Most Any Reason Is Better Than None: Consequences of Implausible Reasons and Warrants in Brief Written Arguments

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Abstract
Argumentation schema theory guided four experiments on the processing of plausible and implausible reasons and warrant statements testing the hypothesis that most reasons produce greater agreement with claims than when claims are presented without support. Another hypothesis was that leaving warrants unstated often produces greater agreement than when the warrant is made explicit. In Study 1, American participants were more likely to agree with claims after they read arguments than beforehand—even those with implausible reasons and warrants. In Study 2, American history and environmental science majors read brief arguments and agreed more with implausible arguments than claims alone. Study 3, with Chinese participants, replicated some but not all earlier results. In Study 4, with Chinese participants, blatantly false claims supported by bogus reasons yielded marginally greater agreement than unsupported claims. These findings suggest that many people have uncritical argumentation schemata with low support thresholds, making them vulnerable to weak and bogus arguments.

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Keywords
argumentation, argument schema, persuasion, environmental science writing, historical writing

In an era where long-respected journals are derided as “fake news,” and where politicians dissemble on a daily basis, the need to examine the extreme dimensions of argumentation has never been greater. The purpose of this investigation is to understand the consequences of providing unreasonable support for reasonable claims. Although research has shown that strong arguments tend to be more persuasive than poor ones, few studies have examined how different conditions—in this case, implausible reasons and warrants versus unsupported assertions—impact audience perceptions of an argument’s validity. This is important because it is difficult, if not impossible, for writers to support every claim. Decisions about where and how to provide supporting reasons for assertions, and whether and how to express the relationship between claims and reasons are at the heart of the rhetorical endeavor. Our overarching hypotheses are as follows: (a) people will be more persuaded by claims supported by implausible reasons than when those same claims are left unsupported; and (b) the warrants connecting claim and reason are better left unstated as opposed to providing a problematic formulation of the warrant.

Perhaps the most influential theory of argumentation over the past 60 years is Stephen Toulmin’s (1958) jurisprudence model, which seeks to establish the procedures by which claims can be argued. Here legal claims are not only the model, but also a special case of how people typically engage in argumentation. In Toulmin’s terms, claims are supported by data (or grounds) and the connection between the claim and data is the warrant. Toulmin (1958, p. 92) asserts that

data are appealed to explicitly, [and] warrants implicitly. In addition, one may remark that warrants are general, certifying the soundness of all arguments of the appropriate type, and have accordingly to be established in quite a different way from the facts we produce as data. This distinction, between data and warrants, is similar to the distinction drawn in the law-courts between questions of fact and questions of law.

Toulmin’s (1958) conceptualization of the warrant as a globally accepted statement broadly connecting the claim to reason has often come under criticism (Grennan, 1994; Levi, 1995; Wolfe, Britt, & Butler, 2009). Hitchcock (2003) argues that “Toulmin equivocates on whether a warrant is a statement
or a rule, often within the space of one or two pages” (p. 70). There is ambiguity about whether warrants are unstated law-like imperatives or specific segments of text, but clearly warrants are the aspect of arguments that are most commonly left for the reader to infer. Yet there is little, if any, evidence that statements of the warrant are easy for readers and writers to construct, and little consensus about the mental representation of inferred warrants. For example, in two empirical laboratory studies Wolfe and Britt (2003) failed to find evidence that warrants are automatically processed as logical inferences. They found that challenges to the warrant were significantly more frequent when the warrant was present, and that warrants were not “primed” to be read faster. It therefore seems unlikely that readers are routinely making a global warrant inference of the sort suggested by Toulmin (1958).

Another view of argumentation is the pragma-dialectic perspective of van Eemeren and colleagues (2014) that “the ‘basic’ argumentation structure of a single argument consists of one explicit ‘reason’ (consisting of a premise and an unexpressed bridging premise) in favor of a standpoint” (p. 23). One difference between Toulmin’s notion of a “claim” and van Eemeren’s “standpoint” is that, for Toulmin, every assertion implies a claim, whereas not every assertion expressed in argumentative discourse automatically implies a standpoint (van Eemeren et al., 2014). This too suggests that important information in arguments is often not explicitly expressed.

Walton (2006; Walton & Macagno, 2016) presents a pragmatic view and provides an astonishing number of argumentation schemes for different kinds of arguments including argument from cause to effect, argument from consequences, and argument from example. For Walton and Macagno (2016, p. 219), “Argumentation schemes are stereotypical patterns of reasoning with a corresponding set of critical questions, namely defeasibility conditions.” For Walton, an inference is “defeasible,” or subject to default, as new data are processed in real time. “A defeasible argument that has not yet been defeated, while the dialogue is still open, even if it is a strong argument that should be accepted, only requires commitment to the conclusion as still tentative” (Walton, 2006, p. 338). Walton’s argumentation schemes are useful for diagraming and analyzing arguments and even for structuring arguments for artificial intelligence systems (Walton & Macagno, 2016). However, it is not psychologically plausible that most individuals hold dozens of such structures in long-term memory as mental representations used for argumentation.

An approach to argumentation and persuasive communication grounded in social psychology is the elaboration likelihood model (Petty & Cacioppo, 1986). The elaboration likelihood model is a dual process approach suggesting that people process arguments along an elaboration continuum that ranges from a peripheral end with no cognitive elaboration of the issues
relevant to a persuasive message to a central end in which people mentally elaborate on all of the issue-relevant information in the message. Cognitive elaboration includes processes such as comprehension, weighing information, comparing persuasive texts to other knowledge, and estimating the likelihood of claims. Carpenter (2015) conducted a meta-analysis of 134 empirical studies stemming from elaboration likelihood model predicting that “in central processing, there will be a substantial argument strength effect, and in peripheral processing, there will be either a null or a small effect of argument strength” (p. 503). Carpenter (2015) found that for posttest studies, the data were largely consistent with the elaboration likelihood model prediction of an interaction between central versus peripheral processing × weak versus strong arguments, with deviations from predictions for studies that employed a pretest, posttest design instead of the more common posttest-only design.

Our empirical research is theoretically motivated by the notion that reading arguments and writing arguments are both guided by argumentation schemata (Wolfe & Britt, 2008; Wolfe et al., 2009). Wolfe et al. (2009) argue that when people comprehend a written argument, they make use of an argumentation schema, mental representations that organize their knowledge and focuses attention on expected inputs (see Figure 1). In both reading and writing argumentative texts, people have a general preference for expending minimal cognitive effort. Although an argument is, minimally, a claim supported by a reason, other elements of the schema such as warrants, backing, qualifiers, and counterarguments may be brought to bear, though generally at the cost of increased cognitive burdens (Simon, 1982; van Merrienboer & Sweller, 2005). In school-based writing, the argument schema is evoked by demands of an assignment, expectations about the audience, and the goals of the author. In reading arguments, a debatable claim produces expectations or “slots” in the schema to be fulfilled by the text, with the most pressing gap to be filled in the schema being one or more reasons to support the claim. When the argumentation schema is evoked, for example by reading an assertion that is even slightly contestable, the reader expects that claim to be supported by a reason. The most important dimensions of the claim “slot” are the theme, side, and specific predicate of the claim, with each producing expectations to be “fulfilled.” Reasons hold schematic expectations with the most important being, “why should I accept this claim?” Warrants, in this model, need only maintain local coherence between claim and reason, are often generated by the reader automatically, and are not law-like general rules. The argumentation schema includes the potential to generate rebuttals and counterarguments as well as additional reasons and modifications to the claim—but each comes with a cognitive cost of expending more mental effort. People generally tend
to exert as little cognitive effort as possible for a given task (Wolfe, Reyna, & Brainerd, 2005).

Argumentation schema theory leads to some provocative questions and counterintuitive hypotheses. Because schema produce expectations that are frustrated when not fulfilled, it is reasonable to ask if practically any reason is better than none. The rationale for this hypothesis is that when the “reason slot” is fulfilled the schema is “satisfied” and attention may be diverted elsewhere. However, when the metaphorical “box is not checked,” the reader remains unsatisfied with unfulfilled expectations. But because warrants are frequently inferred, and need only provide local coherence, argument schema theory suggests a danger of writing a warrant statement that violates expectations or draws attention to flaws, boundary conditions, or counterarguments. Therefore, we predict that, with respect to persuasion, it is better to let readers generate their own warrants rather than providing them with suboptimal warrant statements.

We sought to address these questions about schema-based expectations in a series of four within-subjects experiments using both plausible and implausible statements of reasons and warrants in brief written arguments. Because “the argumentation schema is a learned, culturally derived set of expectations evoked by argumentative texts” (Wolfe et al., 2009, p. 185), we conducted
our research in two countries, the United States and China. There is a growing body of scholarship about cross-cultural similarities and differences in argumentation. Xie, Hample, and Wang (2015) note that Chinese society is typically portrayed as a culture in which argumentation is viewed negatively and conflict avoidance is viewed positively. Yet contrary to these common beliefs, the authors assessed argumentativeness, verbal aggressiveness, and argument frames in American and Chinese samples and found “a reasonable match to expectations based on Western argumentation theories” (Xie et al., 2015, p. 265). Mercier, Deguchi, van der Henst, and Yama (2016) found that benefits of group decision making with argumentation extended to Japanese research participants. In the context of learning technologies, Hsu, van Dyke, Chen, and Smith (2016) found that both American and Taiwanese middle school students learned science and argumentation skills from a graph-oriented, computer-assisted application, and Cedillos-Whynott et al. (2016) found that women with sufficient argumentation skills could learn about breast cancer by making arguments with the assistance of an intelligent tutoring system. We used the “null hypothesis” as a starting point, that there would be few differences in the treatment of reasons and warrants in argumentation between Chinese and American research participants.

Below, we present four empirical studies in which we used brief written arguments to examine schema-based expectations and the consequences of implausible reasons and warrants. The first two studies had American college student participants, and the last two studies had Chinese college student participants. The first investigated the use of plausible and implausible statements of the reasons and warrants in everyday arguments. Next we examined the role of disciplinary knowledge in the domains of American history and environmental science and the effects of presenting reasonable and false supporting reasons. The third study replicated the first with Chinese rather than American participants. The final study tested the hypothesis that people would be more likely to agree with blatantly false claims when they were supported by good sounding bogus reasons, and disagree more when the false claims were rebutted by solid reasons, compared to unsupported claims.

**Study 1: Implausible Reasons and Warrants in Brief Everyday Arguments**

The purpose of the first study was to test the consequences of presenting plausible and implausible reasons and warrants in brief single-sentence arguments. The study tests two specific hypotheses.
Hypothesis 1: Warrants are better left unstated. We predict that stating weak or implausible warrants will undermine the persuasiveness of arguments and that presenting a “reasonable” statement of the warrant will not increase agreement compared to leaving the warrant implied but unstated. Hypothesis 2: Implausible reasons produce more agreement with neutral claims than leaving the reason unstated. We predict that people are less likely to agree with a neutral but unsupported claim than the same claim supported by a reason that is clearly implausible. In other words, we predict that most any reason is better than none—even an implausible reason connected to a neutral claim with an implausible statement of the warrant.

Method
A total of 120 undergraduate students at Miami University in Oxford, Ohio, USA, participated for course credit. As with studies described below, data were collected in compliance with the institution review board at the time the research was conducted. In a within-subjects design with order-effects manipulated between-subjects, participants were presented with 6 brief everyday arguments in 6 conditions with the order (argument by condition) determined by a $6 \times 6$ Graeco-Latin square. The Graeco-Latin square ensures that each time one condition precedes another the order is reversed for other participants to control for priming and other order effects. All analyses were conducted within subject and these materials are presented as Appendix A. The 6 conditions were claim supported by a plausible reason alone (CR), claim supported by an implausible reason alone (Cr), claim supported by a plausible reason with a plausible warrant (CRW), claim supported by a plausible reason with an implausible warrant (CRw), claim supported by an implausible reason with a plausible warrant (CrW), and claim supported by an implausible reason with an implausible warrant (Crw). All of these elements are presented below.

- Neutral claim (C): “Paul should walk to the store”
- Plausible reason (R): “because walking is good exercise”
- Implausible reason (r): “because walking is the absolute best exercise that will ever exist”
- Plausible warrant (W): “exercising is good for you”
- Implausible warrant (w): “exercising can lead to immortality.”

Thus, each participant received arguments on 6 everyday topics (e.g., walking to the store; see Appendix A) and 6 conditions (CR, Cr, CRW, CRw, CrW, and Crw) with only one condition per topic. The analyses collapsed across
topics and orders to assess the effects of the conditions in what are, for present purposes, nuisance variables.

The materials were presented in short booklets that were administered in a large group setting as pencil and paper tasks (see Appendix A). Participants read each statement and made their ratings without conferring with others. The order of claims and conditions differed among individuals as a counter-balancing measure and to reduce any effects of the group setting. For each of the 6 brief arguments, participants were given 4 tasks. First, they were asked to rate their agreement with claim alone (1 = strongly agree to 5 = strongly disagree). Next, they were asked to rate their agreement with whole argument (i.e., CRW). After that they were asked to rate their agreement with claim again. Finally, participants were asked to rate the believability of the argument constituents (reasons and warrants) as a manipulation check (see Appendix A). All of these ratings were made on the same page for each argument ensuring that there was no memory load to account for any differences in ratings. Data were analyzed with repeated measures ANOVA.

**Results**

Our first analysis was to see if implausible reasons and warrants were, in fact, less believable than plausible ones, as a manipulation check. On a scale where 1 = strongly believe and 5 = strongly disbelieve, plausible reasons rated a mean of 1.87 and implausible reasons rated a mean of 3.81, $F(1, 119) = 171.09, p < .0001$. Plausible reasons with plausible warrants rated a mean of 1.85 and implausible reasons with plausible warrants rated a mean of 3.99, $F(1, 119) = 366.72, p < .0001$. Finally, plausible reasons with implausible warrants rated a mean of 2.00 and implausible reasons with implausible warrants rated a mean of 3.92, $F(1, 119) = 425.71, p < .0001$. This indicates that our judgments about the plausibility of reasons matched those of the participants. Similarly, claims with plausible reasons and plausible warrants had a mean believability rating of 1.42, which was significantly higher than the mean rating of 3.96 for claims with plausible reasons and implausible warrants, $F(1, 119) = 624.00, p < .0001$. Claims with implausible reasons and plausible warrants had a mean believability rating of 1.43, which was significantly higher than the mean rating of 4.00 for claims with implausible reasons and implausible warrants, $F(1, 119) = 656.96, p < .0001$. As with implausible reasons, implausible warrant statements were rated as less believable than plausible warrant statements.

Turning to the influence of the reason and warrant statement on agreement, arguments with plausible reasons produced significantly higher levels of agreement both alone and with a plausible warrant (see Table 1). Claim
and plausible reason (CR) yielded more agreement compared to claim with implausible reason (Cr), $F(1, 119) = 30.69, p < .0001$. Claim, plausible reason, and plausible warrant (CRW) produced more agreement than claim, implausible reason, and plausible warrant (CrW), $F(1, 119) = 21.90, p < .0001$. However, the believability of the reason did not significantly affect agreement when paired with an implausible warrant statement. Here, claim, plausible reason, and implausible warrant (CRw) and claim, implausible reason, and implausible warrant (Crw) were not significantly different, $F(1, 119) = 1.69, p = .19$.

As expected, arguments with plausible warrants produce greater agreement than those with implausible warrants. There was more agreement for CRW than CRw, $F(1, 119) = 12.25, p < .0001$, and for CrW compared to Crw, $F(1, 119) = 13.62, p < .0001$. However, CRW produced mean agreement that was not significantly different from the mean for CR, $F(1, 119) = 0.26, p = .61$. Yet agreement for CRw was significantly worse than both, $F(1, 119) = 45.43, p < .0001$. This provides evidence for the hypothesis that explicitly stating a plausible warrant does little to make an argument more persuasive whereas providing a statement of the warrant that is implausible undermines agreement.

Our second hypothesis was tested by comparing agreement with the claim before and after reading the entire argument. As can be seen in Figure 2, in each of the 6 conditions the participants agreed significantly more with the claim after reading the whole argument than beforehand, in each case $p < .0001$. This is the case even when the claim was supported with implausible reasons and warrants. People agree more with the claim “Paul should walk to the store” after reading “walking is the absolute best exercise that will ever

### Table 1. Mean Agreement Rating by Condition (Low Indicates More Agreement, N = 120).

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean</th>
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<tbody>
<tr>
<td>Claim supported by a plausible reason alone (CR)</td>
<td>1.72</td>
</tr>
<tr>
<td>Claim supported by an implausible reason alone (Cr)</td>
<td>2.58</td>
</tr>
<tr>
<td>Claim supported by a plausible reason with a plausible warrant (CRW)</td>
<td>1.68</td>
</tr>
<tr>
<td>Claim supported by a plausible reason with an implausible warrant (CRw)</td>
<td>2.62</td>
</tr>
<tr>
<td>Claim supported by an implausible reason with a plausible warrant (CrW)</td>
<td>2.25</td>
</tr>
<tr>
<td>Claim supported by an implausible reason with an implausible warrant (Crw)</td>
<td>2.84</td>
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</table>
exist, and exercising can lead to immortality” than when they read the same claim alone.

**Discussion**

It appears that, for the brief everyday arguments studied here, there is little upside in making the warrant explicit but a real downside risk of weakening an argument with a questionable warrant statement. Perhaps this explains why in authentic arguments and student writing warrants are so often left unstated (Wolfe, 2011). This result is also consistent with the notion that warrants are typically processed for local coherence (Wolfe et al., 2009) rather than as Toulmin (1958) suggests, “broad universal statements authorizing the link between claim and data” (Wolfe, 2011, p. 195).

A more striking finding for these admittedly inauthentic arguments is that even the most untenable formulations of reasons and warrants significantly increased agreement with neutral claims such as “Don should cut his front lawn.” This result can be explained by the operation of an argumentation schema (Wolfe et al., 2009). When the argument schema is evoked, the schema creates an expectation for a reason to fulfill that “slot” in the schema. Although a good reason is clearly better than a poor one, leaving the slot unfilled provokes the question “why,” and is less likely to produce agreement.
unless the answer is self-evident. Thus, even a ridiculous reason such as “because the grass is 7.6 feet tall” fulfills the reason slot in the argumentation schema and once satisfied is more likely to produce agreement than no reason at all. Although there are undoubtedly limits on the role of minimally satisfying the argument schema to produce agreement, we suspect that for many types of communication, including political discourse, as long as one isn’t negatively inclined toward the claim from the onset, almost any reason is better than none.

One potential criticism of the design of this study is that participants were “primed” to expect that a reason would be supported when evaluating the claim alone. It is true that for each argument all conditions were presented on the same sheet of paper. However, the well-known bias to appear internally consistent works against our hypothesis. In other words, the fact that the influence of implausible reasons was transparent to participants should reduce rather than amplify such effects. Moreover, the counterbalancing of problems in the $6 \times 6$ Graeco-Latin square ensures that any such effects would be systematically distributed across problems.

One could also question whether we were actually manipulating statements of the warrant. All of our warrant statements met the argumentation schema theory criteria of connecting claim to warrant at the level of local coherence. However, most of our implausible warrant statements did not meet Toulmin’s (1958) criteria of being law-like, though they are closer to Walton’s (2006) notion of warrants as rules of inference. Someone using Toulmin’s jurisprudence model might suggest that our warrant statements are better thought of as additional premises. However, given the difficulty many writers have generating law-like warrant statements, our finding that additional premises linking claim to reason reduce agreement highlights the empirical consequences of misstating the warrant and also have ramifications for other theoretical frameworks.

**Study 2: Disciplinary Knowledge and the Consequences of Good and Bogus Reasons**

Study 2 examines the relationship between knowledge of academic disciplines, in this case American history and environmental science, and the consequences of good and poor reasons on the effectiveness of brief written arguments. The relationship between domain knowledge and higher order literacy skills including argumentation is complex. In a classic developmental study of domain knowledge, informal reasoning, and argumentation, Means and Voss (1996) found that knowledge significantly related to the
number and type of reasons generated, but not to the soundness or acceptability of arguments, which were explained by ability track (which were IQ-based). More recently Schmidt, Rothgangel, and Grubec (2017) studied recall of arguments and found that prior domain knowledge helped students recall arguments. Presumably, most educators would hope that their students would be better able to identify and dismiss arguments made on specious grounds.

*Hypothesis 1:* Domain-specific knowledge (of U.S. history and environmental science) influences the persuasiveness of arguments through the believability of supporting reasons.

*Hypothesis 2:* With knowledge of a domain, bogus reasons do more harm than leaving the reason unstated (i.e., the order of persuasiveness will be claim + good reason > claim alone > claim + bogus reason) with the alternative being that most any argument is better than none (i.e., the order of persuasiveness will be claim + good reason > claim + bogus reason > claim alone).

*Method*

Participants were 24 junior and senior undergraduate history majors and 24 upper-class environmental science majors at Miami University in Oxford, Ohio, USA, who were paid to participate. Each read 48 brief statements (24 about U.S. history and 24 about environmental science; see samples in Appendix A). For each knowledge domain, 8 statements presented the claim alone, 8 statements presented claim and good reason, and 8 statements presented claim and bogus reason. To illustrate, for history:

- Claim alone is that “Warren G. Harding was America’s worst president.”
- A claim and historically good reason is “Warren G. Harding was America’s worst president because his administration awarded leases on oil fields to a consortium that ‘kicked back’ money to administration officials.”
- A claim and historically bogus reason is “Warren G. Harding was America’s worst president because he involved the United States in a costly and unnecessary war.”

An example for environmental science:

- Claim alone is “We know a single super continent named Pangea existed at one time.”
• A claim and scientifically good reason is “We know a single super continent named Pangea existed at one time because of evidence from paleomagnetism and geologic evidence such as fossils.”
• A claim and scientifically bogus reason is “We know a single super continent named Pangea existed at one time because it was identified on ancient maps throughout the old-world.”

For each statement, participants rated agreement with each statement on the scale 1 = strongly agree to 7 = strongly disagree, then rated the quality of each argument on the scale 1 = strong argument to 7 = weak argument (see Appendix B). Form (i.e., position and statement-condition pairing) was determined by an incomplete 4 × 4 Latin square. Thus, each participant got each claim, and an equal number of items within each condition. Following the main task, participants were given a brief multiple-choice quiz on American history and environmental science to confirm our expectations that students would know more about their major than the other field. Participants completed the tasks individually under laboratory conditions. Analyses were collapsed across arguments and forms with the data analyzed using repeated measures ANOVA.

Results

Results of the knowledge quizzes confirm that participants know more about their major field of study than the other area. On the 15-item America history multiple-choice test, history majors scored an average of 8.0, which was significantly higher than the mean of 4.9 scored by environmental science majors, $F(1, 46) = 16.2, p < .001$. By the same token, on the 15-item environmental science multiple-choice test, environmental science majors scored an average of 8.5, which was significantly higher than the mean of 6.2 scored by history majors, $F(1, 46) = 24.5, p < .0001$. Although far from experts, the student participants do differ as expected in their domain-specific knowledge.

On materials in the domain of environmental science, there was a main effect for major (see Table 2). Environmental science majors were significantly more likely to agree with statements with a mean of 3.18 than history majors with a mean of 3.76, $F(1, 46) = 13.87, p < .001$. There was also a main effect for statement type. Participants were more likely to agree with arguments supported by either good or bogus reasons than claims alone. The claim alone mean was 3.93, the claim and bogus reason mean was 3.21, and the claim and good reason mean was 3.26, $F(2, 92) = 14.09, p < .0001$. There was also an interaction between major and statement type—but not one we predicted. History majors agreed more with arguments including bogus reasons than either those with good reasons or claims alone. Environmental
science majors agreed more with arguments supported by either bogus or good reasons than claims alone, $F(2, 92) = 7.88, p < .001$.

On statements in the domain of American history, the main effect for major was not significant, $F(1, 46) = 1.75, p = .19$. There was a main effect for statement type (see Table 3). Participants agreed less with the claim alone than when the claim was paired with a good or bogus reason. The means were 4.47 for agree with claim alone, 3.93 for agree with claim and bogus reason, and 4.01 for agree with claim and good reason, $F(2, 92) = 9.24, p < .001$. The interaction of major and statement type was not significant, $F(2, 92) = 1.08, p = .34$. Thus, for both the domain of American history and that of environmental science, participants, regardless of major, were significantly more likely to agree with a claim paired with a bogus reason than the same claim alone. Once again, it appears that most any reason is better than none.

Turning to ratings of the strength or quality of the arguments, in the domain of environmental science there was a main effect for major. Environmental science majors rated the statements as higher in quality, with a mean of 3.52 compared to a mean of 4.03 for history majors, $F(1, 46) = 8.74, p < .01$. There was also a main effect for statement type. Participants of

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<tr>
<th>Table 2. Mean Agreement Rating by Environmental Science and History Majors for Environmental Science Statements Presented Alone, Supported by Bogus Reasons, or Supported by Good Reasons ($1 = high quality$ to $5 = low quality$).</th>
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<tr>
<td><strong>Claim</strong></td>
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<td>Environmental science majors</td>
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<td>History majors</td>
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<th>Table 3. Mean Agreement Rating by Environmental Science and History Majors for American History Statements Presented Alone, Supported by Bogus Reasons, or Supported by Good Reasons ($1 = high quality$ to $5 = low quality$).</th>
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both majors rated arguments supported by bogus reasons as better in quality than claim alone or claim supported by a good reason. The quality of claim and bogus reason mean was 3.28, the mean quality of the claim alone was 4.18, and the mean quality of claim and good reason was 3.87, $F(2, 92) = 9.24, p < .001$. Finally, the interaction of major and statement type was not significant, $F < 1, p > .05$. For the history arguments, there were no significant effects, the main effect for major was not significant, $F < 1, p > .05$; the main effect for statement type was not significant, $F < 1, p > .05$; and the major by statement type interaction was not significant, $F < 1, p > .05$. Thus, in neither domain did participants recognize that claim supported by a historically or scientifically bogus reason was of lower quality than the same claims supported by a valid reason. Indeed, in the case of environmental science claims we were able to fool participants of either major into rating the arguments with bogus claims significantly higher on strength or quality.

**Discussion**

Historical and scientific claims supported by good and bogus reasons produced greater agreement than claims alone. Thus, the hypothesis that people with greater domain-specific knowledge would agree more strongly with unsupported claims than those supported by bogus reasons was not substantiated by the data. Rather, it appears that most any reason is better than none, even for people who are more knowledge about the topic at hand. It seems that the argumentation schema “demands” a reason that can easily be filled by even relatively flimsy statements such as optimal effectiveness is rare in plants “because natural selection favors other phylum with evolutionary advantages.”

We were surprised that in the domain of environmental science, bogus reasons were endorsed as higher in quality or strength than reasonable reasons. Besides confirming our abilities as “fabricators,” it may be that the link between the claims and bogus reasons was stronger than the more typically qualified statements typically seen in environmental science writing. For example, a reasonable reason to support the claim “If nuclear plants generated all of our electricity, acid rain would be greatly reduced” is “because sulfur dioxide and nitrogen oxides may be the primary causes of acid rain and probably about 2/3 of all sulfur dioxide in the U.S. come from electric power plants burning fossil fuels.” The bogus reason, “because discharges from nuclear reactors are remarkably alkaline,” is empirically false, but if it were true there would be a direct inverse relationship between acidity and alkalinity, whereas the more qualified statement about sulfur dioxide and nitrogen oxides merely implies but does not explicitly state that nuclear reactors do
not produce these byproducts. These results are consistent with those of Means and Voss (1996) that knowledge was not related to argument soundness or acceptability judgments.

**Study 3: A Chinese Replication of Study 1 on Implausible Reasons and Warrants**

The purpose of Study 3 was to see whether the results would replicate with Chinese participants. The predictions were the same as for Study 1.

**Method**

**Participants.** A total of 120 undergraduate students (94 females, 26 males) from different majors at Central China Normal University in China participated in this study. All participants were native Chinese speakers.

**Materials.** There were 6 Chinese items translated from Study 1 materials. For each item, there were plausible (or implausible) reasons and warrants. Two of the original items were replaced because those topics were not suitable for Chinese undergraduate students. The character names in the items were changed to common Chinese names. Then 20 graduate students evaluated the believability of these reasons and warrants with a 5-point scale (1 = strongly disbelieve to 5 = strongly believe), which is flipped from the scale used in Study 1. Based on the initial evaluation, some reasons and warrants that were close to 3 (neutral) were modified.

**Design.** There were 6 conditions for every item: claim–plausible reason (CR), claim–implausible reason (Cr), claim–plausible reason–plausible warrant (CRW), claim–plausible reason–implausible warrant (CRw), claim–implausible reason–plausible warrant (CrW), claim–implausible reason–implausible warrant (Crw). Each participant received all these 6 conditions of 6 items which means a within-subjects design. To balance the sequence effect, 6 forms (argument position by condition) were determined by a 6 × 6 Graeco-Latin square.

**Procedure.** Each participant was given one of the six forms in which the tasks were included: rate agreement with claim alone (1 = strongly disagree to 5 = strongly agree), rate agreement with whole argument (CR, Cr, CRW, CRw, CrW, or Crw), rate agreement with the claim again, and rate the believability of argument reasons and warrants as a manipulation check. After finishing the study, the students were given a small gift for their participation.
Results

As with Study 1, our first analysis was to see if implausible reasons and warrants were less believable than plausible ones, as a manipulation check. On a scale from 1 (strongly disagree) to 5 (strongly agree), plausible reasons rated a mean of 3.75 and implausible reasons rated a mean of 2.78, $F(1, 119) = 59.75, p < .0001$. Plausible reasons with plausible warrants rated a mean of 4.17 and implausible reasons with plausible warrants rated a mean of 3.52, $F(1, 119) = 36.97, p < .0001$. Plausible reasons with implausible warrants rated a mean of 3.02 and implausible reasons with implausible warrants rated a mean of 2.39, $F(1, 119) = 20.25, p < .0001$. Although the differences were smaller than those for their American counterparts, this indicates that our judgments about the plausibility of reasons matched those of the participants. Similarly, claims with plausible reasons and plausible warrants had a mean believability rating of 4.17, which was significantly higher than the mean rating of 3.02 for claims with plausible reasons and implausible warrants, $F(1, 119) = 66.90, p < .0001$. Claims with implausible reasons and plausible warrants had a mean believability rating of 3.52, which was significantly higher than the mean rating of 2.39 for claims with implausible reasons and implausible warrants, $F(1, 119) = 60.84, p < .0001$. As was the case in the U.S. study, with implausible reasons, implausible warrant statements were rated as less believable than plausible warrant statements.

As in Study 1, arguments with plausible reasons produced significantly higher levels of agreement both alone and with a plausible warrant (see Table 4). For the claim and plausible reason (CR) agreement was higher compared to claim implausible reason (Cr), $F(1, 119) = 59.75, p < .0001$. For the claim, plausible reason, and plausible warrant (CRW) the agreement was higher compared to claim, implausible reason, and plausible warrant (CrW), $F(1, 119) = 36.97, p < .0001$. However, unlike Study 1, the believability of the reason significantly affected agreement when paired with an implausible warrant statement. Here, claim, plausible reason, and implausible warrant (CrW) was higher than claim, implausible reason, and implausible warrant (Crw), $F(1, 119) = 60.84, p < .01$.

As in Study 1, arguments with plausible warrants produce greater agreement than those with implausible warrants. The mean agreement for CRW was higher than CRw, $F(1, 119) = 66.90, p < .0001$, and agreement for CrW was higher than for Crw, $F(1, 119) = 60.84, p < .0001$. However unlike Study 1, CRW produced more agreement than CR, $F(1, 119) = 5.48, p = .027$. Agreement for CRW was significantly higher than Crw, $F(1, 119) = 60.84, p < .0001$. As in Study 1, providing a statement of the warrant that is implausible undermines agreement. Yet a plausible warrant statement slightly but significantly increased agreement with arguments with implausible reasons.
Our second hypothesis was tested by comparing agreement with the claim before and after reading the entire argument. Whereas in Study 1, in each of the 6 conditions the participants agreed significantly more with the claim after reading the whole argument than beforehand, in this study that was only true in two conditions. For a claim with a plausible reason and warrant (CRW) the initial agreement with the claim was a mean of 3.58 and after reading the whole argument it was 3.74, $F(1, 119) = 10.82, p = .001$. For a claim with a plausible reason and implausible warrant (CRw), the initial agreement with the claim was a mean of 3.46 and after reading the whole argument it was 3.58, $F(1, 119) = 5.71, p = .019$. However, the initial and final agreement with the claim were not significantly different for claims with plausible claims and reasons (CR), $F(1, 119) = 1.56, p = .21$; claims with implausible reasons (Cr), $F(1, 119) = 2.96, p = .09$; claims with implausible reasons and warrants (Crw), $F(1, 119) = 0.04, p = .85$; or claims with implausible reasons and plausible warrant statements (CrW), $F(1, 119) = 1.35, p = .25$.

### Discussion

The most expected findings of Study 1 were replicated, while some of the most interesting results were not. Plausible reasons and statements of the warrant produced greater agreement than implausible reasons and warrants. However, plausible warrant statements help increase agreement with neutral claims supported by implausible reasons. Moreover, in only two of six conditions did the claim alone produce greater agreement after an argument was read than initially. Unlike Study 1, the present study did not strongly uniformly support the assertion that any reason is better than none.
There are several possible explanations for the differences in results between Study 1 and Study 3. One obvious difference is the cultural context. For Chinese participants, plausible reasons and warrants produce greater believability whereas implausible reasons and warrants decrease belief, which could be explained by their field-dependent cognitive style (Nisbett, Peng, Choi, & Norenzayan, 2001). Western countries are found to be high on individualism reflecting independence and detaching from groups, whereas Eastern countries are described in terms of collectivism centering on relationship hierarchies and harmony. Nisbett et al. (2001) describe the East as preferring holistic cognition which has an orientation toward the whole field and assigning causality to it. This is linked to the cognitive style of field dependence, with a special focus on the relationship between the object and the context.

Of course, there are other explanations for the differences between the first and third studies besides cultural differences. There were some differences between the materials used in the studies with some arguments adapted to the Chinese language and context, and a different scale (1 = strongly agree in the first study and 1 = strongly disagree in the present study). The differences could also be attributed to language. Recent research in cognitive neuroscience reveals differences between writers (and readers) of English and Chinese in the activation of the left middle frontal gyrus, whether they are native Chinese or English speakers (Cao & Perfetti, 2016). Both institutions are well respected, but there may be academic differences among the two subject populations. The participants at CCNU attend a school that is considered the 6th ranked psychology program in China (CUCAS, 2015) and ranked 50th overall in that country according to Academic Ranking of World Universities (2015). Miami University participants attend a school with mean ACT scores above the 90th percentile (Fracchia, 2016; Miami University, 2016), ranking 79th in the United States according to U.S. News & World Report (2017).

Interestingly, in the manipulation checks, Chinese participants rated plausible and implausible reasons and plausible and implausible warrants with higher agreement than their American counterparts. Flipping the scale for the American participants (to make it 1 = strongly disagree and 5 = strongly agree), plausible reasons ranked 3.13 for American and 3.75 for Chinese participants, implausible reasons ranked 1.19 for American and 2.78 for Chinese participants, plausible reasons with plausible warrants ranked 3.3 for American and 4.17 for Chinese participants, and plausible reasons with implausible warrants ranked 3.00 for American and 3.72 for Chinese participants. This contradicts an explanation that the Chinese participants simply found the implausible reasons and warrants less plausible than did American
participants. Finally, it is possible that one would have difficulty replicating Study 1 in any setting, including Miami University.

**Study 4: Can Bogus Reasons Salvage Blatantly False Claims?**

Given the propensity of Chinese participants to distinguish between plausible and implausible reasons, we wanted to test the hypothesis that participants would be more likely to agree with blatantly false claims when they were supported by “good” (i.e., plausible) sounding reasons that were themselves bogus, and disagree more when the false claims were rebutted by solid reasons, compared to claims with no reason at all. This extends the hypothesis that “most any reason is better than none” to unbelievable claims and tests whether agreement can be manipulated depending on the nature of the reasons.

**Method**

The same 120 participants used in Study 3 also ranked agreement with 6 false claims under 3 different conditions, false claim alone, false claim supported by a false but good sounding reason, and false claim rebutted by a reasonable reason. For example, a false claim (c) is “Bats do not really have wings;” a false claim supported by a bogus but good sounding reason (cbr) is “Bats do not really have wings because birds have wings and bats are not birds;” and a false claim that is rebutted by an opposing reason (cor) is “Bats do not really have wings. It’s wrong because bats can fly.” The method of this within-subjects experiment is otherwise the same as for Study 3.

**Results**

On a scale from 1 (strongly disagree) to 5 (strongly agree), false claims alone (c) had a mean of 1.97; false claims supported by good sounding but bogus reasons (cbr) had a mean of 2.05; false claims unsupported or refuted by an opposing reasons (cor) had a mean of 3.86; and reversed scored false claims rebutted by the reasons (reversed-scored cor) had a mean of 1.14. The degree of increased agreement caused by good sounding reasons (cbr) was of marginal statistical significance, $F(1, 119) = 3.57, \, p = .06$. Although not quite significant at $p < .05$, this marginal trend indicates that even bogus reasons such as “because birds have wings and bats are not birds” may have an effect on persuasiveness. The rebuttal opposing reasons had a strongly and significant effect on agreement both for cor, $F(1, 119) = 670.81, \, p < .001$, and for
reverse-scored cor, $F(1, 119) = 185.50, p < .001$. Reasons such as “it’s wrong because bats can fly” increased disagreement over and above the low level of 1.97 for the false claims alone.

**Discussion**

Study 4 provided some support for the claim that most any reason is better than none. Even claims producing high levels of disagreement by themselves could produce higher levels of disagreement when refuted by good opposing reasons. Moreover, bogus reasons had a marginally significant effect on the persuasiveness of arguments. This suggests that, as in the American context, Chinese participants can be influenced in either direction by reasons. It also provides a compelling demonstration that the persuasiveness of reasons extends to blatantly false claims. Apparently for these participants, extraordinary claims did not require extraordinary evidence to produce changes in agreement.

**General Discussion**

Writers clearly face hazards when they overstate or misstate the warrant. In both studies of warrants, Study 1 with U.S. participants and Study 3 with Chinese participants, implausible warrants decreased the persuasiveness of arguments. Readers exhibited significantly lower agreement ratings when an implausible warrant was stated than when the same arguments left the warrant unstated. With the U.S. sample plausible warrant statements did not significantly improve agreement ratings whereas with the Chinese sample they did. Moreover, in Study 3 the two claims that were rated higher after an argument than beforehand were both accompanied by explicit warrant statements (both plausible and implausible).

As noted previously, these findings using brief written arguments are consistent with the theoretical position that warrants typically address local coherence (Wolfe et al., 2009) rather than global or superordinate statements such as that a man born in Bermuda is a British citizen as being warranted by the fact that Bermuda was part of the British Empire (Toulmin, 1958). However, as we have also discussed, our warrant statements were not generally stated as laws, though they are somewhat consistent with the idea that warrants are rules of inference (Walton, 2006). Thus, it is possible that more plausible and law-like warrant statements would have yielded higher levels of agreement. In future work, it would be interesting to see if our finding about warrants holds when plausible and implausible warrant statements are formulated to the satisfaction of scholars working from different theoretical orientations.
We also found support for the notion that most any reason that fulfills the reasons slot in an argument schema is better than leaving the argumentation schema wanting a reason. In Study 1, all of the neutral claims were rated higher after participants read arguments with reasons than before when they read the same claims alone. In Study 2, historical and scientific claims supported by good and bogus reasons produced greater agreement than claims alone. In Study 3, the key finding of Study 1 was replicated for only two of six conditions. Finally, in Study 4, reasons forming counterarguments decreased agreement with already unbelievable claims and there was a marginal trend for bogus supporting reasons to increase agreement with those same unbelievable claims ($p = .06$).

The results of Study 2 suggest that educators would be wise to focus more attention on argumentation in the context of undergraduate courses on history and environmental science. In future research, it would be interesting to explore whether evaluating students on their ability to distinguish between arguments supported by solid or specious reasons would improve performance on other critical thinking and comprehension measures.

A virtue of the within-subjects design of these studies is that participants serve as their own control group. Moreover, complementary findings across cultural settings may provide tentative insights into similarities and differences in argumentation schemata in the United States and China. Yet these studies suffer from a number of weaknesses. Needless to say, these studies used brief, artificial arguments devoid of the context that is critical to authentic arguments (see Wolfe & Britt, 2008) or academic arguments typical of academic exercises (Wolfe, 2011). Moreover, persuasiveness comprises much more than rating agreement. Thus, although these studies hint at surprising limits of written warrants and the surprising strength of unbelievable reasons, they are far from definitive.

Part of the motivation for this research was to compare argumentation in two cultural contexts. We found significant differences between plausible and implausible reasons (and warrants) for Chinese undergraduates, perhaps because they are convergent thinkers and have a unified and standard understanding for plausibility. Consistent with the cultural prediction about Eastern and Western cultures differing between social and individual learning (Chang et al., 2011), there are different cultural beliefs about learning between Chinese and American students. For example, in one study Chinese students defined learning in terms of memorization, copying, following instruction, and authorities whereas American students regarded learning as fulfilling curiosity and interest, “adventure,” and “challenge assumptions” (Li, 2003). The Chinese teaching environment is found to create consistency and uniformity whereas the American teaching method is believed to foster creativity.
and critical thinking (An, Kulm, & Wu, 2004). Chinese education focuses on standardized school tests, which makes students become convergent thinkers (i.e., searching for the correct answer) and neglect divergent ways of thinking (Saad, Cleveland, & Ho, 2015). However, as we have noted, there are potentially other noncultural explanations of our findings including language and institution. Future research with participants fluent in both English and Chinese in the U.S. and China employing within-subjects manipulations could help disentangle some of these issues.

It appears that writers should be cautious of making unsupported claims. Yet they may have more license in providing weak support than is generally recognized. Of course, there are other strategies for masking naked claims such as hiding them in the form of a question. Questions evoke a question schema, which encourages the reader to provide an answer, and take the hidden claim as given. In future research, it would be interesting to explore whether a question such as “Why don’t bats really have wings?” leads to greater agreement or acceptance than an unsupported assertion such as “bats do not really have wings” or the same claims supported by manifestly bogus reasons such as “bats do not really have wings because birds have wings and bats are not birds.” This could be addressed in an examination of propositions masked as questions.

Another approach is to employ communication media that suppress the argumentation schema. For example, Twitter, with its 140-character-limit convention, nudges readers to expect bold and unsupported assertions. Thus, it is not surprising that it has become a favorite of politicians who wish to make strong claims without evoking readers’ expectations of supporting evidence. In future research, one could take the same supported and unsupported political claims and present them in different media such as tweets versus email messages versus “policy positions” to explore the schema evoking potential of context.

Appendix A

Sample Arguments and Instructions for Study 1

(Instructions and scale presented only for the first item.) Please read the following statements. You will be asked to rate them by circling the appropriate response. Take your time, and please work in the order that they are presented on the page.

1. Please rate how much you agree with the statement, “Julia needs to replace the old brakes in her car,” by circling one of the following.
Now read the following statement:

“Julia needs to replace the old brakes in her car because old brakes make steering impossible, and working brakes provide more safety when driving.”

2. Please rate how much you agree with the statement, “Julia needs to replace the old brakes in her car because old brakes make steering impossible, and working brakes provide more safety when driving,” by circling one of the following.

1 strongly agree  2 agree  3 neutral  4 disagree  5 strongly disagree

3. Please rate how much you now agree with the statement, “Julia needs to replace the old brakes in her car,” by circling one of the following.

1 strongly agree  2 agree  3 neutral  4 disagree  5 strongly disagree

4. Please rate how much you believe the statement, “Old brakes make steering impossible,” by circling one of the following.

5. Please rate how much you believe the statement, “Working brakes provide more safety when driving,” by circling one of the following.

1 strongly agree  2 agree  3 neutral  4 disagree  5 strongly disagree

1. Please rate how much you agree with the statement, “Don should cut his front lawn,” by circling one of the following.

Now read the following statement:

“Don should cut his front lawn because the grass is 7.6 feet tall, and tall grass is grounds for a felony charge.”
2. Please rate how much you agree with the statement, “Don should cut his front lawn because the grass is 7.6 feet tall, and tall grass is grounds for a felony charge,” by circling one of the following.

3. Please rate how much you now agree with the statement, “Don should cut his front lawn,” by circling one of the following.

4. Please rate how much you believe the statement, “The grass is 7.6 feet tall,” by circling one of the following.

5. Please rate how much you believe the statement, “Tall grass is grounds for a felony charge,” by circling one of the following.

1. Please rate how much you agree with the statement, “Anne should buy new shoes,” by circling one of the following.

Now read the following statement:

“Anne should buy new shoes because the shoes she is wearing now are too small for her feet.”

2. Please rate how much you agree with the statement, “Anne should buy new shoes because the shoes she is wearing now are too small for her feet,” by circling one of the following.

3. Please rate how much you now agree with the statement, “Anne should buy new shoes,” by circling one of the following.

4. Please rate how much you believe the statement, “The shoes she is wearing now are too small for her feet,” by circling one of the following.

1. Please rate how much you agree with the statement, “Dawn should make her bed,” by circling one of the following.

Now read the following statement:

“Dawn should make her bed because good looking rooms attract wish granting genies.”

2. Please rate how much you agree with the statement, “Dawn should make her bed because good looking rooms attract wish granting genies,” by circling one of the following.

3. Please rate how much you now agree with the statement, “Dawn should make her bed,” by circling one of the following.
4. Please rate how much you believe the statement, “Good looking rooms attract wish granting genies,” by circling one of the following.

1. Please rate how much you agree with the statement, “Bobby should pay in advance for outdoor seating,” by circling one of the following.

Now read the following statement:

“Bobby should pay in advance for outdoor seating because the forecast is for nice weather, and sitting outside on a nice day ensures complete happiness.”

2. Please rate how much you agree with the statement, “Bobby should pay in advance for outdoor seating because the forecast is for nice weather, and sitting outside on a nice day ensures complete happiness,” by circling one of the following.

3. Please rate how much you now agree with the statement, “Bobby should pay in advance for outdoor seating,” by circling one of the following.

4. Please rate how much you believe the statement, “The forecast is for nice weather,” by circling one of the following.

5. Please rate how much you believe the statement, “Sitting outside on a nice day ensures complete happiness,” by circling one of the following.

Appendix B

Sample Arguments in American History and Environmental Science

(Instructions and scale presented only for the first item.)

Rate the Statements. In this section you will be given a number of brief statements. For each statement you will be asked to provide your opinions in the form of numeric ratings. You will be asked to rate your agreement with each statement, and asked to rate the quality of the argument provided in that statement. Please answer every item, and please do not flip back to previous pages once you have turned the page.

Strict limits on coal burning are likely to do little to halt the depletion of ozone in the atmosphere.

Rate your agreement with the statement from 1 = Strongly Agree to 7 = Strongly Disagree by circling the appropriate number.
Rate the quality of the argument—regardless of whether you agree or disagree—from 1 = Strong Argument to 7 = Weak Argument by circling the appropriate number.

1  2  3  4  5  6  7
Strongly Agree  Strongly Disagree

Tobacco was the salvation of the British colonies in the New World because Jamestown survived as the result of the emergence of tobacco as a cash crop.

Obtaining carbon dioxide for photosynthesis was not the most difficult problem facing the first land plants.

The Spanish-American war was caused by Yellow Journalism because newspaper mogul William Randolph Hearst used sensational and exploitative stories to stir up public opinion and force President McKinley to wage a war against Spain.

The government should not be concerned with trying to prevent climate changes due to meteorites.

The primary cause of the civil war was slavery.

History will never forgive Richard Nixon because of his possible involvement in illegal activities to ensure his reelection.

Congress’s decision to impeach President Andrew Johnson was wholly justifiable because he repeatedly tried to seize control of the army and defy congress.

In WWII, President Truman was justified in making the very difficult decision to drop the Atomic bomb because a lengthy and vicious ground fight probably would have cost far more American and Japanese lives.

Legislation is needed to protect riparian zones because large and healthy riparian zones may improve water quality, provide habitat, and possibly act as wildlife corridors.

People should greatly restrict their consumption of tuna fish because tuna are predators at the top of the food chain that collect high levels of poisonous Mercury from the fish they eat.

Genetically modified organisms threaten biodiversity because biotechnologically altered crops have been found in varieties of corn grown in Mexico, affecting natural variation.
Indigenous species in Florida are among the most threatened in the U.S. because Florida’s subtropical environment probably allows nonnative exotic species to flourish.

President Lyndon Johnson needlessly escalated the war in Vietnam because he probably did not want his opponents to accuse him of being soft on communism.

Air pollution is the primary cause of global warming because data from polar ice cores suggests that the Earth’s temperature remained remarkably stable prior to the industrial revolution.

John D. Rockefeller should not be considered a “Robber Baron” because he brought stability to the petroleum industry and made a significant contribution to the national economy as a whole.

The Chinese Exclusion Act of 1882 was necessary in order to protect American employment opportunities because it prevented the Chinese population from taking jobs from native-born Americans.

The Germans could have won WWII if Nazi air forces had not focused the Battle of Britain on bombing London.

American democracy started with the Mayflower Compact because that compact lays out the key concepts in the articles of confederation.

The earth’s magnetic core has reversed its polarity a number of times because we may find volcanic rocks with iron magnetite possibly orienting south instead of north.

The strict credit policies of the Bank of the United States were not responsible for the Panic of 1819 because the stock market then was severely undermined by a "crisis in confidence" caused by insider trading.

The pole-fleeing force does not account for the spreading of the sea floor.

Smoking should be banned in public places because "secondhand smoke" contains high levels of carcinogenic radiation.

Genetically modified herbicide-tolerant (GMHT) crops threaten wild bird populations because GMHTs will permit the use of high levels of herbicides on weeds creating negative consequence for seed-eating birds.

The institution of the British debtors prison contributed to the creation of the original American colonies.

The United States was responsible for the Cold War because the Truman administration probably exaggerated the Soviet threat after World War II to promote expansionist political and economic policies.

The progressive era marks one of the greatest strides in American History because hunger and illiteracy were significantly reduced at that time.

Overpopulation threatens aquifers because as the population increases, probably so does our need for fresh water.
Environmentalists are accused of exaggerating the role of human activity in global warming because data from polar ice cores possibly suggests that throughout history the earth may have experienced natural temperature fluctuations.

Water runoff from street storm sewers should be treated at water purification facilities because chemical runoff and non-point pollution has caused a severe degradation in water quality.

Harvest limits should be restricted for shrimp because coastal estuaries are in danger due to the need for more shrimp to meet consumer demand.

The reason the Confederacy wanted to succeed from the Union was primarily economic.

Tobacco is one of the greatest evils in American history because the cultivation of tobacco may be the reason why slavery flourished in the south when it was abandoned in the north.

If nuclear plants generated all of our electricity, acid rain would be greatly reduced because discharges from nuclear reactors are remarkably alkaline.

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

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