

When Our Minds Go Nuclear: Rethinking Nuclear Strategy Through the Psychology of Risk and Decision-Making

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Cognitive biases can systematically distort judgments about the use of nuclear weapons, potentially undermining nuclear stability and increasing the risk of nuclear war. In survey experiments with nearly 3,000 US participants, we show how psychological mechanisms such as the affect heuristic, psychic numbing, and comparative evaluation effects increase support for nuclear strikes, particularly among individuals with strong punitive attitudes. Individuals opposed to nuclear weapons become more accepting of their use as projected US troop fatalities rise. Likewise, those appalled by the prospect of a nuclear strike causing thousands of civilian deaths may come to support it as a “lesser evil” when the alternative is an attack killing millions. These cognitive biases and comparative effects highlight the need for careful efforts to manage the decision-making procedures governing nuclear use. Nuclear-armed states should develop institutional safeguards, training programs, and decision-support systems that account for the limits of human cognition and reduce the dangers of deceptive comparisons.

Since the dawn of the nuclear age, military and political strategists have relied heavily on the assumption that rational actors, with clear information and stable preferences, will be dissuaded from launching a nuclear attack if they understand the costs to outweigh the benefits.¹ However, decades of psychological research on human judgment and decision-making, rooted in Herbert Simon’s theory of bounded rationality,² cast doubt on this assumption. Human decision-making is often driven not by logical deliberation, but by heuristics, biases, and emotional responses that can distort perceptions of risk and reward, even in matters as consequential as war.

Behavioral decision research, particularly in the fields of consumer psychology and cognitive psychology, has shown that subtle contextual cues and

deeply ingrained cognitive biases can lead individuals to make choices that deviate from purely rational expectations. These findings raise concerns that the same cognitive distortions influencing everyday decisions, such as selecting products in a supermarket, may also affect military and civilian leaders, as well as mass public opinion, on more profound decisions regarding high-stakes nuclear scenarios.

This article builds on this growing body of research by exploring the psychological mechanisms that may contribute to support for the use of nuclear weapons. We investigate how cognitive biases, such as the affect heuristic,³ psychic numbing,⁴ and comparative evaluation processes,⁵ can increase the likelihood that nuclear weapons will be used despite the catastrophic consequences involved. The affect heuristic describes

Supplemental material for this article may be found online at https://tnsr.org/wp-content/uploads/2026/06/WhenOurMindsGoNuclear-SupInfo_9.3.pdf.

- 1 Robert Jervis, “Deterrence Theory Revisited,” *World Politics* 31, no. 2 (1979): 289–324; Robert Jervis, “Rational Deterrence: Theory and Evidence,” *World Politics* 41, no. 2 (1989): 183–207; Thomas C. Schelling, *The Strategy of Conflict* (Harvard University Press, 1980).
- 2 Herbert A. Simon, “A Behavioral Model of Rational Choice,” *The Quarterly Journal of Economics* 69, no. 1 (1955): 99–118.
- 3 Melissa L. Finucane, Ali Alhakami, Paul Slovic, and Stephen M. Johnson, “The Affect Heuristic in Judgments of Risks and Benefits,” *Journal of Behavioral Decision Making* 13 (2000): 1–7; Paul Slovic, Melissa L. Finucane, Ellen Peters, and Donald G. MacGregor, “The Affect Heuristic,” *European Journal of Operational Research* 177, no. 3 (2007): 1333–52.
- 4 David Fetherstonhaugh, Paul Slovic, Stephen M. Johnson, and James Friedrich, “Insensitivity to the Value of Human Life: A Study of Psychophysical Numbing,” *Journal of Risk and Uncertainty* 14, no. 3 (1997): 283–300; Paul Slovic, “If I Look at the Mass I Will Never Act’: Psychic Numbing and Genocide,” *Judgment and Decision Making* 2 (2007): 79–95, <http://journal.sjdm.org/vol2.2.htm>; Paul Slovic and Herbert S. Lin, “The Caveman and the Bomb in the Digital Age,” in *Three Tweets to Midnight: Effects of the Global Information Ecosystem on the Risk of Nuclear Conflict*, ed. Harold A. Trinkunas, Herbert S. Lin, and Benjamin Loehrke (Hoover Institute Press, 2020), <https://bit.ly/3pX0hGR>.
- 5 Ian J. Bateman, Alistair Munro, and Gregory L. Poe, “Decoy Effects in Choice Experiments and Contingent Valuation: Asymmetric Dominance,” *Land Economics* 84, no. 1 (2008): 115–27.

how individuals often rely on their immediate emotional feelings when assessing risks and benefits: Nuclear strikes may evoke fear, dread, and anger, and potential military losses may evoke protective instincts. Psychic numbing, in combination with in-group bias,⁶ reflects diminished emotional sensitivity to large-scale human suffering, and can make the prospect of killing hundreds of thousands of enemy civilians feel less significant than the potential loss of a relatively small number of our own troops.

We also examine how numerical comparisons play a crucial role in the construction of preferences. Research demonstrates that individuals often evaluate numbers through relative comparisons rather than absolute values. For instance, the “deal” a car salesperson offers you may seem attractive when compared to the inflated sticker price. This phenomenon—which sometimes includes the decoy effect⁷ and is applied in many consumer contexts⁸ and policy choices⁹—illustrates how decision-makers may be swayed by the presence of a clearly inferior option that makes another option, which would otherwise have been deemed unacceptable, seem more attractive by comparison.

In addition to these psychological mechanisms, personal dispositions and attitudes have also been shown to have a significant impact on decision-making. Recent work has shown that individuals who support punitive domestic policies, such as the death penalty for convicted murderers or harsh treatment for immigrants or women seeking abortions, also tend to be more supportive of using nuclear weapons against an adversary.¹⁰

This article expands on this previous research in three ways. First, we investigate how psychological mechanisms affect nuclear decision-making. Second, we investigate how individuals think about nuclear strikes when presented with different possible war-time outcomes. And third, we explore the impact of political identity, punitive tendencies, and gender differences on these preferences. Our research shows that there is no general human approach to nuclear weapons in war; instead, much depends on context, cognition, and personal idiosyncrasies. This implies that we should be cautious about assuming that

decision-makers will act predictably in the context of limited war, that they will follow a single standard model of rationality (classically understood), and that they will avoid using nuclear weapons in a deep crisis.

We began examining these questions through a series of online survey experiments in 2019. Our experiments all use variations of an Iran War scenario created by Scott Sagan and Benjamin Valentino,¹¹ which was designed to resemble the dilemma faced by President Harry Truman at the end of the Second World War. (In 1945, the question before American decision-makers was whether to use nuclear weapons to bomb Japanese cities, in order to avoid an invasion of the Japanese homeland that was expected to lead to massive fatalities on both sides.¹²) As constructed by Sagan and Valentino, this scenario gave respondents the option to employ a nuclear weapon against Iran to end the conflict and prevent the loss of some 20,000 US troops in a ground war. A substantial percentage of respondents in the Sagan and Valentino studies, as well as in ours, supported using nuclear weapons against Iranian civilians to hasten the end of a difficult ground war with American fatalities, despite the fact that the US would eventually win the war either way.

Because humans rely on affective feelings, their valuation of human life is not linear.

It is important for our scenario to examine how attitudes about nuclear use may change given different expectations of the conventional costs. President Truman dropped the bomb on Japan at a time when desire for vengeance because of Japan’s attack on Pearl Harbor at the start of the war remained salient, and the Second World War was the most lethal conflict in human history. Escalation dynamics in more limited conflicts might not follow the same pattern, and recent US conflicts in Afghanistan and

- 6 Marilyn B. Brewer, “In-Group Bias in the Minimal Intergroup Situation: A Cognitive-Motivational Analysis,” *Psychological Bulletin* 86, no. 2 (1979): 307–24.
- 7 Bateman, Munro, and Poe, “Decoy Effects in Choice Experiments and Contingent Valuation,” 115–27.
- 8 Joel Huber, John W. Payne, and Christopher Puto, “Adding Asymmetrically Dominated Alternatives: Violations of Regularity and the Similarity Hypothesis,” *Journal of Consumer Research* 9, no. 1 (1982): 90–98.
- 9 Kaisa Herne, “Decoy Alternatives in Policy Choices: Asymmetric Domination and Compromise Effects,” *Journal of Political Economy* 13, no. 3 (1997): 575–89.
- 10 Scott D. Sagan and Benjamin A. Valentino, “Revisiting Hiroshima in Iran: What Americans Really Think About Using Nuclear Weapons and Killing Noncombatants,” *International Security* 42, no. 1 (2017): 41–79, https://doi.org/10.1162/ISEC_a_00284; Paul Slovic, C. K. Mertz, David M. Markowitz, Andrew Quist, and Daniel Västfjäll, “Virtuous Violence from the War Room to Death Row,” *PNAS* 117, no. 34 (2020): 20474–82, <https://doi.org/10.1073/pnas.2001583117>.
- 11 Sagan and Valentino, “Revisiting Hiroshima in Iran.”
- 12 Ewan Thomas, *Road to Surrender* (Penguin Random House, 2023).

Iraq suggest that fatalities might be much lower. It is important to understand how these factors could shape opinions around nuclear use.

The first way we build on previous scholarship, therefore, is by varying fatality estimates on both sides of the conflict. We conducted fourteen separate online surveys where the projected troop losses from continuing the ground war varied from unmentioned (implicitly nil); to 100; 1,000; 8,000; 20,000; and 40,000. At each level, there were two separate surveys: one in which the alternative to the ground war was a nuclear strike expected to kill 100,000 Iranian civilians, and one in which the nuclear strike was expected to kill 2 million civilians. To give a definitive near-term benefit of the bombing, respondents were told that a nuclear strike would hasten the end of the war and reduce troop fatalities to zero.¹³

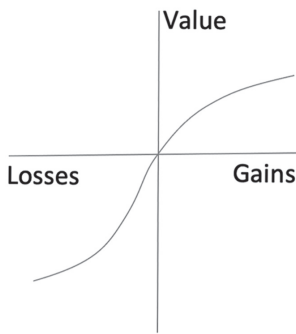


Figure 1. Prospect theory's value function, applicable to losses and gains of lives as their magnitude increases. Based on Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica* 47, no. 2 (1979): 263–92. Figure by authors.

Our experiments verified an important idea found in a leading model of decision-making under conditions of risk named prospect theory: The perceived value of human lives typically follows a nonlinear function as their numbers increase—convex for losses, and concave for lives saved (see fig. 1).¹⁴ Because humans rely on affective feelings, their valuation of human life is not linear—meaning that an endangered life diminishes in value when it becomes part of a larger crisis with many lives at risk. (Many readers are probably familiar with the quote, commonly misattributed to Stalin, that “one death is a tragedy; a million is a statistic.”) In some cases, the value of protecting lives at risk ceases to climb with magnitude, but decreases or even collapses entirely

(“the more who die, the less we care”).¹⁵ As this value function is likely ever increasing within the range of fatalities studied here, we expect that support for a nuclear strike will increase as the number of troops whose lives will be saved increases. Such a finding would counter the notion that there is a normative proscription against first use of nuclear weapons so strong that it meets the criterion of being a taboo.¹⁶

We also build on past scholarship showing high levels of support for the use of nuclear weapons by allowing comparisons between nuclear strikes and other plausible alternatives. We asked participants to say whether they preferred to continue the ground war or use a nuclear weapon, likely killing either 100,000 Iranian civilians or, in a separate set of conditions, killing 2 million. We then asked participants to reconsider their preferred course of action when all three options (ground war, and both nuclear strike options) appeared in the same choice set. We predicted that the second setup, with the side-by-side comparison, would increase the attractiveness of the bomb that kills 100,000 Iranian civilians, leading more respondents to support its use.

Based on prior studies,¹⁷ we expected to see individual decision-makers employ a diverse set of reasons and heuristic strategies, some leading to significant restraint and others leading to unacceptable levels of nuclear violence. We believed that most respondents were likely to reject use of nuclear weapons outright, based on moral grounds, fear of normalizing these weapons, inciting escalation, or drawing the ire of the civilized world. We expected some respondents to simplify this complex dilemma by choosing on the basis of a single prominent reason, such as minimizing overall loss of life (with the ground war), protecting Americans, or protecting civilians, while others were expected to draw guidance from comparing the numbers of projected troop deaths in the ground war to the numbers of bomb deaths. In aggregate, however, we expect that when both nuclear options are available, the 100,000-fatality bomb will gain support because it saves the troops and is “better” than the 2-million-fatality bomb. Respondents with punitive dispositions will seek payback and go with the larger bomb, while psychic numbing will blunt appreciation of the horrific reality of killing 100,000 or 2 million innocent people, but not entirely numb feelings of concern about the smaller number of “our troops.”

13 Except in two conditions where the expected loss of 20,000 troops was reduced by bombing to a loss of 12,000 troops, as explained in the footnote in table 1.

14 Daniel Kahneman and Amos Tversky, “Prospect Theory: An Analysis of Decision Under Risk,” *Econometrica* 47, no. 2 (1979): 263–92.

15 Paul Slovic and Herbert S. Lin, “The Caveman and the Bomb in the Digital Age”; Paul Slovic and Daniel Västfjäll, “The More Who Die, the Less We Care: Psychic Numbing and Genocide,” in *Numbers and Nerves: Information, Emotion, and Meaning in a World of Data*, ed. Scott Slovic and Paul Slovic (Oregon State University Press, 2015), 27–41.

16 Nina Tannenwald, *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons Since 1945* (Brown University, 2009).

17 Sagan and Valentino, “Revisiting Hiroshima in Iran”; Slovic et al., “Virtuous Violence from the War Room to Death Row.”

Participants were randomly assigned to one of seven separate survey conditions that had different projected losses of American troops, as shown in table 1. The projected number of deaths of US troops in a continuation of the ground war that the US was expected to win ranged from 100 to 40,000 (across conditions C1 through C6). A seventh condition, labeled nil, made no mention of troop losses in the ground war, but rather called attention to public opposition to the war and political tensions as costs associated with continuing the ground fighting. Each condition had two versions, A or B, depending on whether the number of expected fatalities from a nuclear strike was 100,000 or 2 million, as shown in the table. This design created fourteen separate surveys, shown in table 1. Conditions C1–6 were surveyed on September 24, 2024, and condition C7 was surveyed on October 30, 2024.

We conducted the survey experiment on Prolific’s online survey platform with 2,957 participants. All participants were American adults (ages 18–85, with mean and median age of 41) who had agreed to take part in online surveys for a modest payment. We asked Prolific to provide an equal number of men and women, and an equal number of self-identified Republicans and Democrats. For gender, 49.5% of respondents self-identified as male and 49.3% identified as female. The proportions of Democrats, Republicans, and independents were 48.6%, 47.2%, and 3.3%, respectively. Most were well educated, with 63.3% having some college attendance or a college degree, and an additional 21.4% having some postgraduate education.

Ethnicity was measured using a select-all-that-apply item. In the analyzed sample, 68.7% selected White identity, 19.4% selected Black identity, 8.7% selected Hispanic identity, and 8.3% selected Asian identity. Because respondents could select more than one cat-

egory, these percentages do not sum to 100%. In mutually exclusive terms, 61.8% identified as White only, 17.2% as Black only, 6.7% as Asian only, and 4.7% as Hispanic only, with additional respondents selecting multiple identities. Although Hispanic respondents were underrepresented relative to their share of the US population, supplemental analyses indicate that this underrepresentation does not appear to materially alter the study’s principal findings. The main predictors of nuclear strike support were generally similar among Hispanic and non-Hispanic respondents.

Instructions to Participants

We asked survey participants to read carefully a mock news article about a hypothetical war between the United States and Iran. Participants were also shown the following summary:

The United States imposes economic sanctions on Iran to punish violations of a nuclear agreement. In response, Iran attacks the United States, leading to a difficult ground war that the US is expected to win. However, the war is costly, with projections that N US troops will die if the fighting continues—where N varies from 100 to 40,000 across experimental conditions. [In one version of the scenario, respondents are not given projected troop losses but are told that the war’s long duration has created significant political tensions and public opposition within the United States.] Facing this situation, US leaders consider dropping a nuclear bomb on Iran to hasten the end of the war and reduce all projected US troop losses to zero. The estimated death toll from such an attack would be 100,000 Iranian civilians in Group A conditions and 2 million in Group B conditions.¹⁸

Table 1. Survey conditions and their number of participants

Projected US military losses with ground war	Number of respondents assigned to each nuclear strike option treatment (A or B)		
	100,000 fatalities	2 million fatalities	Total N
Condition 1 (C1): 100 to 0	A: 207	B: 198	405
Condition 2 (C2): 1,000 to 0	A: 200	B: 198	398
Condition 3 (C3): 8,000 to 0	A: 200	B: 207	407
Condition 4 (C4): 20,000 to 0	A: 205	B: 198	403
Condition 5 (C5): 40,000 to 0	A: 198	B: 209	407
Condition 6 (C6): 20,000 to 12,000*	A: 239	B: 245	484
Condition 7 (C7): number not specified (nil) to 0	A: 226	B: 227	453

* Conditions C6A and C6B were added to test a prediction from prospect theory’s nonlinear value function in figure 1 that support for saving a fixed number of lives through bombing—for example, 8,000, by reducing losses from 20,000 to 12,000—would be lower than support for bombing that reduced 8,000 directly to 0, as in conditions C3A and C3B. This prediction was confirmed, as described in appendix 4 in the supplementary information.

18 The full text of the news article for condition C1 (with the 100,000-fatality strike) is available in appendix 1 of the supplementary information. The article follows closely the scenario created by Sagan and Valentino in “Revisiting Hiroshima in Iran.”

Participants were then asked:

Given the facts described in the article, if you had to choose between launching a nuclear strike against the Iranian city or continuing the ground war against Iran, which option would you prefer?

- *Prefer to continue the ground war (N American military deaths expected)*
- *Prefer to launch a nuclear strike (100,000 Iranian civilian deaths expected [Group A conditions] or 2 million deaths expected [Group B]; American military deaths reduced from N to 0 [except condition C6, where fatalities were reduced from 20,000 to 12,000, or condition C7, where the number of fatalities was not mentioned, as noted above]).*

After answering this question, respondents indicated whether the strength of their preference was slight, moderate, or strong. We have chosen to present our results using the simpler, dichotomous preferences, but describe analyses that fully report preference strength in appendix 2 of the supplementary information.

As we expected, these analyses do not change any of the core findings of the main report. However, they add psychological depth, showing that nuclear preferences are shaped as much by how people feel about their choices as by what they choose to do. The fewest number of projected US military fatalities in a continuation of the ground war (100 in condition C1) still triggered significant support for the larger nuclear strikes. Therefore, about one month later, we added conditions C7A and C7B, which made no specific mention of US fatalities if the ground war continued. Rather, the cost of continuing the ground war was said to be “significant political tensions and public opposition.” We hypothesized that deemphasizing the troop losses would reduce this support below the level of the 100 fatalities conditions. This hypothesis was confirmed.

that a nuclear strike on location A would kill an estimated 100,000 Iranian civilians and a strike on location B would be estimated to kill 2 million Iranian civilians.

In all conditions, participants were then faced with the choice between whether they would continue the ground war or select the nuclear strike at location A or location B:

In light of this new information, if you had to choose between launching a nuclear strike against one of the two possible targets or continuing the ground war against Iran, which option would you prefer?

Earlier studies consistently find that support for nuclear bombing increases sharply with the number of punitive domestic policies the respondent supports.¹⁹ Punitiveness is relevant to nuclear decision-making because it demonstrates the likelihood that personal disposition, rather than neutral deliberation, may drive decisions. If leaders make decisions based on their emotional reactions or psychological state, rather than on careful strategic analysis, then they are more likely to lash out unpredictably or choose options that fail to achieve their long-term goals. We therefore assessed how an expanded set of punitive domestic attitudes affected nuclear decisions when the loss associated with a winnable ground war was greater or less than 20,000 US troops.

We assessed respondent attitudes and opinions pertaining to punitive tendencies using eight questions, four of which were found previously to be highly predictive of support for using nuclear weapons against enemy civilians.²⁰ Unless otherwise noted, the response options were as follows:

Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Moderately agree (6)	Strongly agree (7)
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Later in the survey, at what we are calling Time 2, an additional preference question placed both the 100,000 and 2 million expected civilian deaths from a nuclear strike alongside the ground war option, enabling direct comparison between alternatives. Respondents were told:

Suppose you learn that the military has suggested a revised bombing plan where two target locations in the city are under consideration. Their report to the president estimates

The questions asked were as follows:

- Do you strongly favor, favor, oppose, or strongly oppose the death penalty for persons convicted of murder?
- To what extent do you believe in Hell? (absolutely certain Hell exists; fairly certain; not too certain; don't know; do not believe in Hell)
- Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us.

19 Slovic et al., “Virtuous Violence from the War Room to Death Row.”

20 Slovic et al., “Virtuous Violence from the War Room to Death Row.”

- Confederate monuments should not be removed from public spaces.
- Some people deserve to suffer.
- If a fetal heartbeat is present, a doctor should be prohibited from performing an abortion, unless it is necessary to save the mother's life or "to prevent a serious risk of the substantial and irreversible impairment of a major bodily function."
- What do you think is more important: To protect the right of Americans to own guns, OR to control gun ownership?
- The southern border should be closed to stop illegal immigration into the US.

Each of these eight items plausibly taps into punitiveness, though they also overlap with authoritarianism, social dominance orientation, moral traditionalism, and partisan political identification.

Following Slovic et al., we interpret favoring support for the death penalty as a strong direct indicator of punitive attitudes, because support for capital punishment reflects endorsement of retribution, or the belief that wrongdoers deserve to suffer proportionally to their crimes. Belief in Hell aligns with a moral worldview in which sin must be punished, even eternally. Asserting that some people—not just sinners—deserve to suffer similarly embodies the essence of punitiveness. Another item calls for a mighty leader to destroy sinfulness. All of these statements directly measure the extent to which a respondent agrees with punitive behavior in circumstances unrelated to the use of nuclear weapons.

Connections to punitiveness are subtler and less obvious for the remaining four items—but as we find, they end up being strongly predictive of a respondent's support for the use of nuclear weapons. The statements about abortion, border closure, and gun ownership all reflect a belief in the rightness and desire to have the capability to enact retribution for unjust or immoral action.

Each of these eight items was individually predictive of support for using nuclear weapons, and the items were all moderately correlated with one another, with an average inter-item correlation of .35. We created a punishment index for each respondent by giving them one point for each of the eight punitive attitudes they endorsed. (This index score had a Cronbach's alpha of .77, indicating that the items were homogeneous and consistent with unidimensionality.) For purposes of data analysis and display, we categorize each person's punitiveness score as low (0 or 1 items endorsed), medium (2, 3, or 4 items endorsed), or high (5–8 items endorsed), with roughly equal numbers of respondents in each category.²¹

Figure 2 shows that punitive tendencies were closely aligned with political identity. Among Democrats, 57.5% were low on punitiveness versus only 2.2% of Republicans. Among Republicans, 67.6% were highly punitive, compared to only 7.7% among Democrats. Those of medium punitiveness were about evenly split between the parties.

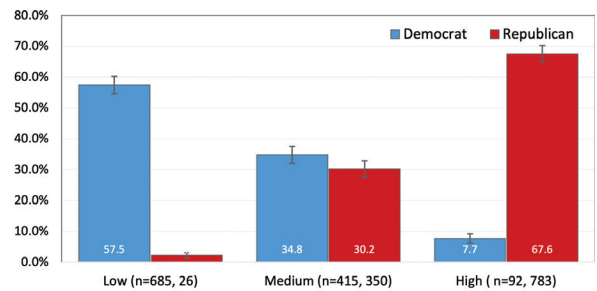


Figure 2. Percentage of Democrats and Republicans at each punishment level, Groups A and B combined. Figure by authors.

After respondents were asked to reconsider their preferences among the expanded choice set (offering both bomb options or continuing a ground war), they were asked to rate the importance of each of seven considerations, using four choices: not at all; slightly; moderately; or very important. The instructions read:

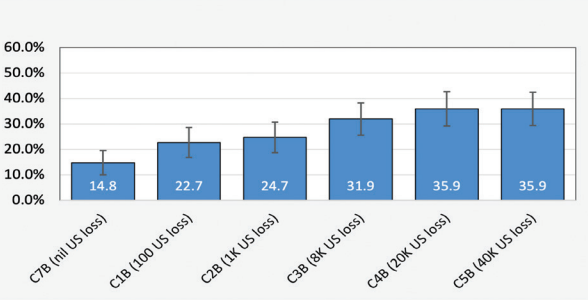
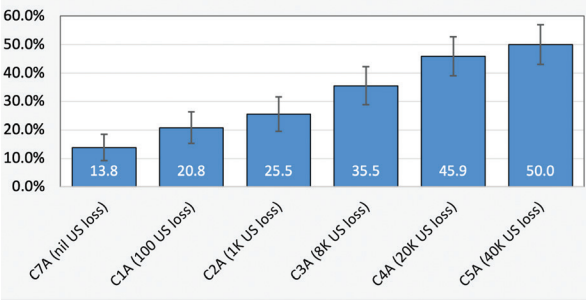
Please rate how important the following considerations were to you when thinking about how much you supported or opposed using nuclear weapons in the revised preference question you just answered.

The considerations included:

- Reducing the number of American troops killed from the original estimate to a smaller number
- Feeling that your decision was justified and virtuous given the circumstances
- Feeling that nuclear weapons should never be used, no matter the circumstances
- Feeling that it is a virtuous act to use nuclear weapons when faced with an existential loss such as the deaths of many American military personnel
- Considering the likelihood that using a nuclear bomb against Iran would be effective in ending the war and saving American lives
- Recognizing the difficulty of comprehending the reality of killing so many Iranian civilians
- Feeling that killing 100,000 Iranian civilians is somehow better in comparison to killing 2 million

"Feeling that killing 100,000 Iranian civilians is somehow better in comparison to killing 2 million" proved to be an exceptionally strong predictor of

21 Endorsement included any level of agreement, such as favoring the death penalty, being fairly certain Hell exists, and protecting the right to own guns.



Figures 3a–b. Percentage of respondents preferring the nuclear strike as projected number of fatalities in a ground war increased from not mentioned (nil; C7A and C7B) and 100 (C1A and C1B) to 40,000. Figures by authors. Note: Conditions C6A and C6B are omitted because the projected death toll of US soldiers could not be reduced to zero by bombing.

support for the 100,000-fatality bomb at Time 2, as we show later, and may also explain some differences in preferences across men and women.

Results

Effect of Varying the Projected Number of American Fatalities

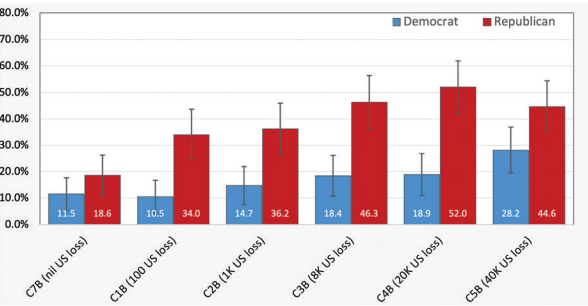
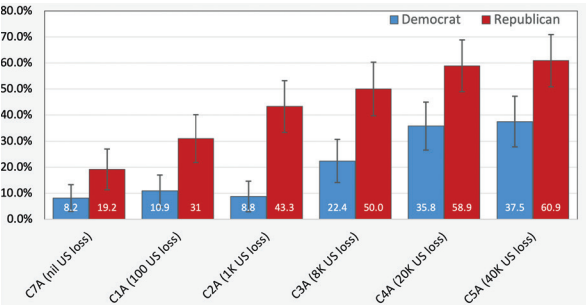
Figures 3a and 3b show that the percentage of respondents supporting nuclear strikes rose steadily as the number of American troops endangered by continuing the ground war increased. The rise in support was greater for the 100,000-fatality strike, from 13.8% to 50% at the 40,000-troop level, compared to 14.8% to 35.9% for the 2-million-fatality strike. There was little difference in support between the 100,000-fatality and 2-million-fatality strikes until expected US fatalities reached 8,000, after which support for the 100,000-fatality strike became increasingly greater; beyond that, support for the 2-million-fatality strike changed little. This appears to be due to some respondents feeling, consistent with prospect theory and psychic numbing, that the ratios between American and Iranian losses were relatively small (for example, 1,000/100,000 or 1,000/2,000,000 for conditions C2A and C2B, whereas 8,000, 20,000 and 40,000 were more substantial percentages of the 100,000 Iranian toll, but

still appeared to respondents to be relatively small proportions of the 2-million-fatality toll).

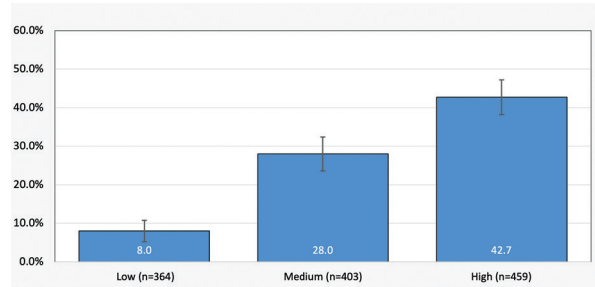
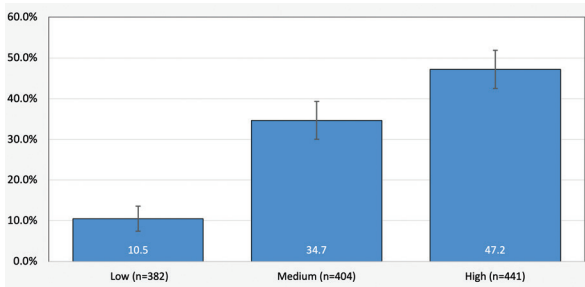
Comments made by respondents illustrate these comparative perspectives:

Killing 2 million people to protect 40,000 is not acceptable. I think that 100,000 foreigners for 40,000 Americans is ok. I would prefer to protect our troops and have other people die. Two million was too great to save the lives of 20K Americans. I found the ratio of 5:1 with the secondary location [the 100,000-fatality strike] to be more acceptable to stomach.

An important implication of figures 3a and 3b is that expected American fatalities served as a loss trigger that created support for the use of nuclear weapons. The greater the expected loss, the greater the support. Also notable is that support for nuclear use was rather insensitive to the number of Iranian deaths, especially at lower levels of troop loss. Even at a projected troop loss as small as 100 lives, more than 20% of respondents preferred nuclear strikes that caused vastly greater fatalities to Iranian civilians. As we expected, not mentioning the number of American fatalities explicitly in condition C7A and C7B did reduce support for bombing to the lowest level, but still, in those conditions, about 1 in 7 respondents went nuclear.



Figures 4a–b.(a) Percentage support for the 100,000-fatality nuclear strike among Republicans and Democrats across Group A conditions; (b) Percentage support for the 2-million-fatality nuclear strike among Republicans and Democrats across Group B conditions. Figures by authors.



Figures 5a–b. Percentage of respondents supporting the 100,000-fatality and 2-million-fatality nuclear strikes at each level of punitiveness, aggregated over all conditions except C6A and C6B. Figures by authors.

Political Identity and Nuclear Preferences

Every study to date using the Iran War scenario with American respondents has found Republicans to be considerably more supportive than Democrats of using nuclear weapons to end a ground war. We examined whether this holds when the scenario moves away from the projected loss of 20,000 US troops, and found that it does.

Both Democrats and Republicans expressed more support for nuclear strikes as the projected ground-war fatalities increased. Figures 4a and 4b, however, show that there was greater support for nuclear use among Republicans than Democrats across twelve independent surveys in which projected American fatalities varied greatly.

How Punitiveness Shapes Nuclear Preference

Figure 5 describes the relation between punitive attitudes and support for strikes that would inflict 100,000 fatalities and 2 million fatalities aggregated across all A and B conditions, except conditions C6A and C6B, which were excluded because they were similar to conditions C3A and C3B. As expected, we see a strong relationship. Highly punitive persons—those endorsing five or more of the eight attitudes discussed above—were almost five times more likely to support the strikes that would cause

100,000 Iranian fatalities and the strikes that would cause 2 million fatalities, compared to the survey respondents whose attitudes were least punitive (those endorsing none or one of the attitudes). Those in the medium category (endorsing two, three, or four attitudes) were roughly three times more likely to prefer the nuclear strikes, relative to the least punitive respondents. Although the projected nuclear fatalities in the B conditions were twenty times greater than those in the A conditions, the overall level of support for the 2-million-fatality bomb at each level of punitiveness—low, medium, high—was only slightly less than support for the 100,000-fatality strike at the same levels of punitiveness.

How Punitiveness Varies by Troop Loss to Shape Nuclear Preferences

Within every level of punitiveness, support for the nuclear option increased as projected troop losses rose. Figure 6 shows that, even among the least punitive respondents, support for the 100,000-fatality strike reached 29% in condition C5A, when ground-war fatalities were projected at 40,000. This sharp rise likely reflects the perception that 40,000 is psychologically “close” to 100,000 deaths—a comparison that was not salient and did not produce a comparable increase in support for the 2-million-death strike in condition C5B (see fig. 7). Medium-punitive respondents also displayed a jump

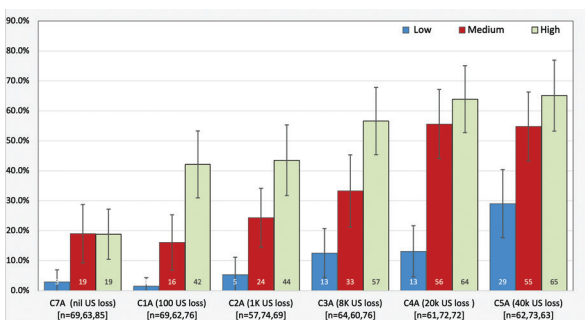


Figure 6. Percentage of respondents in Group A conditions at each level of punitiveness who preferred the 100,000-fatality nuclear strike. Figure by authors.

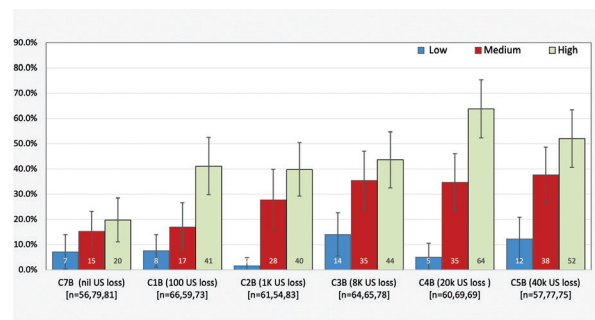


Figure 7. Percentage of respondents in Group B conditions at each level of punitiveness who preferred the 2-million-fatality nuclear strike. Figure by authors.

Table 2a. Percentage of respondents in Group A preferring the 100,000-fatality strike within punishment levels and party identity

	Democrat	Republican
Low punishment	9.9% (353)	23.1% (13)
Medium punishment	33.3% (204)	37.8% (180)
High punishment	46.7% (45)	46.9% (382)
Overall	20.6% (602)	43.5% (575)

Note: Parentheses contain the number of respondents on which the corresponding percentage is based.

Table 2b. Percentage of respondents in Group B preferring the 2-million-fatality strike within punishment levels and party identity

	Democrat	Republican
Low punishment	7.5% (332)	7.7% (13)
Medium punishment	27.5% (211)	30.0% (170)
High punishment	38.3% (47)	43.1% (401)
Overall	17.1% (590)	38.5% (584)

Note: Parentheses contain the number of respondents on which the corresponding percentage is based.

in support for the 100,000-death strike in conditions 4A and 5A as projected troop losses climbed into the 20,000–40,000 range.

Highly punitive individuals were consistently most willing to endorse nuclear use. Remarkably, more than 40% of highly punitive respondents in conditions C1A and C1B supported nuclear strikes killing 100,000 or 2 million enemy civilians to save the lives of only 100 American soldiers.

Figure 7 presents results for preferences for the 2-million-fatality nuclear strike. Compared with the 100,000-fatality strike in figure 6, support for this vastly more destructive option was somewhat lower across all levels of punitiveness and troop-loss conditions. When projected troop losses reached 40,000, only about half of the high punishers endorsed the 2-million-fatality option—underscoring that while punitiveness heightens the willingness to go nuclear, many respondents still recoiled from extreme civilian destruction. The medium-punitive group showed a modest rise in support under higher-fatality conditions, while low-punitive respondents remained largely resistant regardless of troop losses. A consistent pattern nonetheless emerges: As projected American fatalities increase, support for a strike that would cause 2 million Iranian civilian fatalities rises, especially among highly punitive respondents.

Protecting troops clearly emerges as the dominant reason for going nuclear in these scenarios. In conditions C7A and C7B, where troop losses were not explicitly mentioned, support for a nuclear strike did not exceed 20%—even among the most punitive individuals.

Republicans’ Support for Nuclear Bombing Was Mostly Driven by Their Greater Punitiveness

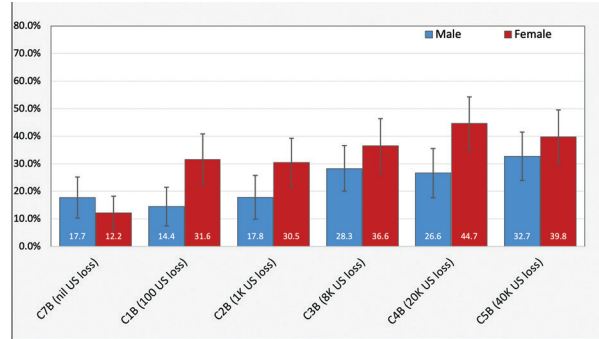
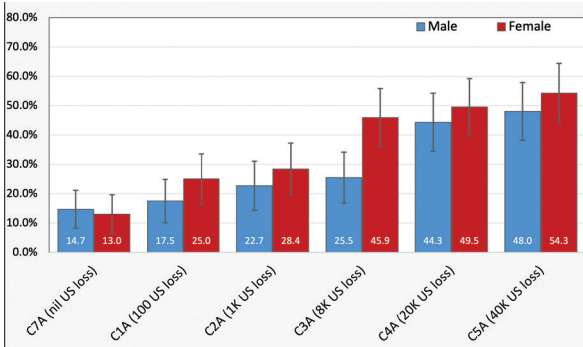
Tables 2a and 2b describe the percentage support for the 100,000-fatality and 2-million-fatality strikes for Democrats and Republicans at each punishment level. Both tables show steady increases in support for a strike as punitiveness increases. The overall support for a nuclear strike was greater among Republicans, for both the 100,000-fatality and 2-million-fatality strikes (see fig. 4), but tables 2a and 2b show that these differences were much smaller at each level of punitiveness.

Gender by Conditions and the Willingness to Go Nuclear

The size and scope of this study enable a closer examination of the surprising finding by Sagan and Valentino²² that, with the Iran War scenario, “women were no less, or even more, hawkish than men regarding their support for killing large numbers of foreign civilians to avoid the deaths of US soldiers.” The data from the present study (see fig. 8) showed that women were more likely than men to support 100,000-fatality and 2-million-fatality nuclear strikes in every condition, from 100 expected US military fatalities to 40,000.

We hypothesized that this consistency across ten separate surveys might arise from women being more sensitive to US military fatalities than men, leading them to be more willing to support a nuclear

22 Sagan and Valentino, “Revisiting Hiroshima in Iran,” 64.



Figures 8a–b. (a) Percentage of female and male respondents supporting a nuclear strike across Group A (100,000 fatalities) surveys. (b) Percentage of female and male respondents supporting a nuclear strike across Group B (2 million fatalities) surveys. Figures by authors.

strike that would save the troops. We therefore conducted two additional surveys, conditions C7A and C7B, that drew attention to political tension and opposition to the ground war, but did not explicitly mention troop losses. We predicted that these new conditions would not show women to be more hawkish than men.

Figures 8a and 8b document the robustness of the gender difference between 100 and 40,000 fatalities across ten independent surveys. They also show that, as predicted, this difference was reversed in conditions C7A and C7B, where no fatalities were mentioned and men were more supportive of going nuclear than women, especially for the 2-million-fatality strike.

Closer examination of figures 8a and 8b shows a marked increase in nuclear strike support among women starting at condition C3A (8,000 troops), with the jump being greater for the A conditions (100,000 fatalities) than the B conditions (2 million fatalities). Men's support for the 100,000-fatality bombing jumped later at conditions C4A and C5A when 20,000 or 40,000 troops were at risk. We suspect that when the projected troop losses reached 8,000 for women and 20,000 for men, the larger numbers of Americans that could be saved by nuclear bombing were seen by some as more valuable than 100,000 Iranian civilians who were projected to die.

Numerous comments support this conjecture:

Killing two million people to save 40,000 US soldiers feels way too much. The 100,000 option seems like a better balance. I would rather lose fewer of ours but not at the cost of millions of civilians.

If 40,000 Americans die, that's a large share of the 100,000 figure, but tiny compared with 2 million. The smaller bomb seems fair and protects our troops.

The higher percentage of women who supported the 100,000-fatality and 2-million-fatality strikes (across ten separate surveys, and the fact that this reversed when troop loss numbers were not made explicit) suggests that women were more concerned than men with protecting American troops.

Taken together, the data from Time 1 choices in this multi-condition study show that support for using nuclear weapons in this scenario was strongly influenced by anticipated US troop loss, punitive disposition, and gender. Political identity also mattered, but this effect was driven mostly by greater punitiveness among Republicans.

Comparative Evaluation Changes Support for Nuclear Use

A novel feature of this study was the comparison of choices at Time 1 with those at Time 2. This allowed us to examine the effect on individual survey participants of enlarging the set of decision options to include two bombing sites (rather than one) along with the ground-war option. We had strong prior reasons to expect that giving participants the opportunity to compare two bombing options at Time 2—one expected to cause twenty times the number of fatalities than the other—would change many of the Time 1 decisions based on explicit comparison.

Evaluability theory²³ proposes that certain attributes like money or lives are inherently hard to evaluate on their own, but easier to evaluate through comparisons. Feelings are innumerate, in that they don't scale up properly.²⁴ When evaluated independently, 100,000 deaths and 2 million deaths—both large numbers—do not feel much different, due to psychic numbing, and may not lead to proportional differences in judgments and decisions. But, side by side, 100,000 deaths appear clearly “much better” than 2 million deaths.

23 Christopher K. Hsee, “The Evaluability Hypothesis: An Explanation for Preference Reversals Between Joint and Separate Evaluations of Alternatives,” *Organizational Behavior and Human Decision Processes* 67, no. 3 (1996): 247–57, <https://doi.org/10.1006/obhd.1996.0077>.

24 Slovic and Lin, “The Caveman and the Bomb in the Digital Age.”

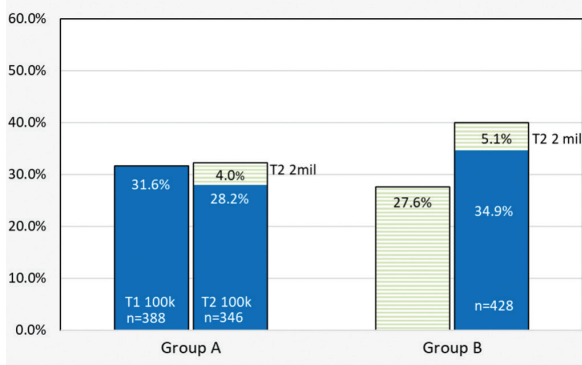


Figure 9. Time 1 and Time 2 percentages of strike preferences aggregated across all 100,000-fatality conditions (Group A) and all 2-million-fatality conditions (Group B). At Time 1, Groups A and B saw only a 100,000-fatality or 2-million-fatality strike option versus continuing the ground war. At Time 2 both strike options were in the choice set. Figure by authors.

The power of comparison shapes how options are evaluated. One well-known form of this is the decoy effect, in which an inferior option increases the attractiveness of a superior one. More broadly, comparative or joint evaluation can make an option appear more acceptable when it is viewed alongside a worse alternative. Thus we predicted that respondents would increase support for the 100,000-fatality strike at Time 2 (compared to Time 1) because it would appear to be much better than the 2-million-fatality strike. Similarly, we expected the 2-million-fatality strike to be preferred less frequently because it compares unfavorably to the smaller death toll.

Figure 9 shows that addition of the second, less destructive bombing option did lead to an increase, as predicted, in overall support for a nuclear strike in the Group B conditions that initially saw the 2-million-fatality option. But adding the 2-million-fatality bomb as an option in the Group A conditions that initially had evaluated the 100,000-fatality strike versus continuing the ground war did not boost overall support for nuclear strikes. At Time 1, 31.6% supported the 100,000-fatality strike in the A conditions. When the 2-million-fatality strike option was added at Time 2, 28.2% supported the 100,000-fatality strike and 4.0% supported the 2-million-fatality strike, for a total of 32.2%, only slightly higher than the Time 1 support for a strike.

The reason that we did not see a greater increase in preference for the 100,000-fatality strike at Time 2 in the A conditions, consistent with a decoy effect, is that two unexpected preference patterns emerged to counter it. Of those who chose the 100,000-fatality strike at Time 1, 11.6% changed to the 2-million-fatality strike at Time 2, and 9.3% reverted to a preference for the ground war. These

patterns reduced support for the 100,000-fatality strike by 20.9% (see table A3.1 in the supplementary information). Thus overall, the addition of the 2-million-fatality strike did not increase preference for the 100,000-fatality strike by much.

The strongest effects of the expanded set of choices appear in Group B, where respondents initially saw only the 2-million-fatality option. When the 100,000-fatality option was introduced at Time 2, support for nuclear strikes rose substantially, from 27.6% to 40.0%. This shift does not reflect a decoy effect, because the new option is not dominant. Instead, it reflects comparative evaluation, in which respondents perceive the smaller strike more favorably when viewed alongside a more extreme alternative. Many respondents shifted away from the 2-million-fatality strike toward the 100,000-fatality option, indicating that the availability of a less destructive alternative can make nuclear use itself more acceptable. Respondents frequently described the smaller strike as a “better” or more defensible option, effectively morally licensing an action that might otherwise have been rejected.

Figure 10 shows that, consistent with comparative evaluation, adding the option to conduct a nuclear strike that produced 100,000 civilian fatalities at Time 2 increased support for a nuclear strike considerably in every Group B condition. Several different changes in preference accounted for this result. First, 169 persons who initially preferred the ground war over the 2-million-fatality strike later changed to the 100,000-fatality strike (see table A3.1 in the supplementary information). Many of these people saw this as a virtuous, win-win decision, because it saved the troops and was “better” than the 2-million-fatality strike. As one respondent explained: “I hate that I’m thinking this way. But it seems like 100,000 is way better than 2 million, so it’s kind of like a bargain. We save our troops and take out the lesser amount of their people than we could.” Another said directly: “As much as I don’t like the idea of nuclear strike, option B seems like the better way to go than option C.”

Second, additional support for the 100,000-fatality strike came from 259 persons who chose the 2-million-fatality strike at Time 1 but changed to the 100,000-fatality strike as a “better” way to end the war and save the troops. These changes, plus another 23 persons who switched from the 2-million-fatality strike to the ground war, reduced overall support for the more lethal strike from 27.6% at Time 1 to 5.1% at Time 2. All in all, the addition of the 100,000-fatality option to the choice set in Group B altered 37.4% of the initial preferences.

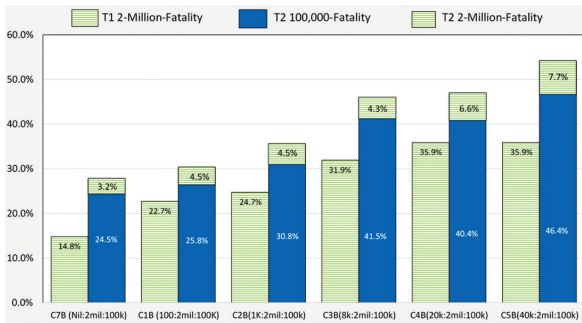


Figure 10. Percentage support for 100,000-fatality and 2-million-fatality strikes at Time 1 and Time 2 in Group B conditions. Figure by authors.

The results presented above show that support for nuclear escalation depends on beliefs about the trajectory of the war. In general, support rises when individuals believe that nuclear use would reduce conventional troop losses. But it also depends on the menu of available options. Individuals who oppose limited nuclear strikes are more likely to change their view if those strikes are presented alongside more extreme options that make them comparatively acceptable. This has significant implications for scenarios in which senior leaders, under severe time pressures, are likely to receive various options. It suggests that decision-making processes surrounding nuclear weapons use should consider the effects of contextual framing when developing and presenting options to the president or others. This also highlights the possibility of advisors manipulating, consciously or not, the decisions of leaders.

Additional Reflections by Respondents

After making their second choice about whether to continue the ground war or drop a nuclear bomb on Iranian civilians, respondents explained their reasoning. Their words reveal the difficulty of weighing catastrophic outcomes and the emotional complexity of deciding between terrible options. These comments also speak to how seriously subjects took the exercise. Some described the situation as a “deeply complex and tragic scenario,” while others acknowledged that there were “no good solutions.”

About 70% of all preferences were for continuation of the ground war. These preferences were centered around two broad themes: outright opposition to nuclear weapons and nuclear war, and comments in favor of the ground war. Nuclear opponents referred to catastrophic, civilization-ending consequences, and evil beyond human imagination. Others thought use of these weapons would bring the enmity of the world down on the US and license other nations to deploy their nuclear weapons. Many emphasized that killing civilians was morally unacceptable, even if it

meant greater losses among American troops who had knowingly taken on the risks of combat. As one wrote, protecting innocent lives must take priority, “even at a cost to the lives of American soldiers.” For many, the ground war was the least catastrophic path.

In contrast, the 307 persons who preferred the 100,000-fatality nuclear strike at both times often framed it as a harsh but pragmatic calculation. They reasoned that saving American soldiers outweighed the loss of Iranian civilian lives, or that the 100,000-fatality bomb strike minimized deaths on both sides compared to the alternative. Others described the nuclear strike projected to kill 100,000 civilians as “logical and efficient” or the “most balanced option.” In this way, the 100,000-fatality strike was frequently rationalized as the “better bomb” or the “lesser evil.”

There were 39 individuals in Group A, the 100,000-fatality condition, and 169 in Group B, the 2-million-fatality condition, who changed from a preference for continuing the ground war at Time 1 to the 100,000-fatality strike at Time 2, in a manner consistent with comparative evaluation (and in Group A, a decoy effect). Like those who preferred that strike both times, they noted the superiority of the 100,000-fatality strike in comparison to the nuclear bomb projected to kill 2 million civilians. One respondent became more satisfied with sacrificing Iranian lives to save Americans when the addition of the 100,000-fatality bomb made the ratio between the Iranian and American losses less extreme, that is, more “balanced.”

Another respondent made similar number comparisons to arrive at an acceptable balance:

We get less fatalities on both sides if we continue with this option. The previous option [2 million at Time 1] would have resulted in too many innocent fatalities within Iran, saving only a small number of US troops. It wouldn't have made sense to trade millions of innocent lives for an even smaller fraction of US soldiers lost. This newer (bomb) location . . . reduces fatalities on both sides compared to previous options. . . . In doing this, the rate of fatalities between both countries is as balanced as it can possibly be, all things considered.

Another who compared the numbers, searching for some sort of cost-benefit balance, said:

While 100,000 is a lot of deaths, I think it is much more reasonable than the 2 million deaths choice. I also think that this is better because of the American lives that would be saved. It feels like the most balanced option for me personally. It's not too many deaths on either side for me and prioritizes American lives without taking too many Iranian lives.



There were 259 individuals in Group B who shifted from the 2-million-fatality bomb to the 100,000-fatality bomb when both options were available, reasoning that the smaller strike did the same job with fewer deaths. “It drastically lowers the bombing deaths from 2 million to 100,000 while also ensuring no American deaths. This is the best option overall,” wrote one.

There were 56 persons who preferred the more destructive 2-million-fatality strike at both times, and 45 who initially preferred the 100,000-fatality bomb over the ground war, but then changed to the 2-million-fatality strike when it became an option at Time 2. Not surprisingly, many of these individuals were motivated by anger and a desire to punish Iran severely—the kind of punitive attitude shown above—to increase support for using nuclear weapons. “You have a country that attacked the United States. . . . It’s time to put them ‘down.’ End your enemies, once and for all,” declared one. Some even dismissed the idea of civilian innocence altogether, with one writing: “Kill every single one of them. There are no civilians in a land that is a proxy terrorist state.” For these respondents, the decision was not about minimizing harm, but about decisive punishment.

An unexpected change in preferences at Time 2 occurred in 36 respondents from Group A (100,000-fatality condition) and 23 from Group B (the 2-million-fatality condition): These individuals turned away from bombing altogether, and chose the ground war, which minimized the number of expected fatalities. Juxtaposing two catastrophic nuclear strikes in the same choice set seems to have caused some who initially preferred the 100,000-fatality nuclear attack, to become sensitive to the enormous loss of life being considered

to protect a vastly smaller number of professional soldiers. Some of them considered the justice and virtuousness of their decision to be important, and others expressed concerns over the killing of Iranian civilians. Said one:

At first, I chose the nuclear option and killing 100,000 Iranian civilians but after careful consideration I’ve decided that no or as little as possible civilians from either side should die. At least the American and Iranian armies know what they’ve signed up for. The civilians have had no such choice, and I wouldn’t want 100,000 let alone 2 million civilians of any nationality to be killed ever. So, I definitely chose to let the ground war continue indefinitely.

A similar epiphany seems to have occurred with the respondents who preferred the ground war at Time 2 after initially preferring the 2-million-fatality strike. Said one:

My primary concern is minimizing harm to civilians. Launching a nuclear strike would result in catastrophic civilian fatalities, with 100,000 deaths at location A and 2 million at location B. Additionally, using nuclear weapons would have severe long-term effects on the environment, global stability, and international relations.

These individuals whose comments we have highlighted here behaved in diverse ways that reveal both the power of comparison and a struggle to balance morality, patriotism, and survival under the threat of mass death. Many accepted the 100,000-fatality strike as a “better bomb” or the “lesser evil.” A notable few reconsidered entirely, becoming less supportive of using nuclear weapons when seeing both nuclear

options side by side, resisting the pull of comparative evaluation. They refused to endorse civilian slaughter at any scale. Others doubled down on punishment, consistent with findings from Brian Rathbun and Rachel Stein showing that support for the use of nuclear weapons was associated with notions of retribution, in-group loyalty, and deference to authority.²⁵

Strength of Preference Responses Add Psychological Insights to the Results

The strength of preference responses do not challenge any of the core findings of the main report. However, they add psychological depth, showing that nuclear preferences are shaped as much by how people feel about their choices as well as by what they choose. They show that ground-war preferences are relatively strong—up to 1,000 fatalities—but weaken as the projected toll rises further. Preference strength varies by identity: Republicans show stronger nuclear strike preferences than Democrats; highly punitive individuals express stronger support; less punitive persons support strikes weakly, if at all. A higher percentage of women than men support nuclear strikes, but their strength of support tends more often than men's to be slight.

The better bomb effect is strong but complex.

The better bomb effect is strong but complex. The highest percentages associated with support for the 100,000-fatality bomb were slight and moderate preferences associated with females who believed the better bomb to be important. Our interpretation suggests that women don't like bombing civilians but they do want to save the troops, so they go with the 100,000-fatality bomb but with less strong preferences. In sum, the strength of preference findings reinforce concerns about the instability of nuclear weapons use and emphasize the need to incorporate psychological insights into nuclear policy decision-making. Appendix 2 of the supplementary information provides tables that present the strength of preference responses in detail.

A Typology of Support for Nuclear Strikes

The percentage of respondents who supported nuclear bombing of civilians to protect the lives of American military troops became greater as the number of troops at risk increased, and with respondents who were relatively more punitive. Female respondents were also more inclined to support nuclear action when the alternative is troop losses, but less inclined when troop losses are not mentioned. In addition, examination of preferences at Time 2 has shown that support for the 100,000-fatality nuclear strike increased when respondents compared it to the 2-million-fatality strike. To better appreciate the importance of these findings at the level of the individual respondent, we created a predictive model by giving each person a code according to their status on three variables:

V1. Gender: male, coded M, or female, coded F

V2. Considered it important that the 100,000-fatality bomb was preferable, coded B, or did not consider that, coded O²⁶

V3. How many of eight punitive domestic policies did they endorse? Zero or 1, coded as L (low); 2, 3, or 4, coded as M (medium); and 5, 6, 7, or 8, coded as H (high)²⁷

This creates twelve combinations of the three variables: MOL, MOM, MOH, MBL, MBM, MBH, FOL, FOM, FOH, FBL, FBM, and FBH.

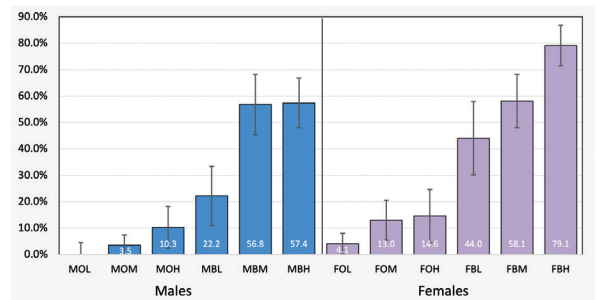


Figure 11. Percentage support for 100,000-fatality strike in Group A conditions at Time 2 when both nuclear options became available simultaneously, along with continuing the ground war. Figure by authors. Type ns: MOL (n = 92); MOM (n = 86); MOH (n = 58); MBL (n = 54); MBM (n = 74); MBH (n = 108); FOL (n = 98); FOM (n = 77); FOH (n = 48); FBL (n = 50); FBM (n = 93); FBH (n = 110).

25 Brian C. Rathbun and Rachel Stein, "Greater Goods: Morality and Attitudes Toward the Use of Nuclear Weapons," *Journal of Conflict Resolution* 64, no. 5 (2020): 787–816.

26 After writing comments describing how they arrived at their preferred option at Time 2, respondents were asked: "Please rate how important the following considerations were to you when thinking about how much you supported or opposed using nuclear weapons in the revised preference question you just answered." These ratings are reported in appendix 3 of the supplementary materials. One such consideration was: "Feeling that killing 100,000 Iranian civilians is somehow better in comparison to killing 2 million." Persons rating this as moderately or very important received B as the second letter in the typology.

27 Political identity was not included in this typology because it was highly correlated with punitiveness (see fig. 2), and punitiveness is a more universal quality of human beings.

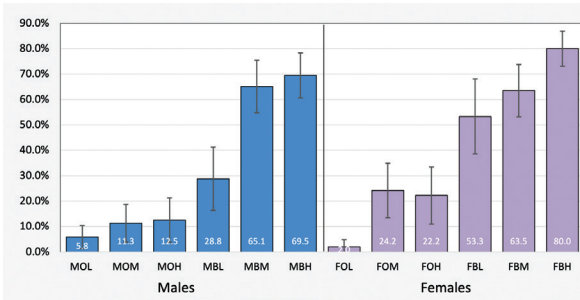


Figure 12. Percentage support for the 100,000-fatality strike in Group B conditions at Time 2 when both nuclear options became available simultaneously, along with continuing the ground war. Figure by authors. Type ns: MOL ($n = 104$); MOM ($n = 71$); MOH ($n = 56$); MBL ($n = 52$); MBM ($n = 83$); MBH ($n = 105$); FOL ($n = 98$); FOM ($n = 62$); FOH ($n = 54$); FBL ($n = 45$); FBM ($n = 85$); FBH ($n = 130$).

Figures 11 and 12 show that support for the 100,000-fatality strike when all three options were presented together at Time 2 varied sharply by comparison-based thinking, punitiveness, and gender, with remarkably similar patterns in those in the 100,000-fatality condition and those in the 2-million-fatality condition. The strongest effect came from a change in the middle code from those who did not consider it important that the 100,000-fatality bomb was preferable to the 2-million-fatality strike (O) to those who did (B). This one change increased the percentage of respondents supporting the 100,000-fatality strike by an average of 46.2% across the two groups. Punitiveness was the next strongest influence: Moving from low to high punitiveness increased support by an average of 23.3%. Gender differences were smaller but still notable. Women were more supportive than men by an average of 9.6%. This gender gap was especially large among low-punitive respondents who viewed the bomb comparison as important: Low-punitive women who preferred the 100,000-fatality strike (FBL) were far more supportive than low-punitive men who preferred the 100,000-fatality bomb (MBL). Overall, the typology shows that support for nuclear use was shaped most strongly by cognitive comparison, then by punitive disposition, and more modestly by gender.

Virtuous Violence

Slovic et al.²⁸ have documented a common thread underlying support for diverse policies that threaten harm to many people: The victims are seen as blame-worthy, and it is believed ethical to take actions or policies that might harm them. This lends support to the provocative notion of “virtuous violence” put

forth by Alan Page Fiske and Tage Shakti Rai,²⁹ who assert that people commit violence because they believe it is the morally right thing to do.

Most respondents believed it important that their decision was justified and virtuous (see tables A3.2 and A3.3 in the supplementary information). Accordingly, they tended to report high levels of moral justification regardless of their preferred course of action. About 70% of respondents who chose the ground war at both Time 1 and Time 2 considered their choice as virtuous. About 65% of those who supported a nuclear strike felt the same. This demonstrates how deeply the search for moral justification permeated our respondents’ nuclear preferences. The logic of virtuous violence not only explains support for violent policies, but also helps illuminate the paradoxical finding that both rejecting and embracing nuclear strikes were framed as morally righteous acts.

Our findings on the effect of punitive tendencies reinforce this conclusion, as these tendencies proved highly predictive of support for nuclear use. This suggests that nuclear attitudes are not grounded primarily in strategic rationality, but rather in a broader moral-emotional architecture of moralized defense. Individuals who favor punitive domestic policies, such as capital punishment, harsh immigration enforcement, or strong gun rights, tend to view moral order and safety as dependent on the willingness to punish. This disposition appears to generalize across domains: The same moral logic that justifies punishing wrongdoers at home can be extended to the perceived necessity of punishing foreign adversaries, even through catastrophic means.

As shown in figures 11 and 12, gender, punitiveness, and attention to the better bomb interact in revealing ways. Highly punitive women exceed men in their support for a nuclear strike whether or not they compare the two bombs (MOH vs. FOH; MBH vs. FBH). Highly punitive men and women exhibit rather low support for bombing (range 10.3%–22.2%) when they do not compare the two bombs, but they exhibit 69.5%–80.0% support for bombing when they do attend to the betterness of the 100,000-fatality bomb.

Such response patterns may help explain why “better-bomb” reasoning proved so influential. When moral injury associated with punitiveness coexists with cognitive framing (for example, “betterness”), a decision that feels empathic can lead to choices with catastrophic consequences. Punitiveness channels concern for protecting one’s own troops and enemy

28 Slovic et al., “Virtuous Violence from the War Room to Death Row.”

29 Alan Page Fiske and Tage Shakti Rai, *Virtuous Violence: Hurting and Killing to Create, Sustain, End, and Honor Social Relationships* (Cambridge University Press, 2014).

civilians into acts that feel virtuous (for example, killing 100,000 enemy civilians) because they minimize unacceptable military losses while preserving moral agency—saving our troops, for both men and women, and applying decisive cost-benefit considerations of efficacy and deterrence, for men. Together these values suggest that punitiveness does not simply predict aggression; it reshapes the moral logic that justifies it. The result is an ethically perilous form of compassion: harm committed in the name of care.

This interpretation is reinforced by the respondent comments discussed earlier. Many respondents who supported the 100,000-fatality strike described it as the “lesser of two evils,” a “bargain,” or “the better way to go” because it saved American troops while avoiding the still greater slaughter of 2 million civilians. The typology suggests that this sense of moral justification was especially likely when punitive disposition and “better-bomb” comparison converged, helping explain how catastrophic harm could come to feel not merely acceptable, but virtuous.

Fiske and Rai³⁰ call virtuous violence the willingness to harm in the service of moral duty. As Slovic et al.³¹ observe, the moral frame of protection can flip from nuclear restraint to justification when suffering is seen as deserved or redemptive. In this study, punitive worldviews appear to transform the empathic impulse to save troops and civilians into a moralized readiness to support nuclear strikes on civilians—a pattern most visible among highly punitive women who otherwise show strong aversion to civilian harm.

Conclusion

We show that decisions in support of using nuclear weapons arise not solely from strategic logic, but from deeply human cognitive and emotional mechanisms. When individuals confront the possibility of losing American troops, encounter options framed through stark comparisons, or bring punitive worldviews to a crisis, nuclear escalation can come to feel not merely acceptable, but moral. Our findings demonstrate how bounded rationality, emotional heuristics, and moral narratives shape nuclear preferences, sometimes in ways that facilitate restraint, and other times in ways that normalize or justify actions with catastrophic cost.

An important finding concerns the psychological importance of anticipated military losses. In our experiments, even the prospect of losing 100 American soldiers, a scale far below historical wartime fatalities, sharply increased support for nuclear use. These

results align with prospect theory’s prediction that losses loom larger than gains, as well as with prior research suggesting that the deaths of one’s own troops can take on existential significance. When troop losses were unspecified, support for nuclear use dropped substantially, underscoring how loss salience drives nuclear permissiveness. At stake is not simply security calculation, but the psychology of irreplaceable loss: For many respondents, even limited troop fatalities triggered an imperative to act, overwhelming concern for civilians abroad.

A broad measure of punitive orientation replicated and extended prior work and affirmed that punitive individuals are vastly more supportive of nuclear strikes. But partisan differences nearly disappear when punitiveness is held constant, suggesting that conventional “hawkish Republican” effects are better understood as psychological, rather than political. Institutional guardrails thus matter profoundly: Escalatory preferences are not evenly distributed across the polity, and concentrated punitive worldviews in positions of authority may lead to extreme trade-offs, justified in the name of protecting one’s own.

Gender effects further illuminate the contingent nature of nuclear restraint. Women in our study were more supportive of nuclear use when troop losses were salient, and more opposed when they were not. Their written responses and ratings of factors important in their thinking make clear that this reflects protective concern, not indifference to civilian suffering. When American troops were seen as at risk, nuclear use often felt “tragic but necessary.” When troop deaths were not mentioned, women were less supportive than men. These findings complicate assumptions that women are inherently more dovish; instead, they highlight that moral priorities shift with context and that empathy, loyalty, and protective instincts can be recruited toward restraint or escalation depending on how losses are framed.

The experimental manipulation of choice options revealed a very consequential thought pattern: the use of comparison to derive meaning from information that, on its own, is difficult to comprehend. Comparative evaluation transformed the 100,000-fatality nuclear strike into the “better bomb” when it was presented alongside a 2-million-fatality option. In Group A this included a decoy option; in Group B it reflected lesser-evil comparison. For many, a catastrophic act appeared humane and necessary simply because a worse alternative sat beside it. However, comparison did not uniformly erode restraint. For some participants, seeing both bombs together reawakened a moral intuition that

30 Fiske and Rai, *Virtuous Violence*.

31 Slovic et al., “Virtuous Violence from the War Room to Death Row.”

restored a blanket aversion to nuclear use. Overall, however, the presence of a more extreme option pulled many respondents toward a willingness to cross the nuclear threshold where such willingness had not existed before. This is particularly troubling because it parallels how real nuclear options might be presented to leaders: as gradations on an escalation ladder.

These modes of thinking are not new and not confined to psychological experiments. The concept of the lesser evil stretches from Aristotle's *Nicomachean ethics*,³² where a smaller harm appeared "good" when contrasted with a greater one, to Hannah Arendt's warning that those who choose the lesser evil "forget very quickly that they chose evil."³³ In the twentieth century, US leaders invoked the lesser-evil rationale when considering atomic strikes against Japan, and later when weighing options in Korea and Vietnam.³⁴ Our respondents echoed this logic: "100,000 is the lesser of two evils," one wrote, "and saves American lives." Once framed as necessary and comparatively humane, nuclear use became not only acceptable but moral—a deeply consequential cognitive transformation with immense human and geopolitical stakes.

Ultimately, the future of nuclear restraint depends on remembering why restraint once held—and on designing institutions and decision processes that do not rely on memory or rationality alone.

During the Cold War, US leaders ultimately refrained from nuclear use in Korea and Vietnam despite severe troop losses and immense frustration. That restraint, however, was not inevitable. It rested on the visceral memory of Hiroshima and Nagasaki, fear of uncontrollable escalation with the Soviet Union and China, reputational concerns, and political anxieties about appearing racist by

bombing another Asian population. Today, those visceral defenses have faded. Policymakers speak of "tailored deterrence," "low-yield options," and "dial-a-yield flexibility"—language that abstracts and sanitizes nuclear violence, making it easier to consider within ordinary strategic calculus. The erosion of fear and memory leaves cognitive biases less constrained and makes the nuclear threshold psychologically shallower.

These fading defenses threaten more than ethical clarity—they make way for deceptions that threaten strategic coherence. As Joshua Rovner argues, effective grand strategy requires aligning immediate war-time aims with long-term security.³⁵ Yet psychology makes this alignment fragile. Evaluability derived through dubious comparisons encourages tactical "wins" that undermine strategic safety; punitiveness turns vengeance into policy; prominence biases elevate short-term force protection over enduring peace. In our data, the urgent desire to save troops often eclipsed the imperative to prevent catastrophe later. What feels morally righteous in the moment—saving "our" lives—can erode the long-term security that prevents nuclear war and other dire consequences.

The typology in figures 11 and 12 adds something important to these separate findings. It shows that support for nuclear use does not arise from one factor at a time, but rather from the complex interaction of biology, personality, and cognition: gender, punitive disposition, and the tendency to see one nuclear bomb as the "better" bomb because it will kill fewer civilians. That is important for policy because it means that willingness to cross the nuclear threshold can be psychologically constructed in predictable ways, not simply derived from strategic analysis. Nuclear decision-making procedures should therefore be designed not only to improve calculation, but also to interrupt comparison-based moral licensing and other pathways by which catastrophic violence can come to feel justified, necessary, or even virtuous.

Thus the same cognitive science that uncovers these vulnerabilities offers pathways for strengthening restraint. Decision structures should be designed to counter comparative moral licensing: Nuclear menus should always include genuine non-nuclear options, and structured dissent and time for deliberation should be mandatory, in both preplanning and in the moment. Simulations and narrative evidence should make nuclear harm vivid rather than

32 Aristotle, *Nicomachean Ethics*, book III, chapter 1, <https://classics.mit.edu/Aristotle/nicomachaen.3.iii.html>.

33 Hannah Arendt, *Eichmann in Jerusalem: A Report on the Banality of Evil* (Penguin Classics, 2006), 150.

34 Harry S. Truman, "Radio Report to the American People on the Potsdam Conference, August 9, 1945," The American Presidency Project (University of California, Santa Barbara), <https://www.presidency.ucsb.edu/node/230985>; Henry L. Stimson, "The Decision to Use the Atomic Bomb," *Harper's Magazine* 194, no. 1161 (February 1947): 97–107, <https://harpers.org/archive/1947/02/the-decision-to-use-the-atomic-bomb/>.

35 Joshua Rovner, *Strategy and Grand Strategy* (Routledge, 2025).

abstract. Institutional practices that force attention to long-term humanitarian, environmental, and geopolitical consequences can counteract short-term emotional impulses. As Cold War dread fades, new cognitive and procedural guardrails must rise to replace it, ensuring that the enormity of nuclear harm remains psychologically present to decision-makers.

Ultimately, the future of nuclear restraint depends on remembering why restraint once held—and on designing institutions and decision processes that do not rely on memory or rationality alone. Good nuclear judgment is a psychological achievement, not a fixed preference. Protecting humanity from nuclear catastrophe therefore requires treating human emotion and cognition as part of the command-and-control system.

One implication of this idea is that the authority to order the use of nuclear weapons should not rest solely in the hands of a single individual. The decision protocol for nuclear employment should instead be distributed, deliberate, and informed. It should include advance planning and structured education of key personnel—including the president—about the long-term humanitarian, environmental, and geopolitical consequences of nuclear use. In an acute crisis, institutional procedures must guarantee both time and mechanisms for reflection, consultation, and dissent, ensuring that no order to use nuclear weapons is made impulsively or under the distortions of loss, fear, or vengeance. The goal of these steps is not to replace deterrence with emotion, but to rehumanize deterrence: to ensure that strategic thinking remains anchored in moral imagination, historical memory, and an unsparing understanding of what nuclear weapons do. In a world where the emotional defenses against nuclear use are fading, the task is not only to deter adversaries, but to safeguard ourselves from the frailties of our own minds.

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Image: Situation Room: Walt Rostow shows President Lyndon B. Johnson a model of the Khe Sanh area.³⁶

36 For the image, see <https://catalog.archives.gov/id/192584>.