

## Original Research Reports

# Lake Wobegon's Guns: Overestimating Our Gun-Related Competences

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### Abstract

The Lake Wobegon Effect is a general tendency for people to overestimate their own abilities. In this study, the authors conducted a large, nationally-representative survey of U.S. citizens to test whether Americans overestimate their own gun-relevant personality traits, gun safety knowledge, and ability to use a gun in an emergency. The authors also tested how gun control attitudes, political identification, gender, and gun experience affect self-perceptions. Consistent with prior research on the Lake Wobegon Effect, participants overestimated their gun-related competencies. Conservatives, males, and pro-gun advocates self-enhanced somewhat more than their counterparts but this effect was primarily due to increased gun experience among these participants. These findings are important to policymakers in the area of gun use, because overconfidence in one's gun-related abilities may lead to a reduced perceived need for gun training.

**Keywords:** self-enhancement bias, overconfidence, political ideology, illusory superiority, gun attitudes

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Discussions surrounding gun rights in the United States have centered on a variety of issues including interpretation of the Constitution, the role of government, hunting traditions, concerns about safety, beliefs about crime prevention, and the logistics of regulating gun purchases. One topic that has been missing from these discussions is whether citizens have adequate self-knowledge regarding their abilities to use guns. Studies on self-perception suggest that people may be prone to overestimate their own gun-related abilities and traits.

### Overconfidence

Researchers have demonstrated that people are generally overconfident when rating their own perceptual abilities, motor skills (West & Stanovich, 1997), memory (Schmidt, Berg, & Deelman, 1999), driving ability (Svenson, 1981), health (Hoorens & Harris, 1998; Larwood, 1978), happiness (Robinson & Ryff, 1999), intelligence (Dufner et al., 2012), and ability to make economic forecasts (Lambert, Bessièrè, & N'Goala, 2012), among others. One specific form of overconfidence is evident when people compare their own abilities to the abilities of the average person. For instance, 93% of U.S. motorists described themselves as above average drivers (Svenson, 1981), a majority

of professors rated themselves as above average teachers (Cross, 1977), and only 1% of 800,000 high school students rated their own social skills as “less than average” (College Board, 1976–1977).

Cannell (1987) used the term *Lake Wobegon Effect* to describe this bias. The term is a reference to Garrison Keillor’s fictional Lake Wobegon – a town where all the “children are above average” (Keillor, 2016). The Lake Wobegon Effect is known by a variety of names including *illusory superiority*, *above average effect*, *better-than-average effect* (Alicke & Govorun, 2005; Williams & Gilovich, 2008) and *false uniqueness bias* (Suls, Wan, & Sanders, 1988). In reviewing studies on the bias, Epley and Dunning (2000) noted that people generally think of themselves as more “charitable, cooperative, considerate, fair, kind, loyal and sincere than the typical person” (p. 861; see also Dunning, Heath, & Suls, 2004, for a review). Given the ubiquitous nature of this bias, we suspect that people also overestimate their competency related to gun use. In this study, we test whether there is a Lake Wobegon Effect for gun safety knowledge, one’s perceptions of their ability to use a gun in an emergency, and the more general personality traits of responsibility, control over temper, and judgement.

To date, few researchers have focused on individual differences in overconfidence effects. To address this gap, a second goal of the study is to examine potential moderators of this bias by examining how political ideology, gun attitudes, gender, and experience with guns affect self-evaluations of gun-related competence.

## Potential Moderators of Overconfidence

### Gun Attitudes

A popular explanation for the Lake Wobegon bias is that it is motivated by a desire to enhance self-esteem (Brown, 1986; Kunda, 1987; Regan, Snyder, & Kassin, 1995; Suls & Wan, 1987). Anderson, Brion, Moore, and Kennedy (2012) offer a related self-presentation explanation suggesting that we self-enhance in order to improve our status in the eyes of others (see also Kennedy, Anderson, & Moore, 2013). Both the self-esteem and self-presentation explanations support the hypothesis that people who have pro-gun attitudes will be more highly prone to overconfidence in their gun-related competence than those who have anti-gun attitudes, due to a desire to enhance their perceived status in the eyes of others who hold pro-gun attitudes. This hypothesis is dependent on assuming that people with pro-gun attitudes may more strongly identify with and/or associate with groups of people who also hold pro-gun attitudes, and therefore are motivated to be perceived positively by those groups of people. To that effect, we also measure political affiliation as one indicator of identification with groups that may align with participants’ own gun attitudes.

### Political Affiliation

When examining identification with political groups, Eriksson and Funcke (2015) found that identifying as a Republican or Democrat influenced the extent to which participants self-enhanced on ratings of qualities associated with each political group. Because political affiliation in the U.S. is tied to gun-related attitudes (Pew Research Center, 2011), we predicted that self-labeled conservatives would show greater confidence in their gun-related competencies than would self-labeled liberals.

### Gender

Sibley and Harré (2009) found that men self-enhanced their driving skills to a greater extent than women (see also McKenna, Stanier, & Lewis, 1991), and that gender role identification fully accounted for this effect. The authors argue that social norms connecting driving skill with masculinity play a role in self-enhancement, such that men

use self-enhancement of their driving ability as a way to successfully 'fit in' to perceived gender roles. Because owning and carrying guns are perceived as more highly consistent with the male role than the female role (Stroud, 2012), men should be more highly prone to overconfidence in gun-related knowledge, skills and personality traits than women.

### Gun Experience

Identifying the extent to which attitudes, political affiliation, and gender affect confidence in gun-related abilities is complicated by participants' varying experience with guns. For example, a 2014 poll from the Pew Research Center found that men were slightly more likely to own guns than women (38% compared to 31%), and Republicans were more likely to own guns than Democrats (49% compared to 22%). Pro-gun participants, Republicans, and males may have greater confidence in their gun-related abilities than their counterparts, but this confidence may simply reflect actually knowing more about guns. Thus, it is important to tease out experience effects from the effects of attitudes on self-ratings of gun-related competence.

### Why Is Overconfidence a Problem?

Research studies in several domains have confirmed that when people are overly optimistic about their ability to avoid negative outcomes, they stop taking measures to protect themselves from risks. For example, Burger and Burns (1988) found that sexually active women generally saw themselves as less likely to accidentally get pregnant compared to other women at their college. Further, the more participants showed this illusion of invulnerability, the less likely they were to report using contraception. Svenson, Fischhoff, and MacGregor (1985) found a small relationship between reported seatbelt usage and optimism that one could avoid having an accident while driving a car such that higher optimism related to less frequent use of seatbelts. Similarly, optimism and overconfidence have been linked to lower vaccination rates (Larwood, 1978), increased rate of unintentional personal injuries (Plumert, 1995), and taking excessive risks in business (Allen & Evans, 2005; Moore, Kurtzberg, Fox, & Bazerman, 1999; Russo & Schoemaker, 1992). To the extent that we overestimate our abilities, knowledge, or personal characteristics, we may endanger ourselves and others through a failure to recognize our limitations and the true likelihood of potential harm.

Advocates of expanded gun ownership extol the benefits of carrying a gun and lobby against increased gun control (NRA.org). On the opposite side of this issue, gun control supporters warn of the dangers that could be present if large portions of the population carry guns (Brady Campaign to Prevent Gun Violence, 2015). Both pro-gun and anti-gun groups agree on the importance of gun safety training. Given the interest in the issue, and the inherent risks of improper use of guns, it is surprising that to date, only one study has examined whether gun users are prone to overestimate their own competencies. Ehrlinger, Johnson, Banner, Dunning, and Kruger (2008), gave participants in a skeet-shooting competition a gun knowledge test, and also asked them to estimate the number of questions they had answered correctly. Participants in this study consistently overestimated their knowledge of safe gun use, getting fewer questions correct than they thought they had, showing that the self-enhancement bias is indeed present in this domain.

### Overview of the Current Study

In the current study, we extend the work of Ehrlinger et al. (2008) to a representative national sample and ask if citizens of the United States have accurate perceptions regarding their own gun-relevant personality traits, gun safety knowledge, and ability to use a gun in an emergency. Consistent with research on the Lake Wobegon Effect,

we predicted a general overconfidence in this area. It is important to note that we do not include an objective, external measure of participants' abilities to use a gun, and instead rely on their self-reports. However, if the general ability to use a gun is normally distributed in the U.S. population, then to the extent that the majority of our representative sample of participants rates their own abilities as above-average, we can interpret that as evidence of overconfidence in this domain.

We also test several potential moderators of the Lake Wobegon Effect and predicted that male, pro-gun, and conservative participants would be more highly prone to the bias than their counterparts would. Finally, we examine whether any gun attitude, political identification, or gender effects on self-evaluation are due to differences in experience with guns.

## Method

### Participants

Six thousand five hundred seventy-four people responded to invitation to complete an electronic survey. Because gun use is an emotionally charged issue, and because we wanted to ensure that people had paid close attention while completing the survey, we created strict criteria for the inclusion of a respondent's answers in the data set. We removed 1,621 participants from the data set because they did not properly respond to two attention checker items embedded in blocks of questions. These checkers simply asked participants to "click agree" in response to one blank item, and "click disagree" in response to another.<sup>1</sup> We also removed three participants because they were under the age of 18.

The final sample included 4,950 participants. Of these, 3,108 were male, 1,814 were female, and 28 did not indicate gender. The mean age of the sample was 47.4 years (median = 49 years). The racial composition of the sample was Caucasian, 80.1% (77.4%), Black/African American 9.5% (13.2%), Hispanic/Latino 7.1% (16.9%), Native American/Alaskan 1.7% (1.2%), Asian/Asian American 4.8% (5.4%); Hawaiian/Pacific Islander .3% (.2%), Other 1.3%. U.S. Census Bureau proportions for 2016 for the U.S. appear in parentheses. ([United States Census Bureau, 2016](#))

The sample included participants from all U.S. states and the District of Columbia. The proportion of participants per state closely paralleled the proportion of the U.S. population from each state. Self-labels for the political beliefs of the participants included: 7.2% very liberal, 14.9% liberal, 12.1% slightly liberal, 13.3% slightly conservative, 18.6% conservative, 9.3% very conservative, and 24.1% did not identify with either liberals or conservatives. The sample included 4.2% Libertarian, 37.1% Democrat, 26.4% Republican, 3.6% Tea Party affiliates, 6.8% other, and 19.6% with no party affiliation.

### Procedure

Participants were recruited via the use of nationwide Qualtrics panels. Qualtrics is a survey software company that submits surveys to people who have indicated a willingness to complete surveys for research and market assessments. The survey was presented entirely online, and opened with a brief description of the study, with a statement to the effect that completing the survey indicated consent to participate in the research. In addition,

participants were provided contact information for the primary researchers and were encouraged to email them to ask any questions.

## Measures

### Personality Traits and Gun-Relevant Abilities

In the first set of questions, participants placed themselves above or below average on several personality characteristics and abilities. Specifically, we asked participants, "Are you more or less responsible than the average U.S. citizen?" Participants were given the options, "more responsible" and "less responsible." They also responded to the item, "Compared to the typical U.S. citizen, do you feel that you possess above or below average judgment?" Participants responded with either "above average" or "below average."

In the next set of questions, the scale was expanded to include a mid-point of "average." This was done to examine the possibility that people may think of themselves as average even though relatively few people will fall exactly on the mean of any measure. Here, participants read: "Many states allow citizens to carry concealed weapons. Not every citizen has the moral standards and/or judgment needed to responsibly carry a gun. Compared to adult U.S. citizens in general, your \_\_\_\_\_ are/is \_\_\_\_\_." Using the three-point scale, *less than average*, *average*, *greater than average*, participants rated their "critical thinking ability," "moral standards," "judgment," and "control over your temper."

A variation on the three-point item read, "Are you more or less likely than the average person to use a gun in anger?" Options included, "I am more likely than the average person to use a gun in anger," "I am just as likely as the average person to use a gun in anger" and "I am less likely than the average person to use a gun in anger."

We then broadened the response scale one final time, inviting participants to "rate how you compare to the rest of the U.S. adult population when it comes to your ability to responsibly own a handgun." Participants categorized themselves into one of the following: top 1% of population (very responsible/trustworthy), top 5%, top 10%, top 20%, top 30%, top 40%, Very average in responsibility/trustworthiness, bottom 40%, bottom 30%, bottom 20%, bottom 10%, bottom 5%, bottom 1% of population (very irresponsible/untrustworthy). This measure provided a more detailed picture of the extent to which people may self-enhance their abilities.

### Gun Safety Knowledge

We asked participants to respond to the question, "Which of the following is true? "I know more than the average U.S. adult about gun safety" or "I know less than the average U.S. adult about gun safety."

To more specifically examine participants' rating of their gun safety knowledge, gun-owning participants assessed themselves on items based on the NRA's guidelines for safe gun use (NRA, 2014), such as "I would keep the gun unloaded until ready to use," "always point the gun in a safe direction," and "know how to use the gun safely." These items were rated on the five-point scale *much less than average*, *less than average*, *average*, *greater than average*, *much greater than average*. The participants who completed these items (gun owners) were asked to compare themselves to the typical U.S. gun owner. We then averaged responses to ten items to create a Gun Safety Scale ( $\alpha = .92$ ; see [Appendix](#) for the full list of items).

## Ability to Use a Gun

We constructed two scales wherein participants rated their own and the average U.S. citizen's ability to use a gun in an emergency. Here, participants simply indicated the extent to which they agreed (on a five-point Likert scale with endpoints of *strongly disagree* to *strongly agree*) with the statements: "I am/would be a responsible gun owner," "I would be able to use a gun safely and accurately in an emergency situation," "If I regularly carried a gun, I would practice shooting and continue training in how to use it," "I would be likely to accidentally shoot an innocent person in an emergency situation" (reverse coded), and "I would be likely to 'freeze' and be unable to react in an emergency situation" (reverse coded). Participants' scores on these items were averaged to create a Personal Ability Scale ( $\alpha = .79$ ).

Participants then responded to the same items in the context of rating the average U.S. citizen (e.g., "The average U.S. citizen is/would be a responsible gun owner"), using the same five-point scale. Their responses to these items were averaged to create a Citizen Ability Scale ( $\alpha = .77$ ). The Likert scales allowed us to measure self-enhancement tendencies indirectly, without asking participants directly to compare themselves to other people.

## Moderators

We assessed attitudes toward gun control, political identification, gender, and experience with guns as potential moderators of self-enhancement. Participants rated the extent to which they agreed or disagreed with 14 gun control statements such as "People should not be allowed to carry guns for self-protection," "People with a criminal record should be unable to purchase guns," and "It should be more difficult to purchase guns in this country." The 14 statements were averaged to form a Gun Control Attitudes Scale ( $M = 3.59$ ,  $SD = .79$ ,  $\alpha = .89$ ), with greater numbers indicating more support for gun control. The full list of items appears in the [Appendix](#).

Participants rated their political beliefs on a seven-point scale ranging from *very liberal* to *very conservative*. Participants indicated their gender. Finally, to assess participants' experience with guns, they responded to several yes/no questions, indicating whether or not they owned any guns, had ever fired a gun, had participated in formal gun safety training, currently held a conceal-and-carry permit, and had ever served in the military. These items were combined in order to separate participants with any experience with guns (i.e., those who responded 'yes' to one or more of these questions) from those with no experience with guns.

# Results

## Personality Traits and Gun-Related Abilities

When asked if they were above average or below average compared to the average U.S. citizen on the qualities of responsibility and judgment, the majority of participants rated themselves as above average: 96.2% indicating they were above average in responsibility ( $\chi^2(1, N = 4933) = 4218.90$ ,  $p < .0001$  compared to 50%) and 95.9% above average in judgment ( $\chi^2(1, N = 4933) = 4152.58$ ,  $p < .0001$  compared to 50%).

As can be seen in [Table 1](#), when using the three-point scale (less than average, average, greater than average) to rate themselves on morals, judgment, critical thinking ability, and control over their temper, a significant majority of participants again chose *greater than average* for each quality.

Table 1

*Self-Ratings of Personality Variables and Gun-Related Abilities*

Characteristic	Less Than Average	Average	Greater Than Average	N
Moral Standards	2.6%	38.4%	59.0%	4,905
Judgment	3.1%	38.2%	58.7%	4,895
Critical Thinking Ability	2.6%	33.9%	63.6%	4,892
Control over Temper	4.9%	40.3%	54.8%	4,901
	<b>More Likely</b>	<b>Just As Likely</b>	<b>Less Likely</b>	<b>N</b>
Are you more or less likely than the average person to use a gun in anger?	4.2%	13.2%	82.6%	4,947

Note. Means tested against 2 or "average." Moral standards ( $M = 2.56$ ),  $t(4905) = 72.51$ ,  $p < .001$ ; Judgment ( $M = 2.56$ ),  $t(4895) = 70.11$ ,  $p < .001$ ; Critical thinking ( $M = 2.61$ ),  $t(4891) = 79.42$ ,  $p < .001$ ; Temper ( $M = 2.50$ ),  $t(4901) = 59.18$ ,  $p < .001$ ; Use gun in anger ( $M = 2.78$ ),  $t(4947) = 109.61$ ,  $p < .001$ .

When we asked people to place themselves within the population distribution in terms of their "...ability to responsibly own a handgun," using the most expanded measure of self-enhancement, the bias became even more apparent. Just over 50% of the participants placed themselves within the 90<sup>th</sup> percentile, and 23% percent placed their ability to responsibly own a handgun within the top 1% of the U.S. population. See Table 2.

Table 2

*Self-Ratings of Ability to Responsibly Own a Handgun*

Self-rating	Percent Who Placed Themselves in Group	Cumulative Percent
Top 1% of population. Very responsible/trustworthy	23.0%	23.0%
Top 5%	14.0%	37.0%
Top 10%	13.4%	50.4%
Top 20%	11.7%	62.1%
Top 30%	07.9%	70.0%
Top 40%	08.2%	78.1%
Very average in responsibility/trustworthiness	18.9%	97.0%
Bottom 40%	0.9%	97.9%
Bottom 30%	0.7%	98.6%
Bottom 20%	0.5%	99.1%
Bottom 10%	0.2%	99.3%
Bottom 5%	0.3%	99.6%
Bottom 1% of population. Very irresponsible/untrustworthy	0.4%	100.0%

Note.  $N = 4928$ . Z test comparing observed proportion 78.1% to expected proportion 40% = 54.595,  $p < .0001$ . Z test comparing observed proportion 23.0% to expected proportion 1% = 155.217,  $p < .0001$ .

## Gun Safety Knowledge

We asked all participants if they were above average or below average compared to the average U.S. citizen on knowledge of gun safety, with 65.8% indicating they were above average in their knowledge of gun safety ( $\chi^2(1, N = 4933) = 494.60$ ,  $p < .0001$ , compared to 50%).

In this next analysis, we focus only on gun owners and examined how they self-report their compliance with NRA gun safety guidelines, using our Gun Safety Scale. We selected participants using their response to the item, “Do you personally own any guns?” The participants qualified by owning any kind of gun ( $n = 1617$ ). A one-sample  $t$ -test examining the difference between the mean score on the Gun Safety Scale and the scale midpoint of 3 (which would reflect a tendency to rate oneself as average) showed that gun owners in our sample significantly enhanced their abilities to meet the NRA’s gun safety guidelines ( $M = 4.45$ ,  $SD = .57$ ,  $t(1586) = 101.05$ ,  $p < .0001$ ), when comparing themselves to the average gun owner.

## Ability to Use a Gun in an Emergency

We next examined self-versus-other ratings of participants’ perceptions of abilities to use a gun in an emergency based on the Likert style items. A repeated measures ANOVA showed that people rated their own gun abilities (Personal Ability Scale,  $M = 3.99$ ,  $SD = .73$ ) as significantly higher than the scale midpoint of 3 ( $z = 93.98$ ,  $p < .0001$ ) and higher than those of the average citizen (Citizen Ability Scale,  $M = 2.87$ ,  $SD = .76$ ,  $F(1, 4867) = 76,247.4$ ,  $p < .0001$ ). Overall, participants rated their own abilities significantly higher than the abilities of the average citizen.<sup>ii</sup>

## Moderators of Overconfidence

### Gun Control Attitudes

As predicted, scores on the Gun Control Attitude Scale were negatively correlated with the Personal Ability Scale ( $r(4767) = -.36$ ,  $p < .0001$ ), indicating that those more in favor of gun control rated their own abilities to use guns lower than those less in favor of gun control. Gun control attitudes were also significantly correlated with the three-point, self-evaluation of moral standards ( $r(4757) = -.04$ ,  $p < .003$ ); judgment ( $r(4750) = -.05$ ,  $p < .001$ ); control over one’s temper ( $r(4753) = -.07$ ,  $p < .001$ ); and critical thinking ability ( $r(4743) = -.04$ ,  $p < .003$ ) items. Given the very low  $r$ -values for these later correlations, we hesitate to interpret these findings, as they represent very low effect sizes. Overall, the more pro-gun (or anti-gun control) the participants were, the greater their confidence in using a gun, but pro-gun attitudes were not related to other types of overconfidence.

### Political Attitudes

As predicted, participants who labeled themselves conservatives scored higher on the Personal Abilities Scale ( $r(4881) = .19$ ,  $p < .001$ ). Participants who labeled themselves conservatives also rated themselves higher on the three-point measures of moral standards ( $r(4882) = .04$ ,  $p < .003$ ); control over temper ( $r(4878) = .03$ ,  $p < .04$ ); and critical thinking ability ( $r(4870) = -.04$ ,  $p < .003$ ), but not judgment ( $r(4872) = .02$ ,  $p = ns$ ). Again, given the very low  $r$ -values for the correlations of political attitudes with the general self-enhancement measures, we cannot interpret these as meaningful relationships, even though some were statistically significant.

### Gender

As predicted, males rated their abilities higher than did females on the Personal Ability Scale: males ( $M = 4.08$ ,  $SD = 3.55$ ), females ( $M = 3.84$ ,  $SD = 3.72$ ),  $F(1, 4874) = 131.13$ ,  $p < .001$ , Partial  $\eta^2 = .03$ ; but the effect size was quite small. There were also very small gender differences for judgment: males ( $M = 2.57$ ,  $SD = .55$ ), females ( $M = 2.53$ ,  $SD = .56$ ),  $F(1, 4865) = 6.97$ ,  $p < .01$ , Partial  $\eta^2 = .001$ ; and critical thinking: males ( $M = 2.64$ ,  $SD = .53$ ), females ( $M = 2.56$ ,  $SD = .55$ ),  $F(1, 4863) = 30.50$ ,  $p < .001$ , Partial  $\eta^2 = .006$ , but no differences for moral standards: males ( $M = 2.55$ ,  $SD = .55$ ), females ( $M = 2.58$ ,  $SD = .54$ ), or control over one’s temper: males ( $M =$

2.51  $SD = .59$ ), females ( $M = 2.49$ ,  $SD = .59$ ). However, again, all groups scored higher than the midpoint, indicating evidence of self-enhancement for all groups of participants.

In sum, participants with anti-gun control attitudes, males, and conservatives were somewhat more confident in their gun related abilities than were their counterparts. There is, however, the possibility that this confidence reflects greater experience with guns.

## Gun Experience

To test how gun experience effected self-evaluations, we completed a mixed-design ANOVA wherein a demographic variable indicating gun experience (novices/non novices) served as the between-subjects variable, and the self-versus-other rating of ability (Personal Ability Scale and Citizen Ability Scale) served as the within-subjects variable. See Table 3. There were two significant main effects and a significant interaction. The critical test in this analysis was the interaction between self/other and non-novice/novice. There was a significant interaction such that the difference between self and others was greater for those with experience than those without. In other words, experience with guns augmented over-confidence. However, the effect sizes for the interaction were very small in comparison to the effect size for self-versus-other rating.

Table 3

*Ratings of Personal vs. Citizens' Abilities to Use a Gun in an Emergency*

Gun Experience	Mean (SE)		Eta Squared		
	Self Ratings	Other Ratings	Demographic Effect	Self-Other Effect	Interaction Effect
Non-Novice, $n = 3487$	4.14 (.01)	2.91 (.01)	.06**	.52**	.03**
Novice, $n = 1326$	3.62 (.02)	2.77 (.02)			

*Note.* \* $p < .05$ , \*\* $p < .01$  for F tests. Novices vs. Non-novices  $F(1, 4811) = p < .001$ ; Self vs. Other  $F(1, 4811) = 5177.42$ ,  $p < .001$ ; Interaction  $F(1, 4811) = 154.26$ ,  $p < .001$ .

## Experience Explaining Gun Attitudes, Political Identification, and Gender Effects

We compared the proportion of gun novices and non-novices for the separate groups of pro-gun control/anti-gun control, Republicans/Democrats, and males/females. As is evident in Table 4, anti-gun control, conservatives, and males had more gun experience than their counterparts. These same groups also rated their gun abilities as greater. It is thus possible that the self-ratings of gun ability may be the result of greater experience with guns rather than an effect of attitudes or gender. The attitude effects on self-ratings are further complicated because political attitudes were correlated with gun attitudes ( $r(3623) = -.42$ ,  $p < .0001$ ) such that conservatives were more anti-gun control.

In an effort to examine the joint effect of the variables, we tested a regression model wherein the Personal Ability Scale served as the dependent variable and Citizen Ability Scale served as a covariate. Dummy coded variables (1/0) were included for having ever fired a gun, owned a gun, participated in gun training, had military experience, and have conceal-and-carry permit. The political attitude item and Gun Control Attitudes Scale were also included as predictors.

Table 4

Proportion of Sample With Gun Experience by Demographic Variables

	No Experience	Some Experience
Males	19%	82%
Females	42%	58%
Republicans	22%	78%
Neither	30%	70%
Democrats	35%	65%
Low Gun Control Attitude Score	15%	85%
Medium Gun Control Attitude Score	24%	76%
High Gun Control Attitude Score	42%	58%

Note. Gender  $\chi^2(1, n = 4878) = 320.81, p < .001$ ; Political Party  $\chi^2(2, n = 4073) = 62.91, p < .001$ ; Gun Control Attitude  $\chi^2(2, n = 4755) = 310.88, p < .001$ .

The overall model was significant ( $F(9, 3613) = 134.87, p < .001, R^2 = .25$ ). The Citizens Ability Scale was a significant predictor ( $\beta = .14, Part r^2 = .01, p < .001$ ). Dummy coded variables indicating gun experience were significant for: ever fired a gun ( $\beta = .12, Part r^2 = .001, p < .001$ ), owned a gun ( $\beta = .16, Part r^2 = .02, p < .001$ ), participated in gun training ( $\beta = .19, Part r^2 = .02, p < .001$ ), and have conceal-and-carry permit ( $\beta = .06, Part r^2 = .003, p < .001$ ) but not having military experience ( $p = .24$ ). Gender was not a significant predictor. The political attitude item ( $\beta = .004, Part r^2 = .007, p < .001$ ) and the Gun Control Attitudes Scale ( $\beta = .15, Part r^2 = .02, p < .001$ ) were significant. Thus, political identification and attitudes about gun control had a relationship with self-ratings when we controlled for gun experience, but the effect was quite small. In other words, after we controlled for gun experience, the variables of political attitudes and gun control attitudes were not strongly related to self-evaluation of gun abilities.

## Discussion

The Lake Wobegon effect was evident for many aspects of gun ownership. It was apparent in self-evaluations of personality traits including responsibility, judgment, moral standards, control over one's temper, and critical thinking. It was evident in self-evaluations of gun safety knowledge and ability to use a gun in an emergency.

The bias did not depend on any one type of response scale. It occurred when we gave respondents two options (above or below average), three options (greater than, average, less than), five options (much less to much greater than average), and 13 options (top 1% to bottom 1%). The bias also occurred when we switched to Likert scales. This indicates that the bias is not simply an artifact of how self-evaluation questions are phrased, nor is it based on a simple aversion to labeling oneself as *less than average*. Finally, the bias was also apparent for different comparison populations; that is, overconfidence was evident when U.S. citizens compared themselves to the average U.S. citizen and when gun owners compared themselves to the average gun owner.

It is important to note, however, that we relied on participants' self-reports of their abilities, and did not directly or objectively assess their abilities to use a gun. But, given that our sample was representative of a national population, the fact that the majority of participants repeatedly assessed themselves as above average, using a number of different scales and options, suggests that overconfidence is indeed present in this domain. Future research in

this area could focus closely on a smaller sample of participants and include objective and direct measures of gun abilities to provide another way of examining overconfidence.

This study also extends research on the impact of individual differences on overconfidence. Consistent with our predictions, the bias was slightly moderated by gun attitudes (pro-gun participants were more confident than anti-gun participants), political ideology (conservatives were more confident than liberals) and gender (males were more confident than females), but this effect was largely due to conservatives, males and anti-gun control advocates having more gun experience (people with some gun experience rated their gun related skills higher than those without). After controlling for gun experience, political ideology and gun attitudes had only small influences on self-enhancement. This difference does suggest that people were honestly assessing their abilities to some extent—that people with more gun experience did accurately note that they were better able to safely use a gun. However, it is important to remember that gun novices also rated themselves as above-average in their gun abilities compared to the average citizen, indicating that overconfidence also influenced these ability ratings. We should also be careful in assuming that experience with guns automatically makes one more able to safely use a gun—examining the impact of various gun training courses and experiences on people's actual abilities to use a gun would be useful for future research in both gun safety and overconfidence.

Researchers who study overconfidence and self-enhancement should continue to unpack the various moderators and antecedent factors that influence when and why we inflate our perceptions of our skills, abilities, and personality traits. For instance, [Kennedy, Anderson, and Moore \(2013\)](#) highlight how the perception of competence affords people greater status within groups (see also [Berger, Cohen, & Zelditch, 1972](#)). In the domain of gun use, overestimating one's skills at using a gun might effectively gain people higher standing in groups that value and promote the use of guns, and researchers could examine how members of various political or activity groups view people with more or less gun experience to directly test this idea. This would also allow researchers to more closely examine how experience in this domain influences peoples' ratings of their own abilities. Given that the topic of gun rights is, and will continue to be, a highly politicized issue and central to elections at the local, state, and national levels, more research is needed into how we present our abilities with guns as a way to gain favor or identify with different groups.

## Safety

Evidence exists that overestimating our abilities can lead us to take more risks ([Burger & Burns, 1988](#); [Larwood, 1978](#); [Plumert, 1995](#)). In the domain of gun use, people who overestimate their own abilities to safely use guns may be less likely to seek training. This could put them at risk of gun accidents. In addition, we found evidence of overconfidence among both participants with extensive experience with guns, as well as among gun novices, suggesting that experience in this domain is not enough to lead to accurate estimations of abilities. Similarly, [Williams and Gilovich \(2008\)](#) found that participants not only gave themselves very positive ratings on various personality traits, but also truly believed these self-enhanced ratings. It is important to remember that overconfident opinions of our abilities are not just delusions or mistakes that can be easily corrected, but could often represent deeply held beliefs about our true skill levels and may thus be difficult to change. Fortunately, some researchers have shown that learning about the existence of this bias can help reduce risky behaviors ([Klein, 1997](#)). It could be that learning about our tendency to be overconfident may reduce people's self-enhancement of their own gun abilities. Researchers and policy-makers should work to examine in more detail the types of training that can help reduce overconfidence in this domain. For example, gun safety courses could include information about this bias,

as well as knowledge calibration tests to potentially show trainees that they may be over-estimating their knowledge. Researchers could then assess the impact of these experiences on participants' rating of their own abilities to extend our understanding of this bias and how to mitigate it.

Both anti-gun and pro-gun organizations have emphasized the importance of gun safety training. For instance, the National Rifle Association (NRA, 2014) encourages gun owners to take gun safety courses. The NRA also provides safety guidelines for gun storage and use. If people overestimate their abilities, they may underestimate the benefits of taking a safety class. If gun owners underestimate the likelihood that accidents could happen, they may be less likely to take precautions and correctly follow all safety guidelines. Overconfidence has been found in a number of domains, and the current study makes clear that gun users are not immune to the bias. Research like the current study has the potential to lead gun owners, and the people who are thinking about buying a gun, to pause and reflect on their personal need to complete training and follow safety guidelines.

Legislators who will make decisions about gun use should not only take into account the opinions of the populace, but also psychological research such as the current study that can help clarify the biases and assumptions that drive our opinions. In a similar domain, Greene, Bornstein, and Dietrich (2007) recommend that legislators consider the potential risks of gun ownership in an aging population, calling for more research into the risks posed by guns in the household of a person suffering from dementia or cognitive declines, particularly because increased aggression or violence can be symptoms of dementia. They note that there are currently few guidelines to help evaluate when cognitive limitations should be considered a factor in determining gun ownership, and suggest that this discussion is similar to that on restrictions on driving for elderly people who demonstrate reduced ability to drive safely. The concerns about capacity for gun ownership, and how the onset of dementia may affect this capacity, are relevant to our discussion about the overconfidence bias, as in both cases potential cognitive limitations may affect one's ability to safely use a gun. Overall, the area of gun ownership and relevant abilities represents a prime opportunity for social science researchers to study the Lake Wobegon bias, and how various experiences with gun training or safety courses can work to moderate this effect. Researchers should consider how people might be motivated to enhance their status in groups supportive of gun use through self-enhancing their abilities to use guns, and also directly test the effects of various types of safety trainings and/or exposure to information about this bias influence people's self-ratings. Understanding how the overconfidence bias influences our self-perceptions in regards to gun use, and our activities regarding gun training, is an essential addition to current conversations about gun rights and responsibilities.

## Notes

i) The survey was started by 6,574 people of whom 417 stopped well before they reached the first attention checker. Fifty-six participants reached the attention checker but failed to respond to the item. Of the people who did respond to the item, 793 provided the wrong answer to the first attention checker. If a participant either failed to respond to the attention checker, or provided the wrong answer, the participant was automatically directed to the end of the survey and thanked for their participation. This left 5,308 participants. Of this group, 23 stopped working on the survey well before they reached a second attention checker. Sixteen participants completed survey items right up to the second attention checker but failed to respond to the item. Of the people who did respond to the item, 316 provided the wrong answer to second checker. This left 4,953 participants. Self-evaluations were somewhat lower for the participants who failed the attention checkers. It is difficult to say whether this reflects an accurate self-assessment of being somewhat less conscientious (responsible, moral, temperamental, etc.) or whether the low scores represent thoughtless responses which would necessarily have the effect of lowering the average of any positively skewed distribution.

ii) To test the extremity of overconfidence, we examined responses of participants who had no gun experience. These were respondents who met all of the following criteria: they had never fired a gun, did not own a gun, had not participated in any formal gun safety training, had not served in the military, and did not have a permit to carry a weapon ( $n = 1350$ ). Gun novices rated their Personal Gun Ability (Scale  $M = 3.62$ ,  $SD = .73$ ) as greater than Citizen Gun Ability (Scale  $M = 2.77$ ,  $SD = .72$ ),  $F(1, 1325) = 1299.96$ ,  $p < .0001$ . In addition, when we examined how novices placed themselves within the population distribution in their "... , ability to responsibly use guns," 20.1% of gun novices still placed themselves in the top 1% of the U.S. population, and a total of 40% of gun novices placed themselves within the 90th percentile. Thus, even participants who had no experience with guns self-enhanced their abilities to use guns responsibly.

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## Competing Interests

The authors have declared that no competing interests exist.

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## Appendix: Scale Items

### Gun Safety

Overall prompt: "The following are the NRA's safety guidelines for using guns. Compared to the typical U.S. gun owner, how likely are you to follow these rules?"

1. Keep the gun pointed in a safe direction.
2. Keep my finger off the trigger until ready to shoot.
3. Know my target and what is beyond.
4. Know how to use the gun safely.
5. Be sure the gun is safe to operate.
6. Use only the correct ammunition for my gun.
7. Wear eye and ear protection as appropriate.
8. Never use alcohol or over-the-counter, prescription, or other drugs before or while shooting.
9. Store guns so they are not accessible to unauthorized persons.
10. When cleaning a gun, I would always check to be sure that it is unloaded.

All responses were given on a 5-point scale, with endpoints of *much less than average* to *much greater than average*.

### Gun Control Attitudes

Overall prompt: "Please indicate the extent to which you agree or disagree with the following statements:"

1. If more people carried guns, there would be less crime. (reverse-coded)
2. People should have to undergo background checks in order to purchase a gun.
3. People who wish to purchase a gun should have to wait at least 14 days before they can receive a gun.
4. People who own a gun should be required to undergo regular training.
5. People with a criminal record should be unable to purchase or own guns.
6. People with any history of mental illness should be unable to purchase or own guns.
7. People should not be allowed to carry guns for self-protection.
8. All people who wish to purchase a gun should be required to obtain a permit from a government agency.
9. Civilians should be unable to purchase an assault rifle.
10. Civilians should be unable to purchase high-capacity magazines (sometimes called clips).
11. People should have to undergo a mental health screening to purchase a gun.
12. It should be more difficult to purchase a gun in this country.
13. Gun control infringes on people's 2<sup>nd</sup> Amendment rights. (reverse-coded)
14. "The only thing that will stop bad guys with guns is good guys with guns." (reverse-coded)

All responses were given on a 5-point scale, with endpoints of *strongly disagree* to *strongly agree*.