

Applying Principles of Economic Psychology to Nuclear Decision-Making Processes

Abstract

The presence of nuclear arms is beginning to be felt worldwide again. It is extremely prevalent now more than ever to return to the exploration of nuclear weaponry and its implications. For decades, the subject has been explored through the lens of the physical realm. Questions of blast radius, environmental impact, game theory and more have dominated the discussion regarding these weapons of mass destruction. The behavioral component, however, has seen little research but may have a severe impact on nuclear decision-making. Currently, decision-making comes down to 9 individuals across the world. When considered this way regarding psychology, previous theories begin to lose weight. Thus, this paper begins work into how economic psychology may be a transferable field to the study of nuclear decision-making.

Methods

Three surveys were provided to subjects online through Qualtrics. All participants were American citizens, and were fairly compensated for their time. All conditions and tests were born from psychology behind marketing and economics to measure whether they affected this realm as well.

Study 1 was designed to measure effects of the decoy effect as seen in economic psychology on nuclear decision-making. The survey consisted of 1401 participants. 717 were male, 663 female, and 21 that preferred not to answer. All but 30 participants were at minimum

high school graduates, many of whom went on to complete at least some higher education. 74.8% of participants were Caucasian, 8.5% were Asian or Pacific Islanders, 6.5% were African American, 7.2% were Hispanic, and the remaining 2.8% of participants had different ethnic backgrounds. Participants were widely split between Democrat(48.9%) and Republican(29%) with 22.1% of participants either registering as Independent or other political affiliations.

Study 1 assigned each participant to one of 5 conditions. All conditions prefaced the survey with a short article about a potential military conflict with Iran. Between the conditions, one paragraph in the article was effected, that which informed how many civilian casualties there would be for the proposed nuclear strikes. All conditions provided participants with the option to continue the ground war as is the stated norm in the article, or choose from one to three nuclear strike actions with differing levels of civilian casualty count. The first two conditions served as control and provided one option for nuclear strike each. One had a civilian casualty count of 100 thousand, and the other had a civilian casualty count of 2 million. The third condition gave two options for nuclear strike—100 thousand and 2 million casualties respectively. The fourth and fifth conditions each provided three options for nuclear strike. The first with the respective severity of 50 thousand, 100 thousand, and 2 million civilian casualties as options, and the second with 100 thousand, 2 million, and 4 million civilian casualties as options.

Study 2 was designed to measure multiple things. First, whether priming and ordering of stories impacted decision-making. Second, whether a previous denial statement made by a nation would change responses to that nation. Third, whether participants would respond differently if they were asked to use the perspective of a citizen rather than a president making decisions. Study 2 was the smallest group with 788 participants and had a very similar breakdown to that of Study 1. 408 were male, 377 female, and 3 that preferred not to answer. All but 5 participants

were at minimum high school graduates, many of whom went on to complete at least some higher education. 66.6% of participants were Caucasian, 11.9% were Asian or Pacific Islanders, 12.3% were African American, 7.0% were Hispanic, and the remaining 2.2% of participants had different ethnic backgrounds. Participants were widely split between Democrat(49.9%) and Republican(42.6%) with 7.5% of participants either registering as Independent or other political affiliations.

This survey assigned each participant to one of four conditions. A fourth of the participants first read a scenario in which China provokes the United States to a war, and asks the participant what they would do as the President of the United States in regards to nuclear powers. As with all of these studies, this primarily focuses on whether they would engage in nuclear readiness and why or why not. After questions about this scenario, they received a similar scenario but instead one that replaces China with Russia as the opposing party. This includes a statement made by Russia in the past that they would never be the first to engage in nuclear conflict. Similar questions were asked about this scenario as the previous one. The next condition group received the same two scenarios, but in flipped order. Participants read the Russia scenario and answered questions on that first, and then the China scenario. The third condition group saw only the Russia scenario, but had the non-nuclear statement made by Russia omitted. Lastly, the fourth condition group once again saw only the Russia scenario(with the non-nuclear statement) in which the participants are no longer answering questions in place of the President of the United States, but instead as citizens.

Finally, the Study 3 consisted of 801 participants. The participants were split in half primarily by those male(50.1%) and female(48.8%). The remaining 1.1% of participants chose not to respond. The distribution of education received by each participant was near the same to

the previous two surveys. The breakdown of ethnic background remains similar. 69.8% of participants were Caucasian, 11.6% were Asian or Pacific Islander, 7.0% were African American, 8.6% were Hispanic, and the remaining 3.0% had different ethnic backgrounds. This was the only survey with a greater number of Republicans(46.8%) than Democrats(42.9%).

Each participant was assigned to one of four conditions. Each proposed a scenario in which there is a military conflict with Iran. These were split in groups of two. In the two control conditions was included a statement that Iran recently used a small tactical nuclear weapon that killed several thousand American troops. This was followed by another statement that it has been verified that Iran has no more nuclear weapons in their arsenal. The other two experimental conditions maintained the Iran scenario, but did not include those statements. Each of these two condition groups once again had a difference in severity in civilian casualty count from a proposed nuclear strike by the United States. In each group, one condition was listed with a casualty count of 100 thousand, and the other with a casualty count of 2 million.

Results

Study 1 questioned the relevance of the decoy effect on nuclear decisions. Two questions were in primary focus when considering the effects of conditions. The first of which marks the distribution of a 6 option ordinal scale indicating what participants prefer United States action to be in the case of the scenario given. The scale enables participants to choose anywhere from strongly preferring to continue a ground war to strongly preferring nuclear action be taken(Fig. 1). The second question tracks directly whether participants, acting as president, would choose to continue the ground war or take nuclear action in the form of any of the options provided to them(Fig. 2). Not all that said they preferred ground war chose to continue ground war in the

second question, and not all that preferred nuclear strike chose to take that action in the second question.

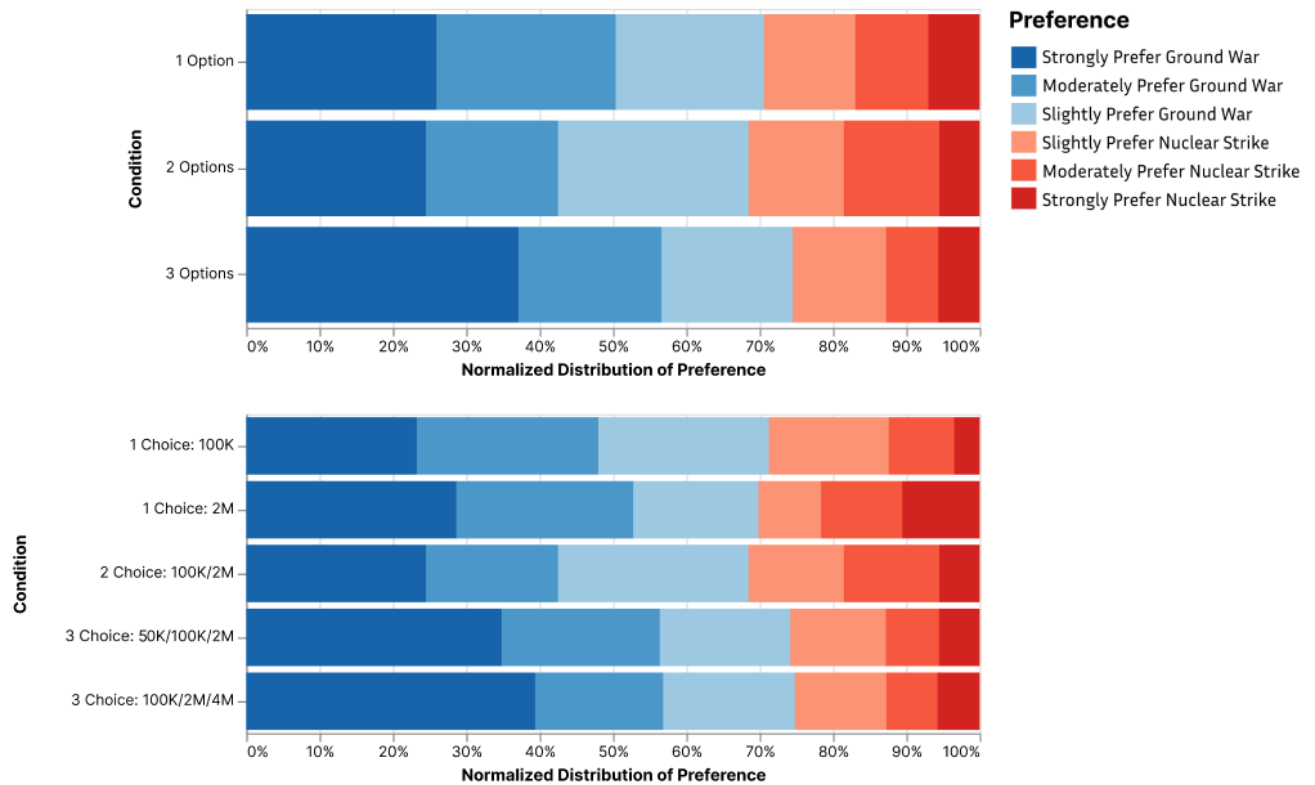


Figure 1

Conditions in Figure 1 are marked by how many nuclear choices the participants were provided as well as how many civilian casualties would be caused by each nuclear strike option. As amount of choices and potential casualties increased, the greater proportion of individuals strongly preferred to continue ground war rather than take nuclear action. 51% more of those in the conditions offering 3 nuclear choices strongly preferred to continue ground war over other groups.

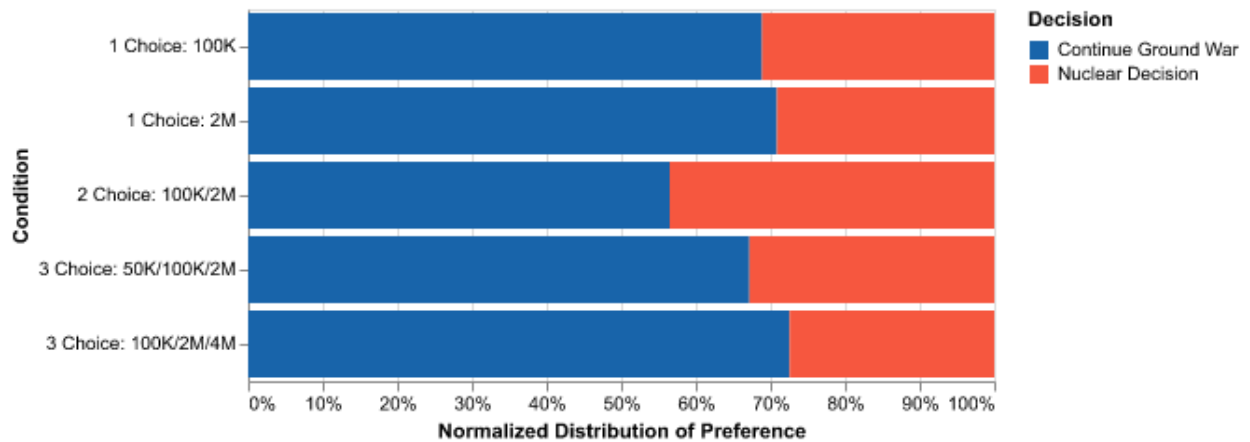


Figure 2

There was not, however, a significant impact on actual decision making caused by providing 3 nuclear options rather than 1 or 2 despite the observed reticence to participate in nuclear action. Participants given 2 nuclear options were 1.78 times more likely than those in other conditions to take a nuclear decision($p < .001$). Within the observed group, 19% less participants in proportion to their population were willing to choose to continue the ground war.

Ordering of stories and questions within Study 2 widely had no significant impact on participants' responses to the Russian story. Being given the Russian scenario and questions first did lead 22% more participants to expect Russia to follow their denial statement that was included($p = .023$)(Fig. 3). There was no measurable impact on participants' decision to take nuclear action on Russia nor on their self-reported difficulty making that decision.

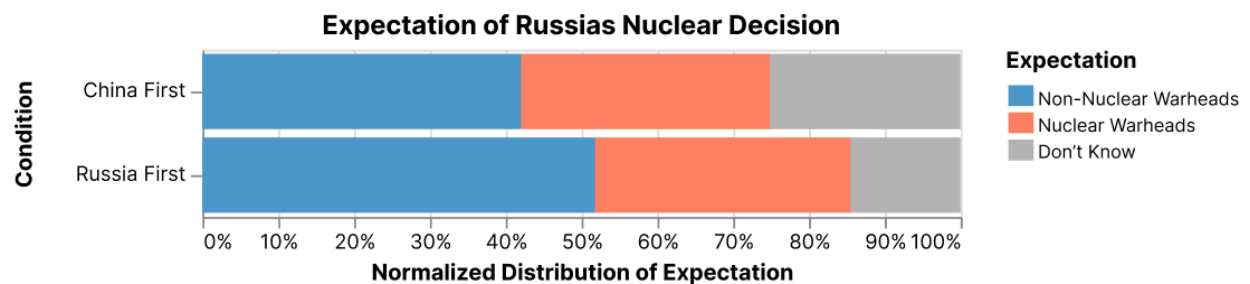


Figure 3

The second part of Study 2 focused on differences between the condition that received the Russia scenario first and the one that received Russia as well, but without their statement of denial. No significance was found between the presence of the statement on expectation of whether Russia was planning to initiate nuclear conflict. Alongside this, no significance was found on participants' chosen decision on the response of the United States to Russia. When placed in the position of answering questions from the perspective of a citizen in the United States rather than as president had a great impact on responses. Markedly less participants preferred to take nuclear action as citizens rather than president. Participants were asked whether they would load nuclear weaponry onto US aircraft to ask as a deterrence method against Russia. Those acting as president were 2.26 times more likely to order the US to load nuclear weapons than those acting as citizens($p < .001$).

Study 3 showed little to no effect between control and experimental groups(Fig. 4) in the same question focused on for Study 1. There was no effect measured between the two control groups despite the drastic difference in casualty count. While there was a 27.4% increase in number of participants who strongly preferred a ground war in the experimental group with larger civilian casualty count over the less severe experimental group, this appears to be due to statistical chance rather than any significance.

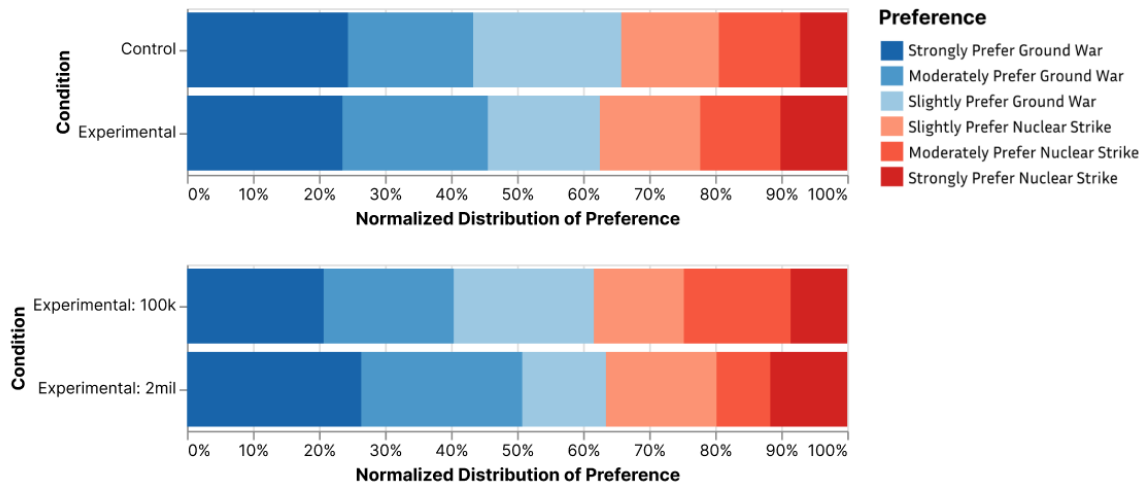


Figure 4

Discussion

Results of Study 1 indicate that the decoy effect has relevance on nuclear decision-making. How situations and options are framed to decision-makers is crucial in the chosen outcome. Providing more nuclear options strengthens convictions about avoiding a nuclear strike without necessarily changing the options chosen. Of course, this study relies on providing discrete options to the decision-maker. Only one option to continue the ground war rather than take nuclear action simplifies greatly what in reality would be a highly complex situation. Multiple options expanding on ground war may have similar effects, strengthening convictions in some direction.

Study 2 showed most importantly how much more willing people are to take nuclear action as president rather than as citizens. This could be due to any number of reasons and warrants further research. Perhaps there is a responsibility to take more drastic action when acting as president. Both Study 2 and 3 showed a lack of effect of other nation's statements or past actions on participant nuclear decisions. This has relevance not just in the domain of

decisions made by the President of the United States, but on public opinion of those decisions. If previous statements such as Russia's statement of no denial has little hold on the public, the lack of change in public perception due to this effect should be taken into account.

It should be noted that across the board were correlations along political lines with nuclear decisions. Those self-reporting as more conservative were often more willing to take nuclear action, with those reporting as more liberal were less so willing. Many other demographics were also reported by participants (ethnicity, gender, etc.) but had very little shown effect on these decisions.

Limitations

This study was unable to take into account the full difference between citizen and president and what responsibilities either party may feel when answering these questions. As all surveys were conducted digitally with situations based on short newspaper clippings, participants may have been more detached from the situation given as well as their own responses. Participants may have a different emotional response when asked to answer questions digitally on a survey. Individuals were expected to complete the study within a short timespan (10-15 minutes), which does not allow for the level of decision that may be allowed for in real-life scenarios. The individual surveys were only able to evaluate a small range of psychological effects that may be present.

Those in the sample are not entirely representative of those who are in office. All participants were American citizens, which only applies to the president of the United States and not all those who currently possess the power to take nuclear action. That position has historically been occupied by White Men, though much of the sample population was not a

member of that demographic. While important information to know, they may not have the same cultural influence on their responses to the questions. Sample size was varied among the groups and in the future can very easily be expanded to have more participants due to the digital nature of the surveys. Sample size in particular can be volatile when working with primarily chi-squared tests to understand a dataset widely built on categorical variables.

Future Work

In the future, others might use this psychological framework to examine nuclear decision-making further. This study only covered a small sample of a wide range of known psychological effects that have yet to be applied to this field. Others with psychology and business backgrounds should continue to cover the wealth of other biases that may or may not have an effect on these decisions that have such wide-ranging consequences. Future work should work to expand the range of who is surveyed and how many are surveyed to build a greater understanding of the effects of these psychological phenomena on a wider audience.

Conclusion

Studies done as part of this piece were varied in their results. Where it was clear that the decoy effect has some hold on nuclear decision-making, it is less clear whether statements made by opposing nations have any impact on participant decision. Study 2 indicated a strong correlation between acting as president and being more willing to take nuclear action than as a citizen. This in turn informs the other studies as well as provides information on how the psyche of a presidential figure may vary from that of a citizen in accordance with these large scale decisions. It is imperative that future work in this domain expands upon investigation into the

psychological impacts on such world-affecting decisions, and greater resources are allocated to those efforts.