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INTERVENTION OF CHOICE: BEHAVIORAL SCIENCE AND GUN VIOLENCE

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I. INTRODUCTION	409
II. BEHAVIORAL SCIENCE AND PUBLIC POLICY.....	411
III. REDUCING GUN VIOLENCE.....	412
IV. MOVING FORWARD.....	417

I. INTRODUCTION

Everyone can agree that far too many people are the victims of gun violence in the United States; nearly 40,000 Americans die by gunshot each year.¹ People, however, disagree intensely about what exactly should be done.

Sixty percent of Americans say gun laws should be stricter.² Guns intensify violence;³ they can make arguments, robberies, accidents, and

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¹ *National Center for Health Statistics: All Injuries*, CTRS. FOR DISEASE CONTROL & PREVENTION (Jan. 25, 2021), <https://www.cdc.gov/nchs/fastats/injury.htm>.

² John Gramlich & Katherine Schaeffer, *7 Facts About Guns in the U.S.*, PEW RES. CTR. (Oct. 22, 2019), <https://www.pewresearch.org/fact-tank/2019/10/22/facts-about-guns-in-united-states/>.

³ See e.g., Scott Phillips & Michael O. Maume, *Have Gun Will Shoot? Weapon Instrumentality, Intent, and the Violent Escalation of Conflict*, 11 HOMICIDE STUD. 272, 282, 287–88, 291 (2007) (concluding that the presence of guns in certain interpersonal conflicts often increases the chances of violence).

moments where people wish to harm themselves more deadly. More than four in ten Americans personally know a victim of an accidental or intentional shooting.⁴ Yet the vast majority of gun owners describe their right to gun ownership as essential to their sense of personal freedom.⁵ Today, 42% of Americans live in a household with a gun.⁶ The result is a sort of stalemate: depending on how exactly one counts,⁷ legislatures have passed only a half-dozen major federal gun laws in the 243-year history of this country.⁸

Against this backdrop, Ian Ayres and Frederick Vars' *Weapon of Choice* brings a needed set of pragmatic new ideas to the table.⁹ The authors ask what we can feasibly do to reduce gun misuse given the existing political and legal constraints within the United States.¹⁰ What can we do to start making progress despite the disagreements that we have?

Our hope is that *Weapon of Choice* starts an urgently needed conversation that leads to new policy proposals beyond those outlined in the book. In what follows, we discuss one illustrative direction this conversation could take. The same pragmatic spirit of the book underlies much of the policy-oriented work within behavioral science, including the philosophy of "libertarian paternalism" that seeks to reduce social harms while simultaneously respecting individual preferences and autonomy.¹¹ Behavioral science has made important progress in improving a wide range of health outcomes, personal financial decisions, government tax collection, and consumer product design and regulation.¹² There could be ways to use behavioral science to address gun violence as well, in ways that respect current political constraints. This article gives one example of

⁴ Ruth Igielnik & Anna Brown, *Key Takeaways on Americans' Views of Guns and Gun Ownership*, PEW RES. CTR. (Jun. 22, 2017), <https://www.pewresearch.org/fact-tank/2017/06/22/key-takeaways-on-americans-views-of-guns-and-gun-ownership/>.

⁵ *Id.*

⁶ Gramlich & Schaeffer, *supra* note 2.

⁷ See PHILIP J. COOK & KRISTIN A. GOSS, *THE GUN DEBATE: WHAT EVERYONE NEEDS TO KNOW* 98 (2014) (noting that how many gun laws the U.S. has as a country ultimately depends upon how we define "a law.").

⁸ *Id.* at 105–06 (listing major federal gun control legislation since the 1920s).

⁹ See IAN AYRES & FREDRICK E. VARS, *WEAPON OF CHOICE: FIGHTING GUN VIOLENCE WHILE RESPECTING GUN RIGHTS* 118 (2020).

¹⁰ *See id.*

¹¹ See Richard H. Thaler & Cass R. Sunstein, *Libertarian Paternalism*, 93 AM. ECON. REV. 175, 175 (2003).

¹² See Gordon W. Blackwell, *Behavioral Science and Health*, 32 J. SOC. FORCES 211, 211 (1953).

what that could look like, expanding on the excellent work of Harvard public health professor David Hemenway and his colleagues.

II. BEHAVIORAL SCIENCE AND PUBLIC POLICY

Behavioral science interventions build on the idea that there is often a gap between our intentions and our behavior. Human cognition occurs in two ways: (1) the sort of deliberate conscious thought that we normally mean by “thinking” (sometimes called in psychology “System 2 thinking”), which requires real mental effort on our part; and (2) automatic responses that do not require any mental effort (“System 1 thinking”).¹³ To conserve our mental energy, we tend to rely whenever we can on automatic System 1 cognition, particularly in situations we encounter over and over again.¹⁴ We do not realize we are doing it.¹⁵ As University of Virginia psychologist Timothy Wilson put it, we are often “strangers to ourselves.”¹⁶

Our automatic systems are designed to be fast, effortless, and generally accurate.¹⁷ A naturally adaptive automatic response, however, can become maladaptive when overgeneralized.¹⁸ For example, in forming judgments, people tend to move quickly to draw conclusions, which is a useful skill when our ancestors were trying to decide whether a shadow on the horizon was indeed a lion, but in the modern world means we tend to draw upon available information inconsistently and incompletely.¹⁹ That can lead to systematic misjudgments of reality, for instance, in the choice to delay retirement savings because of the mistaken belief that investments grow linearly over time.²⁰

One way to improve decision making is to provide additional information or reframe existing information to correct common misunderstandings.²¹ Employees that see graphs depicting how their

¹³ DANIEL KAHNEMAN, THINKING, FAST AND SLOW 20–22 (1st ed. 2011).

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *See generally* TIMOTHY D. WILSON, STRANGERS TO OURSELVES: DISCOVERING THE ADAPTIVE UNCONSCIOUS (2004).

¹⁷ *Id.* at 35.

¹⁸ *Id.* at 40–41.

¹⁹ *See id.*

²⁰ *See* Victor Stango & Jonathan Zinman, *Exponential Growth Bias and Household Finance*, 64 J. FINANCE 2807, 2807–08 (2009).

²¹ Jack B. Soll et al., *A User’s Guide to Debiasing*, in THE WILEY BLACKWELL HANDBOOK OF JUDGMENT AND DECISION MAKING 924, 925 (Gideon Keren & George Wu eds., 2015).

retirement contributions would accrue over time are more inclined to opt into higher savings plans.²² If they are too quick to draw conclusions, we can sometimes do the mental calculation for them. Another way to correct mistaken judgments is through a “nudge,” an intervention that adapts the environment to people’s biases without limiting choices or changing incentives.²³ Thaler and Benartzi’s *Save More Tomorrow*TM plan is one such program: it uses an automated system to encourage employees to increase retirement contributions with every raise.²⁴

III. REDUCING GUN VIOLENCE

Where might there be intention-behavior gaps in the area of gun violence that are amenable to a behavioral science intervention? Consider one example that contributes to interpersonal gun violence in practice. Over 70% of all homicides in the US involve a gun.²⁵ In cities like Chicago, 86% of homicides occur in public,²⁶ and the majority of all homicides stem from an altercation.²⁷ That is, a large share of gun homicides seem to be arguments that turned into tragedies because someone had a gun on hand.²⁸ Put differently, illegal gun carrying in public is an important contributing cause of our interpersonal gun violence.

Traditionally, the policy response has been proactive policing, including street stops and searches that have led to large racial disparities in law enforcement harms.²⁹ Since legislatures first popularized stop-and-

²² Craig R.M. McKenzie & Michael J. Liersch, *Misunderstanding Savings Growth: Implications for Retirement Savings Behavior*, 48 J. MARKETING RES. S1, S8 (2011).

²³ RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 8 (2008).

²⁴ Richard H. Thaler & Shlomo Benartzi, *Save More TomorrowTM: Using Behavioral Economics to Increase Employee Saving*, 112 J. POL. ECON. S164, S168–S169 (2004).

²⁵ Of 14,123 homicides in 2018, 10,265 were committed with a firearm. FBI UCR, *Expanded Homicide Data Table 9*, FED. BUREAU INVESTIGATION: UNIFORM CRIME REP. (2018), <https://ucr.fbi.gov/crime-in-the-u.s/2018/crime-in-the-u.s.-2018/tables/expanded-homicide-data-table-9.xls> (last visited Feb. 15, 2021).

²⁶ Out of the 10,895 homicides in Chicago since 2001, only 1,502 occurred in a house or apartment. *Homicide Map*, CHI. DATA PORTAL, <https://data.cityofchicago.org/Public-Safety/Homicide-Map/53tx-phyr> (last visited Feb. 15, 2021).

²⁷ In 2011, Chicago recorded 433 murders, 219 of which were the result of an altercation. CHI. POLICE DEP’T., 2011 CHICAGO MURDER ANALYSIS REPORT 2, 27 (2012), <https://home.chicagopolice.org/wp-content/uploads/2014/12/2011-Murder-Report.pdf>.

²⁸ *See id.* at 22 (noting that 361 of 433 homicides, or 83.4%, involved guns).

²⁹ Aaron Moselle, *ACLU: New Stop-and-Frisk Numbers ‘Not What People of Philadelphia Deserve,’* WHY (Apr. 28, 2020), <https://why.org/articles/aclu-ncw-stop-and-frisk-numbers-not-what-people-of-philadelphia-descrv/>.

frisk policies in the early 2000s, federal investigations have questioned their legality in over a dozen cities,³⁰ and researchers have documented how exposure to proactive policing can lead to lasting adverse psychological effects for its targets.³¹ In 2020, we saw the result: millions of people across the country marched in the streets asking for alternative ways to keep the public safe without so much enforcement harm.³²

Another issue surrounding increased gun violence may revolve around misperceptions of peer gun use. Consider how difficult it would be for any of us to have a sense of how many others are carrying guns. Survey data suggests one key reason young people carry guns is that they are worried about other people carrying guns.³³

In a 2011 survey of Boston teenagers, a research team at Harvard University led by David Hemenway found that respondents overestimated gun carrying by other teenagers in their neighborhoods by a median of fifteen percentage points.³⁴ Teenagers estimated that 32.6% of their peers carried guns.³⁵ When asked how often they carry guns themselves, however, the reality was under 6%.³⁶

It is easy to see how such a large misperception could become self-perpetuating. If teenagers expect that one in every three of their peers they encounter in their neighborhood is carrying a gun, it might seem prudent to arm themselves just in case, creating an even more entrenched gun-carrying culture. It is quite literally an arms race; however, as Hemenway

³⁰ *An Interactive Guide to the Civil Rights Division's Police Reforms*, DEP'T JUSTICE (Jan. 18, 2017), <https://www.justice.gov/crt/page/file/922456/download>.

³¹ Emily Badger, *The Lasting Effects of Stop-and-Frisk in Bloomberg's New York*, N.Y. TIMES, <https://www.nytimes.com/2020/03/02/upshot/stop-and-frisk-bloomberg.html> (last updated Nov. 30, 2020).

³² See Larry Buchanan et al., *Black Lives Matter May Be the Largest Movement in U.S. History*, N.Y. TIMES (Jul. 3, 2020), <https://www.nytimes.com/interactive/2020/07/03/us/george-floyd-protests-crowd-size.html> (surveying that 15–26 million Americans participated in Black Lives Matter protests in the weeks following the police killing of George Floyd).

³³ See e.g., Deanna L. Wilkinson et al., *Peers and Gun Use Among Urban Adolescent Males: An Examination of Social Embeddedness*, 25 J. CONTEMP. CRIM. JUST. 20, 25 (2009) (commenting on prior studies that found an increase in teenage gun carrying based on perceptions of classmates' gun carrying); David Hemenway et al., *Gun Carrying Among Adolescents*, 59 L. & CONTEMP. PROBS. 39, 43 (1996) (noting that the majority of teenage males participating in a survey attributed their gun carrying to protection or self-defense); Philip J. Cook & Jens Ludwig, *Does Gun Prevalence Affect Teen Gun Carrying After All?*, 42 CRIMINOLOGY 27, 50 (2004) (finding close associations between the prevalence of guns in a community and the number of teens carrying guns).

³⁴ David Hemenway et al., *Gun Carrying by High School Students in Boston, MA: Does Overestimation of Peer Gun Carrying Matter?*, 34 J. ADOLESCENCE 997, 999 (2011).

³⁵ *Id.*

³⁶ *Id.*

points out, this state of affairs also suggests a concrete intervention: recalibrate those mis-calibrated expectations.³⁷

We have seen past success of this basic playbook in other policy areas. For example, on college campuses, where surveys showed students overestimate the amount of binge drinking by their peers, simply providing more accurate information about the number of students who binge drink reduces negative perceptions and drinking behaviors.³⁸ Similarly, sending a letter notifying people whether their energy usage was above or below that of their neighbors can reduce energy consumption significantly.³⁹ These interventions, known broadly as “social norms interventions,” effectively achieve goals as diverse as increasing hotel towel reuse,⁴⁰ reducing truancy,⁴¹ encouraging exercise,⁴² and getting people to pay their taxes on time.⁴³ As Alan Berkowitz writes, such interventions “inform[] the majority that their behavior is actually

³⁷ *Id.* at 1000 (showing that 69% of surveyed teens would be less likely to carry a gun if they found their perceptions of peer gun carrying was overestimated).

³⁸ See Michael P. Haines & Gregory P. Barker, *The Northern Illinois University Experiment: A Longitudinal Case Study of the Social Norms Approach*, in *THE SOCIAL NORMS APPROACH TO PREVENTING SCHOOL AND COLLEGE AGE SUBSTANCE ABUSE: A HANDBOOK FOR EDUCATORS, COUNSELORS, AND CLINICIANS* 21, 26–28 (H. Wesley Perkins ed., 2003); H. Wesley Perkins & David W. Craig, *The Hobart and William Smith Colleges Experiment: A Synergistic Social Norms Approach Using Print, Electronic Media, and Curriculum Infusion to Reduce Collegiate Problem Drinking*, in *THE SOCIAL NORMS APPROACH TO PREVENTING SCHOOL AND COLLEGE AGE SUBSTANCE ABUSE: A HANDBOOK FOR EDUCATORS, COUNSELORS, AND CLINICIANS* 35, 54–61 (H. Wesley Perkins ed., 2003) (noting a decrease in perception of peer binge drinking from 52% to 32%, and an increase in more conservative drinking behavior over the course of two years after correcting student misperceptions); Koreen Johannessen & Peggy Glider, *The University of Arizona’s Campus Health Social Norms Media Campaign*, in *THE SOCIAL NORMS APPROACH TO PREVENTING SCHOOL AND COLLEGE AGE SUBSTANCE ABUSE: A HANDBOOK FOR EDUCATORS, COUNSELORS, AND CLINICIANS* 65, 80 (H. Wesley Perkins ed., 2003) (showing a 29% decrease in heavy drinking among college students between 1995 and 1998 following a campaign to correct peer drinking misperceptions); see also Alan D. Berkowitz, *The Social Norms Approach: Theory, Research, and Annotated Bibliography* at 2, 18 (Aug. 2004), http://www.alanberkowitz.com/articles/social_norms.pdf (evaluating the success of past misperception correction campaigns for multiple behavioral problems and trends through implementation of the “social norms approach”).

³⁹ Hunt Allcott, *Social Norms and Energy Conservation*, 95 J. PUB. ECON. 1082, 1093 (2011).

⁴⁰ Gerhard Recse et al., *A Towel Less: Social Norms Enhance Pro-Environmental Behavior in Hotels*, 154 J. SOC. PSYCHOL. 97, 99 (2014).

⁴¹ Todd Rogers & Avi Feller, *Reducing Student Absences at Scale by Targeting Parents’ Misbeliefs*, 2 NAT. HUM. BEHAV. 335, 335 (2018).

⁴² John Maltby et al., *Contextual Effects on the Perceived Health Benefits of Exercise: The Exercise Rank Hypothesis*, 34 J. SPORT & EXERCISE PSYCHOL. 828, 838 (2012).

⁴³ Christopher Larkin et al., *Testing Local Descriptive Norms and Salience of Enforcement Action: A Field Experiment to Increase Tax Collection*, 2 J. BEHAV. PUB. ADMIN. 1, 8 (2019).

more normative and healthy than they think.”⁴⁴ In the case of illegal gun carrying, a social norms intervention could be employed to update young people’s perceptions that the risks to them from carrying by their peers, and hence their perceived benefits of carrying themselves, are not as great as they had thought.

Could a social norms intervention have a similar beneficial impact in reducing illegal gun carrying and gun violence? It is hard to know for sure, but it is very much in the spirit of what Ayres and Vars propose in *Weapon of Choice*. Like Donna’s Law and the other policies that Ayres and Vars recommend, an intervention along these lines would not be gun control so much as self-control.⁴⁵ These policies would not infringe on anyone’s rights. No government or legal entity—or even parental or school authority—would be imposing any kind of restriction on gun carrying beyond those self-imposed. It would also be apolitical and easy to scale; unlike some behavioral interventions, this would not require complicated training or large monetary investments, and would not be any less effective in larger groups. The intervention would merely help people more effectively respond to their situation based on a more accurate understanding of reality.

Here is how a simple version would work. First, surveyors would administer a baseline survey to the population of interest. It asks two basic questions of each respondent: (1) do you carry a gun? and (2) what percentage of your peers do you believe carry a gun? Using the answers to the first question, researchers can get a sense of the reality of how many people actually carry guns, while the second question would inform researchers about the extent of the disparity between perceptions and reality. The next step would be delivering a “reality check” to adjust the prevailing norm. That can take the form of a general marketing campaign—posters, emails, letters home—or more personalized feedback that tells respondents whether or not they overestimated gun carrying and by how much. If the intervention is successful, not carrying a gun would no longer be a risky move; it would be the correct response to knowing that fewer peers carry guns than originally believed. Reducing the perceived danger thus reduces the perceived need to carry a gun. In fact, David Hemenway’s 2011 survey asked respondents how they would react if they found out there were not as many people carrying guns as they thought: 69% said they would be less likely to carry a gun themselves.⁴⁶

⁴⁴ Berkowitz, *supra* note 38, at 7.

⁴⁵ See AYRES & VARS, *supra* note 9, at 1–9.

⁴⁶ Hemenway, *supra* note 34, at 1000.

In practice, running this playbook to address illegal gun carrying raises a number of important design decisions that are particularly challenging compared to other applications.

Pinpointing the right peer group is an important step. For binge drinking, it is easy to see what the relevant peer group might plausibly be: other students on campus. For illegal gun carrying, however, the relevant peer group might not be limited to students, but rather other youth in the neighborhood or other cross-sections of populations in areas where gun violence is particularly likely.

Establishing the legitimacy of the survey findings is also vital. Because norms may be very ingrained, the information the intervention presents may be doubted by participants or even completely ignored. These norms seem particularly challenging in a country where trust in government and other social institutions has declined substantially over time,⁴⁷ particularly among young people.⁴⁸

Getting the messaging and marketing of the information campaign right can be almost as important as the information itself. Additionally, researchers have found that the information must be mentally prominent to influence subsequent behavior, so social norms interventions face the challenge of keeping information salient over time.⁴⁹

Moreover, this intervention would rely on the accuracy of survey data. Here, accuracy would require a way to solve self-presentation bias and the difficulty of getting people to tell the truth about illegal activity—a challenge the survey research community has made some progress on over time.⁵⁰ It also requires ensuring the survey population is an accurate

⁴⁷ *Public Trust in Government: 1958–2019*, PEW RES. CTR. (Apr. 11, 2019), <https://www.pewresearch.org/politics/2019/04/11/public-trust-in-government-1958-2019/> (last visited Feb. 16, 2021) (finding that since 2007, no more than 30% of people say that can trust the government all or most of the time).

⁴⁸ John Gramlich, *Young Americans Are Less Trusting of Other People – And Key Institutions – Than Their Elders*, PEW RES. CTR. (Aug. 6, 2019), <https://www.pewresearch.org/fact-tank/2019/08/06/young-americans-are-less-trusting-of-other-people-and-key-institutions-than-their-elders/> (last visited Feb. 16, 2021) (showing declining trust in the military, religious leaders, police, business leaders, and school principals among young adults).

⁴⁹ Robert B. Cialdini & Noah J. Goldstein, *Social Influence: Compliance and Conformity*, 55 ANN. REV. PSYCHOL. 591, 614 (2004).

⁵⁰ See e.g., Ana Nuno & Freya A.V. St. John, *How to Ask Sensitive Questions in Conservation: A Review of Specialized Questioning Techniques*, 189 BIOLOGICAL CONSERVATION 5, 12–13 (2015) (suggesting protecting respondent confidentiality as one means of increasing reliability of responses); M. Mofizul Islam et al., *The Reliability of Sensitive Information Provided by Injecting Drug Users in a Clinical Setting: Clinician-Administered Versus Audio Computer-Assisted Self-Interviewing (ACASI)*, 24 AIDS CARE 1496, 1501 (2012) (showing respondents' preference for digitally-administered questionnaires over in-person

representation of the actual population. Ensuring accuracy has proven more challenging, as evidence from Duke's Philip J. Cook shows that even some of our highest-quality social science surveys, such as the National Crime Victimization Survey, seem to severely under-represent those people at highest risk for gun violence involvement.⁵¹ These are important design details that we need to get right.

IV. MOVING FORWARD

Similar to the policies described in *Weapon of Choice*, behavioral science interventions create the possibility of reducing the social harms from gun violence within our current highly polarized political environment. The potential public health gains are substantial. Interventions similar to the one we describe here have successfully reduced rates of binge drinking and chronic school absenteeism.⁵² Similar impacts from a nationwide intervention targeted at illegal gun carrying could mean hundreds or even thousands of fewer interpersonal shootings per year.

Deaths from almost every major leading cause have plummeted in the United States since 1950—yet the murder rate in America today is not much different from the murder rate in 1950,⁵³ and the gun suicide rate continues to rise.⁵⁴ Setting aside the question of whether the specific

questioning); Ulf Böckenholt & Peter G. M. Van Der Heijden, *Item Randomized-Response Models for Measuring Noncompliance: Risk-Return Perceptions, Social Influences, and Self-Protective Responses*, 72 *PSYCHOMETRIKA* 245, 259 (2007) (observing the truthfulness of responses to correlate with a respondent's perception that lying will result in punishment); Graeme Blair & Kosuke Imai, *Statistical Analysis of List Experiments*, 20 *POL. ANALYSIS* 47, 72 (2012) (suggesting various study and question formats to better elicit truthful responses from survey participants).

⁵¹ Philip J. Cook, *The Case of the Missing Victims: Gunshot Woundings in the National Crime Survey*, 1 *J. QUANTITATIVE CRIMINOLOGY* 91, 101 (1985) (finding a general unwillingness of gun assault victims to voluntarily report to National Crime Survey interviewers).

⁵² See *supra* notes 38, 41 and accompanying text. We use these interventions as comparisons because they aim to reduce the incidence of behavior to zero; interventions in areas such as energy usage aim only to reduce the behavior to some lower rate.

⁵³ The homicide rate was 4.6 per 100,000 in 1950 and 5.0 per 100,000 in 2019. James Alan Fox & Marianne W. Zawitz, *Homicide Trends in the United States*, BUREAU JUST. STAT. (2006), <https://www.bjs.gov/content/pub/pdf/htius.pdf> (last visited, Feb. 24, 2021); *2019 Crime in the United States: Rate: Number of Crimes per 100,000 Inhabitants*, FED. BUREAU INVESTIGATION: UNIFORM CRIME REP. (2019), <https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/tables/table-16> (last visited Feb. 16, 2021).

⁵⁴ Dylan Matthews, *There Are More Gun Suicides Than Gun Homicides in America*, VOX <https://www.vox.com/2015/10/1/18000510/gun-suicide-homicide-comparison> (last updated, Nov. 14, 2018, 4:19 PM).

behavioral science intervention we illustrate here or other behavioral science interventions wind up being helpful, the larger point raised by the Ayres and Vars book is right— it is past time to start trying something new.