

## A CRITIQUE OF FINDINGS ON GUN OWNERSHIP, USE, AND IMAGINED USE FROM THE 2021 NATIONAL FIREARMS SURVEY: RESPONSE TO WILLIAM ENGLISH

*Deborah Azrael,\* Joseph Blocher,\* Philip J. Cook,\*  
David Hemenway,\* & Matthew Miller\*<sup>1</sup>*

### INTRODUCTION

For a paper that has not yet been through peer review or even been formally published, William English's "2021 National Firearms Survey"<sup>2</sup> has been remarkably prominent in gun rights advocacy and scholarship. As of June 2024, it has been cited in roughly 50 briefs, generally to support claims that assault weapons, high-capacity magazines, and defensive gun uses (DGUs) are common.<sup>3</sup>

Those citations have translated into influence. English's work was explicitly invoked at oral argument during the Supreme Court's consideration of *New York State Rifle and Pistol Association v. Bruen*,<sup>4</sup> was discussed during oral argument in

---

\* Director of Research, Harvard Injury Control Research Center, Harvard University.

\* Lantý L. Smith '67 Distinguished Professor of Law, Senior Associate Dean for Faculty, and Faculty Director of the Center for Firearms Law, Duke University School of Law.

\* IIT/Terry Sanford Distinguished Professor Emeritus of Public Policy Studies

\* Professor of Health Policy and Co-Director of the Harvard Injury Control Research Center, Harvard University.

\* Professor of Health Sciences and Epidemiology at Northeastern University, Adjunct Professor of Epidemiology at the Harvard T.H. Chan School of Public Health, and Co-Director of the Harvard Injury Control Research Center.

<sup>1</sup> Authors are listed alphabetically. They thank Jacob Charles, Darrell Miller, and Eric Ruben for helpful suggestions, and Waka Ogihara for excellent research assistance.

<sup>2</sup> William English, "2021 National Firearms Survey: Updated Analysis Including Types of Firearms Owned," [Georgetown McDonough School of Business Research Paper No. 4109494](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4109494) (last revised Sept. 28, 2022) [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4109494](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4109494) (last visited June 6, 2024).

<sup>3</sup> As of June 6, 2024, a search for "2021 National Firearms Survey" in the WestLaw's "All State & Federal" database, sorted for "Briefs" returns 49 hits, all of them to English's study.

<sup>4</sup> Transcript of Oral Argument at 119, *N.Y. State Rifle & Pistol Ass'n v. Bruen* (2021) (No. 20-843) (statement of Paul Clement) ("If you want to look at the empirical evidence -- and I know, Justice Breyer, you asked about this - please also look at the English brief on the top side because it's a very rigorous statistical analysis that shows that, as a matter of actually doing statistics right, there's no difference here and what -- the only difference you really see is that people who have a handgun for self-defense end up with a better outcome. They're not shot. They're -- they're not made victims.").

The English brief draws on the 2021 study to argue that "recently and reliably concluded that lawful carriage of firearms for self-defense and defensive gun use are statistically common phenomena." Brief of Amici Curiae English and the Ctr. for Human Liberty in Support of Petitioners at 2, *N.Y. State Rifle & Pistol Ass'n v. Bruen*, 142 S. Ct. 2111 (Jul. 19, 2021) (No.20-

recent Second Amendment cases at the Fourth and Ninth Circuits,<sup>5</sup> and was recently relied on by a federal district court striking down California's restriction on assault weapons and large capacity magazines.<sup>6</sup> His survey has been regularly cited by gun rights advocates and scholars in public writings<sup>7</sup> and in published academic work.<sup>8</sup>

English's work is being treated as an authoritative scientific source, and an important one at that. But the normal scientific process requires peer-review prior to publication. The drafts that have been cited by litigants and others have not undergone this scientific review process.<sup>9</sup>

The authors of this response are experts on the estimation of rates of gun ownership, use, and misuse, and have made extensive use of population surveys

843).

<sup>5</sup> Oral Argument at 2:40, *Bianchi v. Frosh*, No. 21-1255 (4th Cir. 2021) <https://www.ca4.uscourts.gov/OAarchive/mp3/21-1255-20221206.mp3>; Oral Argument at 52:10, *Duncan v. Bonta*, No. 23-55805 (9th Cir. 2024), <https://www.ca9.uscourts.gov/media/audio/?20240319/23-55805/>.

<sup>6</sup> *Miller v. Bonta*, No. 19CV01537BENJLB, 2023 WL 6929336, at \*34 (S.D. Cal. Oct. 19, 2023) (“William English estimates from his survey results that guns are used defensively approximately 1,670,000 times each year. Disturbingly, English found 51.2% of defensive gun uses involve more than one assailant. In contrast to Allen’s estimate, English estimates that rifles are used defensively approximately 13% of the time. English also estimates about 24,600,000 individuals have owned AR-15 styled rifles. The evidence, once again, suggests that modern rifles are commonly owned and useful for self-defense.”); see also *Duncan v. Bonta*, No. 17-CV-1017-BEN (JLB), 2023 WL 6180472, at \*4 (S.D. Cal. Sept. 22, 2023).

<sup>7</sup> See, e.g., Stephen Halbrook, *Second Amendment Roundup: D.C.’s Magazine Ban Argued Again in D.C. Circuit*, Reason.com (Feb. 2, 2024) <https://reason.com/volokh/2024/02/20/second-amendment-roundup-d-c-s-magazine-ban-argued-again-in-d-c-circuit/> (calling English’s the “leading survey we have on use of magazines capable of holding more than ten rounds”); Clark Merrefield, *Gun Buybacks: What the Research Says*, JOURNALIST’S RESOURCE (Oct. 21, 2022) <https://journalistsresource.org/health/gun-buybacks-what-the-research-says/>; Caroline Covington, *Texas’ Complex Relationship with Firearms: Leading America in Gun Sales, but with a Declining Gun Ownership Rate*, TEXAS TRIBUTE (Jul. 28, 2022) <https://www.texastribune.org/2022/07/28/texas-gun-stats/> (comparing English’s survey to a Rand Corporation analysis).

<sup>8</sup> See, e.g., C.D. Michel & Konstadinos Moros, *Restrictions “Our Ancestors Would Never Have Accepted”: The Historical Case Against Assault Weapon Bans*, 24 WYO. L. REV. 89, 92 n.15 (2024); Eugene Volokh, *A Normal Supreme Court*, 2023 WIS. L. REV. 675, 682 (2023); Eugene Volokh, *Implementing the Right to Keep and Bear Arms After Bruen*, 98 N.Y.U. L. REV. 1950, 1967 n.96 (2023).

<sup>9</sup> Only recently has English’s survey received any sort of critical review. One such review was a feature in the *New York Times*. Mike McIntire & Jodi Kantor, *The Gun Lobby’s Hidden Hand in the 2nd Amendment Battle*, N.Y. TIMES (June 18, 2024). The *Times* article, which includes quotes from two authors of this paper (Blocher and Miller), reports that he “received tens of thousands of dollars as a paid expert for gun rights advocates, and his survey work, which he says was part of a book project, originated as research for a National Rifle Association-backed lawsuit.” *Id.*

English responded he was the victim of “a well-funded, ideologically motivated plot” and that his “funding has been fully disclosed, in accordance with academic practice, in every journal article accepted for publication.” William English, *Anti-Gun Activists Ambushed Me*, WALL ST. J. (June 26, 2024). The funding of the survey, which has not been published, remains undisclosed as far as we are aware.

30-Jun-24]

*Response to William English*

3

of the sort employed by English.<sup>10</sup> Thus, we are qualified to serve as peer reviewers of the English article. As is typical of such reviews, our focus is on methodological issues, questionable statistical results, and problematic conclusions. Usually, the purpose of peer review is to provide guidance for revision of the current draft.<sup>11</sup> But since the article is being treated by litigants as a finished product, our main purpose in this case is to provide context and a methodological critique of some of English's prominent findings and conclusions. In several cases we also provide alternative estimates based on reputable peer-reviewed surveys.

During the last 30 years, we and others have contributed to the creation of an extensive body of scientific research on best practice in using population surveys to estimate firearms ownership, possession and use. English cites some of this research but in several cases has not adopted what we consider best practices in constructing the questionnaire for his survey, analyzing data from the survey, and interpreting the results. That is important because survey-based estimates in this arena are sometimes highly sensitive to what may seem like minor details of questionnaire design.

We organize the review around the three propositions for which English's survey has most often been cited: English's estimate of the prevalence of gun ownership and the number of guns owned; his estimate of the annual number of self-defense gun uses; and his characterization of the usefulness of high-capacity magazines.

Part I addresses English's estimates of the prevalence of firearms ownership (i.e., the proportion of adults who personally own at least one firearm) and the number of AR-style rifles that have ever been owned by current gun owners. Because current doctrine ties the constitutional protection of weapons to whether they are "in common use"<sup>12</sup> (as opposed to being "dangerous and unusual"<sup>13</sup>) these empirical estimates have major implications for Second Amendment cases,<sup>14</sup> and indeed every brief or opinion that uses the English

---

<sup>10</sup> Blocher is an expert on firearms law, not on empirical methods.

<sup>11</sup> We note that Professor English posted his survey questionnaire and data in September 2023 and has invited other scholars to comment. That information is welcome and has been incorporated in our review. William English, *2021 National Firearms Survey*, HARVARD DATAVERSE (2023) <https://doi.org/10.7910/DVN/58TXW6>.

<sup>12</sup> *District of Columbia v. Heller*, 554 U.S. 570, 627 (2008). On the conceptual difficulties of a common use test, Eugene Volokh, *Implementing the Right to Keep and Bear Arms for Self-Defense: An Analytical Framework and a Research Agenda*, 56 U.C.L.A. L. REV. 1443, 1480 (2009).

<sup>13</sup> *Heller*, 554 U.S. at 625.

<sup>14</sup> While English's estimates have implications for Second Amendment cases, his estimates are hardly alone in providing credible estimates of the US gun stock by firearm type. See, e.g., John Berrigan, Deborah Azrael, & Matthew Miller, *The Number and Type of Private Firearms in the United States*, 704(1) THE ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE 70 (2022). English's claim that his estimates are "better" than existing estimates due to his large sample size is overstated. English's larger sample (under the insupportable assumption that his survey is representative of the US population and somehow better at eliciting truthful

survey has cited it for its finding on the common ownership of assault weapons.<sup>15</sup>

English's estimates for the prevalence of gun ownership are close to those obtained by several other surveys in 2021, although higher than others for women. That difference may reflect a positive bias resulting from the ambiguity of the screener question with respect to a fundamental distinction: Is the question asking about "household" gun ownership or "personal" gun ownership? English analyzes the responses as referring to personal ownership, but to the extent that some respondents interpreted the item as referring to household ownership, the resulting estimates of the proportion of the population of US adults who personally owned guns in 2021 and of the US gun stock have a positive bias, especially for women.

We also take a close look at English's estimate, based on his survey, that current (as of 2021) gun owners have at one time or another owned a total of 44 million "AR-15-style rifles."<sup>16</sup> That figure is nearly twice as high as the industry estimate of the total number of such rifles manufactured and imported between 1990 and 2020. This large difference may be due to the double counting engendered by the fact that respondents are not asked how many AR-15-style rifles they currently own, but instead how many they have *ever* owned. Since there is an active market in used rifles, some of the rifles reported as ever owned by the respondent are not currently owned by that individual.<sup>17</sup> Anyone interested in knowing the number of these rifles that were in private hands in 2021, or the number of people who owned one at that time, should look elsewhere.

Part II considers English's estimate of the annual volume of defensive gun uses (DGUs). Because the Supreme Court has identified self-defense as the "core" of the interest protected by the Second Amendment,<sup>18</sup> how commonly guns are, in fact, used for self-defense purposes<sup>19</sup> is a central consideration in

---

answers from gun owners) produces similar estimates of the size and composition of the gun stock as those from other contemporary surveys. (see Miller et al.). In theory, English's estimates should have tighter confidence intervals than those from smaller surveys, but as English does not consistently provide these, the value added is speculative.

<sup>15</sup> See, e.g., *Duncan v. Bonta*, No. 17-cv-1017-BEN (JLB), 2023 WL 6180472, at \*4 (S.D. Cal. Sept. 22, 2023); Brief of Amicus Curiae Nat'l Shooting Sports Found. in Support of Plaintiffs-Appellants and Supporting Reversal at 11–13, *Capen v. Campbell*, No. 24-1061 (1st Cir. Mar. 20, 2024); Supplemental Opening Brief at 29, *Bianchi v. Frosh*, No. 21-1255 (4th Cir. Aug. 22, 2022); Brief of Plaintiffs-Appellants at 18, *Nat'l Ass'n for Gun Rights v. Naperville, Ill.*, No. 23-1353 (7th Cir. Apr. 3, 2023); Plaintiffs-Appellants' Opening Brief at 19–20, *Gray v. Att'y Gen. Del.*, No. 23-1633, 23-1634 (3d Cir. July 3, 2023).

<sup>16</sup> English, *supra* note 2, at 20.

<sup>17</sup> For this topic, our discussion references and builds on a declaration authored by Louis Klarevas. Declaration of Louis Klarevas, *Barnett v. Raoul*, 671 F.Supp.3d 928 (2024) (No. 3:23-cv-00209-SPM).

<sup>18</sup> *Heller*, 554 U.S. at 630.

<sup>19</sup> English's survey reports that 61.9% of AR-style firearms list self defense as a reason for

30-Jun-24]

Response to William English

5

gun rights litigation and scholarship.

English estimates 1.67 million DGUs annually.<sup>20</sup> In contrast, the U.S. Bureau of Justice Statistics (BJS) estimates that there were just 70 thousand instances per year in which an individual used a gun to defend against a property crime or non-fatal violent crime.<sup>21</sup> The BJS estimate is based on data from the National Crime Victimization Survey (NCVS) for the years 2014 to 2018. That Survey is conducted by the US Census Bureau and has been in the field since 1973. The NCVS is generally recognized as of very high quality.<sup>22</sup> It employs a sample far larger than English's and utilizes a questionnaire that provides a more well-defined estimate of the number of gun uses in self-defense against crime. The 24-fold difference between English's estimate and the BJS estimate is partly a matter of definition, and partly the result of an error in the estimation method used by English.

The key differences in definition are twofold. First, the English survey does not limit DGUs to cases in which the respondent believed themselves to be the victim of a criminal threat, attack, or theft – as does the NCVS. An extensive literature has documented the tendency of respondents to report as DGUs the use of a gun in circumstances that were not a response to criminal threat, including instances in which the event as reported amounts to criminal misuse of a gun by the respondent.<sup>23</sup> Second, English's survey does not restrict DGUs to uses against people, thus potentially conflating defense against animals with defense against criminal threats. While he does not ask respondents to state

---

ownership. English at 33-34. This number is often cited to suggest that such weapons are “in common use” for self-defense. *See, e.g.*, Rupp v. Bonta, No. 9:17-cv-00746-JLS-JDE, 2024 WL 1142061, at \*17 (S.D. Cal. Mar. 15, 2024); Opening Brief of Appellants, Capen; Nat'l Ass'n for Gun Rights at 6, Capen v. Campbell, No. 24-1061 (1st Cir. Mar. 7, 2024); Miller v. Bonta, No. 19-cv-01537 BEN (JLB), 2023 WL 6929336, at \*34 (S.D. Cal. Oct. 19, 2023); Supplemental Reply Brief at 11, Bianchi v. Frosh, No. 21-1255 (4th Cir. Oct. 31, 2022); Emergency Application for Injunction Pending Appellate Review at 8, Nat'l Ass'n for Gun Rights v. Naperville, Ill., No. 22A948 (U.S. Apr. 26, 2023).

<sup>20</sup> English, *supra* note 2, at 35.

<sup>21</sup> Grace Kena & Jennifer L. Truman, *Trends and Patterns in Firearm Violence, 1993–2018*. Bureau of Justice Statistics, US DEP'T OF JUSTICE BUREAU OF JUSTICE STATISTICS (April 2022), available at <https://bjs.ojp.gov/library/publications/trends-and-patterns-firearm-violence-1993-2018>.

<sup>22</sup> *National Crime Victimization Survey (NCVS)*, BUREAU OF JUST. STAT. (May 18, 2009), <https://bjs.ojp.gov/data-collection/ncvs#0-0>.

<sup>23</sup> For example, Hemenway et al asked their respondents for an account of the DGU incident in their own words, which they then sent to criminologists and criminal court judges. Even assuming the gun ownership and carrying were legal, and the one-sided description of the event was completely accurate, in more than half the cases most criminal court judges rated the DGU as probably illegal, and the criminologists rated only 25% of the defensive gun uses as socially desirable. Probably more would have been judged poorly if the event were described by the other party involved in this hostile interaction. Many of the events reported as DGUs appeared to be escalating arguments. David Hemenway & Elizabeth P Nolan, *The Scientific Agreement on Firearm Issues*, in 23 INJURY PREVENTION 221, 221–223 (2017).

whether their reported DGUs were against people or animals, in a subsequent question asking for instances from their lives in which a large capacity magazine would have been useful for defensive purposes, he does ask them to provide a description, and a number of the descriptions he cites are about defending against animals.

The error in English's estimation method is the result of the fact that his survey asks about lifetime DGUs rather than DGUs occurring in a recent time period that is common to all respondents. The "lifetime" question as analyzed by English only provides a valid estimate of the number of DGUs in any one year under assumptions that are demonstrably false in English's own dataset, beginning with the assumption that the "production" of DGUs is uniform across age (and thus the same in a given year for respondents who are age 20 as for respondents who are age 70) and cohort (and thus the same during high as during low crime periods). On the contrary, the age pattern of DGU reports in the English survey suggests that DGU production declines with age, including among age groups that lived through periods with high crime rates. There are other, logical problems with using the "lifetime" question that further distort the estimates.<sup>24</sup>

Part III briefly considers English's estimates of the ownership of large capacity magazines and survey respondents' assessments of their (hypothetical) utility for purposes of self-defense. English's study states that approximately 39 million Americans have ever owned feeding devices that hold more than 10 rounds,<sup>25</sup> and that they have been owned primarily for purposes of self-defense. As with English's estimates of how many AR-15-style rifles have ever been owned, his estimate that 39 million Americans *have ever owned* large capacity magazines has been erroneously invoked in briefs or scholarship to support inferences about the proportion of people who currently own and use these devices.<sup>26</sup> With respect to the utility of such magazines, moreover, English's assessment is based on respondents' speculations rather than their actual experience and hence offer a very uncertain guide to reality.

The Conclusion recaps our principal concerns and, in the spirit of a referee's report, indicates needed revisions should there be a next draft.

---

<sup>24</sup> See *infra* Section II.B.1.

<sup>25</sup> English, *supra* note 2, at 22.

<sup>26</sup> See, e.g., Brief for Amicus Curiae Nat'l Shooting Sports Found. in Support of Applicants at 10, Nat'l Assoc. for Gun Rights v. Naperville, Ill., No. 22A948 (U.S. May 5, 2023); Opening Brief of Plaintiffs-Appellants Nat'l Ass'n for Gun Rights, Flanigan and Special Appendix at 34, Nat'l Ass'n for Gun Rights v. Lamont, No. 23-1162 (2nd Cir. Nov. 22, 2023); Brief of Amicus Curiae Nat'l Shooting Sports Found. In Support of Plaintiffs-Appellants and Supporting Reversal at 13, Capen v. Campbell, No. 24-1061 (1st Cir. Mar. 20, 2024); Petition for Writ of Certiorari at 10-11, Harrel v. Raoul, No. 23-877 (U.S. Feb. 12, 2024); Petition for Writ of Certiorari at 9, Barnett v. Raoul, No. 23-879 (U.S. Feb. 12, 2024).

30-Jun-24]

*Response to William English*

7

## I. ESTIMATING OWNERSHIP OF ALL FIREARMS AND OF ASSAULT WEAPONS

In the United States, owners are not required to register most types of firearms. Scientific estimates of the prevalence of gun ownership, and of the total number of guns in private hands, are usually based on population surveys, which are subject to several types of error. In particular, for a variety of reasons some survey respondents may be inclined to misrepresent the number of guns they own or refuse to answer questions on that subject. The accuracy of self-reporting may be influenced by the wording of the relevant questions, the response mode, and the respondent's understanding of the purpose of the survey, among other things. For those and other reasons, it is not surprising that reputable surveys generate somewhat different estimates.

English contracted with the survey-research firm Centiment to conduct an on-line survey of gun owners drawn from the firm's survey panel of individuals aged 18 and over who had indicated a willingness to respond to such surveys for a small fee.<sup>27</sup> An initial sample of more than 50,000 individuals who agreed to participate in this survey were asked "Do you own any of the following? (please select all that apply)." The choices were Bicycle, Canoe or Kayak, Firearm, Rock Climbing Equipment, None of the Above."<sup>28</sup> Only those who selected "firearm," 31.9% of that initial sample (age 18 and over), were included in the subsequent survey.

The initial sample was not strictly representative of the American adult public. In his Appendix B, English contrasts the sample distributions across sex, age, income, and state with the true population distribution. For example, 27.5% of the sample has household income less than \$30,000, compared with 14.6% of the U.S. population; only 8.1% of the sample had income over \$150,000, compared with 20.2% of the U.S. population. A standard approach in generating population estimates from an unrepresentative sample is to utilize sampling weights that "correct" for under- and over-sampling of identified population groups. English reports weighted estimates for the prevalence of gun ownership, but not for other topics. He states that "For the purposes of analyzing responses within the sub-sample of firearms owners, we do not employ weighting schemes ..."<sup>29</sup> He has calculated the weighted results as a "robustness exercise," and asserts that the weighted results are "substantially identical" to the unweighted results.<sup>30</sup> Best practice in a scientific paper would be to report the weighted results throughout.<sup>31</sup>

---

<sup>27</sup> English provides few details about how Centiment drew the original sample of over 53,000 individuals. Standard scientific practice requires that the survey methods be documented in some detail.

<sup>28</sup> English, *supra* note 2, at 6.

<sup>29</sup> *Id.* at 5.

<sup>30</sup> *Id.*

<sup>31</sup> English applies sampling weights provided by the survey company to produce his estimate that 31.9% of US adults are firearm owners. This weighting was necessary (and

*A. Conflating Individual and Household Ownership*

In analyzing his survey data, English generates all estimates concerning the number of guns in private hands on the assumption that his respondents interpreted the screener question to refer to their personal ownership. Yet it is quite possible that some respondents interpreted it to refer to *household* gun ownership. The list of items in the screening question includes “canoe or kayak”, which would typically be a household item (like furniture or kitchen utensils) rather than a personal item (like clothing or a cell phone). For that reason, some of the respondents may have been included in the “gun owning” sample even though the gun(s) belonged to someone else in their household.<sup>32</sup>

The difference between personal and household ownership is illustrated by a number of surveys that clearly make that distinction. The General Social Survey, for example, asks about both household and personal ownership. Since 1973, the General Social Survey has asked the question: “Do you happen to have

---

appropriate) because his initial sample of approximately 54,000 US adults 18 and over, derived from quota sampling rather than from a probability-based sample, was not representative of the adult public overall. While English uses weights to derive an estimate of the proportion of US adults who own firearms for the overall sample, he does not pursue this standard approach (i.e., weighting) in generating estimates among gun owners (e.g., what proportion of gun owners report DGU). He justifies not doing so by asserting that in a “robustness exercise,” the details of which he does not specify, weighted results are “substantially identical” to unweighted results. But, if weights were needed to produce representative estimates of gun ownership from the overall sample, weights are likewise needed to produce unbiased subgroup analyses. In the dataset that English has made public, no weights were provided, making it impossible to independently assess differences in weighted and unweighted estimates. The unweighted data for ownership by age group and income, however, are meaningfully different from estimates reported in peer-reviewed studies. As these characteristics are well-established correlates of gun ownership, unbiased estimates require, at minimum, weighting to account for the extent to which these characteristics differ in English’s sample compared with their distribution in the adult population from which his gun owners are derived.

<sup>32</sup> There is another, more pervasive source of ambiguity, namely that the distinction between “personal” and “household” may be blurred. In some households one or more guns may be viewed as shared property, rather than belonging to just one individual. If adults in the same household share ownership of a firearm, then population surveys should take that possibility into account in generating population estimates. Logically there is no problem if respondents are asked how many guns are in the household, and household sampling weights are applied in generating population estimates from the sample. But if respondents are asked how many guns they (personally) own, then shared guns will be double counted in generating a population estimate. For a simple example, suppose the population has 10 households each with two adults, and that each household has one gun with shared ownership. Ten adults are selected at random from this “population” so that the sample is 10 adults out of the 20 in the population. In this example, all respondents will indicate that they own a gun. The population estimate based on the assumption that gun ownership is unique to a single person will then be 20 guns, twice the true total, while the population based on the assumption that guns are shared property within the household will generate an accurate estimate of 10 guns.



30-Jun-24]

*Response to William English*

9

in your home (if house: or garage) any guns or revolvers?”<sup>33</sup> Since 1980, General Social Survey respondents who state that they have a gun in their home have then been asked, “Do any of these guns personally belong to you?”<sup>34</sup> In 2021, 35.2% of respondents lived in a home with a gun, while just 24.5% indicated that they personally owned a gun.<sup>35</sup>

Similarly, a 2021 survey conducted by researchers at Northeastern and Harvard universities (titled the “National Firearms Survey”, as is English’s survey) asked:

Do you personally own a working gun?” (yes/no) and “Does anyone ELSE in your household own a working gun?” (yes/no/don't know).”<sup>36</sup>

In this survey, an estimated 28.8% (CI 28.0% to 29.6%) of U.S. adults personally owned firearms, representing approximately 75 million people. An additional 10.4% (CI, 9.8% to 11.0%) lived in households with firearms but did not personally own firearms themselves, 84% of whom were women. In these two surveys and others, respondents are explicitly asked to make a distinction between “personal” and “household.”<sup>37</sup>

The possibility that some respondents in English’s survey interpreted the screener question in terms of household ownership rather than personal ownership would help explain why English’s prevalence estimate is high for female respondents. In gun-owning households headed by a man and woman, it is very common for the man to personally own the guns and the woman not.<sup>38</sup> Women from such a household would be included as gun owners if they interpreted the item as pertaining to the household, and otherwise left out. To give a sense of the magnitudes involved, the NEU/Harvard survey estimated 6 million fewer adult gun owners than the English survey (75 million vs. 81 million), with the difference due to the higher prevalence of female owners in the English survey.

The prevalence estimates from the three surveys that have been mentioned are displayed in Table 1, together with two others: the Gallup Crime Survey and the Pew Survey, both conducted in 2021. The Gallup Survey found that about 31% of individuals owned a gun; the corresponding estimate from the Pew

---

<sup>33</sup> *GSS Data Explorer*, NORC AT THE UNIV. OF CHI., <https://gssdataexplorer.norc.uchicago.edu/variables/680/vshow> (last visited Jun. 24, 2024).

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*

<sup>36</sup> Matthew Miller et al., *Firearm Purchasing During COVID-19 Pandemic: Results from the 2021 National Firearms Survey*, 175 ANNALS OF INTERNAL MED. No. 2 at 2 (2022).

<sup>37</sup> *Id.*

<sup>38</sup> In 2021, data from the Harvard/Northeastern National Firearms Survey indicate that among married people in gun-owning households, 5% of males are non-gun owners while 58% of females are. In addition, among married people in gun owning homes, 36% of male respondents say that someone else in their household owns a gun, whereas 77% of female respondents do. *Id.*

survey is 30%. What we see is that the English survey generates the highest point estimate of individual ownership overall (though close to the Gallup survey), due to the relatively high estimate for female respondents – as would be expected if some respondents are reporting on household rather than individual ownership.

	Personal ownership, Male	Personal ownership, Female	Personal Ownership, Overall	Household Ownership
English Survey 2021 <sup>39</sup>	36.3	27.4	31.9%	NA
NEU/Harvard Survey 2021 <sup>40</sup>	38	20	28.8	39.2
General Social Survey 2021 <sup>41</sup>	35.7	14.3	24.5	35.2
Gallup Crime Survey 2021 <sup>42</sup>	40	22	31	44
Pew 2021 <sup>43</sup>	39	22	30	40

Table 1. Comparison of 5 national surveys of gun ownership conducted in 2021

We conclude that English's survey data generated weighted estimates of the national prevalence of personal gun ownership that are high for women but otherwise in line with several surveys of note conducted in the same year. A possible explanation for this difference lies in the ambiguity of his screener question with respect to the distinction between personal ownership and household ownership.

<sup>39</sup> The prevalence of gun ownership among men and women was derived from the statistics English reports, e.g., the overall rate of personal gun ownership, the percentage of gun owners who are male (and female), and the total population of adults in 2021.

<sup>40</sup> Matthew Miller et al, *Firearm Purchasing During the COVID-19 Pandemic: Results From the 2021 National Firearms Survey*. 175(2) ANN INTERN MED. 219 (2022).

<sup>41</sup> VIOLENCE POL'Y CTR., GUN OWNERSHIP IN AMERICA: 1973 TO 2021 (Nov. 2022), available at <https://www.vpc.org/studies/ownership.pdf>.

<sup>42</sup> Jeffrey M. Jones, *Gun Owners Increasingly Cite Crime as Reason for Ownership*, GALLUP (Nov. 17, 2021) <https://news.gallup.com/poll/357329/gun-owners-increasingly-cite-crime-reason-ownership.aspx>.

<sup>43</sup> Ted Van Green, *Wide Differences on Most Gun Policies Between Gun Owners and Non-owners, But Also Some Agreement*, PEW RSCH CTR. (Aug. 4, 2021), <https://www.pewresearch.org/short-reads/2021/08/04/wide-differences-on-most-gun-policies-between-gun-owners-and-non-owners-but-also-some-agreement/>.

30-Jun-24]

*Response to William English*

11

*B. AR-15s and Similarly Styled Rifles*

In his survey, English asked his sample of gun owners “Some have argued that few gun owners actually want or use guns that are commonly classified as “assault weapons.” Have you ever owned an AR-15 or similarly styled rifle? You can include any rifles of this style that have been modified or moved to be compliant with local law. Answering this will help us establish how popular these types of firearms are.”<sup>44</sup> He reports that 30.2% of the sample of gun owners responded affirmatively, implying that 24.6 million current gun owners had at some point in their life owned such a rifle. Based on a follow-up item, he estimates that this group owned an average of 1.8 such rifles, and concludes “This suggests that up to 44 million AR-15 styled rifles have been owned by U.S. gun owners.”<sup>45</sup>

He does not estimate the number of current owners or the number currently owned. A respondent in English’s sample who had owned an AR-15-style rifle at some point in his or her life but then sold it would be included in his estimates of prevalence and quantity. In contrast, a survey conducted by the *Washington Post* in October, 2022, found that just 20% of gun owners reported current ownership of an “AR-15-style rifle, including any semi-automatic weapon built on a common AR-15 platform.”<sup>46</sup> The English prevalence estimate is half again as high. The difference could be the result of the inclusion of former AR-15 owners.

Similarly, English’s estimate that a total of 44 million such rifles had ever been owned appears far higher than the number in private hands. One estimate that appears to be an upper bound on the current number in private hands in 2021 comes from the industry trade association, the National Shooting Sports Foundation (NSSF). In 2022, NSSF published an estimate of the number of “modern sporting rifles” that were domestically manufactured (net of exports) or imported between 1990 and 2020, totaling 24.4 million.<sup>47</sup> (“Modern sporting rifle” is the industry euphemism for military-style rifles more commonly known as AR-15-style rifles.) This estimate, while it may exaggerate the number in private hands as of 2021,<sup>48</sup> is similar to one from a 2019 survey of gun owners, which estimated that there were approximately 23 million military-style semi-automatic rifles in civilian hands.<sup>49</sup>

---

<sup>44</sup> English, *supra* note 2, at 33.

<sup>45</sup> *Id.*

<sup>46</sup> Emily Guskin et al, *Why Do Americans Own AR-15s?*, WASH. POST (March 27, 2023) <https://www.washingtonpost.com/nation/interactive/2023/american-ar-15-gun-owners/>.

<sup>47</sup> *Commonly Owned: NSSF Announces Over 24 Million MSRS in Circulation*, NAT’L SHOOTING SPORTS FNDN (July 20, 2022), <https://www.nssf.org/articles/commonly-owned-nssf-announces-over-24-million-msrs-in-circulation/>.

<sup>48</sup> For a discussion of the definitions of the related categories, and a critique of the NSSF estimate, see Klarevas, *supra* note 17, at 12, 20.

<sup>49</sup> [Berrigan, Azrael & Miller, \*supra\* note 14.](#)

It is possible to reconcile English's estimates with smaller estimates based on other surveys or manufacturing data. The logical link is that guns often change hands after the first retail sale. For example, the 2015 NFS reported that approximately one-third of all guns acquired over the prior five years were not new.<sup>50</sup> While we lack data on transactions involving AR-15-style rifles, it is plausible that the current (2021) stock of these rifles averaged two owners. The number that were "ever owned" would then be twice as high as those currently owned.

English does not misrepresent his findings on AR-15 ownership, and in particular does not claim that his estimate of the number of AR-15s "ever" owned is referring to 44 million *different* AR-15s. But he also does not explain why he chose to ask the "ever owned" question rather than asking about current ownership, let alone why he phrased the question as he did. And citations of his work have regularly treated the 44 million figure as if it represents a current count.<sup>51</sup>

## II. DEFENSIVE GUN USE ESTIMATES

English's survey asked gun-owning respondents "Have you ever defended yourself or your property with a firearm, even if it was not fired or displayed? Please do not include military service, police work, or work as a security guard."<sup>52</sup> He reports that "About a third (31.1%) answered in the affirmative, representing a population of 25.3 million adults."<sup>53</sup> These respondents were then asked how many times they had defended themselves with a firearm.<sup>54</sup> From these responses, he estimates that respondents who said they had ever used a gun in self-defense had done so about twice on average, and goes on to estimate that the current US adult population of gun owners had been involved in about 50 million DGUs in their lifetimes. Using Census data, he estimated that US adults had been alive for 48 years on average, or 30 years as an adult 18 and over. (He presumes that youths under 18 do not produce DGUs.) Dividing the 50 million DGUs by 30 provides his "bottom line" estimate that there is an annual average of 1.67 million DGUs each year.

That estimate is more than 20 times as high as estimates based on data from

---

<sup>50</sup> Deborah Azrael et al, *The Stock and Flow of US Firearms: Results from the 2015 National Firearms Survey*, 3(5) RSF: THE RUSSELL SAGE FOUNDATION JOURNAL OF THE SOCIAL SCIENCES 38-57 (Oct. 2017).

<sup>51</sup> Opening Brief of Appellants Del. State Sportsmen's Ass'n, et al. at 11 n.7, Del. State Sportsmen's Ass'n, et al. v. Del. Dep't of Safety and Homeland Sec., et al., No. 23-1641 (3d Cir. July 3, 2023); Reply Brief of Appellants Del. State Sportsmen's Ass'n, et al. at 12 n.5, Del. State Sportsmen's Ass'n, et al. v. Del. Dep't of Safety and Homeland Sec., et al. No. 23-1633 (3d Cir. Sep. 20, 2023).

<sup>52</sup> English, *supra* note 2, at 11.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

30-Jun-24]

*Response to William English*

13

the National Crime Victimization Survey, the largest and in some ways highest quality survey on this subject.<sup>55</sup> Other survey-based estimates of the yearly number of DGUs cover a very wide range, both higher and lower than English's.<sup>56</sup>

The fact is that survey-based estimates are highly sensitive to the details of the survey. Surveys that, like English's, leave it to the respondent to decide whether any particular event in which they used a gun could be properly deemed a defensive use, tend to produce estimates several-fold higher than those like the NCVS that explicitly require that the gun use be preceded by, and in response to, a criminal threat or other victimization. Furthermore, distortion in English's estimates arises from two odd features which set English's survey apart from most others in this area. First, his respondents are invited to report defensive uses without specifying that these uses should be restricted to uses against people, as opposed to animals. Second, they are asked to report their cumulative lifetime number of DGUs rather than DGUs during a specified time period common to all respondents (e.g., the previous year). Because converting responses about cumulative DGUs over a lifetime to an average annual incidence of DGUs depends on strong assumptions, doing so is problematic. The assumptions English makes, moreover, are both falsified by his own data and inconsistent with reasonable expectations based on historical trends in victimization, rendering his "annual" estimate essentially meaningless.

---

<sup>55</sup> *National Crime Victimization Survey (NCVS)*, *supra* note 22.

<sup>56</sup> Gary Kleck has long been assembling lists of private surveys that asked about DGUs. His 2019 list of national surveys shows that only 2 of the 21 surveys listed were conducted after 2001 and many seemed to have asked only one or two questions about DGU. Gary Kleck, *Response Errors in Surveys of Defensive Gun Use: A National Internet Survey Experiment*, 64 *CRIME & DELINQUENCY* 1119, 1119–1124 (2018). Kleck's goal from these lists has been to provide estimates of the annual number of DGUs extrapolated from each of these surveys. Because the questions were often different—e.g., some asked about DGU by the respondent, some asked for the household; some asked about handgun DGU only, some asked about all guns; some asked only registered voters; some did not exclude military and police; the recall period was sometimes 1 year, 5 years, or longer—to try to make the survey results comparable Kleck created a method of adjustment. Kleck's 2019 adjusted annual DGU estimates of DGU from these past 21 polls range from 0.6 and 0.8 to 5.1 and 5.2 and 6.1. The only two post 2000 surveys on his list—CNN (2014) and Pew Research Center (2017) have adjusted annual DGUs of 3.2 million and 2.6 million respectively.

See also David Hemenway & Sara J. Solnick, *The Epidemiology of Self-Defense Gun Use: Evidence from the National Crime Victimization Surveys 2007-2011*, 79 *PREVENTIVE MED.*, 22, 23 (2015) (stating that the NCVS surveys from 2007 to 2011 estimated victims to have used a gun to threaten or attack the perpetrator in less than 0.9% of 14,145 crime incidents); Deborah Azrael & David Hemenway, *'In the Safety of Your Own Home': Results from a National Survey on Gun Use at Home*, 50 *SOC. SCI. & MED.*, 285, 289 (2000) (stating that less than 1% of respondents reported a self-defense gun use in the past 5 years); David Hemenway & Deborah Azrael, *The Relative Frequency of Offensive and Defensive Gun Uses: Results from a National Survey*, 15 *VIOLENCE AND VICTIMS* 257, 257 (2000) (finding that firearms are used far more frequently to frighten and intimidate than they are used in self-defense).

We begin with a discussion of the generic problems associated with surveying DGUs, and then turn to the odd features of English's survey in particular. Finally, we report estimates from the National Crime Victimization Survey.

*A. What We Have Learned About Responses Errors to DGU Questions*

One fundamental problem for generating a satisfactory survey estimate of the number of DGUs is that there is no officially recognized definition of a DGU. Public discussion of DGU typically occurs in the context of promoting the claim that private guns are often used to promote socially desirable ends, including fending off criminal attacks and thefts.<sup>57</sup> If the private use of a gun against another person is deemed a good thing, it is presumably because it is a legitimate and proportionate response to an immediate credible threat to person or property. Making operational a standard of that sort is not easy, and many surveys used to estimate the number of DGUs do not make any attempt to screen respondent reports.

There is a related debate over the legal standard for using lethal force in response to a perceived threat.<sup>58</sup> A person using defensive force must have a "reasonable belief" about the need for such force,<sup>59</sup> and such force must be reasonable and proportional to the threat.<sup>60</sup> But of course the reasonableness of a threat perception is anything but a clear rule, and can lead to tragic errors—especially in jurisdictions where "stand your ground" laws have reduced the duty to retreat before using deadly force. In other instances, the gun use may be problematic because it is the result of a confrontation initiated or escalated by the individual who then uses his gun in "self-defense."<sup>61</sup> The extent to which these events are reported by survey respondents as DGUs is not known. What is known is that private surveys that have elicited narrative information about the context in which self-reported DGUs occur cover a wide range of circumstances, including instances in which the event as reported amounts to

---

<sup>57</sup> Amy Swearer, *12 Defensive Gun Uses Show that Armed Citizens Make Communities Safer*, THE HERITAGE FOUND., <https://www.heritage.org/second-amendment/commentary/12-defensive-gun-uses-show-armed-citizens-make-communities-safer> (Sep. 12, 2023); Jacob Sullum, *The Largest-Ever Survey of American Gun Owners Finds that Defensive Use of Firearms is Common*, REASON, <https://reason.com/2022/09/09/the-largest-ever-survey-of-american-gun-owners-finds-that-defensive-use-of-firearms-is-common/> (Sep. 9, 2022, 5:05 PM).

<sup>58</sup> See generally, Eric Ruben, *An Unstable Core: Self-Defense and the Second Amendment*, 108 CALIF. L. REV. 63 (2020).

<sup>59</sup> JOSHUA DRESSLER, UNDERSTANDING CRIMINAL LAW 212-13, 225-29 (2018).

<sup>60</sup> 2 PAUL ROBINSON, CRIM. L. DEF. § 132 (2018) ("Conduct constituting an offense is justified if: 1) an aggressor unjustifiably threatens harm to the actor; and 2) the actor engages in conduct harmful to the aggressor a) when and to the extent necessary for self-protection, b) that is reasonable in relation to the harm threatened.").

<sup>61</sup> See Cynthia Lee, *Firearms and Initial Aggressors*, 101 N.C. L. REV. 1 (2022).

30-Jun-24]

*Response to William English*

15

criminal misuse of a gun by the respondent by any existing standard.<sup>62</sup>

There are two basic approaches to dealing with the problem of distinguishing between reported uses that are more or less legitimate. The first is to limit questioning on DGUs to respondents who first report being the victim of a crime, such as an assault, purse-snatching, or burglary. That approach, used by the National Crime Victimization Survey, ensures that there is the predicate for a legitimate DGU. The second is to pose the question to all respondents, and then ask those who report a DGU to provide some detail regarding the sequence of events. English's survey, like many others conducted since Gary Kleck and Mark Gertz's well-known 1995 study,<sup>63</sup> does not incorporate either approach, and thereby leaves it to the respondent to determine if an instance in which they used their gun was a legitimate response to a credible threat.<sup>64</sup>

In survey methodology, the problem of definition can be viewed as one aspect of a much larger category known as "response error."<sup>65</sup> When respondents are asked about DGUs, they may fail to mention an actual event (a type of response error known as a "false negative") or may mention an event that did not occur or was not a legitimate DGU (a "false positive"). False positives (and false negatives) may arise due to distorted memory and may be influenced by the tendency of respondents (and other humans) to present themselves in a favorable light. For rare events, there is no reason to expect that false positives and false negatives balance out. Moreover, for rare events such as self-defense gun use, the opportunity for false positives greatly exceeds that for false negatives, creating a strong tendency to overestimate the frequency of the event in question.<sup>66</sup>

All attempts to validate published estimates that there are millions of DGUs each year have led to absurd conclusions. If the descriptions of the respondents were accurate, gun owners would be saving from homicide more than 20 times the number of people who are actually murdered each year; they would be shooting more assailants than the number of gunshot wounds seen in all medical care institutions (and the morgue), and would be protecting themselves against

---

<sup>62</sup> See, e.g., Hemenway & Azrael, *supra* note 56; David Hemenway, Matthew Miller & Deborah Azrael, *Gun Use in the United States: Results from Two National Surveys*, 6 INJURY PREVENTION 263 (2000).

<sup>63</sup> Gary Kleck & Mark Gertz, *Armed Resistance to Crime: The Prevalence and Nature of Self-defense with a Gun*, 86 J. CRIM. CRIMINOL. 150 (1995).

<sup>64</sup> Both types of survey also rely on the report of only one side of a hostile interaction. Yet whether one is a defender or perpetrator in any hostile interaction may depend on perspective. The perceptions of the defender are important but may not tell the whole story about what actually happened.

<sup>65</sup> W. Edwards Deming, *On Errors in Surveys (An Excerpt)*, 60 THE AMERICAN STATISTICIAN 34, 34 (2006).

<sup>66</sup> David Hemenway, *The Myth of Millions of Annual Self-defense Gun Uses: A Case Study of Survey Overestimates of Rare Events*, 10(3) CHANCE 6 (June 1997).

more than 100% of the burglaries of gun owning homes in which there was someone awake during any part of the event.<sup>67</sup>

Not surprisingly, by a 10-1 margin, firearm researchers do not believe there are millions of DGUs each year<sup>68</sup> and the RAND firearms review concludes that the private survey DGU results “do not appear to be consistent with more-trusted sources of information.”<sup>69</sup>

In sum, English is by no means alone in estimating an annual volume of millions of DGUs based on a national survey. These surveys are similar in a key respect, that they make little or no attempt to screen out false positives.

### B. *Odd and Unique Features of the English Survey*

Over and above the usual problems of definition and systematic response error, three unusual features of English’s survey further render his estimate of the average annual incidence of DGUs uninformative. First, his survey, unlike most such surveys, does not explicitly ask the respondent to confine incidents to those against people. Someone who had shot a coyote or rabid raccoon could logically report that they had used a gun to defend themselves or their property. Several individual accounts of DGUs quoted by English are of gun use against animals rather than people.<sup>70</sup> English’s questionnaire did not solicit the details of reported DGUs for the survey question from which he derives his DGU estimates, so the percentage of DGUs that were against animals cannot be determined. In any event, most surveys of this sort ask respondents to limit their response to DGUs against people.<sup>71</sup>

Second, most surveys that ask about DGUs specify a time period that applies to all respondents, such as the previous six months, year, or five years. English estimates the annual rate of DGUs based on an item that asked respondents whether they ever in their lifetimes had used a gun in self-defense. As noted, English uses responses to this lifetime question to compute an average annual rate by dividing the estimated total number of adult lifetime DGUs by the *average* number of adult years lived by his gun-owning respondents (30 years).

<sup>67</sup> *Id.*

<sup>68</sup> David Hemenway D & Elizabeth P. Nolan, *The Scientific Agreement on Firearm Issues*, 23 INJURY PREVENTION 221 (2017).

<sup>69</sup> RAND, GUN POLICY IN AMERICA, THE CHALLENGES OF DEFINING AND MEASURING DEFENSIVE GUN USE (MARCH 2, 2018) <https://www.rand.org/research/gun-policy/analysis/essays/defensive-gun-use.html>.

<sup>70</sup> For example, “Every time I fired my gun in defense of my property it was to deter bears from damaging my property.” English, *supra* note 2, at 41. This statement is quoted from a pilot survey that English conducted in Vermont, which uses the same questions as in his national survey. Following the general questions on DGUs, respondents were asked this item: “Have ever been in a situation (including any referenced in earlier responses) in which it would have been useful for defensive purposes to have a firearm with a magazine capacity in excel of 10 rounds?”

<sup>71</sup> DAVID HEMENWAY, PRIVATE GUNS PUBLIC HEALTH, ch. 4 (2017).



30-Jun-24]

*Response to William English*

17

One obvious problem with this approach is that memory of events that occurred decades earlier are likely to be lost or distorted. But even if we take the “lifetime” counts at face value, and memory of these events as infallible, they only provide an unbiased estimate of the DGUs in any given calendar year if the likelihood of adult involvement in a DGU in a year is the same for all age groups and unchanging over time (i.e., no age or cohort effects: the same at age 20 as at age 70, and the same in 1991 as in 2021). Neither of these conditions are plausible and yet both are fundamental to the method English uses to obtain his annual DGU estimates. In addition, English’s own data are inconsistent with the very assumptions he relies on for his estimates.

Third, the English survey specifically asks for DGU incidents where the gun was not even displayed. By contrast, other DGU surveys commonly ask for incidents when the gun was used, even if not fired. The goal of that common wording is to make it clear that gun brandishing counts. The English wording states that the gun does not even need to be displayed and explicitly expands the definition of DGU. It indicates that the respondent is using the gun in self-defense even if he never shows the gun, never touches the gun, and the offender has no idea whether the respondent actually has a gun. More than 30% of English’s DGUs appear to be such situations. English’s explicit expanded definition of gun “use” helps increase his estimates.

#### 1. The Problems with Relating Lifetime Totals to an Annual Rate

English generates an estimate of average annual DGUs using the lifetime data for every gun owner interviewed in 2021. His estimate is essentially meaningless since his survey procedure does not provide a logical basis for estimating the number of DGUs in any one year. Assume as he does that DGUs begin at age 18. So the youngest respondents will report just for the previous year, but the respondents age 50 will report on the previous 32 years, and the 80 year olds on the previous 62 years. All those years and reported DGUs are counted equally in English’s average. We can identify two sorts of logical problems.

First, all of the respondents, including the youngest, are reporting about their DGUs at age 18, but only those age 50 and above can logically report DGUs at age 50. If we consider the unit of observation to be a year of the life of each respondent, his sample is not of individuals but of individual life years, and that sample is far younger than the adult population.<sup>72</sup>

---

<sup>72</sup> In English’s sample, 5.0% are age 18-20. If English had asked for a report on DGUs during the prior year, then the relevant sample would have followed the age distribution, for that year, with about 5.0% age 18-20. The result would be the basis for a valid estimate of the number of reported DGUs in the previous year. But by asking for *lifetime* DGUs, all of the respondents are in effect asked to report on their DGUs at age 18-20. In terms of total life years, the representation of age 18-20 increases from 5.0% of the total (if the survey had asked about

In other words, English is trying to estimate the number of DGUs produced by the adult population in a single calendar year by using a sample that is far younger than the adult population. That is an obvious problem if there is a systematic association between age and DGU production. There are several reasons to believe that a 30 year old is more likely to produce a DGU in any one life year than a 70 year old.<sup>73</sup> Indeed, English's sample provides evidence of a strong inverse association between DGU production and age.<sup>74</sup> So, the fact that his sample of life years is grossly unrepresentative of the population age distribution in any one year ensures that his estimate of an annual rate is biased.

But that is not the only problem with English's estimation procedure. Suppose we lived in a world in which the likelihood of producing a DGU did not change over the life course of each individual. Person X is just as likely to produce a DGU at age 70 as they were at age 20 or 50. Even in this (unlikely) world, English's sample of life years is still problematic, because of what the demographers call "cohort effects." The 70-year-olds grew up in a different era with respect to experience with guns, gun carrying, and crime exposure than the 30-year-olds, and may at every age have had different rates of DGU production.<sup>75</sup> Again, English's distorted sample greatly oversamples the older

---

a single year) to 14.4% of life years. Older life years can only be reported on by older respondents, which implies that those life years are of less importance relative to the actual age distribution. The representation for those aged 75 and over declines from 8.0% (population prevalence in 2021) to 1.8% (the share of total life years in that age range. These statistics are close approximations based on the statistics in Appendix B of English, *supra* note 2, at 43. The calculation is based on the observation that given the "lifetime" question, 100% of the sample reports on DGUs occurring during age 18-20, whereas just 4.5% report on age 80 and over. The resulting distribution of the combined age-years in the sample is much younger than the actual age distribution at the point of the survey. It is the latter that is relevant to estimating the number of DGUs in any one calendar year.

<sup>73</sup> The logic is simply that legitimate DGUs are a response to criminal threats and victimization, which is far more common among youths than for older groups. For example, homicide victimization peaks in the early 20s and declines steadily with age thereafter. For the period 2012-2021, the homicide victimization rates were 14.5 at age 22, declining to 5.0 at age 50, and 1.9 at age 70 (customized WISQARS report). NCVS data provides a similar profile for all nonfatal violence (excluding simple assault). Alexandra Thompson & Susannah N. Tapp, *Criminal Victimization 2022*, US DEP'T OF JUSTICE BUREAU OF JUSTICE STATISTICS (Sept. 2023), at 5, available at <https://bjs.ojp.gov/library/publications/criminal-victimization-2022>. The rates per 1,000 population for 2021 were 11.9 (18-24); 8.3 (25-34); 6.1 (35-49); 3.8 (50-64); 2.2 (65+).

<sup>74</sup> For example, 18-20-year-olds in his sample reported more than half (54%) of the total number of lifetime DGUs reported by all age groups combined.

<sup>75</sup> The volume and rates of violent victimizations have plunged during the last three decades, and by 2021 were a fraction of the volume in 1994. Specifically, during that period the number of violent victimizations (excluding simple assault) declined 62.4% for those 12 and older. The population-adjusted rate fell by 76.9%. In short, the likelihood of being physically threatened, attacked or robbed in 1994 was over four times as high as in 2021. These statistics are based on the report of NCVS by Thompson & Tapp, *supra* note 73, at Appendix Tables 1 and 15. The volume of violent victimizations for those age 12 and over declined from 2,966 thousand to 1,114 thousand. The rates for individuals age 12 and over declined from 3.24% to

30-Jun-24]

*Response to William English*

19

cohorts relative to the younger ones with respect to life years.

The bottom line is that results from English's sample of life years does not provide a valid basis for estimating the number of DGUs in any calendar year. That is true even if the self-reports at every age are considered accurate.

To sum up, English reports an annual number of DGUs based on his survey's items regarding the respondents' lifetime DGUs. Most other survey estimates of the volume of DGUs have asked all respondents about a particular time period, such as the previous year. For English's estimate of the annual number to be comparable to the usual survey estimate requires several assumptions that are in fact falsified by his own data as well as in conflict with reasonable expectations based on historical trends in crime victimization. One of those assumptions is that DGU productivity is uniform over the life course, so that the overrepresentation of youthful life years is of no statistical consequence. Yet English's own data find a very strong inverse correlation between age and annual per capita DGU. Another assumption is that DGU production has been constant over time, or at least has not had a strong trend. In fact, there is a strong cohort effect in his data. His estimate of 1.67 million DGUs per year is essentially meaningless even if we do not consider the possibility of response error and definitional problems considered in the previous section.

## 2. The Largest and Best Survey of DGUs

English observes that “[t]his survey thus contains what we believe is the largest sample of firearms owners ever queried about their firearms ownership and firearms use in a scientific survey in the United States.”<sup>76</sup> While he may be right that his initial sample of 53,834 individuals is the largest used to estimate the prevalence of firearms ownership, he is not correct with respect to surveying defensive gun use. The NCVS includes items on self-defense against crime. It has been in the field every 6 months since 1973, with sample sizes exceeding 50,000 households. The 2018 NCVS data file includes interviews from 151,055 households. Each household was interviewed twice during the year. Within participating households, 242,928 persons completed an interview in 2018, representing an 82% response rate among eligible persons from responding households.<sup>77</sup>

The NCVS asks respondents about victimization experiences during the 6 months prior to the survey. If the respondent reports being robbed, threatened, assaulted, burglarized, or otherwise victimized while present at the scene, there are follow up questions about whether and how they responded. One option is that they used a gun in self-defense.

---

0.75%.

<sup>76</sup> English, *supra* note 2, at 4.

<sup>77</sup> Kena & Truman, *supra* note 21, at 16.

Table 1 summarizes the national estimates of DGUs from 5 years (2014-2018) of the NCVS. The overall annual estimate is 70,040, divided nearly evenly between use of a gun to defend against violent crime (aggravated assault, robbery, rape) and against property crime in which the victim was present (purse snatching, burglary of an occupied dwelling, etc.).

	Count	Percent
Non-Fatal Violence (Excluding simple assault)	2,006,480	
DGU	33,380	1.7%
Property victimization, victim present	2,556,420	
DGU	36,660	1.4%
Total DGU	70,040	1.5%

Table 1. *Self-Protective Actions of Victims, by Type of Crime, Gun Use: 2014-2018 (annual average)*<sup>78</sup>

The huge gap between DGU estimates from NCVS and from a number of one-shot surveys is likely due primarily to the fact that the NCVS only asks about self-protective actions of respondents who first report being the victim of a crime. While it seems logical that justifiable uses of a gun against another person are limited to instances in which the defender is the victim of a criminal attack or threat, in fact many respondents report events as DGUs in which there was no crime or even direct threat or provocation.

### 3. Summary

The events reported as DGUs in English's survey occurred over the past 50+ years, an indeterminant proportion of which may not have involved a response to criminal behavior or a perceived human threat. English's survey does not provide information on whether the reported DGU was against an animal or human threat, nor does it provide any indication of whether the DGU was in response to a credible criminal threat or action. Thus the English survey provides no information about whether the reported DGU incidents were beneficial to society, or even more beneficial to the respondents than had they

<sup>78</sup> Calculated from Kena & Truman, *supra* note 21, at Table 12.

30-Jun-24]

*Response to William English*

21

used other methods of self-protection.

Even if the respondents' reports of how often they had engaged in DGUs are accepted, the fact that English asks for a "lifetime" report requires him to make assumptions about cohort, period, and age effects that are implausible and not supported by his own data, rendering his estimates about annual rates meaningless. The NCVS, on the other hand, provides a credible estimate of the national rate of DGUs, albeit one that is restricted to gun uses in response to criminal threats or thefts. The NCVS-based estimates are a small fraction of English's estimate for a year's production of DGUs.

### III. ASSESSING THE USEFULNESS OF LARGE CAPACITY MAGAZINES

The English survey includes several items on large capacity magazines (LCMs) – those that hold more than ten rounds of ammunition. To determine the potential need for LCMs, English included the following open-ended item: "Have you ever been in a situation (including any referenced in earlier response) in which it would have been useful for defensive purposes to have a firearm with a magazine capacity in excess of 10 rounds? If so, please briefly describe that situation."<sup>79</sup> Of his 16,708 gun owning respondents, 550 respondents (about 3% of the sample of gun owners) responded in the affirmative. He quotes 31 of them.

In contrast to his items about actual defensive gun uses (discussed above), this item is hypothetical. The responses that he quotes are for the most part not compelling as instances in which a LCM would have been "useful." For example, here are four of those he quotes:

"I was walking my dog, three men ambushed me, and my dog chased them away";

"I went in a store and 4 thugs approached me, I produced my handgun and they left";

"We have mountain lions killing our calves so a larger animal could require more rounds";

"I often carry large amounts of cash, on more than 1 occasion I was faced with pulling my weapon or lose my cash."<sup>80</sup>

English provides data indicating that about half of gun owners do own or have owned magazines that hold over 10 rounds (39 million gun owners). Yet in only one of the examples he cites does it appear that 10 or more shots were fired, or that a LCM would clearly have been useful. The example is about animals: "About 20 coyotes attacked some of my livestock. It took two 30 round

---

<sup>79</sup> English, *supra* note 2, at 27-28.

<sup>80</sup> *Id.* at 28-31.

magazines to repel the animals and then only after killing 10 of them.”<sup>81</sup> In that case having to reload more often would likely have lead—at worst—to a loss of some additional livestock.

We conclude that the survey responses to this item do not make a credible case for the value of LCMs in self-defense.

#### CONCLUSION

William English’s survey has been cited by a number of litigants in gun rights cases as an authoritative source of information on several topics, but as far as we know the manuscript has not been reviewed by experts. We offer this Article as a sort of peer review and find that several of his findings are based on flawed evidence. In addition, several findings are difficult to interpret, and do not support the lessons that litigants have drawn. The three issues on which he has most frequently been cited—gun ownership (especially ownership of AR-15-style weapons), defensive gun uses, and the utility of large capacity magazines for self-defense—are all problematic, as is the failure to disclose his source of funding for the survey.

First, English’s screener question for determining whether to include a respondent in his subsample of gun owners may confound personal gun ownership with household gun ownership. It is plausible, given that screener, that some respondents said they owned a gun when what they meant was that someone in their household owned a gun. The difference between personal and household gun ownership has a direct and potentially large effect on estimates of the number of guns in private hands.

English estimates the percentage of current (2021) gun owners who have ever owned an AR-15-style rifle. His estimate is far higher than the estimated prevalence of current AR-15 ownership among gun owners in 2021. Similarly, English’s estimate of the number of AR-15s ever owned is twice as high as the best estimate of the number manufactured or imported in the previous 30 years. There is a logical explanation for these disparities, namely that AR-15s, like other types of guns, often change hands after they are first sold at retail. English gives no explanation for why he asked about lifetime experience instead of asking about current ownership status.

Second, English estimates that current gun owners have over the course of their lifetimes been involved in 50 million defensive gun uses (DGUs), from which he derives an average annual incidence of 1.67 million DGUs per year. We believe that his approach to deriving an annual DGU incidence from survey questions about the total number of lifetime DGUs is hopelessly problematic, relying as it does on several assumptions that are either falsified by his own data or in conflict with reasonable expectations based on well-established trends in

---

<sup>81</sup> English, *supra* note 2, at 29.

30-Jun-24]

*Response to William English*

23

criminal victimization, or both. These problems add to the challenges faced by prior surveys that ask respondents an unconditional question about DGUs, which tends to generate a large percentage of responses that are not a justified response to a criminal threat. In English's case, the added feature that an indeterminant portion of the DGU reports are likely against animals, not people, further compounds the problems with his estimates, as does the fact that he invites respondents to report incidents in which they claimed to have a gun but never displayed it. Indeed, English's estimate is more than 20 times as high as the estimate using the National Crime Victimization Survey, which only asks for DGU information of those respondents who first report being the victims of a criminal threat or personal crime.

Finally, when asked to speculate about whether they have ever been in a position when it would have been useful to have a large capacity magazine for a defensive gun use, 3% of his gun owners said yes and provided details. There apparently were no cases reported in the survey in which a respondent actually fired 10 or more shots in defending against a criminal attack or intrusion, and the cases cited in detail by English do not support the assertion that an LCM would have made a difference.

Courts, litigants, and scholars are giving English's study serious, sometimes determinative, treatment. It is better used as a case study for why the norms of scientific study exist and as a warning to actors in the legal system when considering projects that have not been conducted in accordance with those norms.

\* \* \*