompted to answer the question of how likely they are to go forward with the scenario (e.g., likelihood to invest, confidence in the weather, likelihood to undergo a medical procedure, etc.). Control conditions had been implemented as well. The controls asked the same questions as the test items but use percentages with a zero in the ones digit to negate any German inversion (e.g., 70, 80, 90). One example of

an experimental sentence is seen below in Table 1. The selected percentages for Part 1 include 61-64%, 71-74%, and 81-84%. These numbers have a larger tens digit and smaller ones digit, which isolates the possibility to observe an inversion effect. The full set of experiment items is included in the appendix.

Table 1

Part 1 Example Item

83%	You are preparing for a hiking trip to a remote mountain range. As you prepare for the journey, you come across a weather forecast indicating that there is an **eighty-three** percent [German: three and eighty percent] chance of clear and sunny weather during your hike. Sie bereiten sich auf einen Wanderausflug in ein abgelegenes Gebirge vor. Während Sie sich auf den Ausflug vorbereiten, stoßen Sie auf eine Wettervorhersage, die eine **dreiundachtzig** prozentige Chance auf klares und sonniges Wetter während Ihrer Wanderung angibt.
	Considering this forecast, how confident are you about the favorable weather conditions and the enjoyable experience of your hiking trip? In Anbetracht dieser Vorhersage, wie zuversichtlich sind Sie, dass die Wetterbedingungen günstig sind und Sie eine schöne Wanderung erleben? 1 = Very low/Sehr gering; 6 = Very high/Sehr hoch

Methods Part 2

The second part in this experiment is an extension of Part 1, the only difference being that it uses different percentages. This part utilizes the same participants and was conducted in conjunction with part one. This part is being examined separately in order to highlight how the

selection of experimental items shifts the hypotheses. Part 2 seeks to look at edge cases in which two numbers that are very close together have largely different one's digits, and a minorly different tens digit. This is 89% and 91% in this part. This part of the experiment uses a between-subjects design, as participants are randomly assigned to one edge case item among four different conditions (89 or 91, German or English). A within-subject design would not be possible to test this idea as all four conditions utilize the same prompt and thus participants could not reliably answer the same question multiple times. The stimulus for this part with different condition combinations is included in the appendix.

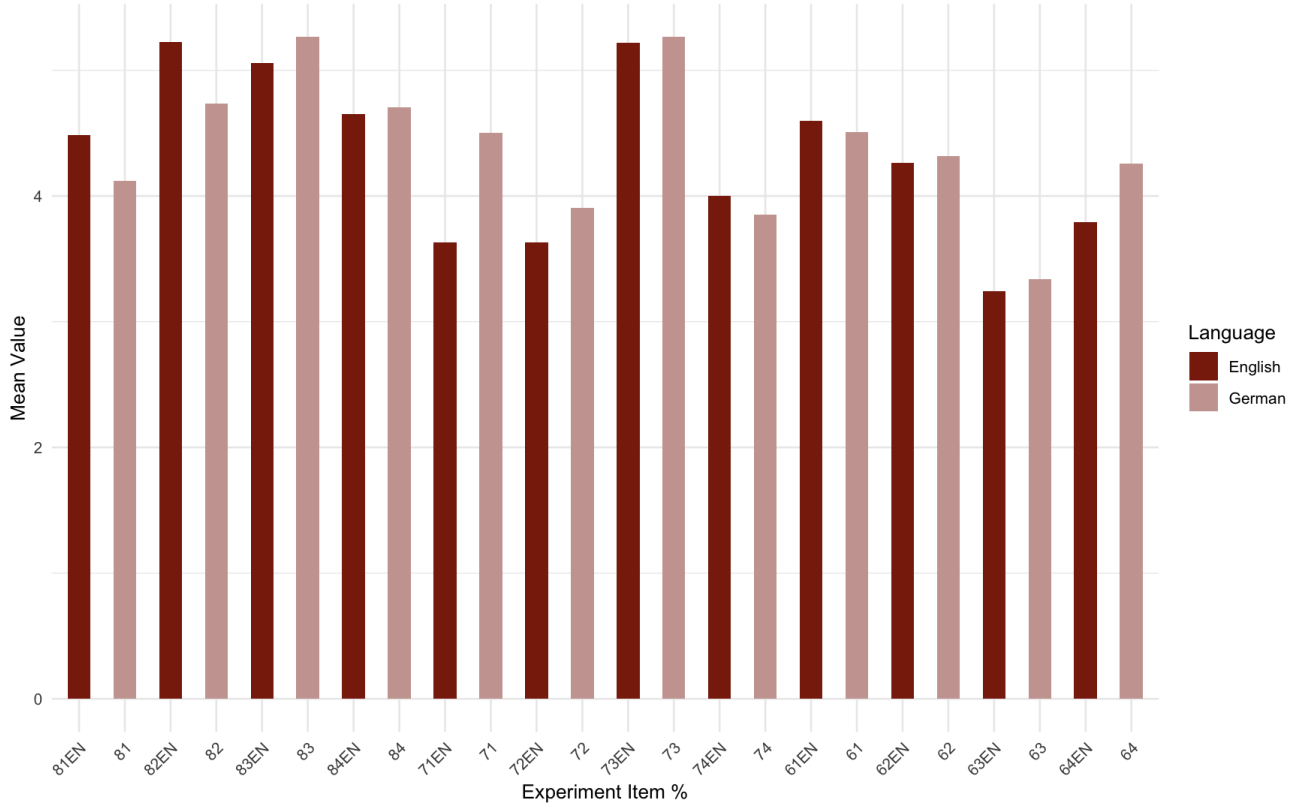
Results

Results Part 1

A repeated measures analysis of variance (ANOVA) was conducted to examine the difference in risk perception between English and German conditions. The analysis revealed that there was no significant effect of language on participants' risk perception (F [1, 1436] = 1.017, p = .313), with a partial eta squared (ηp^2) of .0007, indicating a very small effect size. A plot including the mean value for each experiment item in both English and German can be seen below in Figure 1. This plot is included to highlight the lack of any directional trends when it comes to a difference in ratings across the two languages.

Figure 1

Mean ratings of Part 1 items in English and German.



Results Part 2

The results of Part 2 revealed that participants rate the two edge case risk items similarly in English. Specifically, the 91% condition had a mean score of *M* = 5.03, 95% CI [4.81, 5.24], and the 89% condition had a mean score of *M* = 4.66, 95% CI [4.41, 4.92]. There is not a significant difference between those assigned the English 91% condition and the English 89% condition.

In contrast, participants rated these items differently in German. The German 91% condition received a significantly higher rating (M = 5.25, 95% CI [4.96, 5.53]) compared to the German 89% condition (M = 4.46, 95% CI [4.06, 4.86]). This difference is visually represented

in Figure 2 below. The ANOVA confirmed a significant interaction between language and risk type ($F [1, 202] = 6.411$, $p = .012$, $\eta p^2 = .031$), indicating that the effect of language is not consistent across the two risk types. Specifically, the difference in ratings between the 91% and 89% conditions was much larger when participants used their native German compared to their foreign English, where the difference was effectively negligible.

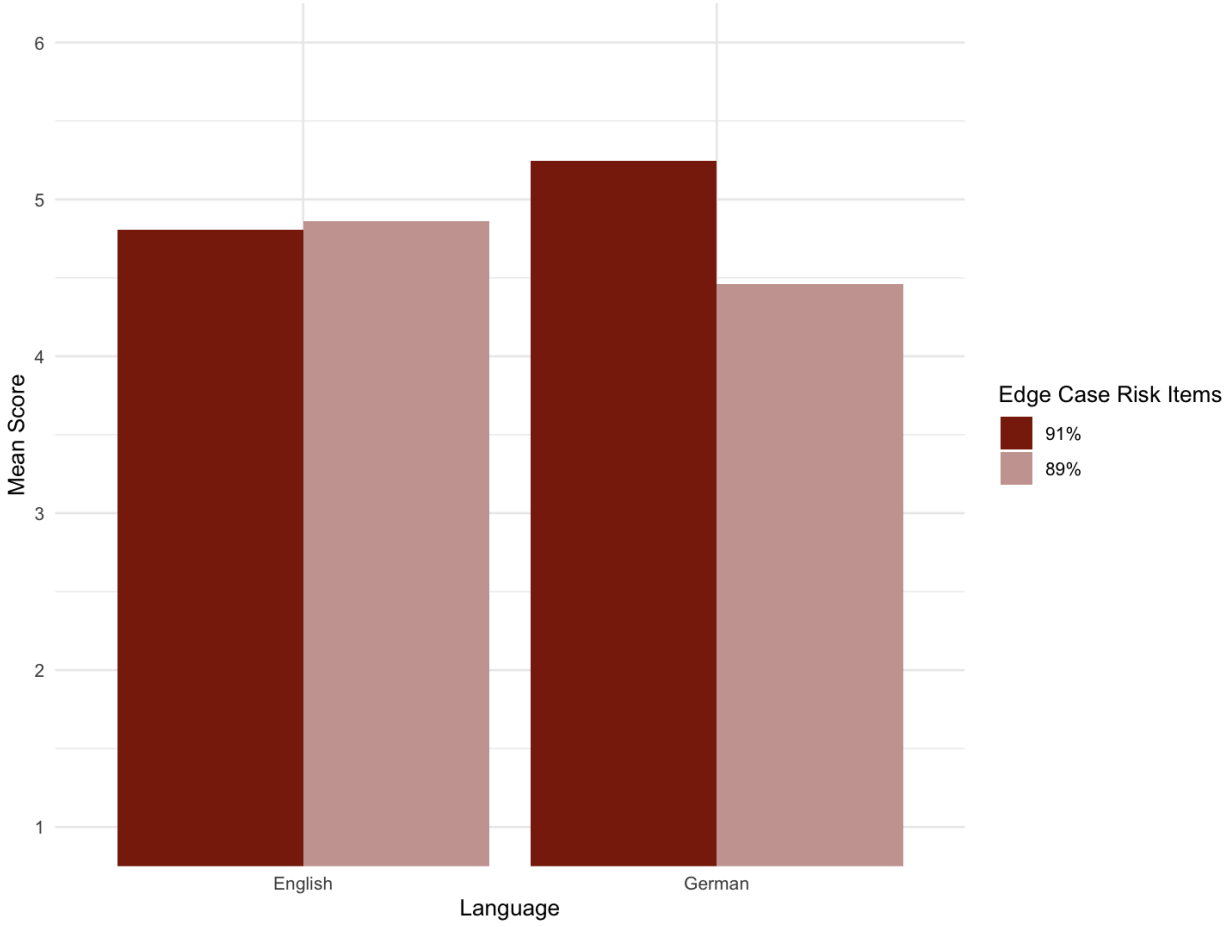
Although there was no significant main effect of language ($F [1, 202] = .031$, $p = .861$, $\eta p^2 = .0001$), with similar average risk judgments in German ($M = 4.86$, 95% CI [4.61, 5.12]) and English ($M = 4.83$, 95% CI [4.61, 5.06]), the significant interaction effect highlights how language influences risk perception differently depending on the specific risk type.

Furthermore, there was a significant main effect of risk type, with higher risk ratings given to the 91% condition compared to the 89% condition overall ($F [1, 202] = 4.84$, $p = .029$, $\eta p^2 = .023$). This suggests that participants are sensitive to small percentage differences, though this sensitivity is more pronounced in German due to the differences in ratings between conditions in the native language.

Overall, while Part 1 showed no significant overall effect of language on risk perception, Part 2 demonstrated that language can influence how nuanced numerical differences are perceived, especially in edge case scenarios. This highlights the importance of considering linguistic factors when interpreting numerical data.

Figure 2

Mean ratings of Part 2 items in English and German.



Discussion

The results of Part 1 lead me to reject all three hypotheses. The effect of language does not reveal an inversion effect that leads to a primacy, recency, or summation effect. Native speakers of German judged the risks of a wide range of events similarly independent of whether they read the reference likelihood in their native German or English. A limitation of this study, that may have led to a null finding, is the demographic of participants utilized. While a bilingual sample was selected intentionally in order to isolate an effect of language, it may be possible that

the participants' proficiency in both languages led to null findings. It is unclear whether the results would be the same with a participant group of monolinguals. Future research may attempt to broaden the scope of this study by increasing the language demographics to include participants that are native speakers of English and foreign German bilinguals as well as test monolinguals of both languages. This could provide a more comprehensive picture of those that use German and English to make judgements of risk scenarios with a numerical percentage based on the outcome supporting or disproving these findings.

The results of Part 2 allow us to accept that German-English bilinguals judge the edge case risk items differently depending on the language that the scenario presented to them is in. The most likely explanation for the results of Part 2 is that we are observing a foreign language effect: when using a native German, participants seem more sensitive to small differences in percentages than when using a foreign English. The similar ratings across conditions in English suggest that participants may not be as attuned to small differences in numbers in their foreign language. Further research testing a group of participants that have English as their native language and German as their foreign language could confirm that this explanation is generalizable to the inverse demographic. This information would provide insight as to how two individuals that utilize the same number systems but speak different languages may be perceiving the same percentages in different ways.

The findings of this experiment have both theoretical and practical implications. The theoretical consequence is that any linguistic influence on an individual's processing is supportive of the Sapir-Whorf hypothesis that the language one uses impacts the way they perceive reality in a major observable way (Sapir, 1949; Whorf, 1956). This is a mixed implication as there was no observable linguistic influence in Part 1 while there was in Part 2.

This highlights how the effects of language on perception are nuanced and do not operate the same across all scenarios. As far as practical consequences, the linguistic effect observed in Part 2's edge case risk scenarios may impact people faced with a tough decision to make in terms of healthcare, investments, etc. Given this is most people at some point or another, this is important to consider. Statistics are often presented to us as an informative mechanism that can make tough decisions easier. These statistics allow us to perceive the risk of a situation and evaluate if the benefits outweigh the risks. Understanding how these statistics of risk are perceived across languages is important to ensure that the decisions made are as informed as possible. The industries presenting these statistics may wish to integrate these findings as well. For instance, healthcare providers, financial advisors, and policymakers must be aware of these nuances when presenting statistical information to ensure that it is interpreted consistently across different language speakers. This awareness can help mitigate misunderstandings and improve decision-making processes. International companies and organizations should consider customizing their communication strategies to account for these linguistic differences. By doing so, they can enhance the clarity and effectiveness of their messaging, thereby better supporting individuals in making informed decisions based on accurate risk perceptions. This approach not only fosters better outcomes for individuals but also builds trust and reliability in the information provided by these organizations.

Conclusion

This experiment highlights how the effect of language on bilingual individuals' risk perception is nuanced. There is no linguistic difference observed in Part 1 which focused on risk scenarios with the numbers 61-64, 71-74, and 81-84 which were selected for their larger tens digit and smaller ones digit. This goes against the theory of an inversion effect in German-

English bilinguals. Part 2, however, does suggest a linguistic difference in the risk perception of a scenario containing either 89 or 91. These two numbers are judged more similarly in the participants' foreign language (English) than in their native language (German). This points to a language effect that is a matter of native versus foreign language. In the participants' native language, they are more perceptive to the small difference of two percentage points and rate their likelihood to move forward with the scenario as significantly higher when there is a 91% success rate compared to an 89% success rate. In the English foreign language condition, the two percentage points made no difference to the participants. Future research should attempt to uncover if this is limited to the sort of bilinguals included in this study (German native, English foreign) or if it is generalizable to other demographic groups. The two parts of this experiment together emphasize how complex the effects of language on perception can be. These effects, while nuanced, are important to understand for the sake of individuals making important decisions that are guided by statistical chances. This research expands our understanding of bilingual risk perception and decision making, which is an increasingly important area of study considering the increasingly bilingual nature of the world.

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Appendix

Complete Collection of Experiment Items Used

Part 1 Stimuli

81% A new financial investment opportunity has emerged in the market. This investment has an eighty-one percent chance of yielding high returns, and it is available through a reputable investment firm.

Auf dem Finanzmarkt ist eine neue Geldanlagemöglichkeit erschienen. Diese Anlage hat eine einundachtzig prozentige Chance, hohe Renditen zu erzielen, und wird von einer angesehenen Investmentfirma angeboten.

How likely are you to proceed with investing your savings in this new financial venture?

Wie wahrscheinlich ist es, dass Sie Ihre Ersparnisse in dieses neue Finanzprojekt investieren?

82% In a recent confidential survey completed by graduating seniors, eighty-two percent of those completing the survey stated that they had cheated during their college career.

In einer kürzlich durchgeführten vertraulichen Umfrage unter Universitätsabsolventen gaben zweiundachtzig Prozent der Befragten an, während ihrer Universitätszeit in Klausuren betrogen zu haben.

Considering the results of the survey, how would you rate the incidence of cheating at your university?

Wie würden Sie angesichts der Ergebnisse dieser Umfrage, die Häufigkeit von Betrug an Ihrer Universität einschätzen?

83%	You are preparing for a hiking trip to a remote mountain range. As you prepare for the journey, you come across a weather forecast indicating that there is an eighty-three percent [German: three and eighty percent] chance of clear and sunny weather during your hike. Sie bereiten sich auf einen Wanderausflug in ein abgelegenes Gebirge vor. Während Sie sich auf den Ausflug vorbereiten, stoßen Sie auf eine Wettervorhersage, die eine dreiundachtzig prozentige Chance auf klares und sonniges Wetter während Ihrer Wanderung angibt.
	Considering this forecast, how confident are you about the favorable weather conditions and the enjoyable experience of your hiking trip? In Anbetracht dieser Vorhersage, wie zuversichtlich sind Sie, dass die Wetterbedingungen günstig sind und Sie eine schöne Wanderung erleben?
84%	You are attending a job fair to explore potential career opportunities. As you interact with different companies, you come across a booth of a company that has a retention rate of eighty-four percent for their employees. Sie besuchen eine Jobmesse, um sich über mögliche Karrierechancen zu informieren. Während Sie sich mit verschiedenen Unternehmen unterhalten, stoßen Sie auf den Stand eines Unternehmens, das eine Weitere Beschäftigungsquote von vierundachtzig Prozent bei seinen Mitarbeitern hat.
	Considering this statistic, how would you assess the company's reputation as an attractive and supportive employer for prospective employees like yourself? Wie würden Sie angesichts dieser Statistik den Ruf des Unternehmens als attraktiver und unterstützender Arbeitgeber für potenzielle Mitarbeiter wie Sie selbst bewerten?

71%	There is a complex surgical procedure available for people who have been diagnosed with a rare and life-threatening medical condition. The surgical procedure provides a seventy-one percent chance of successfully treating the condition. However, the procedure is known to carry potentially severe side effects, including temporary paralysis and memory loss. Es gibt ein komplexes chirurgisches Verfahren für Menschen, bei denen eine seltene und lebensbedrohliche Krankheit diagnostiziert wird. Der chirurgische Eingriff bietet eine einundsiebzig prozentige Chance, die Krankheit erfolgreich zu behandeln. Es ist jedoch bekannt, dass das Verfahren potenziell schwerwiegende Nebenwirkungen hat, darunter vorübergehende Lähmungen und Gedächtnisverlust.
	How likely would you be to undergo this surgical procedure to treat your condition? Wie wahrscheinlich wäre es, dass Sie sich diesem chirurgischen Eingriff unterziehen würden, um die Krankheit zu behandeln?
72%	You are planning a vacation and considering booking a hotel for your stay. While researching hotels, you come across a review that mentions the hotel has a customer satisfaction rate of seventy-two percent. Sie planen einen Urlaub und überlegen ein Hotel für Ihren Aufenthalt zu buchen. Bei der Suche nach Hotels stoßen Sie auf eine Bewertung, in der erwähnt wird, dass das Hotel eine Kundenzufriedenheitsrate von zweiundsiebzig Prozent hat.
	Considering this statistic, how would you evaluate the likelihood of having a satisfactory experience if you choose to stay at this hotel? Wie hoch schätzen Sie angesichts dieser Statistik die Wahrscheinlichkeit ein, dass Sie in diesem Hotel einen zufriedenstellenden Aufenthalt haben?

73%

A new smartphone model has been recently released. A review is stating that the battery life of this smartphone lasts for seventy-three percent longer compared to its predecessor.

Vor kurzem ist ein neues Smartphone-Modell auf den Markt gekommen. In einem Testbericht heißt es, dass die Akkulaufzeit dieses Smartphones im Vergleich zum Vorgängermodell um dreiundsiebzig Prozent länger ist.

Considering this information, how would you evaluate the improvement in battery performance of this new smartphone model?

Wie beurteilen Sie angesichts dieser Informationen die Verbesserung der Akkuleistung dieses neuen Smartphone-Modells?

74%

A new cooking class has been introduced to enhance culinary skills and healthy eating habits. This class has received excellent feedback, with seventy-four percent of participants rating it positively. The class is now available at a local community center.

Es wurde ein neuer Kochkurs eingeführt, um die kulinarischen Fähigkeiten und die gesunden Ernährungsgewohnheiten zu verbessern. Dieser Kurs hat ein ausgezeichnetes Feedback erhalten: Vierundsiebzig Prozent der Teilnehmer haben ihn positiv bewertet. Der Kurs wird nun in einem örtlichen Gemeindezentrum angeboten.

How likely are you to recommend this cooking class to your friends or family members?

Wie wahrscheinlich ist es, dass Sie diesen Kochkurs Ihren Freunden oder Familienmitgliedern empfehlen?

61%

A new technique has been developed to treat a particular kind of cancer. This technique has a sixty-one percent chance of success and is available at the local hospital. A member of your immediate family is a patient at the local hospital with this kind of cancer.

Es wurde eine neue medizinische Technik zur Behandlung einer bestimmten Krebsart entwickelt. Diese Technik hat eine einundsechzig prozentige Erfolgschance und ist im örtlichen Krankenhaus verfügbar. Ein Mitglied Ihrer unmittelbaren Familie ist ein Patient des örtlichen Krankenhauses mit dieser Art von Krebs.

How likely are you to encourage him or her to undergo treatment using this technique?

Wie wahrscheinlich ist es, dass Sie dem Mitglied ihrer Familie zu einer Behandlung mit dieser Technik raten?

62%

A state-of-the-art environmental initiative has been launched in your community to reduce carbon emissions significantly. This initiative has a success rate of sixty-two percent in decreasing greenhouse gas emissions.

In Ihrer Gemeinde wurde eine hochmoderne Umweltinitiative ins Leben gerufen, um die Kohlenstoffemissionen erheblich zu verringern. Diese Initiative hat eine Erfolgsquote von zweiundsechzig Prozent bei der Verringerung der Treibhausgasemissionen.

How likely are you to actively participate in this initiative and reduce your own carbon footprint?

Wie wahrscheinlich ist es, dass Sie sich aktiv an dieser Initiative beteiligen und Ihren eigenen CO2-Fußabdruck verringern?

63%	A new fitness program has been developed to improve physical health and well-being. This program has a success rate of sixty-three percent, and it is being offered at your local gym. Es wurde ein neues Fitnessprogramm entwickelt, um die körperliche Gesundheit und das Wohlbefinden zu verbessern. Dieses Programm hat eine Erfolgsquote von dreiundsechzig Prozent und wird in Ihrem örtlichen Fitnessstudio angeboten.
	How likely are you to encourage your family member to participate in this new fitness approach? Wie wahrscheinlich ist es, dass Sie ein Familienmitglied dazu ermutigen, an diesem neuen Fitnesskonzept teilzunehmen?
64%	A new educational method has been developed to enhance learning outcomes for students. This method has a sixty-four percent chance of success, and it is being implemented in some German schools. Es wurde eine neue pädagogische Methode entwickelt, um die Lernergebnisse von Schülern zu verbessern. Diese Methode hat eine Erfolgschance von vierundsechzig Prozent und wird schon in einigen Schulen in Deutschland angeboten.
	How likely are you to support the implementation of this new educational approach? Wie wahrscheinlich ist es, dass Sie die Einführung dieses neuen Bildungskonzept unterstützen?

Part 2 Stimuli

89% or 91%	A new fitness program has been developed to improve physical health and well-being. This program has a success rate of **eighty-nine/ninety-one** [German: nine and eighty/one and ninety] percent, and it is being offered at your local gym. Es wurde ein neues Fitnessprogramm entwickelt, um die körperliche Gesundheit und das Wohlbefinden zu verbessern. Dieses Programm hat eine Erfolgsquote von **neunundachtzig/einundneunzig** Prozent und wird in Ihrem örtlichen Fitnessstudio angeboten.
	How likely are you to encourage a family member to participate in this new fitness approach? Wie wahrscheinlich ist es, dass Sie ein Familienmitglied ermutigen würden, an diesem neuen Fitnesskonzept teilzunehmen? 1 = Very low/Sehr niedrig; 6 = Very high/Sehr hoch