

Case No. 19-56004

In the United States Court of Appeals
for the Ninth Circuit

STEVEN RUPP, et al.,
Plaintiffs-Appellants,

v.

XAVIER BECERRA,
in his official capacity as Attorney General of the State of California,
Defendant-Appellee.

On Appeal from the United States District Court
for the Central District of California
Case No. 8:17-cv-00746-JLS-JDE

**APPELLANTS' EXCERPTS OF RECORD
VOLUME XIV OF XXII**

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January 27, 2020

Under Federal Rules of Appellate Procedure for the Ninth Circuit, rule 30-1, Plaintiffs-Appellants Steven Rupp, Steven Dember, Cheryl Johnson, Michael Jones, Christopher Seifert, Alfonso Valencia, Troy Willis, Dennis Martin, and California Rifle & Pistol Association, Incorporated, by and through their attorney of record, confirm to the contents and form of Appellants' Excerpts of Record.

Date: January 27, 2020

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s/ Sean A. Brady

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CERTIFICATE OF SERVICE

I hereby certify that on January 27, 2020, an electronic PDF of APPELLANTS' EXCERPTS OF RECORD, VOLUME XIV OF XXII was uploaded to the Court's CM/ECF system, which will automatically generate and send by electronic mail a Notice of Docket Activity to all registered attorneys participating in the case. Such notice constitutes service on those registered attorneys.

Date: January 27, 2020

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UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
SOUTHERN DIVISION

STEVEN RUPP, et al.,

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vs.

XAVIER BECERRA, in his official
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Case No.: 8:17-cv-00746-JLS-JDE

**EXHIBITS 28-44 TO
DECLARATION OF SEAN A.
BRADY IN SUPPORT OF
PLAINTIFFS' MOTION FOR
SUMMARY JUDGMENT**

Hearing Date: May 31, 2019
Hearing Time: 10:30 a.m.
Courtroom: 10A
Judge: Josephine L. Staton

[Filed concurrently with Notice of
Motion for Summary Judgment,
Memorandum of Points and Authorities,
Statement of Uncontroverted Facts and
Conclusions of Law, Request for
Judicial Notice, Declarations of Steven
Rupp, Steven Dember, Cheryl Johnson,
Christopher Seifert, Alfonso Valencia,
Troy Willis, Michael Jones, Dennis
Martin, and Richard Travis]

EXHIBIT 28



The AR for Home Defense: One Expert's Opinion

by American Rifleman Staff - Tuesday, May 26, 2015



One of today's best-known and most respected trainers in the art of gun fighting, retired Sgt./Maj. Kyle E. Lamb, spent more than 21 years with the U.S. Army—more than 15 years of which were in Special Operations. Lamb is one of those who has “been there and done that”—including combat operations such as the infamous “Blackhawk Down” incident in Mogadishu, Somalia, and throughout numerous tours in Iraq and Bosnia. He currently operates Viking Tactics as a military, law enforcement and civilian trainer teaching courses in tactical entry and the use of the carbine, among others.

Lamb is an unassuming individual who has the appearance of an “average Joe,” but when

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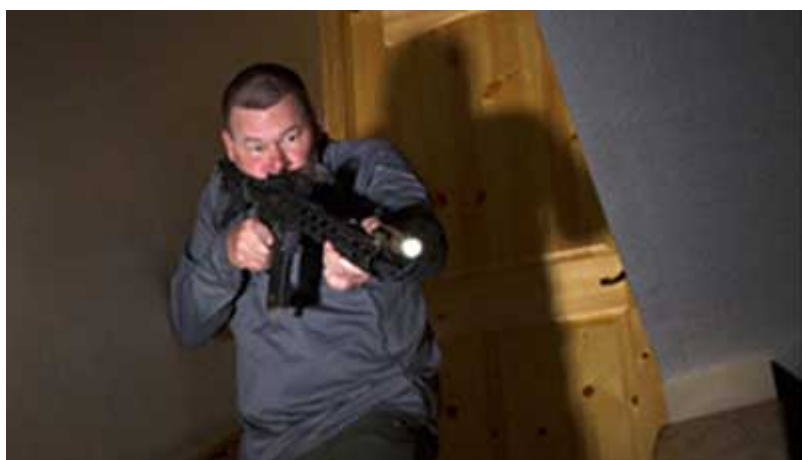
it comes to kitchen-table discussions about the effectiveness of the general-purpose rifle—in today's guise, the AR carbine—for use in a home-defense scenario, he is anything but. That's why we decided to sit down with him for a question-and-answer session on exactly that topic. Here's what he had to say.

AR: Kyle, we know you're passionate about the AR because it's the platform you've relied on for years to see yourself through some desperate situations. What runs through your mind when you hear people with significantly less fighting experience than yourself opine about the AR's unsuitability or deficiencies in the role of home/self-defense?

KL: Several folks have come forward in recent years to spout gallantly the mental deficiencies of those who would choose the "general-purpose rifle" for home defense.

Well, I may have been hit on the head a few too many times, and I have been in very close proximity to large explosions, but I personally stand in support of the AR-15 chambered in 5.56x45 mm NATO/.223 Rem.

The catch with many magazine articles, Internet postings and gun shop discussions is not the fact that folks want to select a different system for the defense of their home—as an unbending supporter of the Second Amendment I am in favor of whatever you prefer, are comfortable with, or can afford. The rub comes when folks tell me that mine is a poor choice and cite reasons that cannot be supported by fact.



In any fight, movement is key. And in a home-defense scenario, the defenders have the advantage of knowing the terrain. Practicing movement throughout the home—clearing corners, climbing stairs, opening doors—can give armed defenders a decisive edge.

AR: So, what is it about the AR that makes it so suitable, in your opinion, for a home-defense scenario?

KL: The AR is very easy to shoot. Head out to the range and test my theory. Ask anyone who wants to join in on the fun to try shooting a scored event, under pressure, with a pistol at home-defense ranges. After you see their performance, try the same with an AR, I will bet money you see much better control of the system. Men and women alike just shoot better with a carbine than with a pistol. As long as the carbine is light enough for the shooter to handle properly, the learning curve will be straight-up.

The AR is unbelievably versatile, from contact shooting distances out to 300 yds., the carbine will outperform the pistol. Most of us don't think of 300-yd. shooting as a likely home-defense scenario, and, in many areas, it wouldn't be. But if given an option of defensive tools, and considering our country's independent heritage and past experiences, why wouldn't you want extended-range capabilities?

AR: What about other choices, such as the shotgun, for home defense?

KL: For self-defense, a reliable semi-automatic is king. That is why I would not pick the shotgun. Rarely can you find a semi-automatic shotgun that is 100-percent reliable with assorted ammunition. Add the fact that you may need to shoot without your shoulder to the buttstock and reliability with the scattergun drops even more. Recoil-operated semi-automatic shotguns are light and handy but unreliable when not held tightly, and gas-operated guns are heavier than I prefer for a home-defense scenario. Once again, if you want to carry a shotgun for home defense, knock yourself out. I choose not to do so. I am sure those who carry pump shotguns will chime in with the absolute final word on the proper pick for the home-defense shotgun—all I ask is that you head to the range and try to operate your pump gun with only one hand. Simulating a disabled arm will make you a believer in the semi-automatic carbine. The shotgun is also extremely deficient in magazine capacity. Once again, the AR shines in this category. Even in 10-round-maximum states, in which long-gun rights have been destroyed, you have more firepower than with most shotguns.

AR: Considering its portability and maneuverability, wouldn't the pistol be the best choice for home defense?

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KL: If you are among those who say, “If I can’t fix the problem with my eight rounds of .45 ACP, it can’t be fixed,” I say please grab a big old mug of black coffee and wake up from your dream. No one knows who, what, when, where or why the fight will start—blowhard statements only degrade an intelligent conversation.

Once again, focusing on reality, 5.56x45 mm NATO ammunition just plain works. There are literally thousands upon thousands of terrorists who have met their ends because of it. Apparently, they did not have a chance to read the latest gun blog decrying the lack of stopping power from the 5.56.

“Pistols point faster,” is a common proclamation, and it can be true if you already have your hands on the gun. However, the last part of that statement is often overlooked: “Pistols point faster, and miss more often.” Although we can quickly get the pistol into the fight, the carbine will get there and be more shootable for the average person. With a carbine in the low-ready position, the average shooter can get shots on target in less than one second. Of course, that is the reaction time once you have made the determination that you should, in fact, shoot. It does not take into consideration the fact that you will have to work your way through a decision-making process that includes threat identification.

AR: *What else has your experience as a trainer taught you about why the AR seems to be so effective for so many users?*

KL: The AR has little to no recoil. Even when fired from a strong- or support-hand-only position, its recoil is negligible. Pistols and shotguns recoil far more than most .223 carbines. Less recoil means more time on target—that is a good thing when the shooting starts. Another concern I hear is the carbine’s noise level. Ok, you got me, and you are correct. Guns are loud, and ARs are really loud. But .40 S&W pistols and shotguns are really loud, too. If you feel this is a serious concern for home defense there are a few ways around the extra sound. For instance, have you considered a suppressor? They are legal to own in many states, and with their threaded muzzles, most ARs are “suppressor ready” as is. Also, suppressors are available from more and more manufacturers in recent years at reasonable prices.



Flash hidere and suppressors are an easy way to upgrade an AR and downgrade its muzzle flash and report.

AR: Isn't sight acquisition slower and more difficult with a carbine than with a handgun?

KL: With a red-dot or low-power scope on your carbine you won't need to align sights as you would need to with your pistol. Simply keep both eyes open, place the red dot on the threat and squeeze the trigger. I am not trying to oversimplify the process, but in reality it will be easier to stay proficient with a red-dot mounted on the carbine than iron sights on a pistol. That's not a guess, it's a fact.

AR: Isn't there a risk of over-penetration with a carbine versus a pistol?

KL: When it comes to over-penetration you will have to determine what is acceptable. You must make the decision, no one will be there to hold your hand and give guidance as to whether or not you should shoot. You will have to make the call. If you are using ammunition that stops in one layer of sheetrock, it will likely have trouble reaching the vitals of an assailant. In all actuality, if you have children in the next room, you'd better not miss. A shot from a pistol, shotgun or the AR will all easily penetrate a conventionally constructed wall consisting of sheetrock, wooden studs and possibly insulation.

Statements are made that the shotgun or pistol should be used because of the over-penetration problem with 5.56 carbine ammunition. This could not be further from the truth. If you conduct a little research you will find that numerous law enforcement departments, to include the FBI, have proven this to be false in most cases. The fact of the matter is that many of these bullets will penetrate numerous walls, but standard 5.56 loadings are the least of your worries when compared to pistol and shotgun fodder, which

continue to take top honors in the category of over-penetration.

AR: Are there other considerations or concerns that people should be aware of when looking at the AR as a primary home-defense tool?

KL: Absolutely. The ease with which you can transport a carbine in and around the battlefield is one of the reasons I immediately gravitate to it for home protection. When the battlefield is your domicile, the only real difference between Iraq and Home Town, USA, is the distances you may need to engage. Most civilians won't have to shoot 400 yds. at enemy insurgents, but it never hurts to be prepared.

Figuring out exactly how to wear a pistol can be problematic. A reasonable setup would be a pistol belt with holster and magazines standing by for you to strap on. This can be easily stashed conveniently beside or under your bed. Pistol, pistol ammunition, rifle magazines, flashlight and basic medical gear intact, this will help with the employment of the carbine, but I digress. With the carbine, though, a simple two-point sling is all you need to have the ability to go hands-free. Grabbing the carbine, if needed, is quick and safe.

Another consideration to keep in mind when you do head to the range with your AR is offset. Offset is the difference between your line of sight and the bore axis, which typically causes you to shoot low at contact, or close-quarter, distances. When I say low, I am talking about 2½" if your carbine is zeroed for 50 or 100 yds., but you are engaging a threat at 3 to 5 yds. As the target moves away, your point of impact will move closer to your point of aim. This may take a little thinking, but as soon as you fire your first few training rounds within room-size distances you will be well aware of the need to hold for offset.

AR: OK, let's say, just for the sake of argument, that you've convinced us the AR is the best tool for home defense. What are a couple of specific things—drills or features—that someone should strive for when setting one up?

KL: Since I did say the semi-automatic is king, I must delve into this a little bit further. No matter the system you choose, you should spend time on the range fighting through the loading, stoppages and shooting positions with the use of only one arm. This isn't easy, but it can be done. Most general-purpose rifles will work perfectly when fired with only one hand. While you are at it, try shooting with your support-side eye as well.

When it comes to capacity, I have been in situations where not only did I want an AR, I wanted 30 rounds loaded in my magazines. Not 28, but 30. I know that violates an unwritten code of tactical efficacy, but I can attest to the fact that most U.S. Army elite counter-terrorist commandos load 30 rounds per magazine. Disregard the naysayers and their minimalist-capacity mindset. Live in the real world.

Some who employ the AR for home defense have told me they like to store the carbine with a 20-round magazine in place. I agree this does make the carbine a little easier to store, but make sure you have quick access to a 30-rounder when the shooting starts.



The stopping power of various loadings is itself a lively debate, but there is no doubt that the AR possesses a substantial advantage in on-board ammunition, at least for standard-capacity firearms.

AR: Does the fact that we're now relying on a more powerful arm for home defense mean that we don't have to be as precise in our application of its greater power? And what about ammunition selection?

KL: When it comes to terminal performance, shot placement is key, be it with a shotgun slug, .45 caliber pistol, .50 cal., or 5.56 mm bullet. If you want to be effective, you must hit the central nervous system to get immediate debilitation of your enemy. Much ado has been made of the performance of the .223, and I must say picking the right ammo is key. I prefer the Hornady GMX bullet loaded by Hornady or the Barnes TSX bullet which is available in loaded form from Black Hills Ammunition and Remington. These bullets are solid with an open tip and no lead core. They perform well against barriers as well. If you envision any scenario that involves you shooting through automobile windshield glass I would highly recommend this type of projectile.



Copper-alloy hollow-point bullets, such as Hornady's GMX or Barnes' TSX, are proven projectiles and effective expanders under most conditions.

With the AR you can also make changes to ammunition selection quickly by changing magazines. This is especially important to military and law enforcement personnel but sometimes affects civilians as well. You can easily keep lighter weight bullets that limit any potential over-penetration with the option to change to heavier barrier-blind bullets if special performance is required.

AR: What kind of training do you recommend that people pursue, and are there any specific tips that you can provide here that would elevate the average person's rifle-handling capabilities?

KL: Since some say the pistol is faster, you will have to head to the range and work a little on your presentation with the rifle. In no time at all you will be making first-round hits in less than a second. It is also important that you think through the decision-making sequence that will lead to your “shoot” or “don’t shoot” resolution. More time will be used thinking through options and analyzing those options. Try to go with scenario-based training as often as you can. With a little practice, the rifle becomes extremely easy to point quickly at a target, confirm sights and engage.

AR: We're getting the sense that you see handling a long gun as something that should be entirely integrated with the shooter's physical dynamics and surroundings. Is that right?

KL: Yes. And you'll see that, once you become familiar with the carbine on the range, movement is a must.

When working on your movement techniques in tight quarters, always keep the muzzle of the carbine down as you make your quick turns. Having the muzzle down is much safer and will also be quick since you are pivoting on the rifle and driving the carbine to the target once the turn is complete. Practice every possible turn, especially starting with your back to the target. I always try to step forward into the fight, if I step backwards there is a good chance stumbling will lead to sitting on your butt—not cool in a gunfight. As to retention of your firearms in a conflict, the pistol and rifle are pretty safe in your retention position as long as you use good technique. If you get lazy, the ability of the bad guy to take away or at least deflect your carbine or pistol off target is a real potential threat. When you use the carbine for home defense, keep your support hand forward to help with leverage for driving the muzzle from target to target, this will also give you the needed strength to maintain control in a gun-grab scenario.

AR: What are a few last-minute tips for getting the most out of our time at the range and knowing whether we have the right gun?

KL: When you do get range time, make good use of the time. Don't just stand at the 5-yd. line conducting drills the entire day. Use smaller targets, increase the distance and push yourself to quickly get the rifle on target. Once on the rifle, confirm that the red dot is aligned with your intended hold-off point or offset adjustment point and squeeze the trigger. Repeat as necessary. The end state will be building confidence that you have the ability to use your carbine effectively in a fight if the need should ever arise.

When you leave the range, make sure you have ammunition that not only performs terminally but also operates flawlessly in your carbine. If your carbine is not 100-percent suited for you, it shouldn't be the gun you choose for the fight. Do what is necessary to reconfigure your gun or get one that is perfect and never look back.

AR: What final thoughts would you like to leave us with regarding the AR for home 2699

defense?

KL: When it comes right down to it, this discussion is about using what you are most comfortable and extremely confident with. Once again, for me that happens to be the AR, chambered in 5.56x45 mm NATO/.223 Rem. What's in your closet?

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EXHIBIT 29



AR-15 Rifles For Home Defense? Yes!

by Sheriff Jim Wilson - Tuesday, June 27, 2017



There is not much question that the AR is the most popular rifle in America today. By the way, AR does not stand for *assault rifle*. It stands for Armalite Rifle, the original designers of this concept. However, the gun is manufactured today by many companies and in price ranges that will fit just about any budget. It is used for target shooting, plinking, hunting, personal defense, and, yes, even home defense.

In fact, the AR is a rather good choice for home defense. It is lightweight and the caliber choices are effective against armed criminals. Its profile is one that is readily recognized by most people and the crooks who see it in your hands will get the idea that you mean business and can probably take care of business if forced to. What follows are a few things to consider when choosing the AR for home defense.

2702

While the modern AR is offered in quite a number of calibers, its .223 chambering probably makes the most sense for the home owner. To begin with, .223 ammunition is readily available in just about any store that sells ammo. This caliber is also probably the least expensive of any of the offerings. It can also be found in a number of different bullet weights. However, for in-house use, a 55-grain soft-point load is probably the best choice in order to minimize bullet penetration. If it can be avoided, we don't want our bullet to punch through walls, into other rooms where family members might be located. And we certainly don't want the bullet exiting the house, or apartment, and endangering neighbors.

Another factor favoring the AR as a home-defense gun is that it is relatively short and quite portable. When operating in the close quarters of a home, the armed citizen must be careful that he or she does not let the barrel of the long gun precede them through doorways and around corners, thus alerting the home invaders to their location. The collapsible stock found on many ARs keeps the gun's overall length to a minimum and helps avoid this defensive mistake.

The AR is designed so that many accessories can be easily attached to it. Slings and lights can be easily added, as can additional laser sights and many other shooting aids. However, one of the real assets of the AR is that it is lightweight and portable, so keep in mind that accessories will add weight. For this reason, accessories shouldn't be added because they look cool, but only if they are really needed. In a home defense situation, most shooters can get along just fine with a box-stock AR that has a sling attached for portability.

Another advantage of the AR is that recoil is very light, especially in one chambered for the .223 cartridge. This makes it comfortable for all members of the family to fire. Of course, this also means that everyone in the family who is authorized to use the AR should also be trained in its operation and safe use. This will rarely be a problem because the gun is fun to shoot and its lack of felt recoil is just one of the reasons that this is the case.

In addition to the other advantages of the AR as a home-defense gun, it is also quite accurate, although at the ranges one encounters in home defense, accuracy may not be a serious issue. However, shooting 1-inch, and smaller, groups at 100 yards during practice sessions is a good way to build confidence in one's own ability and equipment.

The smart defensive shooter buys the best quality firearm that he or she can afford and this is true when shopping for ARs. Good quality magazines are also important, and a person should buy several. When buying .223 practice ammo, one can shop around for deals on bulk prices for whatever is least expensive. However, when loaded for defensive use, best quality ammunition is the only way to go.

AR may stand for Armalite Rifle, but it could also easily be used for America's Rifle. Some version of it is carried by most of our military as well as local law enforcement personnel. When considering the purchase of some sort of long gun for home defense, the armed citizen is well advised to spend time with the AR. It is truly America's Rifle.

EXHIBIT 30

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5 Reasons to Hunt with an AR15

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According to a recent study by the National Shooting Sports Foundation, 27 percent of hunters surveyed have used an AR-15 in pursuit of game. Of those, 48 percent report having used an AR-15 within the past five years, illustrating a growth in the use of the platform among those hunters surveyed. Of those answering yes to the use of an AR-15 for hunting, nearly 60 percent state they have used the platform to hunt large game. (Source: RealTree (<https://www.realtree.com/brow-tines-and-backstrap/why-you-should-use-an-ar-15-as-a-deer-rifle>))

In this article, I give you five reasons and the benefits of hunting with an AR-15—and why you should consider one for your next hunt whether hunting deer, elk, hogs, varmints and beyond.



(<https://www.brentonusa.com/ar-hunting-chambers/>)Popularity

The popularity of the AR-15 style rifle is at an all-time high. More people are owning and shooting AR style rifles than ever before. I believe this is partly due to the semi-auto nature of the rifle and the affordability of plinking ammo. Beginning around 2000-2005, many serious wildcatters started experimenting with cartridges in the AR-15 beyond the standard 5.56/.223 rounds. Soon after—new commercially available cartridges—began to appear including the 450 Bushmaster (<https://www.brentonusa.com/ar-hunting-chambers/#450BM>), 6.5 Grendel (<https://www.brentonusa.com/ar-hunting-chambers/#65Grendel>), and 204 Ruger (<https://www.brentonusa.com/ar-hunting-chambers/#204Ruger>) just to name a few. As a result of these new-found cartridges, we are now seeing the AR-15 rifle used for the hunting of all species of North American game in addition to all types of varmints.

The below video by the NSSF outlines the evolution of the American Hunting Rifle.

Compact

Compact features of the AR-15 make it an excellent hunting rifle (<https://www.brentonusa.com/b-20-stalker-ar-hunting-rifle/>). The vertical grip and magazine make for a much more ergonomic fit of rifle to shooter, especially for younger or smaller hunters. Larger or taller hunters also enjoy the vertical grip as well as the additional advantage of being able to reach further down the free-floating handguard for more comfort if needed. The front carry sling system found on most AR-15's allows the hunter to walk extended distance without any concern for the rifle as it always hangs ready from the shoulders. The front carry makes for a very quick, maneuverable first move when game is spotted. A hunter can be walking hands-free and immediately have rifle in hand and ready for a shot as game comes into view. A small feature but one I really

like is the detachable magazine. The detachable magazine makes loading and unloading safe and simple. Insert the magazine and close the bolt... loaded. Drop the magazine, cycle the bolt... unloaded. It may not sound like such a big deal but where I am from (Michigan) exposure to the cold, rain and snow while fumbling around loading and unloading is something we like to avoid.



Semi-Auto

Semi-auto features of the AR-15 make it extremely attractive to the serious hunter. Semi-auto reloading means the shooter always keeps the hands in a shooting position and ready between shots. Unlike a bolt 2709 gun where the shooter must completely release the rifle, find the bolt, cycle it and return to the grip/trigger

Familiarity and similarity between home defense rifles and hunting rifles make the AR-15 an obvious choice for the family hunting rifle. Many first time AR-15 buyers are purchasing for home defense. They will spend hard earned money on ammo and accessories. They will spend valuable time with family and friends learning and practicing to be proficient with the rifle. Split second home defense decisions are not unlike split second hunting situations. When that split-second decision presents itself, familiarity of the rifle in your hand is always an advantage. It is a natural transition from a defensive AR-15 to a hunting AR-15 and back again. Differences only being color and caliber. The family of AR-15s can be converted from 5.56/.223 over to a larger hunting caliber in a matter of seconds by pushing out two pins, removing the defensive upper and replacing with the hunting caliber upper (<https://www.brentonusa.com/b-16-stalker-black-upper-ar-hunting-rifle/>). For those who own multiple AR's the defensive rifle may stay intact and ready at all times while the hunting rifle may consist of one favorite lower which gets paired with various other upper setups in different calibers ready for different game.

Do you Hunt with an AR-15?

☐ No

Vote

In the end, it really boils down to what makes you confident as a hunter. Americans are scrappers, and we like to argue about everything. An example from the archery community; cross-bow shooters don't like compound shooters, compound shooters don't like recurve shooters, recurve shooters don't like stick bow shooters... In the handgun community, we have the revolver people, and we have the pistol people, of course, each thinks the other is crazy. In recent years the hunting community has been divided between the bolt gun hunters, lever gun hunters, and muzzleloader hunters. Now we have AR hunters. Preference—you just have to choose which makes you confident and go with it. What a great time to be born and what a great country to be born in. I can choose to hunt with everything from a stick, to smoke poles, to cowboy rifles, to the most modern AR! Personally, I want them all. Each has a place in my gun safe (except the stick), but the majority of space is taken by AR's, they are just plain fun. Nobody shoots an AR for the first time without cracking a smile.

My intent for writing this brief blog is to identify some of the primary reasons why we choose to hunt with an AR-15. Please do not use any of my words to divide shooters and hunters across America as we are all one community. We live in the greatest country at a great time in history.

Awaken Your Hunger... and go hunting. When you return tell others about your incredible experience in the wild!

God Bless the United States of America!



By Bartt Brenton, President of Brenton USA

Bartt is an engineer with thirty-plus years of experience from working at the world's largest superconducting cyclotron laboratory at Michigan State University. He has taken over 200 North American big game animals and as many varmints and predators. [Learn more about his story. \(/about-brenton-usa-our-story/\)](/about-brenton-usa-our-story/)

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NEWS NAVIGATION ∨

WHY HUNTERS ARE TRADING IN TRADITIONAL HUNTING RIFLES FOR THE AR-15

11/17/17 10:00 AM | by Jacki Billings (<https://www.guns.com/news/author/jackibillings>)

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A happy hunter downs a buck with an AR-15. (Photo: Wing Tactical)

AR-15s (<https://www.guns.com/firearms/rifles/semi-auto>) have long been a symbol of the tactical world, but black rifles are slowly creeping their way past military and law enforcement applications and into the world of hunting. Touting more caliber options, efficiency and modularity, the versatile platform is transforming the way hunters down prey, but what's causing hunters to ditch traditional rifle set-ups in favor of modern sporting rifles?

The biggest benefit to the AR, or modern sporting rifle (<https://www.nssf.org/msr/>), platform has always been its modularity. Unlike traditional bolt-action setups, gun owners can easily swap between an almost endless sea of uppers and lowers. This ability to trade in and out parts allows hunters to fine-tune their hunting platform to desired specifications.

This modularity is especially useful for hunters who routinely stalk various kinds of prey, utilizing an array of calibers to do it. While the most common chambering on the MSR lineup is undoubtedly .223/5.56, an increase in popular cartridges like .300 Blackout and 6.5 Creedmoor (<http://www.guns.com/2017/02/06/6-5-creedmoor/>) have pushed parts manufacturers to offer more uppers and barrels outside the 5.56 realm. This caliber modularity advantage elevated the AR-15s popularity in the hunting world, making it a viable contender against bolt-action.

Mark Grimsley, a hunter out of Kansas and owner of the Fit'n Fire (<https://www.youtube.com/channel/UCeA9Tup1fVMZ6JrDJwNV6WQ>) YouTube channel told Guns.com in an interview that the AR-15's vast array of caliber options is one of many reasons he chose an AR setup for hunts.

"One rifle can be easily converted in to several different variants that will allow you to choose the right caliber for your hunt," Grimsley said. "Going coyote hunting on Monday, use your .223/5.56 upper. Going whitetail hunting Tuesday, switch to the .300 Blackout. Going Elk hunting on Wednesday, change your upper again to a 6.5 Grendel. All of those upper receivers can be used with the same type of lower which gives greater flexibility for the hunter and the AR platform."

Grimsley, an 11-year U.S. Army veteran (<https://www.instagram.com/fitnfire78/>), also pointed to the AR-15s widespread familiarity as a reason some hunters, especially those coming from military and law enforcement backgrounds, are choosing modular sporting rifles.

"One of the main reasons that I started using an AR style rifle to hunt with was because it was so familiar to me," Grimsley said. "I have been around the AR platform for about two decades now, between my father's influence and my military time, and I have become extremely comfortable with its feedback, loading/unloading, placement of the safety, and remedial actions to clear malfunctions should there ever be any."

Aside from modularity, hunters say the AR-15 offers a level of versatility unparalleled in the bolt-action universe. MSR's easy disassembly and reassembly procedure in addition to the advent of the collapsible stock grants hunters the ability to hike in several miles on foot with the gun carried stealthily and safely in a backpack. Hunters traipsing through fields in unrestricted states are also afforded the luxury of 30 round magazines which increase the number of shots a hunter can fire in a given time period while decreasing follow-up shot time. This can often mean the difference between taking a trophy and going home empty handed.

"I believe in one well-placed shot," coyote hunter Greg Sodergren told Time Magazine (<http://time.com/4390506/gun-control-ar-15-semiautomatic-rifles/>) of the AR-15. "(But) if you've got multiple animals or you miss, you've got a quick follow-up shot."

In addition, the speed in which the AR cycles its bolt as compared to the manual cycling of a bolt-action means more potential shots on target or multiple shots effortlessly carried out on multiple targets.

"A semi-auto changed my life," Eric Mayer, who runs AR15hunter.com, told Time Magazine. "I'm able to make the (shot) because I don't have to run the bolt (and) lose the target in my scope."

Despite its advantages, the AR-15 (<https://www.guns.com/firearms/armalite-rifles>) has had its swath of bad press, earning it a bad boy reputation among its fellow rifle peers.

"I feel that the AR has previously received a bad rap as far as it being used as a hunting rifle (<https://www.guns.com/firearms/rifles/bolt-action>)," Grimsley said. "Because of its military inception, it has been seen as an under powered, military application rifle only. Not until recently, with the popularity of the newer rounds have people started to consider it as a viable option for hunting applications."

Regardless of its reputation, loyalists to the MSR point to its efficiency as the number one reason ARs are enjoying such success on the shoulders of hunters.

"It's the most capable tool for the job at this time," Mayer said. "Bar none. Period. It is."

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EXHIBIT 32



ARs for Deer Hunting: The Modern Answer to an Age Old Tradition

by Richard Mann, OutdoorHub - Thursday, November 17, 2016



This article was originally published on OutdoorHub and as been repurposed with permission.

There's no question – the AR-15 doesn't look like your daddy's deer rifle. Of course, the Winchester Model 94 lever-action rifle your granddad used doesn't look anything like his father's Hawken, either.

However, we see progress all around us. The smartphone is nothing like the rotary phones I grew up with, and if my grandpa stepped in my pickup truck, he'd think it was a

2719

spaceship.

The American hunter is experiencing this same thrust into the 21st century. While it might not have the lure, feel and warmth of walnut and blued steel, performance matters over nostalgia. I'm not suggesting you trade in your old .30-30 on an AR, or regulate your bolt rifle to the closet for all eternity. What I hope you will do is consider the many factors that make the AR-15, and its bigger brother the AR-10, ideal for deer hunting.

We're living in a brave new world and the AR is the hunting rifle of the new millennium – and here's why:



The author loves pursuing whitetails with an AR.

Fit

Anyone serious about shooting a rifle realizes that the interface between the rifle and the shooter is paramount. A rifle needs to fit you if you want to shoot it well. Many years ago, when my son was way shorter than me, I was struggling to find a deer rifle compact enough for him. I noticed my AR leaning in the corner and then an idea hit me: with its adjustable stock, the AR would be ideal for him (photo below).

The adjustable stock common on many ARs isn't the only thing that makes an AR ideal for a small-statured shooter. Many modern ARs weigh in at right about 6 pounds. Those hunters with limited arm strength will find them lighter than many bolt-action alternatives. Additionally, with the interchangeability option of an endless variety of handguards and accessories, an AR can be tailored to perfectly fit any shooter and any shooting situation.



Like father, like son. ARs with adjustable stocks fit small-framed shooters very well.

Function

When I was a young deer hunter, there was an intense distrust in semi-automatic big-game rifles. Not all that long ago, the AR's reputation for reliability was not all that stellar. Well, things have changed. Modern ARs might be more reliable than many manually operated rifles. Competition in the marketplace and modern manufacturing capabilities have made the AR almost as dependable as the sunrise.

Semi-automatic fire can be of some help to the deer hunter, too. As much as we all like to think we never miss, that's not the case. Follow-up shots after a miss or even a poor hit can be the deciding factor in whether a hunt is a success or failure.

Accuracy

Over the last 10 years, I've tested enough ARs from enough different manufacturers to arm a small country's army. I went back, looked at all the shooting data from these tests, and I was rather astonished to discover the average accuracy delivered by all of these rifles was 1.5 inches for five, five-shot groups at 100 yards.

This is plenty of precision for deer hunting, and way better than most shooters can perform from field positions. In my experience, if an AR has an accuracy problem, it's often the fault of the trigger. Fortunately, the installation of an excellent replacement trigger, such as the one from Timney, is easy.

Power

Many hunters mistakenly believe that the .223 Remington cartridge is not "enough gun" for whitetail deer and a more powerful cartridge is necessary. I've taken many deer with the .223 Remington and have never found it lacking when used with bullets designed for big game.

There does exist more powerful options for those who demand it. Nine of the 41 states permitting centerfire rifles for deer hunting prohibit the use of the .223 Remington. If you hunt in one of those states, the 6.8 SPC or .300 Blackout are an option, as is the new .25-45 Sharps, which duplicates the performance of the old .250 Savage. If you want to stretch

2722

your range or just think you need more power, you can step up to an AR-10 and choose a cartridge like the .243 Winchester, 6.5 Creedmoor, .308 Winchester, and in some cases even magnum cartridges.

Familiarity

Another factor that makes the AR ideal for deer hunters is the same factor that has been influencing hunters since the early 1900s. When veterans return home from war, they do so with a deep trust for the weapons that kept them alive in battle. That's why the bolt action eclipsed the popularity of the lever action after WWI, and it's why rifles like the Browning BAR and Remington 742 became so popular after WWII.

Today's veterans have learned to trust the AR platform because it kept them alive in places like Vietnam and the Middle East. Not only that, but they are intimately familiar with its operation and maintenance, which allows them to be more effective and safer at home, on the range, and in the field.



Hunters of all ages and backgrounds have discovered the many benefits of deer hunting with an AR.

2723

Versatility

Finally, you can't discuss the AR without recognizing its versatility. Though many consider the AR and the accessories for it only tactical tools, you can assemble an AR to complete any hunting adventure. The modularity of the system allows you to configure an AR for deer hunting, and with quick-attach accessories and components, you can easily convert it to a predator rifle or set it up for home defense. This includes the ability to switch between different cartridges in a matter of seconds.

It seems like the entire firearms industry has jumped onboard with AR accessories, and you can find more accessories for an AR than for any other firearm. Maybe just as important, is the fact that you can build your own AR at home. There is no other rifle where something that fulfilling can be accomplished so simply.

America's Rifle

Many people don't realize AR stands for Armalite Rifle, the company that introduced the AR-10 and AR-15 in the mid-1950s. Much of the mainstream media and the anti-gun crowd mistakenly assume AR stands for "assault rifle," a convenient acronym for promoting an anti-gun agenda.

It's time to eliminate the misconception that AR stands for assault rifle, and tell the world what AR really stands for: America's Rifle. After all, it is the most popular rifle in this country, and as more and more hunters become exposed to all it has to offer, it just might one day be the most popular deer rifle in America, too.

Images by Richard Mann

EXHIBIT 33



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Turning The AR-15 Into A Great Hunting Rifle

Written by: [Adam C. Survival Hunting](#) 56 Comments [Print This Article](#)

The AR-15 is a rifle that needs no introduction; it's the penultimate American rifle, recognizable by anti-gunners and shooting enthusiasts alike across the globe. Chambered in 5.56 NATO or .223 Remington (basically interchangeable), the AR-15 is essentially a semiautomatic version of the military's M16 rifle.



image credit NaturalWorldNews.com

While the words "hunting" and "AR-15" don't always get spoken in the same sentence, there is no reason why they shouldn't, as the AR is perfectly capable of legitimately taking game – game such as hogs. The lowly hog, sometimes referred to as boars, wild pigs, feral pigs, and so on, is an excellent choice for hunting in general; the USDA reports that there are more than 1.5 million feral pigs in the United States. Not only are the pigs plentiful – they are a nuisance, with wild pigs blamed for the destruction of many crops. Pigs also make great eating, and pork in general is a familiar staple of the American diet.

When hunting pigs with the AR, and more specifically 50 to 62 grain bullets, shot placement is key, as the little .22 caliber round lacks the punch to take conventional style heart shots on really big game animals. On hogs especially, consideration should be made to going for headshots, which will minimize damage to the meat and will result in a quick kill which the .223 round is more than capable of delivering.

THE PROPER SETUP FOR A HUNTING AR

One of the aspects that makes an AR so versatile is its modularity, and seeing as the upper receiver of an AR is readily interchangeable, there's no reason why you shouldn't build a dedicated hunting upper. Barrel length is definitely a consideration here, and for adequate sight radius, velocity and accuracy, a 20-inch barrel makes lots of sense. Long enough to deliver tack driving accuracy yet still short enough to remain maneuverable, a 20-inch barrel won't add much more weight to your rig.

The ideal optic for a hunting AR is definitely a 10 power fixed scope with a good sized objective to aid in light transmission. Avoid variable power scopes for hog hunting inside of 150 yards, and resist the temptation to increase the magnification above 10x for such short-range shooting, as all it will do is narrow your field of view.

[*How-To Techniques for Making and Enjoying 100 Sausages at Home...*](#)

WHEN CALIBER IS A CONSIDERATION

Some localities will not allow .223 for hunting purposes, the rationale being that the caliber is (in their opinion) too small to do the job, and will cause unnecessary suffering to the animal. Wherever such regulations exist, the AR is still capable of being an excellent hunting rifle primarily by purchasing an upper that is chambered in one of the many available up-sized calibers.

There are a slew of hard-hitting calibers that are available in the AR platform with the simple switch of an upper. These calibers use cartridges that are sized to an overall length which makes them fit inside a conventional .223 Remington magazine well, which is critical if you want to be able to use

your .223 lower receiver, which obviously has a fixed magazine well size. Calibers that deserve further consideration are:

- 6.5 Grendel
- 6.8 Remington SPC
- .300 AAC (Advanced Armament Company) Blackout
- .450 Bushmaster
- .458 SOCOM
- .50 Beowulf

Each of the above calibers represents an amazing pig hunting caliber for various reasons. On the smaller end, both the 6.8 SPC and 6.5 Grendel both dramatically increase the power available to the AR platform while satisfying the minimum game-hunting caliber in most counties of .243" (these are both .277"). The 6.8s increase effective range and punch of the AR series rifle, allowing the hunter to go for conventional body shots on big animals, as well as reach out further than possible with the .223.

.300 AAC Blackout takes the AR platform to a whole new level, and brings .30 caliber performance to the AR while using conventionally sized magazine wells. If you've ever wanted .308 style, short-range performance out of an AR, the .300 AAC Blackout is the round to get.

The .450 Bushmaster, .458 SOCOM, and .50 Beowulf represent the pinnacle of big bore AR shooting, and while these rounds originally developed with a military purpose in mind, they are amazing hog calibers and are able to take the largest tuskers on the planet with ease. Don't think that you need to get a custom built upper receiver to shoot these rounds; they are available off the shelf by established manufacturers.

The AR-15 is such a versatile rifle in part because of its modularity, and there's no secret why it remains popular today as a sporting caliber. It's perception as a hunting rifle is somewhat tarnished by the AR being the target of anti-gun groups and the media, but make no mistake, the AR is just as much a legitimate hunting instrument as it is a defensive instrument.

EXHIBIT 34

**TELEPHONE VERSUS FACE-TO-FACE
INTERVIEWING OF NATIONAL
PROBABILITY SAMPLES WITH LONG
QUESTIONNAIRES**
COMPARISONS OF RESPONDENT SATISFICING
AND SOCIAL DESIRABILITY RESPONSE BIAS

ALLYSON L. HOLBROOK
MELANIE C. GREEN
JON A. KROSINICK

Abstract The last 50 years have seen a gradual replacement of face-to-face interviewing with telephone interviewing as the dominant mode of survey data collection in the United States. But some of the most expensive and large-scale nationally funded, long-term survey research projects involving national area-probability samples and long questionnaires retain face-to-face interviewing as their mode. In this article, we propose two ways in which shifting such surveys to random digit dialing (RDD) telephone interviewing might affect the quality of data acquired, and we test these hypotheses using data from three national mode experiments. Random digit dialing telephone respondents were more likely to satisfice (as evidenced by no-opinion responding, nondifferentiation, and acquiescence), to be less cooperative and engaged in the interview, and were more likely to express dissatisfaction with the length of the interview than were face-to-face respondents, despite the fact that the telephone interviews were completed more quickly than the face-to-face interviews. Telephone respondents were also more suspicious about the interview process and more likely to present themselves in socially desirable ways than were face-to-face respondents. These findings shed light on the nature of the survey response process, on the costs and benefits associated with particular survey modes, and on the nature of social interaction generally.

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Fifty years ago, the vast majority of high-quality surveys in America were conducted via face-to-face interviewing. But following the widespread introduction of the telephone in the United States in the mid-twentieth century, survey researchers began a swift shift to conducting surveys via telephone instead. Today, most local, regional, national, and listed sample surveys are conducted by telephone. When researchers conducting such surveys seek representative general population samples, they most often sample via random digit dialing (RDD).

The appeal of telephone interviewing is multifaceted, because this method has many practical advantages, most notably reduced cost, the possibility of quick turnaround time, and the possibility of closer supervision of interviewers to assure greater standardization of administration. Initially, telephone interviewing had another unique advantage as well: the possibility of computer-driven questionnaire presentation. With the advent of Computer Assisted Personal Interviewing (CAPI), telephone interviewing's edge in this regard is gone, but this mode continues to maintain its other unique advantages and its popularity in practice.

Telephone interviewing has obvious disadvantages, too. For example, show cards, which are often used to present response choices in face-to-face interviews, are more difficult to employ in telephone surveys, requiring advance contact, mailing of cards to respondents, and respondent responsibility for manipulating the cards during the interview. Therefore, telephone surveys routinely forgo the use of show cards (but see Miller [1984] for a discussion of the effects of this omission and Groves and Kahn [1979] for a discussion of possible disadvantages of show cards). As of 1998, about 5 percent of the U.S. population did not have a working telephone in their household, thereby prohibiting these individuals from participating in telephone surveys (Belinfante 1998). And for a variety of reasons, it has always been more difficult to obtain response rates in telephone surveys as high as those obtained in face-to-face surveys (e.g., Groves 1977; Mulry-Liggan 1983; Shanks, Sanchez, and Morton 1983; Weeks et al. 1983). Thus, it is not obvious that data quality in telephone surveys will meet or exceed that obtained from face-to-face surveys.

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Perhaps for such reasons, a diverse group of the nation's most expensive, long-term, large-scale, federally funded survey studies of national samples involving long questionnaires have retained the face-to-face method while most other survey research moved to the telephone. For example, the National Election Studies have conducted face-to-face interviews since the 1940s; the General Social Survey has done so since 1972. The National Health Interview Survey (conducted by the U.S. Census Bureau for the Centers for Disease Control and Prevention), the National Crime Victimization Survey (conducted by the U.S. Census Bureau for the Bureau of Justice Statistics), and many other such large survey projects sponsored by government agencies have done so as well.

In this article, we explore whether there are potential benefits of such continued reliance on face-to-face interviewing of national area probability samples for studies with long questionnaires, as compared to the obvious alternative of RDD telephone interviewing.¹ We focus in particular on two possible sources of response error differences. First, we consider the possibility that face-to-face respondents may be more likely to exert the required cognitive effort to answer questions carefully, whereas telephone respondents may be less likely to do so. As a result, the latter individuals may manifest more survey satisficing, thereby compromising response quality. Second, we consider the possibility that face-to-face respondents may differ from telephone respondents in the comfort they have in reporting socially undesirable attitudes, beliefs, or behaviors. As a result, the magnitude of social desirability response bias may differ between the modes.

We begin below by outlining the theoretical rationales underlying these hypotheses. Then, we review the results of many past studies that at first seem to offer evidence regarding these hypotheses. But as we will explain, the designs of these studies render most of them uninformative about the issues of interest here. We therefore proceed to describe the results of new tests of the satisficing and social desirability hypotheses using data from three large-scale experiments that involved long interviews of representative national samples.

Hypotheses

SATISFICING

The last 30 years have seen a blossoming of the literature on response errors in surveys, and many interesting theoretical approaches have been offered and

1. Although it is impossible to specify a precise length to separate short questionnaires from long ones, it is easier to note that in practice most telephone surveys are kept to lengths shorter than 30 minutes on average, whereas many face-to-face surveys involve interviewing that lasts notably longer than that. Our interest in this article is in surveys of this latter type.

developed to characterize and explain such errors. Some work has focused on the impact of misdating or forgetting on reports of behavioral events (e.g., Abelson, Loftus, and Greenwald 1992; Belli et al. 1999; Burton and Blair 1991; Sudman and Bradburn 1974). Other work has examined conversational conventions and norms and the ways in which they govern respondent behavior (e.g., Schwarz 1996; Schwarz et al. 1991). Still other work has focused on how linguistic processing of words in questions is accomplished by respondents (e.g., Tourangeau, Rips, and Rasinski 2000). All of these sorts of perspectives and others as well could be useful in exploring mode effects. In this article, we focus on another one of these theoretical accounts: satisficing theory.

Satisficing theory. Krosnick's (1991, 1999) theory of survey satisficing is based upon the assumption that optimal question answering involves doing a great deal of cognitive work (see also Cannell, Miller, and Oksenberg 1981; Tourangeau 1984). A respondent must interpret the meaning and intent of each question, retrieve all relevant information from memory, integrate that information into a summary judgment, and report that judgment accurately. Many respondents who initially agree to be interviewed are likely to be willing to exert the effort necessary to complete an interview optimally. But many other respondents who agree to be interviewed may become fatigued and may lose their motivation to carry out the required cognitive steps as they progress through a questionnaire, or respondents may be willing to carry out the required cognitive steps but lack the ability to do so. And some respondents who reluctantly agree to be interviewed may do so with no intention of thinking carefully about any of the questions to be asked.

According to the theory, people can shortcut their cognitive processes in one of two ways, via either weak satisficing or strong satisficing. Weak satisficing amounts to a relatively minor cutback in effort: a respondent executes all the cognitive steps involved in optimizing, but less completely and with bias. When a respondent completely loses motivation, he or she is likely to seek to offer responses that will seem reasonable to the interviewer without having to do any memory search or information integration. This is referred to as strong satisficing, which can be done by looking for cues in questions pointing to easy-to-defend answers.

The likelihood that a respondent will satisfice is thought to be a function of three classes of factors: respondent ability, respondent motivation, and task difficulty. People who have more limited abilities to carry out the cognitive processes required for optimizing are more likely to shortcut them. People who have minimal motivation to carry out these processes are likely to shortcut them as well. And people are most likely to shortcut when the cognitive effort required by optimizing is substantial. Respondents' dispositions are thought to interact with situational factors in determining the degree to which any given person will satisfice when answering any given question (see Krosnick 1991, 1999; Krosnick, Narayan, and Smith 1996). That is, satisficing may be most likely when a person is disposed to do so and when circumstances

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encourage it. In light of this theoretical perspective, it seems possible that interview mode might affect response quality to factual and opinion questions for a series of reasons, involving nonverbal communication, pace, and multi-tasking, as we describe next.

Nonverbal communication. When an interviewer conducts a face-to-face conversation with a respondent, the interviewer's nonverbal engagement in the process of exchange is likely to be infectious (e.g., Chartrand and Bargh 1999). A respondent whose motivation is flagging or who questions the value of a survey can observe his or her interviewer obviously engaged and enthusiastic about the data collection process. Some interviewers may not exhibit this sort of commitment and enthusiasm nonverbally, but many are likely to do so, and they may thereby motivate their respondents to devote effort to the cognitive processing required for generating optimal answers.

Respondents interviewed by telephone cannot observe all of these same nonverbal cues of commitment to and enthusiasm for the task from an interviewer. Interviewers can certainly convey such commitment and enthusiasm verbally and paralinguistically (Barath and Cannell 1976; Oksenberg, Coleman, and Cannell 1986), but those same messages can and probably are conveyed to respondents in face-to-face interviews. These latter interviews permit additional, nonverbal messages to be sent, and their absence during telephone interviews may leave those respondents less motivated. Furthermore, face-to-face interviewers are uniquely able to observe nonverbal cues exhibited by respondents indicating confusion, uncertainty, or waning motivation, and interviewers can react to those cues in constructive ways, reducing task difficulty and bolstering enthusiasm. Face-to-face interviewers can also better observe events that might distract the respondent (e.g., the presence of another person) and may be able to react to overcome or avoid that distraction (Shuy 2002).

Research in psychology and communication offers compelling indirect support for this notion. This research has shown that observing nonverbal behavior during dyadic bargaining and negotiation interactions favorably affects the outcomes of those interactions. People are less competitive, less contradicting, more empathetic and interested in their partners' perspectives, and more generous to one another when interactions occur face to face instead of by telephone (Morley and Stephenson 1977; Poole, Shannon, and DeSanctis 1992; Siegal et al. 1986; Turoff and Hiltz 1982; Williams 1977).

Furthermore, Drolet and Morris (2000) showed that face-to-face contact (as compared to aural contact only) improved cooperation on complex tasks, and this effect was mediated by rapport: face-to-face contact led participants to feel more "in synch" with each other, which led to improved collaborative task performance. Indeed, Drolet and Morris (2000) showed that such improved performance is due to nonverbal cue exchange, because dyads conversing with one another while standing side by side (and therefore unable to see one another) performed less effectively than dyads conversing facing

one another. This is not surprising, because rapport between conversational partners has been shown to arise in particular from the convergence or synchrony of their nonverbal behaviors (Bernieri et al. 1994; Tickle-Degnen and Rosenthal 1990). If nonverbal communication optimizes cooperative performance in bargaining and negotiation for this reason, it seems likely to do so in survey interviews as well by enhancing respondent effort and reducing the likelihood of satisficing.

Pace. A second key difference between survey modes probably is the pace at which the questions are asked. All interviewers no doubt hope to complete each interview as quickly as possible, but there may be special pressure to move quickly on the phone. Silences during telephone conversations can feel awkward, whereas a few seconds of silence during a face-to-face interview are not likely to be problematic if a respondent can see the interviewer is busy recording an answer, for example. This may lead both interviewers and respondents to proceed through a telephone interview more quickly than a face-to-face interview. Furthermore, break-offs are more of a risk during telephone interviews, partly because it is easier to end a phone interview (by simply hanging up) and because talking on the telephone may be especially fatiguing for some people. Therefore, interviewers may feel pressure to move telephone interviews along more quickly than they conduct face-to-face interviews.

Even if interviewers speak more quickly on the telephone than they do face to face, respondents could in principle take the same amount of time to generate answers thoughtfully in the two modes. But respondents might instead believe that interviewers communicate their desired pace of the conversation by the speed at which they speak, and respondents may be inclined to match such desired speeds. Respondents may also choose to speak quickly on the telephone because they are anxious to finish the interview. Consequently, people may spend less time formulating answers carefully during telephone conversations. Furthermore, asking questions at fast speeds may make it more difficult for respondents to understand the questions being asked (thereby increasing task difficulty), which may lead to more satisficing as well.

Multitasking. Finally, multitasking is a phenomenon that may characterize telephone interviews to a greater extent than face-to-face interviews. A telephone respondent can easily be cooking dinner or paying bills or even watching television while answering survey questions without the interviewer's being aware of it. Therefore, doing such multitasking may not be inhibited by the norm of being polite to the interviewer. Certainly, interviewers have relayed remarkable stories of respondents multitasking during face-to-face interviews as well (such as an instance in which an interviewer saw only the feet of a respondent as he answered questions while repairing his car from underneath; see Converse and Schuman [1974]), but this seems less likely to occur during face-to-face conversations than during telephone interviews. In addition, face-to-face interviewers are more likely to be aware of such mul-

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titasking and can adapt to it. Because interviewers cannot observe telephone respondents, it is difficult to collect evidence about whether mode is related to multitasking. However, a recent study examining teleconferencing in businesses provides evidence that many people do engage in multitasking during such telephone interactions (Mark, Grudin, and Poltrok 1999). Respondents in telephone interviews may similarly engage in multitasking. The added distraction caused by multitasking enhances task difficulty and therefore may enhance the likelihood of satisficing.

Conclusion. In sum, telephone interviewing may increase the likelihood of respondent satisficing by decreasing the time and effort respondents devote to generating thoughtful and careful answers and increasing the difficulty of the task. Consequently, response quality may decline. It is possible that some measurements may in fact be improved by minimizing the effort people spend generating them, because rumination might cause people to mislead themselves about their own feelings, beliefs, attitudes, or behavior (Wilson and Schooler 1991). So the shortcutting of cognitive processing might actually improve measurement reliability and validity in some cases. But in most surveys, devoting more careful thought is likely to yield more accurate responses. In the most extreme case, respondents who choose to implement strong satisficing are not answering substantively at all. So if telephone interviewing increases strong satisficing, response quality must, by definition, be decreased.

In this article, we investigate the impact of survey mode on three forms of satisficing. Two are forms of strong satisficing: choosing an explicitly offered no-opinion response option and nondifferentiation (see Krosnick 1991, 1999). These are thought to occur when a respondent chooses not to retrieve any information from memory to answer a question and instead seeks an easy-to-select and easy-to-defend answer from among the options offered. If a “don’t know” option is offered, it is particularly appealing in this regard. And if a battery of questions asks for ratings of multiple objects on the same response scale, selecting a reasonable-appearing point and sticking with it across objects (rather than differentiating the objects from one another) is an effective effort-minimizing approach.

The third response strategy we investigated is a form of weak satisficing: acquiescence response bias, which is the tendency to agree with any assertion, regardless of its content. Acquiescence is thought to occur partly because some respondents think only superficially about an offered statement and do so with a confirmatory bias, yielding an inclination toward agreeing (see Krosnick 1999). If respondents interviewed by telephone satisfice more than respondents interviewed face to face, then we should see more no-opinion responding, more nondifferentiation, and more acquiescence among the former than among the latter.

Satisficing theory suggests that the impact of mode might be strongest among respondents who are most disposed to satisfice. An especially powerful

disposition in this regard appears to be the extent of a person's cognitive skills (for a review, see Krosnick 1991), which is very strongly correlated with years of formal education (see Ceci 1991; Nie, Junn, and Stehlik-Barry 1996) and can therefore be effectively measured in that way. We assessed whether the mode effects on satisficing were stronger among less educated respondents.

We also examined the impact of mode on interview length. If telephone interviewing brings with it pressure on both participants to move quickly, this would make respondents' tasks more difficult and would therefore enhance the likelihood of satisficing. We tested whether this speculation about speed is correct.

SOCIAL DESIRABILITY

The second substantive hypothesis we explored involves social desirability response bias, the tendency of some respondents to intentionally lie to interviewers at times. Theoretical accounts from psychology (Schlenker and Weingold 1989) and sociology (Goffman 1959) assert that inherent in social interactions are people's attempts to construct favorable images of themselves in the eyes of others, sometimes via deceit. And a great deal of evidence documents systematic and intentional misrepresentation in surveys, showing that people are more willing to report socially embarrassing attitudes, beliefs, and behaviors when the reporting circumstances assure anonymity (Himmelfarb and Lickteig 1982; Paulhus 1984; Warner 1965) or when respondents believe researchers have other access to information revealing the truth of their thoughts and actions (e.g., Evans, Hansen, and Mittlemark 1977; Pavlos 1972; Sigall and Page 1971). Taken together, these studies suggest that some people sometimes distort their answers to survey questions in order to present themselves as having more socially desirable or respectable characteristics or behavioral histories (see DeMaio [1984] for a review).

The notion that social desirability response bias might vary depending upon data collection mode seems quite plausible. All of the above evidence suggests that people are more likely to be honest when there is greater "social distance" between themselves and their interviewers. Social distance seems to be minimized when a respondent is being interviewed orally, face to face in his or her own home by another person.² Under such conditions, a respondent knows that he or she could observe frowns of disapproval or other nonverbal signs of disrespect from an interviewer. In contrast, a more remote telephone interviewer has less ability to convey favorable or unfavorable reactions to the

2. Our use of the term "social distance" is closest to that of Aquilino (1994), who used it to describe the physical and psychological proximity of one conversational partner to another. This use of the term differs from other uses, referring to discrepancies in social status (e.g., Dohrenwend, Colombotos, and Dohrenwend 1968) or in the desired degree of intimacy between people in different social groups (e.g., Bogardus 1933).

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respondent and may therefore be seen as meriting less concern in this regard. Consequently, more social desirability bias might occur in face-to-face interviews than over the phone.

At the same time, the telephone does not permit respondents and interviewers to develop as comfortable a rapport and as much interpersonal trust as emerges in face-to-face interactions (e.g., Drolet and Morris 2000; see also Groves and Kahn 1979, p. 222). Consequently, respondents may not feel as confident that their interviewers will protect their confidentiality as respondents in face-to-face interviews. Furthermore, the reassurance that face-to-face respondents can get from an interviewer's identification materials and other documentation may increase their comfort with discussing sensitive issues, whereas the greater uncertainty about the interviewer's identity and motives likely to typify telephone respondents may make them less willing to reveal potentially embarrassing facts about themselves. And telephone respondents may be less sure of who will have access to their answers and how they might be used, leading these people to be less honest in discussing potentially embarrassing attitudes or behaviors. If this latter process occurs, social desirability response bias might occur more often in telephone interviews than in face-to-face interviews. Of course, both rapport and social distance may influence social desirability response bias simultaneously and cancel each other out, leading to a null effect of mode.

Available Evidence

At first glance, many past studies appear to be useful for testing these hypotheses, because they compared data collected from face-to-face interviews to data collected from telephone interviews (see Shuy [2002] for a review). However, upon close inspection, the designs of most of these studies make it difficult to draw any inferences with confidence about the hypotheses of interest here. Next, we explain the design features that studies must have to be informative for our present purpose. Then, we describe which studies do and do not meet these criteria.

NECESSARY FEATURES OF A STUDY

Over the years, researchers have employed various different sorts of study designs for investigating differences between face-to-face and telephone surveys. And each study design has value for answering a particular question. For example, studies that began with a single sample of respondents and randomly assigned each person to be interviewed either face to face or by telephone provide a solid basis for making inferences about the impact of interview mode per se. But our interest here is not in isolating the impact of one or more aspects in which RDD telephone and area probability face-to-

face surveys differ. Rather, our goal is to identify the full set of differences that emerge when a survey is moved from the area probability face-to-face approach to the RDD telephone approach, a transition that involves many different sorts of changes in procedures.

In order to identify cleanly differences in satisficing and social desirability response bias between these two types of surveys, a study should have the following eight characteristics. First, one group of respondents should be interviewed face to face, and a different group of people should be interviewed by telephone; if the same people are interviewed first in one mode and then in another, this could produce order and practice effects that alter performance (Smith, Branscombe, and Bormann 1988). Second, the telephone respondents and face-to-face respondents should both be representative samples of the same population. Third, respondents assigned to be interviewed in a particular mode should be interviewed in that mode. In other words, respondents who are difficult to contact or who refuse to be interviewed in one mode should not then be interviewed in another mode, because such reassignment would confound any comparison of modes. Fourth, respondents should be interviewed individually in the face-to-face and telephone surveys, rather than interviewing individual respondents by telephone and groups of respondents simultaneously face to face. For example, if face-to-face interviews are conducted with all available members of a household at once in a group and telephone interviews are conducted with just one household member at a time, then observed differences between the modes could be attributable to differences in the group versus individual interview approach.

Fifth, respondents should not be able to choose whether they will be interviewed face to face or by telephone. Such self-selection could lead other factors to be confounded with mode. Sixth, respondents in both modes should not have been interviewed previously about similar issues, because such prior interviewing could also produce practice effects that would distort comparisons. Seventh, the questions used to gauge satisficing and social desirability response bias should be asked identically in the two sets of interviews, and they should be asked in identical contexts; that is, the number, content, and sequence of prior questions should be the same. And finally, comparisons across modes should be subjected to tests of statistical significance.

IDENTIFYING USEFUL STUDIES

After conducting an exhaustive literature search, we uncovered 48 studies that compared data collected in face-to-face and telephone interviews; these studies are listed down the left side of table 1.³ Some of these studies are potentially

3. Table 1 includes published studies and reports available on the world wide web. These studies were located in a search involving two steps. First, on-line databases of publications and reports were searched for relevant keywords in titles and abstracts. And second, the references of studies found in the first step were used to identify additional books, articles, chapters, and reports to obtain.

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useful for our purposes, but many of them are not. The *X*'s in each row of the table indicate features of a study that render it uninformative with regard to the comparison of general population RDD telephone surveying with area probability face-to-face surveying. A study could have *X*'s in multiple columns, indicating multiple such features.

The first column of *X*'s identifies studies in which the same group of respondents was interviewed face to face and over the telephone. Column 2 identifies studies in which face-to-face and telephone respondents were sampled from different populations. Column 3 identifies studies in which some people assigned to one mode were actually interviewed in a different mode. Column 4 identifies studies in which respondents in the face-to-face survey were interviewed in groups and telephone interviews were conducted with individuals one at a time. Column 5 identifies a study in which respondents were given the choice to be interviewed face to face or by telephone (90 percent of people contacted in the study identified in that column chose to be interviewed by telephone). Column 6 identifies studies in which respondents in one or both modes had been interviewed previously. Column 7 identifies studies in which very different questionnaires were used in the face-to-face and telephone surveys. And column 8 identifies studies whose reports did not describe the questionnaires used in sufficient detail to permit adequate evaluation of measurement equivalence across modes.

The 23 studies in the rows in the two lower parts of table 1 were not eliminated by any of the above filters, and these are therefore potentially informative for our present purpose. The seven studies in the bottom third of table 1 compared telephone interviews of national RDD samples to face-to-face interviews of national area probability samples and are therefore of particular interest. However, in order to be useful for addressing the satisficing and social desirability hypotheses of interest in this article, a study must also have assessed the extent of satisficing-related response effects and/or social desirability bias in responding, and many of the 23 studies listed at the bottom of table 1 did not do so.

FINDINGS REGARDING SATISFICING

To gauge satisficing, a questionnaire must include appropriate measures. For example, questions offering explicit no-opinion response options must be asked in order to measure no-opinion responding.⁴ A battery of rating scale questions with identical response options must be asked in order to measure nondifferentiation, and agree/disagree or yes/no opinion questions must be asked in order to measure acquiescence. To gauge social desirability response

4. Volunteering a no-opinion response when it is not explicitly offered does not constitute satisficing, because no cue in the question encourages satisficing in that way. In fact, offering a no-opinion response under these circumstances entails breaking the "rules of the game" (Schuman and Presser 1981) by insisting on going outside the sanctioned set of response options.

Table 1. Summary of Previous Studies Comparing Face-to-Face and Telephone Interviewing

Publication	The Same Respondents Were Interviewed Face-to-Face and by Telephone	Telephone and Face-to-Face Samples Were of Different Populations	Some People Assigned to a Mode Were Not Interviewed in That Mode	Face-to-Face Respondents Interviewed in Groups and Telephone Respondents Interviewed Individually	Respondents Were Given the Choice to Be Interviewed Face-to-Face or by Telephone	Respondents in One or Both Modes Were Interviewed Previously	Very Different Questionnaires	Questionnaire Not Described Adequately	Not an RDD Telephone Survey vs. an Area Probability Face-to-Face Survey	Not National Samples
Confounded mode comparisons:										
Henson, Roth, and Cannell 1978	X								X	
Herzog and Rodgers 1988	X								X	
Midanik, Rogers, and Greenfield 2001	X								X	
Rogers 1976	X								X	
Schmiedeskamp 1962	X								X	
Cahalan 1960	X								X	X
Larsen 1952		X							X	X
Siemiatycki 1979			X				X		X	
Mangione, Hingson, and Barrett 1982			X						X	
Hochstim 1962, 1967			X						X	
Herman 1977			X						X	X
Rosenstone, Petrella, and Kinder 1993			X						X	
Thornberry 1987				X						
Cannell, Groves, and Miller 1981				X						
Calsyn, Roades, and Calsyn 1992					X				X	
Yaffe et al. 1978						X				
Morchio, Sanchez, and Traugott 1985						X			X	
Esaiasson and Granberg 1993						X			X	
Herzog and Rodgers 1999						X			X	
Woltman, Turner, and Bushery 1980						X			X	
Aquilino 1992							X			

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bias, questions must be asked about attitudes, beliefs, or behaviors that empirical evidence documents are on sensitive topics and therefore subject to such bias.

Many of the 24 studies in the lower two sections of table 1 did not include appropriate measures to yield useful evidence for gauging mode effects on satisficing, and in the few cases where such measures existed, previous researchers did not examine mode effects on satisficing and report their findings in their publications. Specifically, no published report has examined no-opinion responding in questions that explicitly offered “don’t know” response options.⁵ Likewise, none of the reports of these studies examined nondifferentiation in a battery of rating scale questions that was asked identically in the two modes. And none of the relevant publications examined answers to agree/disagree or yes/no questions that were asked identically in the two modes.⁶ In fact, no reports of these past studies compared any indicators of satisficing across modes.

FINDINGS REGARDING SOCIAL DESIRABILITY

Only two of the publications listed in the bottom section of table 1, both reporting analyses of the same data, gauged social desirability response bias in answers to questions with empirically established social desirability connotations.⁷ Colombotos (1965, 1969) asked five social scientists and two physicians to choose the most socially desirable response to a series of questions about the professional conduct of physicians, and some behaviors were thusly identified as respectable or not. New York and New Jersey physicians who were randomly assigned to be interviewed either face to face or via telephone did not give significantly different answers to these questions. However, it is difficult to know whether this result can be generalized to general public samples.

Seven studies of general public samples did not pretest the social desirability connotations of the questions they examined, but some of those questions seem likely to have such connotations. Two of these studies reported a significant mode effect: Weeks et al. (1983) found that telephone respondents were significantly more likely to report that they had visited a dentist during the past

5. A number of past studies examined item nonresponse for questions that did not offer an explicit no-opinion response option (Greenfield, Midanik, and Rogers 2000; Groves and Kahn 1979; Hinkle and King 1978; Jordan, Marcus, and Reeder 1980; Kormendi 1988; Quinn, Gutek, and Walsh 1980; Saris and Kaase 1997). By definition, this behavior is not satisficing, so those studies are not relevant to testing the satisficing hypothesis.

6. Jordan, Marcus, and Reeder (1980) compared agree-disagree questions asked using show cards in face-to-face interviews to comparable items asked without show cards in telephone interviews.

7. Quinn, Gutek, and Walsh (1980) examined questions asking whether or not the respondent or a family member had experienced 28 problems or difficulties, but these questions did not have clear social desirability connotations. Wiseman (1972) and McQueen (1989) examined potentially informative attitudes and behaviors but did not report tests of statistical significance of observed differences between modes.

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12 months than were face-to-face respondents, and Aquilino (1994) found that admission of illegal drug use was more likely in face-to-face interviews than in telephone interviews.⁸ In a study of University of Kentucky students, Johnson, Hougland, and Clayton (1989) found reports of more illegal drug use and alcohol use in face-to-face interviews than in telephone interviews, but the social desirability connotations of these behaviors for college students are not necessarily clear. Four other studies found no significant differences between telephone and face-to-face reports of being registered to vote, turning out to vote, being arrested for drunk driving, declaring bankruptcy, and experiencing symptoms associated with depression (Aneshensel et al. 1982; Aquilino 1998; Groves 1977; Groves and Kahn 1979; Locander, Sudman, and Bradburn 1976).

The Present Investigation

In light of how limited the relevant available evidence is regarding mode differences in satisficing and social desirability response bias, it seemed appropriate to explore these issues further, so we did so using three datasets: (1) the 1982 National Election Study Methods Comparison Project (MCP), an experiment designed to compare face-to-face interviewing of a block-listed national sample with RDD telephone interviewing of a national sample and conducted jointly by the University of Michigan's Survey Research Center (SRC) and the Program in Computer-Assisted Interviewing at the University of California, Berkeley, for the National Election Study (NES), (2) a comparable experiment conducted in 1976 by the University of Michigan's Survey Research Center (SRC) for Groves and Kahn (1979), and (3) a comparable experiment conducted as a part of the 2000 National Election Study.

All of these studies met the necessary criteria we outlined above: they all involved essentially identical questionnaires being administered to separate groups of individuals interviewed either face to face or by telephone who had not been previously interviewed and who were selected from their households by the same method. The telephone interviews were conducted with national RDD samples; the face-to-face interviews were conducted with national area probability samples; and the questionnaires were quite lengthy.

In our investigation, we tested our hypotheses controlling for differences between the face-to-face and telephone samples in terms of an array of demographic characteristics, which none of the 18 studies highlighted in the bottom section of table 1 did. There are several reasons to expect that certain demographic groups may be more frequently represented in a sample interviewed

8. Consistent with the notion that frequency of dental check-ups has social desirability connotations, Gordon (1987) reported evidence that having regular dental checkups is socially desirable. Weeks et al. (1983) examined five other health-related behaviors, but these behaviors do not have clear social desirability connotations. Aquilino (1994) found more reports of alcohol consumption in face-to-face interviews than in telephone interviews, but it is not clear that questions about alcohol use have clear social desirability connotations.

by one method than the other. First, as we mentioned, coverage error occurs in RDD telephone samples because about 5 percent of American households are without working telephones (Belinfante 1998). Members of households with telephones are more likely to be highly educated, to have high incomes, and to be women, older, and white than people living in households without phones (Gfroerer and Hughes 1991; Groves and Kahn 1979; Mulry-Liggan 1983; Wolfe 1979).

Second, the two modes may differ in the nature of unit nonresponse error as well if some sorts of people are willing to participate in surveys in one mode but not the other, which seems likely. Contact by a stranger over the telephone always involves a degree of uncertainty, so people who are most socially vulnerable because of a lack of power or resources may feel they have the most to lose by taking the risk of answering and may therefore be reluctant to participate in telephone interviews. Even if survey interviewers' calls are preceded by advance letters, and even if respondents have called a toll-free telephone number to reassure themselves about the identity of their interviewers, respondents cannot be completely sure their interviewers are the people they claim to be and cannot be sure that the questions being asked are truly for their purported purpose.

The same uncertainties exist when an interviewer knocks on a respondent's door, and the same means of reassurance are available. But the doorstep contact offers more: the nonthreatening and professional physical appearance of most interviewers and their equipment, along with their pleasant, friendly, professional, and nonthreatening nonverbal behaviors. All this may help to reassure respondents. Furthermore, the effort expended by the interviewer to travel to the respondent's home communicates a degree of professionalism that may assuage hesitations from reluctant respondents. Consequently, factors such as having limited income, having limited formal education, being female, elderly, and of a racial minority may all make respondents more reluctant to participate in telephone interviews than in face-to-face interviews.

Of course, doorstep contact entails another consideration as well: the risk that the interviewer might be physically threatening or even motivated to rob or otherwise take advantage of the respondent. This might lead some respondents, especially women and the elderly, to be reluctant to let a stranger into their home. Studies comparing respondents in telephone surveys to those who own telephones in face-to-face surveys (a method to eliminate coverage bias when examining nonresponse) suggest that telephone respondents are more likely to be well educated, to have high incomes, and to be male, older, and white (Gfroerer and Hughes 1991; Groves and Kahn 1979; Thornberry 1987; Weeks et al. 1983). This is further reason to expect that socially vulnerable groups will be less well represented in telephone surveys.

Consistent with this expectation, previous studies combining coverage error and unit nonresponse by comparing data collected by face-to-face interviewing of national area probability samples with data collected by national RDD

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telephone interviews (the seven studies in the bottom section of table 1) have indeed documented reliable demographic differences between the samples. For example, all of the six studies that compared education levels for the two types of surveys found fewer low-education respondents in the telephone samples than in the face-to-face samples (Greenfield, Midanik, and Rogers 2000; Groves 1977; Groves and Kahn 1979; Klecka and Tuchfarber 1978; Mulry-Liggan 1983; Shanks, Sanchez, and Morton 1983; Weeks et al. 1983). All of the five studies that compared income levels found fewer low-income respondents in the telephone samples than in the face-to-face samples (Greenfield, Midanik, and Rogers 2000; Groves 1977; Groves and Kahn 1979; Klecka and Tuchfarber 1978; Shanks, Sanchez, and Morton 1983; Weeks et al. 1983). Of the six studies that examined age, five found fewer older people in the telephone samples than in the face-to-face samples (Groves 1977; Groves and Kahn 1979; Herzog, Rodgers, and Kulka 1983; Klecka and Tuchfarber 1978; Mulry-Liggan 1983; Weeks et al. 1983). Greenfield, Midanik, and Rogers (2000) found no age differences between a face-to-face sample and a telephone sample. And of the six studies that examined race, five found fewer minority respondents and more white respondents in the telephone samples than in the face-to-face samples (Greenfield, Midanik, and Rogers 2000; Klecka and Tuchfarber 1978; Mulry-Liggan 1983; Shanks, Sanchez, and Morton 1983; Weeks et al. 1983). In the remaining study, there were only slightly more whites interviewed in the telephone survey than in the face-to-face survey (Groves 1977; Groves and Kahn 1979).

Demographic characteristics are sometimes related to the likelihood that a respondent will satisfice (e.g., Narayan and Krosnick 1996) and to the likelihood that a respondent will have performed various sensitive behaviors or will hold certain sensitive attitudes. Therefore, it is important to control for demographic differences in order to isolate the effect of mode on no-opinion responding, nondifferentiation, acquiescence, and social desirability response bias, and we have done so.⁹

The 1982 NES Methods Comparison Project

DATA COLLECTION

The 1982 NES Methods Comparison Project (MCP) involved 998 telephone interviews and 1,418 face-to-face interviews with representative national sam-

9. It is probably impossible to measure all possibly relevant demographic variables, and controlling for demographics in this way requires the assumption that sample members from a particular demographic group adequately represent their population (an assumption routinely made when weighting samples). So our approach here will not completely eliminate all threats due to demographic differences between the samples, but it will help to reduce concern about this alternative explanation for our findings.

ples of noninstitutionalized American adults, conducted during November and December 1982 and January 1983. All of the face-to-face interviews were conducted by the University of Michigan's Survey Research Center and involved their conventional approach to area probability sampling via block-listing. The telephone sample was generated via RDD. Half of the telephone respondents (selected randomly) were interviewed by Michigan's SRC, and the other half were interviewed by the Survey Research Center at the University of California, Berkeley. A respondent was randomly chosen to be interviewed from among all eligible household members. The response rate was 72 percent for the face-to-face sample and 62 percent for the telephone sample (Shanks, Sanchez, and Morton 1983).¹⁰

Essentially identical questionnaires were used for all interviews; show cards that accompanied some questions in the face-to-face interviews were not used during the telephone interviews, but we did not analyze those items. The questionnaire was similar in length and character to those of other National Election Study surveys (which typically last over an hour) and asked about respondents' participation in politics, attitudes toward political candidates and public policies, and much more.

MEASURES

This survey's questionnaire permitted assessment of no-opinion responding, nondifferentiation, and social desirability response bias (for details of the measures and coding procedures, see app. A). No-opinion responding was measured by calculating the percent of questions that offered an explicit no-opinion response option to which each respondent answered "no opinion." Nondifferentiation was measured by counting the number of identical or nearly identical responses each respondent gave in answering two batteries of ratings using the same scale. Social desirability response bias was measured by calculating the proportion of questions with social desirability connotations to which a respondent gave the socially desirable response. We identified these items based upon a pretest designed to determine the extent to which items had social desirability connotations (for details on this survey, see app. B).

All variables were coded to range from 0 to 1, with 0 meaning the least possible no-opinion responses, the least possible nondifferentiation, and the least frequent offering of socially desirable answers, and 1 meaning the most

10. These response rates correspond to AAPOR's response rate 1. These response rates are a bit lower than those observed in other high quality surveys conducted at about the same time. For example, the University of Michigan's Monthly Survey of Consumer Attitudes, a telephone survey, had a response rate of 72 percent in 1982 (AAPOR response rate 2; the numerator included completed and partial interviews, and the denominator included all sampled phone numbers except those known to be ineligible; Curtin, Presser, and Singer 2000), and the General Social Survey, done face-to-face by the National Opinion Research Center, had a response rate of 77.5 percent in 1982 (Smith 1995).

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possible no-opinion responses, the most possible nondifferentiation, and the most frequent offering of socially desirable answers.

ASSESSING MODE EFFECTS

We approached the assessment of mode effects in two ways. To gain the maximal statistical power by using the full array of cases, we compared the face-to-face interviews to the full set of telephone interviews. However, this comparison confounds mode with house, because Michigan conducted all the face-to-face interviews, but half the telephone interviews were done by Berkeley. If the standard interviewing practices at these institutions differentially encouraged or discouraged satisficing or socially desirable responses, the confounding of mode with house would yield misleading results regarding mode. To deal with this problem, we also conducted less powerful tests of mode differences comparing only the Michigan telephone respondents to the face-to-face respondents.

All statistical analyses were conducted using Stata, which allowed for proper weighting by the reciprocal of the known probability of selection. In the analyses reported below, the telephone respondents were weighted by the number of adult residents in the household and by the reciprocal of the number of telephone lines in the household, and the face-to-face respondents were weighted by the number of adult residents in the household.¹¹

In order to reduce travel costs for face-to-face interviews, clusters of households were selected for generating the area probability samples. This clustering reduces standard error estimates and makes statistical tests misleadingly liberal. We therefore controlled for clustering at the level of the primary sampling unit in the face-to-face sample.

RESULTS

No-opinion responses. The first two columns of rows 1 and 2 in table 2 display the adjusted mean proportions of no-opinion responses for the face-to-face respondents and the telephone respondents.¹² The first row combines the Michigan and Berkeley telephone respondents, and the second row displays figures using only the Michigan telephone respondents. The remaining columns of the table display the results of ordinary least squares (OLS) regressions predicting the proportion of no-opinion responses using mode (coded

11. The number of telephone lines was not recorded for the Berkeley telephone respondents. Therefore, all Berkeley telephone respondents were assigned a value of 1 for the number of telephone lines.

12. These means were adjusted for demographic differences between the two respondent groups interviewed in the two modes.

Table 2. Regression Coefficients Estimating the Impact of Mode on Satisficing

		Adjusted Means		Regression Coefficients											
Response Strategy	House(s)	Face-to-													
		Face (1)	Telephone (2)	Mode (3)	Education (4)	Income (5)	Race (6)	Gender (7)	Age (8)	Age ² (9)	Married (10)	Employed (11)	R ² (12)	N	
1982 NES MCP:															
No-opinion responding:															
Full sample	Michigan & Berkeley	.17	.24	.07**	-.29**	-.07**	.05*	.02*	-.08	.11 ⁺	.00	.01	.18	2,093	
	Michigan	.17	.26	.08**	-.28**	-.08**	.04	.02	-.06	.10 ⁺	.01	.00	.18	1,680	
Low education	Michigan & Berkeley	.32	.46	.14**	-.37 ⁺	-.12	.01	.08*	.22	-.17	.01	-.02	.10	410	
	Michigan	.32	.53	.22**	-.43 ⁺	-.15 ⁺	-.02	.09**	.19	-.16	.02	-.03	.14	350	
High education	Michigan & Berkeley	.14	.18	.05**	-.22**	-.04 ⁺	.06*	.01	-.17**	.17**	.01	.01	.11	1,683	
	Michigan	.14	.19	.05**	-.21**	-.05*	.05 ⁺	.00	-.16*	.17**	.01	.01	.10	1,330	
Nondifferentiation:															
Full sample	Michigan & Berkeley	.37	.41	.04**	-.02	-.02	-.01	-.01	-.13*	.08 ⁺	.00	.01	.02	2,095	
	Michigan	.37	.41	.03**	-.01	-.02	-.01	-.01 ⁺	-.13*	.08	.00	.02	.02	1,682	
Low education	Michigan & Berkeley	.38	.44	.06**	.04	.05	.00	-.02	-.09	.09	.02	.02	.05	411	
	Michigan	.38	.41	.03	.05	.04	-.01	-.03	.01	.01	.02	.03	.04	351	
High education	Michigan & Berkeley	.37	.41	.04**	.00	-.02	-.01	-.01	-.13*	.07	-.01	.00	.03	1,684	
	Michigan	.37	.40	.03**	.02	-.03	-.01	-.01	-.14*	.07	.00	.01	.03	1,331	

1976 SRC datasets:													
No-opinion responding:													
Full sample	.62	.69	.35**	-2.50**	-.75*	.27	.72**	-1.47	1.35	.16	.10	1,344	
Low education	.80	.86	.42	-2.48	-.34	-.44	.66 ⁺	3.63 ⁺	-4.59 ⁺	-.35	-.22	359	
High education	.55	.63	.34*	-2.46**	-.73 ⁺	.57*	.74**	-2.84*	3.25*	.30 ⁺	.16	985	
Nondifferentiation:													
Full sample	.62	.65	.03*	.00	.16**	-.11**	-.06**	.39**	-.18 ⁺	-.03*	-.03	.09	2,633
Low education	.60	.65	.05*	.10	.20**	-.13**	-.06 ⁺	.41*	-.11	.00	.00	.13	684
High education	.63	.65	.02	-.07 ⁺	.15**	-.09**	-.07**	.44**	-.25 ⁺	-.05**	-.04 ⁺	.08	1,949
Acquiescence:													
Full sample	.33	.37	.03*	-.05	.01	.06*	-.02	.00	.24	.01	-.03	.02	2,485
Low education	.38	.43	.06	-.18	-.23 ⁺	.03	.03	-.23	.36	.08*	.01	.03	605
High education	.32	.34	.03	-.03	.05	.07*	-.03	-.02	.33	.00	-.04	.02	1,880
2000 NES:													
No-opinion responding:													
Full sample	.11	.19	.07**	-.14**	-.05**	.08**	.03**	-.53**	.67**	.01	.03*	.17	1,488
Low education	.14	.22	.08**	-.20**	-.06*	.09**	.04**	-.54**	.67**	.00	.04*	.16	1,029
High education	.06	.12	.06**		-.03	.05*	.01	-.52**	.62*	.01	.01	.07	459
Acquiescence:													
Full sample	.31	.33	.02*	.10**	.00	.02	-.02	.20**	-.19*	.01	-.01	.05	1,488
Low education	.29	.32	.03*	.14**	.01	.01	-.01	.17 ⁺	-.13	.01	-.01	.05	1,029
High education ^a	.34	.35	.01		-.01	.04	-.03*	.30 ⁺	-.34 ⁺	.01	-.02	.03	459
Interview time	70.75	64.96	-5.79**	9.32**	-1.45	.59	-.55	40.82**	-16.65	-.03	-1.99	.09	1,487

NOTE.—All variables were coded to range from 0 to 1. Mode was coded 0 for face-to-face and 1 for telephone. Gender was coded 0 for males and 1 for females. Race was coded 0 for whites and 1 for nonwhites. All coefficients are from OLS regressions except coefficients for no-opinion responding for the 1976 SRC datasets, which are from logistic regressions.

^a Education has no coefficient in this equation because there was no variance in the coding of education within this group of respondents.

⁺ $p < .10$.

* $p < .05$.

** $p < .01$.

0 for face-to-face respondents and 1 for telephone respondents) and various demographic control variables.¹³

Higher levels of no-opinion responding occurred in the telephone samples (Michigan and Berkeley adjusted mean = 24 percent, Michigan adjusted mean = 26 percent) than in the face-to-face sample (adjusted mean = 17 percent), consistent with the satisficing hypothesis. The difference between the telephone and face-to-face samples was significant regardless of whether we included or dropped the Berkeley data (b 's = .07 and .08, $p < .01$).¹⁴

To test whether the mode effect varied with respondent education, we repeated these analyses separately for respondents who had not graduated from high school and for respondents with more education (for the rationale for this split, see Narayan and Krosnick [1996]). As shown in rows 3–6 of table 2, the mode effect was larger among the least educated respondents than among more educated respondents. When looking only at the Michigan data, the average proportion of no-opinion responses increased from 32 percent in the face-to-face interviews to 53 percent on the telephone ($b = .22$, $p < .01$). The difference was smaller but nonetheless significant when the Berkeley data were folded in ($b = .14$, $p < .01$). The mode effect was smaller in the highly educated subsample, though it was statistically significant there as well ($b = .05$, $p < .01$).

Nondifferentiation. In rows 7–12 of table 2, we see evidence consistent with the satisficing hypotheses regarding nondifferentiation. There was more nondifferentiation in the telephone samples (adjusted mean = .41) than in the face-to-face sample (adjusted mean = .37). This later rate was significantly lower than the telephone rate, whether we excluded the Berkeley data ($b = .03$, $p < .01$) or included it ($b = .04$, $p < .01$).

When only the Michigan data were considered, the mode effect was no stronger in the least educated group ($b = .03$, N.S.) than in the more educated group ($b = .03$, $p < .01$). But when the Berkeley data were included, the mode effect was stronger in the least educated group ($b = .06$, $p < .01$) than in the more educated group ($b = .04$, $p < .01$), as expected.

Social desirability. Respondents interviewed by telephone gave socially desirable responses more often (Michigan and Berkeley adjusted mean = .46; Michigan adjusted mean = .44) than did respondents interviewed face to face (adjusted mean = .41), regardless of whether the Berkeley respondents were included ($b = .05$, $p < .01$; see row 1 of table 3) or excluded ($b = .03$, $p < .10$; see row 2 of table 3).

13. Ordinary least squares regressions were conducted for all dependent variables with three or more possible values. When a dependent variable had only two possible values, logistic regressions were conducted.

14. Throughout this article, significance tests of directional predictions are one-tailed, and tests of differences for which we did not make directional predictions are two-tailed. When a directional prediction was tested but the observed mean difference was in the opposite direction, a two-tailed test is reported.

Table 3. Regression Coefficients Estimating the Impact of Mode on Reporting Socially Desirable Attitudes and Behaviors and Uneasiness Discussing Such Topics

Response Strategy	House(s)	Adjusted Means		OLS Regression Coefficients									R ²	N
		Face-to-		Mode	Education	Income	Race	Gender	Age	Age ²	Employment			
		Face	Telephone								Married	Status		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		
Socially desirable responding:														
1982 NES MCP	Michigan & Berkeley	.41	.46	.05**	.33**	.06*	.13**	−.02 ⁺	.34**	.00	.02	.00	.21	2,095
	Michigan	.41	.44	.03 ⁺	.34**	.05 ⁺	.14**	−.03*	.39**	−.08	.02	.00	.21	1,682
1976 SRC datasets		.76	.81	.05**	.31**	.05 ⁺	−.12**	.01	.76**	−.56**	.04**	.03*	.20	2,627
2000 NES		.41	.44	.03*	.14**	.03	.06**	.00	.48**	−.02	.04**	−.04**	.25	1,488
Unease discussing sensitive topics:														
1976 SRC datasets		.08	.14	.05**	.00	−.00	.01	.01	−.13**	.04	.01	.00	.04	2,630

NOTE.—All variables were coded to range from 0 to 1. Mode was coded 0 for face-to-face and 1 for telephone. Gender was coded 0 for males and 1 for females. Race was coded 0 for whites and 1 for nonwhites.

⁺ $p < .10$.

* $p < .05$.

** $p < .01$.

Summary. In sum, the 1982 NES MCP data showed that respondents manifested indications of greater satisficing over the telephone than face to face, and this effect was larger among the least educated respondents. Furthermore, socially desirable attitudes were reported more often by telephone respondents than by face-to-face respondents.

1976 Survey Research Center Datasets

Next, we explored whether these findings would replicate in a second, comparable experiment conducted only by the University of Michigan's Survey Research Center. This survey also involved a comparison of a block-listed national sample interviewed face to face with a national RDD sample interviewed by telephone. The questionnaire allowed us to examine no-opinion responding, nondifferentiation, acquiescence, and social desirability response bias. The questionnaire also allowed us to explore whether respondents were more likely to express unease about discussing sensitive topics over the phone than face to face, which would be consistent with the social desirability findings from the 1982 NES MCP. And we explored whether respondents expressed impatience with telephone interviews more often than they did with face-to-face interviews, which would be consistent with the logic articulated above to justify our suspicions about the tendency to satisfice in telephone surveys.

These data had been analyzed previously by Groves and Kahn (1979), but those investigators did not test most of the hypotheses we explored. Relevant to the social desirability hypothesis, Groves and Kahn (1979) and Groves (1979) reported that respondents expressed more discomfort about discussing sensitive topics (e.g., racial attitudes, political opinions, and voting) over the telephone than face to face, and their telephone sample claimed to have voted in recent elections at higher rates than did their face-to-face sample. And these investigators reported that most respondents said they would prefer to be interviewed face to face rather than by telephone. But none of these differences was tested controlling for the demographic differences between the two modes' samples, and none of the satisficing-related hypotheses articulated above were tested by Groves and Kahn (1979) at all. It therefore seemed worthwhile to revisit these data to conduct more comprehensive analyses of them.

DATA COLLECTION

The face-to-face interviews were conducted during the spring of 1976, with a multistage stratified area probability sample of the coterminous United States. Households were randomly selected from within 74 primary sampling areas, and respondent selection within households was accomplished by the Kish

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(1949) method of random selection from a complete household listing. The response rate for the face-to-face mode was 74.3 percent.¹⁵

Two RDD samples were generated for the telephone interviews, which were also conducted during the spring of 1976. The first was a stratified RDD sample, in which working combinations of area codes and three-digit central office codes were selected systematically from a stratified list. A second, clustered sample was generated by selecting among area codes and central office codes for working telephone numbers within the 74 primary sampling units of the Survey Research Center's national sample of dwellings. Respondent selection within households was accomplished by the Kish (1949) method, adapted for telephone administration.¹⁶ The response rate for the telephone mode was 70 percent if we assume that all numbers unanswered after 16 attempts were nonworking, and 59 percent if we assume that none of these numbers were nonworking.¹⁷

The questionnaires used in both modes addressed consumer attitudes and behaviors, economic beliefs, life satisfaction and living conditions, political attitudes, and more. The face-to-face questionnaire was a bit longer than the telephone questionnaire, because some sets of questions asked late in the face-to-face interviews were omitted from the telephone questionnaires. In addition, some questions asked with show cards in the face-to-face interviews were asked without any visual displays during the telephone interviews. Our analyses focus on questions that were asked identically in the two modes, that were asked quite early in the interviews, and that had essentially identical questions preceding them in the two modes.

MEASURES

No-opinion responding, nondifferentiation, and social desirability response bias were assessed as in the 1982 NES MCP. Acquiescence was measured by calculating the percent of the agree/disagree and yes/no questions a respondent was asked to which he or she responded "agree" or "yes." Respondent dissatisfaction with the length of the interview was assessed by a question that explicitly asked respondents whether they thought the interview had taken

15. This response rate is similar to those observed in other high quality surveys being conducted at about the same time. For example, the GSS had a response rate of 73.5 percent in 1978 (Smith 1995).

16. The face-to-face data were weighted by the number of eligible adults in the household, and the telephone data were weighted by the number of eligible adults in the household and by the inverse of the number of residential phone lines in the household. Clustering in primary sampling units was controlled for in the face-to-face data. We were not able to control for clustering in the clustered telephone component of the sample because no variable differentiated the two telephone samples from one another.

17. These response rates were calculated by dividing the number of completed interviews by the total number of eligible households. The higher of these response rates is identical to that of the Survey of Consumer Attitudes (approximately 70 percent) in 1979 (Curtin, Presser, and Singer 2000).

too long and by the interviewer's record of whether the respondent ever spontaneously voiced dissatisfaction that the interview was taking a long time. All measures were coded to range from 0 (meaning the least possible no-opinion responding, nondifferentiation, acquiescence, socially desirable responding, and dissatisfaction with interview length) to 1 (meaning the most possible no-opinion responding, nondifferentiation, acquiescence, socially desirable responding, and dissatisfaction with interview length). Full details about the measures and coding procedures are provided in appendix A.

RESULTS

No-opinion responses. The telephone respondents chose an explicitly offered no-opinion response option more often than did the face-to-face respondents (62 percent for face-to-face respondents and 69 percent for telephone respondents; logistic regression coefficient = .35, $p < .01$; see the first row in the middle panel of table 2). This effect was slightly larger among low-education respondents (logistic regression coefficient = .42, N.S.) than among high-education respondents (logistic regression coefficient = .34, $p < .05$), although the former was not significant and the latter was.¹⁸

Nondifferentiation. Nondifferentiation was more prevalent in the telephone sample than in the face-to-face sample ($b = .03$, $p < .05$; see col. 3 in row 4 of the middle panel of table 2). Furthermore, this mode effect was significant among the least-educated respondents ($b = .05$, $p < .05$; see col. 3 of row 5 in the middle panel of table 2), and smaller and not significant in the high-education group ($b = .02$, N.S.; see col. 3 of row 6 in the middle panel of table 2).

Acquiescence. The telephone respondents were more likely to acquiesce than were the face-to-face respondents ($b = .03$, $p < .05$; see row 7 of the middle panel of table 2). The coefficient estimating this effect was slightly larger among low-education respondents ($b = .06$, N.S.) than among high-education respondents ($b = .03$, N.S.), but neither of those coefficients was significant.

Dissatisfaction with interview length. Respondents interviewed by telephone were significantly more likely than the face-to-face respondents to express dissatisfaction with the interview's length ($b = .06$, $p < .01$; see col. 3 of row 2 in table 4) and to ask how much longer the interview would take (logistic regression coefficient = .98, $p < .01$; see col. 3 of row 1 in table 4).

Social desirability. The telephone respondents were more likely to give socially desirable responses than were the face-to-face respondents ($b =$

18. No-opinion responding was unusually common for this question (greater than 60 percent). Unlike questions that tag a no-opinion response option on at the end of a list of substantive answer choices, this item began by saying: "Not everyone has an opinion on this next question. If you do not have an opinion, just say so." This heavy-handed encouragement of no-opinion responses seems likely to explain their popularity.

Table 4. Regression Coefficients Estimating the Impact of Mode on Respondent Dissatisfaction and Engagement

Respondent Reaction	Adjusted Means		Regression Coefficients									R ²	N
	Face-to-Face (1)	Telephone (2)	Mode (3)	Education (4)	Income (5)	Race (6)	Gender (7)	Age (8)	Age ² (9)	Married (10)	Employed (11)		
1976 SRC datasets:													
Asked how much longer the interview would be	.04	.11	.98**	.41	−.69	.52*	.05	2.10 ⁺	−1.27	.08	−.51*		2,625
Expressed dissatisfaction with interview length	.52	.58	.06**	.03**	−.03 ⁺	.02 ⁺	.00	.03	−.01	.02**	.00	.07	2,570
2000 NES:													
Interviewer rating of respondent interest	.73	.69	−.04*	.21**	.03	.00	−.02 ⁺	.36*	−.27	−.01	−.01	.12	1,487
Interviewer rating of respondent cooperation	.91	.88	−.02*	.08**	.02	−.01	−.01	−.02	.04	.01	.00	.05	1,487
Interviewer rating of respondent suspicion	.08	.12	.04**	−.02	−.01	.05*	.00	.15	−.17	.01	−.01	.02	1,487
Said he or she wanted to stop the interview	.01	.02	.98 ⁺	.35	−1.30	1.21 ⁺	.40	12.39 ⁺	−6.53	.01	.43		1,488
Said interview was too long	.01	.09	2.03**	.18	−.32	.03	.41	2.85	−1.99	−.08	.12		1,488

NOTE.—All variables were coded to range from 0 to 1. Mode was coded 0 for face-to-face and 1 for telephone. Gender was coded 0 for males and 1 for females. Race was coded 0 for whites and 1 for nonwhites. OLS regression coefficients are shown for dissatisfaction with interview length, and respondent suspicion, cooperation and interest, and logistic regression coefficients are shown for asking how much longer the interview would be, complaining about the interview length, and wanting to stop at some point during the interview.

⁺ *p* < .10.

* *p* < .05.

** *p* < .01.

.05, $p < .01$; see col. 3 of row 3 of table 3). And respondents interviewed by telephone expressed significantly more unease about discussing sensitive topics than did respondents interviewed face to face ($b = .05$, $p < .01$; see row 5 of table 3).

2000 National Election Study

Finally, we tested the satisficing and social desirability hypotheses using data from a more recent survey conducted by the University of Michigan's Survey Research Center for the 2000 National Election Study. This survey compared an area probability sample of 1,006 people interviewed face to face to an RDD sample of 801 people interviewed by telephone. The questionnaire allowed us to assess the extent of no-opinion responding, acquiescence, social desirability response bias, and respondent dissatisfaction with interview length. We also examined the extent to which respondents expressed suspicion about the trustworthiness of the interview process, which the logic articulated above suggests might be a precursor of social desirability response bias.

In addition, this questionnaire allowed us to examine the effect of mode on interview length. The logic we articulated earlier about the pressure to move quickly through telephone conversations suggests that telephone interviews may be completed more quickly than are face-to-face interviews. And we examined respondents' level of interest in the interview and their cooperativeness, on the assumption that more interest and cooperation were signs of greater engagement in the process and less inclination toward satisficing.

DATA COLLECTION

Face-to-face and telephone interviewing began on September 5, 2000, and ended on November 6, 2000. The population for these surveys was all U.S. citizens of voting age. Within each household, an eligible respondent was randomly chosen to be interviewed.¹⁹ The response rate for the face-to-face interviews was 64.3 percent, and the response rate for the telephone interviews was 56.5 percent.²⁰ The questionnaires addressed political attitudes and behaviors and often focused on the upcoming presidential election.

19. The number of telephone lines in the household was not recorded for the telephone respondents, so the telephone and face-to-face respondents were weighted only by the number of adults in the household. Clustering in primary sampling units was controlled for in the face-to-face data.

20. These response rates were calculated by dividing the number of completed interviews by the total number of potential respondents (and correspond to AAPOR's response rate 1). The response rates for these two surveys were somewhat lower than those observed in other contemporaneous high quality surveys. The Survey of Consumer Attitudes had a response rate of approximately 67 percent in 1996 (Curtin, Presser, and Singer 2000), and a national RDD telephone survey using rigorous methodology conducted in 1997 by the Pew Research Center for the People and the Press had a response rate of 60.6 percent (AAPOR response rate 3; the

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MEASURES

No-opinion responding, acquiescence, social desirability response bias, and respondent dissatisfaction with interview length were gauged as in the 1976 SRC datasets. And interviewers recorded spontaneous expressions of respondent suspicion and rated respondent engagement in the interview process. All of these variables were coded to range from 0 (meaning the least possible no-opinion responding, acquiescence, social desirability response bias, respondent dissatisfaction, suspicion, and engagement) to 1 (meaning the most possible no-opinion responding, acquiescence, social desirability response bias, respondent dissatisfaction, suspicion, and engagement). Interview length was recorded in minutes. Details about the measures and coding procedure are provided in appendix A.

RESULTS

No-opinion responses. The telephone respondents were more likely than the face-to-face respondents to choose a no-opinion response option (19 percent for telephone respondents vs. 11 percent for face-to-face respondents; $b = .07, p < .01$; see col. 3, row 1 in the bottom panel of table 2). This effect was slightly stronger among the low-education respondents ($b = .08, p < .01$; see col. 3, row 2 in the bottom panel of table 2) than among the high-education respondents ($b = .06, p < .01$; see col. 3, row 3 in the bottom panel of table 2).

Acquiescence. Respondents interviewed by telephone were significantly more likely to give “agree” and “yes” responses than were respondents interviewed face to face ($b = .02, p < .05$; see col. 3, row 4 in the bottom panel of table 2), and this effect was significant among low-education respondents ($b = .03, p < .05$; see col. 3, row 5 in the bottom panel of table 2), but not among high-education respondents ($b = .01, \text{N.S.}$; see col. 3, row 6 in the bottom panel of table 2).

Dissatisfaction with interview length. Respondents interviewed by telephone were significantly more likely than face-to-face respondents to complain that the interview was too long (9 percent of telephone respondents vs. 1 percent of face-to-face respondents; $b = 2.03, p < .01$; see col. 3 of row 5 in the bottom panel of table 4) and to want to stop at some point during the interview (2 percent of telephone respondents vs. 1 percent of face-to-face respondents; $b = .98, p < .10$; see col. 3 of row 4 in the bottom panel of table 4).

Respondent engagement. Respondents interviewed by telephone were rated as less cooperative ($b = -.02, p < .05$; see row 2 in the bottom panel of table

numerator included only completed interviews, and the denominator included all sample numbers known to be eligible and 20 percent of the sample numbers for which eligibility was not known). The GSS had a response rate of 82 percent in 1998 (Smith 1995).

4) and less interested in the survey ($b = -.04, p < .05$; see row 1 in the bottom panel of table 4) than were respondents interviewed face to face.

Interview length. The face-to-face interviews were approximately 6 minutes longer than telephone interviews on average ($b = -5.79, p < .01$; see col. 3, row 7 in the bottom panel of table 2).

Social desirability. The telephone respondents were more likely to give socially desirable answers than were the face-to-face respondents ($b = .03, p < .05$; see col. 3 of row 4 in table 3). And the telephone respondents were more likely to express suspicion about the interview process than were the face-to-face respondents ($b = .04, p < .01$; see col. 3 of row 3 of the bottom panel of table 4).

Meta-analysis of the Education Effect

Satisficing theory anticipates that the mode effect on use of satisficing response strategies may be larger among less-educated respondents. In eight of the nine tests of this hypothesis reported thus far, we saw differences between high- and low-education groups in the expected direction. And in the ninth instance, the mode effect was of equal magnitude in the two education groups. This consistent pattern of differences between the education groups suggests that there may in fact be a meaningful trend here consistent with satisficing theory. However, the difference between the high- and low-education groups was statistically significant only in the case of no-opinion responding in the 1982 NES MCP data and was marginally significant in the case of acquiescence in the 2000 NES (see the last column of table 5).

Meta-analysis was designed precisely to test hypotheses in these sorts of circumstances, where multiple tests point in similar directions (Rosenthal 1984). Therefore, to test whether the moderating effect of education was in fact reliable, we performed a meta-analysis using the data from all three of our studies at once. We compared the difference in the impact of mode between respondents low and high in education across the satisficing indicators using the statistics shown in table 5. At the bottom of table 5 are two meta-analytic test statistics representing the effect of education combined across the 1982 NES MCP, the 1976 Survey Research Center datasets, and the 2000 National Election Study data. One of these tests used the Michigan and Berkeley data from the 1982 NES MCP, in addition to the 1976 and the 2000 data. The other test used only the Michigan data from the 1982 survey, in addition to the 1976 and 2000 data. These statistics were generated by computing a planned contrast between the education groups of the combination of the seven p -values of the mode effect tests within each group.

Both test statistics suggest that the role of education in moderating the effect of mode on satisficing was statistically reliable and in the expected direction (1976 data plus 2000 data plus the 1982 Michigan and Berkeley data: $z =$

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Table 5. Meta-analysis of the Moderating Effect of Education on the Impact of Mode

Response Strategy	Low-Education Coefficient	High-Education Coefficient	z-Test of the Education Difference
1982 NES MCP:			
Michigan and Berkeley:			
No-opinion responding	.14** (.03)	.05** (.01)	2.85**
Nondifferentiation	.06** (.02)	.04** (.01)	.89
Michigan:			
No-opinion responding	.22** (.05)	.05** (.01)	3.33**
Nondifferentiation	.03 (.03)	.03** (.01)	.00
1976 SRC datasets:			
No-opinion responding	.42 (.31)	.34** (.15)	.23
Nondifferentiation	.05** (.03)	.02 (.02)	.88
Acquiescence	.06 (.04)	.03 (.02)	.74
2000 NES:			
No-opinion responding	.08** (.02)	.06** (.01)	1.26
Acquiescence	.03** (.01)	.01 (.01)	1.56 ⁺
Combination of significance levels from all three surveys:			
Using the Berkeley and Michigan data from the 1982 NES MCP, the 1976 SRC dataset, and the 2000 NES			3.11**
Using only the Michigan data from the 1982 NES MCP, the 1976 SRC dataset, and the 2000 NES			2.85**

NOTE.—OLS regression coefficients are shown for all effects except no-opinion responding for the 1976 SRC datasets, for which logistic regression coefficients are shown. Standard errors are shown in parentheses.

⁺ $p < .10$.

* $p < .05$.

** $p < .01$.

3.11, $p < .01$; 1976 data plus 2000 data plus the 1982 Michigan data only: $z = 2.85$, $p < .01$).

General Discussion

Taken together, this evidence suggests that interview mode can affect response patterns in long interviews with representative national samples. In particular, answers given during telephone interviews of RDD samples appear to have manifested more satisficing and greater social desirability response bias than

did answers given during face-to-face interviews of area probability samples. Furthermore, respondents interviewed by telephone appear to have been more suspicious and less cooperative and less interested in the survey, suggesting they may have had less motivation to generate optimal answers. These differences are consistent with the notion that the rapport probably developed during the lengthy face-to-face interviews may have inspired respondents to work harder at providing high-quality data, even when doing so meant admitting something that may not have been socially admirable.²¹

The magnitudes of the mode effects documented here might appear to be small enough to justify concluding that there is no reason for concern about the telephone mode. And these mode effects on data quality may appear even smaller in light of the large cost savings associated with telephone interviewing relative to face-to-face interviewing. However, we have seen that telephone interviewing is associated with an increase in systematic bias in response patterns, and these effects were sometimes sizable among respondents who were the least educated. Furthermore, it is well established that telephone samples underrepresent low-education respondents, low-income respondents, and minority respondents. Therefore, if one intends survey research to give equally loud voices to all members of society, the biases apparently associated with telephone interviewing may discriminate against population segments that already have limited impact on collective decision making in democracies.

There is reason for concern here even among researchers who do not view surveys as providing vehicles for public influence on public policy and societal deliberation. For example, our findings suggest that basic researchers interested in comparisons across population subgroups may reach different conclusions depending upon which mode they employ. Specifically, many studies have explored the notion that more socially disadvantaged segments of democratic publics are less likely to have opinions on political issues and therefore have less to offer the collective decision-making process (for a review, see Krosnick and Milburn [1990]). One would reach this conclusion more strongly when analyzing telephone survey data than when analyzing face-to-face data.

This perspective suggests potential costs that may be borne by shifting long-term large-scale survey studies that have been done face to face for many years over to the telephone mode in order to cut costs. Because comparisons over time are the lifeblood of these studies, any shift of mode confounding substantive shifts in the phenomena of interest with methodological perturbations may cloud these studies' abilities to make clean historical comparisons.

21. Our findings regarding reports of behaviors and attitudes with social desirability connotations may seem surprising given evidence that people are more likely to disclose potentially embarrassing behaviors and attitudes when their reports are anonymous (Himmelfarb and Lickteig 1982; Paulhus 1984; Warner 1965). However, our findings suggest that any benefit of increased privacy over the telephone for the accuracy of reports of sensitive behaviors and attitudes is less than the advantage of greater rapport developed in face-to-face interviews.

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Our results therefore suggest caution regarding mode shifts, pointing to systematic biases that may emerge in the data.

OTHER STUDIES OF SOCIAL DESIRABILITY RESPONSE BIAS AND MODE

Our evidence that telephone respondents manifested more social desirability response bias than face-to-face respondents might appear to some readers to conflict with the findings of some past investigations sometimes viewed as offering evidence on this point (e.g., Aquilino 1992; Aquilino and LoSciuto 1989, 1990; Hochstim 1962; Sykes and Collins 1987, 1988). However, a close look at those past studies shows that their results do not in fact conflict with ours. For example, in all of Aquilino's studies (Aquilino 1992; Aquilino and LoSciuto 1989, 1990), respondents interviewed in the face-to-face mode actually answered the drug use questions (which were used to assess social desirability bias) on self-administered paper-and-pencil questionnaires, not aloud. Hochstim (1962) did not report tests of the statistical significance of observed differences, and Sykes and Collins (1987, 1988) did not report enough details of their quantitative findings to permit a meaningful assessment of the results. Furthermore, neither of those studies documented that the items they presumed had social desirability implications did indeed do so. Therefore, we do not see a basis for concluding that our social desirability findings are inconsistent with those of these other studies.

TRENDS OVER TIME AND ACROSS HOUSES

We have examined new data, from 2000, and what might be considered fairly old data, collected 21 and 27 years ago. Face-to-face and telephone interviewing have certainly changed over the years, and these procedures are no doubt practiced differently today across different "houses" in the United States. So it is difficult to generalize about these methodologies today or in the past from a single study.

In that light, it is reassuring that we saw similar patterns across a series of three studies spread out in time and across different sorts of measures of response quality included in them. Furthermore, there is no notable trend in tables 2–5 indicating that the mode effects we uncovered were any weaker in the older data or in the newer data. Nonetheless, both face-to-face and telephone interviewing could change in the future in ways that make the patterns we have documented here no longer applicable. Indeed, these findings may not even apply directly today to some houses, because the University of Michigan and the University of California at Berkeley's interviewing facilities are relatively expensive, academic operations, which may differ from other academic and nonacademic survey organizations in their procedures and response quality.

IMPLICATIONS FOR REINTERVIEWING

Some previous research yielded evidence that appears consistent with our findings and therefore reinforces confidence in them. Although demographics were not included as controls, Groves (1979) found that respondents interviewed face to face were very satisfied with the process, a majority (78 percent) of them saying they would rather be interviewed face to face than by telephone. In contrast, only 39 percent of respondents interviewed by telephone indicated satisfaction with that method; the majority of these individuals said they would prefer to provide data through face-to-face interviews or self-administered questionnaires. Not surprisingly, people interviewed by telephone said they preferred another mode of interviewing most often because it would allow them more time to think about the questions. This is consistent with the notion that telephone interviewing encourages satisficing even among people who would otherwise prefer to optimize instead.

If, in fact, there are such dramatic differences between the modes in respondent satisfaction, this has at least two interesting implications. First, being interviewed by telephone may be more frustrating than fulfilling for individuals, and these people may be less willing to participate in other surveys in the future because their initial experience was not comfortable and rewarding. Second, individuals who have been interviewed once by telephone may be especially unwilling to participate in a follow-up interview as a part of the same study by telephone, because they can anticipate what the experience will probably be like. Therefore, panel reinterview rates may be lower for telephone surveys than for face-to-face surveys partly because follow-up refusal rates may be higher in the former than the latter.

OTHER ADVANTAGES AND DISADVANTAGES OF FACE-TO-FACE INTERVIEWING

The response quality advantages associated with face-to-face interviewing apparent here are not the only strengths of this method, of course. A significant additional advantage is response rates, which tend to be at least 10 percentage points higher for face-to-face than telephone surveys (Aneshensel et al. 1982; de Leeuw 1992; Henson, Roth, and Cannell 1977; Hox and de Leeuw 1994; Thornberry 1987), as they were in the experiments we analyzed here. As new technologies such as call-blocking make it increasingly difficult to reach potential respondents by telephone, telephone response rates may continue to drop (holding budget constant), while face-to-face response rates may be less susceptible to such declines in participation (Smith 1995). Furthermore, visual aids (show cards) are more difficult to employ in telephone interviews than in face-to-face interviews. Using show cards without in-person assistance may be especially challenging for respondents with more limited literacy.

Another advantage of face-to-face interviewing is the capacity to employ

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new measurement technologies. For example, assessments of reaction time with millisecond resolution and subliminal presentation of visual stimuli are core parts of social cognition's new generation of tools for assessing attitudinal dispositions such as racism and various other aspects of cognitive structure and processes (see, e.g., Bargh and Chartrand 2000; Fazio et al. 1995). Enriching the study of public opinion with these methodologies is more difficult with telephone interviewing, though it is readily accomplished if face-to-face interviewers turn their laptops around so that respondents can see the screens and complete tasks on their own. Of course, laptops are routinely used in face-to-face interviewing these days to permit Audio Computer Assisted Self-Interviews (ACASI), so respondents can answer sensitive questions privately, without the involvement of the interviewer.²² Therefore, the use of laptops for unobtrusive measurement of information processing would be a natural and potentially very rich expansion of our toolbox for studying public opinion in the general population.

IMPROVING RESPONSE QUALITY IN TELEPHONE INTERVIEWS

Although the findings reported here suggest that face-to-face interviews provide higher response quality than do telephone interviews, our findings do not pinpoint precisely why these differences appear. We have speculated that the differences are a result of greater trust and rapport and more effective nonverbal communication in face-to-face interviews, as well as less multitasking and more comfort moving slowly through the latter. This logic suggests that telephone interviewing might be improved if it were able to emulate these characteristics of face-to-face interviewing.

Reductions in multitasking and improved nonverbal communication during telephone interviews are not likely to occur until videophones become commonplace in American homes. But steps can be taken now to encourage interviewers to slow the pace of telephone interviews, and enhancing interviewer credibility by sending out advance letters may be at least somewhat effective in shrinking the gap between telephone and face-to-face interviewing by reducing suspicion (see Miller and Cannell [1982] for additional techniques to improve telephone data quality).

Conclusion

The book is far from closed on the relation of interview mode to data quality in national probability sample surveys, and this issue will remain an important

22. Although having respondents answer questions privately on a computer is often done as part of face-to-face interviews, new technology such as telephone audio computer assisted self-interviewing (T-ACASI) may soon make it possible to collect data via similar methods in telephone interviews (Turner et al. 1998).

one for survey researchers. The findings reported here indicate that although telephone interviewing may be particularly appealing to researchers doing such studies because of its affordability, there may be costs associated with this method in terms of response quality. Thus, at least to some extent, we may get what we pay for.

But we must guard against overgeneralizing the findings reported here. Most survey studies conducted around the world today do not involve national American samples and such long questionnaires. Therefore, what we have seen here may not generalize to other, more conventional survey settings. Furthermore, we have focused here only on survey satisficing and social desirability bias, and other types of response errors may not show the same mode-related patterns we have documented here. We hope the findings reported here encourage researchers to continue the investigation of mode effects and to do so in ways driven by theories of information processing and social interaction, so in the long run, we gain a fuller understanding of the trade-offs inherent in mode choices and their impact on the findings of past research.

Appendix A

Measures and Codings

1982 NES Methods Comparison Project

No-opinion responses. Seven questions measuring attitudes explicitly offered respondents no-opinion response options. Five involved 7-point scale ratings of attitudes toward public policies (regarding defense spending, government efforts to improve the social and economic position of minorities, government's role in guaranteeing jobs and a good standard of living, women's rights, and government spending vs. services). The other two asked respondents how the defeat of the Equal Rights Amendment made them feel and their opinion about government regulation of business. For each respondent, we calculated the percent of these questions he or she was asked and answered that were answered "don't know" or "haven't thought much about this." This variable ranged from 0 to 1, with higher numbers meaning more no-opinion responding.

Nondifferentiation. Two batteries of questions asked respondents to make a series of judgments on the same rating scale, which allowed us to assess nondifferentiation. The first battery was a set of seven 101-point feeling thermometer ratings of well-known political figures and groups, such as Ted Kennedy and the Republican Party. For computing nondifferentiation, we divided the 0–100 scale into 10 segments (0–10, 11–20, 21–30, 31–40, 41–50, 51–60, 61–70, 71–80, 81–90, 91–100). The second battery asked respondents if each of nine personality trait terms described President Ronald Reagan extremely well, quite well, not too well, or not well at all. For each battery, we counted up the maximum number of identical or quasi-identical ratings made by each respondent. These two scores were rescaled to range from 0 to 1 and were averaged to yield a single index of nondifferentiation.

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Social desirability. Five items in this questionnaire seemed likely to have widely shared social desirability connotations (see app. B for details about the pretest study in which these items were identified), involving interest in politics, voting in previous elections, and support for government aid to blacks (the latter among Caucasians only). Following government and public affairs “most of the time,” being “very much interested” in political campaigns, having voted in previous elections, and supporting government aid to blacks were considered socially desirable responses. An index of socially desirable responding was created by computing the proportion of these items that a respondent answered by giving the socially desirable response (the question about government aid to blacks was included in this index for white respondents only).

Demographics. Demographic measures included education (coded 0 for respondents who completed eighth grade or less, .33 for respondents who completed between ninth and eleventh grades, .67 for respondents with a high school diploma, and 1 for respondents with more than a high school diploma), income (coded 0 for respondents with incomes less than \$5,000, .14 for incomes between \$5,000 and \$9,999, .29 for incomes between \$10,000 and \$14,999, .43 for incomes between \$15,000 and \$19,999, .57 for incomes between \$20,000 and \$24,999, .71 for incomes between \$25,000 and \$34,999, .86 for incomes between \$35,000 and \$49,999, and 1 for incomes of \$50,000 and above), race (coded 0 for Caucasians and 1 for others), gender (coded 0 for males and 1 for females), age (in years, coded to range from 0 to 1, with 0 meaning the youngest observed age in the sample and 1 meaning the oldest observed age in the sample), married (coded 1 if the respondent was married and 0 otherwise), and employment (coded 1 if the respondent was employed and 0 otherwise).

1976 Survey Research Center Datasets

No-opinion responses. In the 1976 SRC Datasets, a random subsample of respondents was told: “Not everyone has an opinion on the next question. If you do not have an opinion, just say so.” Then they were asked if they agreed or disagreed with the statement “The Arab nations are trying to work for a real peace with Israel.” Respondents who said they had no opinion were coded 1, and those who reported a substantive opinion were coded 0.

Nondifferentiation. Nondifferentiation was assessed using a battery of questions asking whether each of five possible problems that respondents might have had with their house or apartment (e.g., not enough heat, not enough living space, insects) was “a big problem, a small problem, or not a problem at all” for them. The maximum number of identical ratings made by each respondent was computed and rescaled to range from 0 to 1 to measure nondifferentiation.

Acquiescence. Acquiescence was measured using responses to three questions. All respondents were asked about the issues of free speech. A random subsample of respondents were also asked questions about peace in the Middle East and women in politics. We calculated the proportion of these agree/disagree questions that each respondent was asked to which he or she responded “agree.”

Social desirability. Based on the first social desirability pretest study described in appendix B, three items in this survey appeared to have social desirability connotations. Two questions asked about whether the respondent had voted in the 1972 U.S. presidential election and planned to vote in the 1976 U.S. presidential election. Our pretest

suggested that saying one would vote or had voted was socially desirable. The third item asked whether white people should have the right to keep black people out of their neighborhoods or whether black people have a right to live wherever they can afford to. The latter of these answers was found in our pretest to be more socially desirable among white respondents. We calculated the proportion of socially desirable answers given by respondents (the last question was used for Caucasian respondents only).

Unease. Near the ends of the interviews, respondents were asked: “Sometimes, even though a person answers a question, he/she may feel uneasy about discussing the particular subject. I’ll mention several types of questions and I would like you to tell me whether or not you felt uneasy about them.” Respondents indicated unease about questions on five potentially sensitive topics: their income, racial attitudes, income tax return, voting behavior, and political opinions. We calculated the proportion of topics each respondent felt uneasy discussing.

Dissatisfaction with interview length. The final question in the questionnaire asked respondents whether they felt the interview had been “much too long, too long, about right, too short, or much too short.” Responses were coded to range from 0 to 1, with higher numbers indicating greater dissatisfaction with being too long. After the interviews, interviewers recorded whether the respondent had at any time asked how much longer the interview would take. Respondents who asked such a question were coded 1, and those who did not were coded 0.

Demographics. The survey included measures of race, gender, age, marital status, and employment that were coded as in the 1982 NES MCP. The survey also included measures of education (coded 0 for respondents who completed eighth grade or less, .2 for respondents who completed between ninth and eleventh grades, .4 for respondents with a high school diploma, .6 for respondents with some college, .8 for respondents with a college degree, and 1 for respondents with an advanced/graduate degree) and income. Income was measured differently for face-to-face and telephone respondents. Face-to-face respondents were given a show card listing 18 dollar ranges and were asked to indicate in which range their total 1975 family income fell. Telephone respondents were asked directly to report their total family incomes in dollars to the interviewer. We recoded these latter responses into the ranges offered to the face-to-face respondents and then coded the ranges to span from 0 (meaning the lowest income range) to 1 (meaning the highest income range).

Telephone respondents who refused to answer the initial income question were asked to place their income in one of three broad categories: less than \$7,500, between \$7,500–\$15,000, and more than \$15,000. Individuals who answered this follow-up question were assigned the midpoint of the range they specified (\$3,750 for the lowest, \$11,250 for the middle, and \$24,525 for the highest; this last value was the median of the amounts above \$15,000 reported by people who answered the open-ended initial income question). We then assigned these respondents scores on the income index accordingly.

2000 NES

No-opinion responses. Five questions measuring attitudes explicitly offered all respondents no-opinion response options. Four of these questions measured attitudes

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toward public policies (regarding government services, government's role in guaranteeing people jobs and a good standard of living, how much the government should help blacks, and environmental protection), and one asked respondents about their political ideology. Four additional questions explicitly offered a random subset of respondents in each mode no-opinion response options. Three of these questions dealt with attitudes toward public policies (placing limits on foreign imports, protecting the environment, support for school voucher programs), and the fourth question dealt with respondents' beliefs about the roles men and women should play in today's society.²³ We calculated the percent of no-opinion responses a respondent gave to the questions he or she was asked.

Acquiescence. Acquiescence was gauged using answers to eight agree/disagree or yes/no questions asked of all respondents. Some of these questions asked about whether George W. Bush and Al Gore had ever made them feel angry, hopeful, proud, and afraid. Respondents interviewed before September 28 were asked whether Pat Buchanan elicited these emotional responses, and a random subset of respondents were asked whether President Bill Clinton elicited these emotional responses. A random subset of respondents was also asked whether they agreed or disagreed with an isolationist foreign policy, and a different subset of respondents was asked whether they thought companies who have a history of discriminating against blacks should be required to have an affirmative action program. We then calculated the percent of these questions each respondent was asked and answered "agree" or "yes."

Social desirability. The first social desirability experiment described in appendix B suggests that three questions asked in this survey had social desirability connotations: reported voter turnout in the 1996 U.S. presidential election, intentions to vote in the 2000 election, and interest in political campaigns. The NES also conducted a pilot study to test whether other typical NES questions had social desirability connotations (see the description of study 2 in app. B). This investigation identified three other questions with social desirability connotations asked in the 2000 NES: frequency of religious services attendance, watching late afternoon/early evening local television news, and watching late evening local television news. Voting in 1996, planning to vote in 2000, being interested in political campaigns, attending religious services every week, watching late afternoon/evening news every day, and watching late evening news every day were considered socially desirable responses. The proportion of socially desirable responses was calculated for each respondent.

Respondent suspicion. After completing an interview, interviewers rated how suspicious the respondent was about the interview. This variable was coded to range from 0 to 1, with higher numbers indicating greater suspicion.

Dissatisfaction with interview length. After each interview, interviewers recorded whether the respondent complained that the interview was too long or said at some point during the interview that he or she wanted to stop (each of these was coded 1 if a respondent did so and 0 if he or she did not).

Respondent engagement. Interviewers rated how cooperative the respondent was and the respondent's interest in the interview. These variables were coded to range from 0 to 1, with higher numbers indicating greater cooperation and interest, respectively.

23. Some of these questions were presented as rating scales in the face-to-face interviews and as branching questions in the telephone interviews. Previous research indicates that this format difference does not affect rates of "don't know" answering (e.g., Krosnick and Berent 1993).

Demographics. The survey included measures of gender, age, race, marital status, and employment coded as in the first two studies. Measures of education (coded into four categories: 0 for people who did not have a high school diploma, .33 for people with a high school diploma, but no further education, .67 for people with more than a high school degree, but less than a 4-year degree, and 1 for people with at least a 4-year degree) and household income (coded into seven categories: 0 for less than \$15,000, .17 for \$15,000–\$24,999, .33 for \$25,000–\$34,999, .5 for \$35,000–\$49,999, .67 for \$50,000–\$64,000, .83 for \$65,000–\$74,999, and 1 for \$75,000) were also included.

Appendix B

Social Desirability Studies

Study 1

In the 1982 NES MCP, only five items seemed to us likely to have widely shared social desirability connotations, involving interest in politics, voting in previous elections, and support for government aid to blacks (the latter among Caucasians only). Interest and participation in politics are presumably civic virtues in this culture, and the entire 1982 NES MCP interview was on the topic of politics, suggesting that the interviewer and researchers valued political interest. Previous research suggests that Caucasian respondents intentionally underreport animosity toward African Americans, presumably because reporting such feeling is not socially respectable (Pavlos 1972; Sigall and Page 1971). So these items seemed to have sufficient social desirability connotations to allow detection of mode differences in social desirability response bias.

To test our suspicion that these items did evoke social desirability concerns, we asked a sample of 112 adults to answer the same questions, interspersed with filler items. Respondents were 48 males, 63 females, and one person who did not report gender, all attending Ohio State University. Half of the sample (selected randomly) was asked to “fake bad”: give socially undesirable answers, described as those that would “create a negative reaction from society . . . the answers you would least respect or admire from another person answering this questionnaire.” The other half of the sample was asked to “fake good”: provide socially desirable answers, responses that were “most likely to create a positive reaction from society.” If these two groups of respondents gave significantly different answers to the key items, this would indicate that there was a generally agreed-upon desirable answer to each one (e.g., Wiggins 1959, 1962; see also DeMaio 1984).

As expected, significant differences appeared between the “fake good” and “fake bad” respondents on reported voter turnout, $F(1, 110) = 58.79, p < .001$, following government and public affairs, $F(1, 110) = 103.35, p < .001$, interest in political campaigns, $F(1, 110) = 39.16, p < .001$, and government aid to blacks (among white respondents only), $F(1, 84) = 22.37, p < .001$. Not surprisingly, people who “faked good” were more likely to report voting (66 percent of respondents faking good reported voting, compared to 8.9 percent of respondents faking bad), following government and public affairs closely (only 1.8 percent of “fake good” respondents said

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that they follow public affairs “hardly at all,” while 73.2 percent of “fake bad” respondents gave this answer), and being interested in political campaigns (only 16.1 percent of “fake good” respondents indicated “not much interest,” while 76.8 percent of “fake bad” respondents selected that choice). Also, “fake good” respondents who were white said that they believed that the government should provide more help to blacks (only 4.7 percent of “fake good” respondents selected “government should not make any special effort to help blacks,” while 46.5 percent of “fake bad” respondents chose that option). These data were collected nearly 20 years after the 1982 NES MCP was conducted, and social desirability connotations of opinions may have shifted during the intervening years. But this evidence is at least reassuring that these items are potentially reasonable diagnostic tools.

Study 2

In order to identify other questions with social desirability connotations, the NES conducted a similar pretest. In that experiment, half of respondents were asked about one set of four questions (attending religious services, following politics, social security spending, and school integration), and the other half of respondents were asked about a different set of four questions (voting, term limits, religion provides guidance, and frequency of watching local television news). Half of the respondents who were asked about each set were asked to say how they would answer questions if they were trying to make the best impression possible on the interviewer (corresponding to the “fake good” condition reported in study 1), and half were asked to say how they would answer the same questions if they were trying to make the worst impression possible on the interviewer (corresponding to the “fake bad” condition in study 1).

Of these eight questions, four were similar to questions asked in the 2000 NES preelection interview, and we focus on those results here. Significant differences appeared between the “fake good” and “fake bad” respondents on all these items (frequency of religious services attendance: $t(211) = 9.09, p < .001$; social security spending: $t(211) = 5.62, p < .001$; reported voter turnout: $t(211) = 9.10, p < .001$; and frequency of watching local television news: $t(211) = 9.09, p < .001$). People who “faked good” were more likely to report attending religious services (42.7 percent of respondents faking good reported attending services every week, and 16.7 percent reported that they never attended services while 9.4 percent of respondents faking bad reported attending services every week, and 76.0 percent reported that they never attended religious services), voting (81.1 percent of “fake good” respondents reported they voted in the 1998 election, and 18.9 percent reported they did not, while 28.0 percent of “fake bad” respondents reported they voted in the 1998 election, and 63.4 percent respondents reported they did not), and watching local television news (58.6 percent of “fake good” respondents said they watched local television news every day, and 5.4 percent reported they never watched local television news; in contrast 27.7 percent of “fake bad” respondents said they watched local television news every day, and 63.4 percent said they never watched local television news). For social security spending, 65.6 percent of “fake good” respondents reported that spending should be increased, and 27 percent reported it should be decreased, but there was little consensus about the socially undesirable response (although 44 percent of “fake bad” respondents

said spending should be decreased, 39 percent said it should be increased). Therefore, we did not analyze the impact of mode on attitudes toward social security spending.

References

- Abelson, Robert P., Elizabeth F. Loftus, and Anthony G. Greenwald. 1992. "Attempts to Improve the Accuracy of Self-Reports of Voting." In *Questions about Questions*, ed. Judith M. Tanur, pp. 138–53. New York: Russell Sage Foundation.
- Aneshensel, Carol S., Ralph R. Frerichs, Virginia A. Clark, and Patricia A. Yokopenic. 1982. "Measuring Depression in the Community: A Comparison of Telephone and Personal Interviews." *Public Opinion Quarterly* 46:110–21.
- Aquilino, William S. 1992. "Telephone versus Face-to-Face Interviewing for Household Drug Use Surveys." *International Journal of Addictions* 27:71–91.
- . 1994. "Interview Mode Effects in Surveys of Drug and Alcohol Use: A Field Experiment." *Public Opinion Quarterly* 58:210–40.
- . 1998. "Effects of Interview Mode on Measuring Depression in Younger Adults." *Journal of Official Statistics* 14:15–29.
- Aquilino, William S., and Leonard A. LoSciuto. 1989. "Effects of Mode of Data Collection on the Validity of Reported Drug Use." In *Conference Proceedings Health Survey Research Methods*, ed. Floyd J. Fowler. Washington, DC: U.S. Department of Health and Human Services.
- . 1990. "Effects of Interview Mode on Self-Reported Drug Use." *Public Opinion Quarterly* 54:362–95.
- Barath, Arpad, and Charles F. Cannell. 1976. "Effect of Interviewer's Voice Intonation." *Public Opinion Quarterly* 40:370–73.
- Bargh, John A., and Tanya L. Chartrand. 2000. "The Mind in the Middle: A Practical Guide to Priming and Automaticity Research." In *Handbook of Research Methods in Social and Personality Psychology*, ed. Harry T. Reis and Charles M. Judd. New York: Cambridge University Press.
- Belinfante, Alexander. 1998. *Telephone Subscribership in the United States*. Washington, DC: Federal Communications Commission.
- Belli, Robert F., Michael W. Traugott, Margaret Young, and Katherine A. McGonagle. 1999. "Reducing Vote Overreporting in Surveys: Social Desirability, Memory Failure, and Source Monitoring." *Public Opinion Quarterly* 63:90–108.
- Bernieri, Frank J., Janet M. Davis, Robert Rosenthal, and Robert C. Knee. 1994. "Interactional Synchrony and Rapport: Measuring Synchrony in Displays Devoid of Sound and Facial Affect." *Personality and Social Psychology Bulletin* 20:303–11.
- Biemer, Paul P. 1997. *Dual Frame NHIS/RDD Methodology and Field Test: Analysis Report*. Report prepared for the National Center for Health Statistics, Hyattsville, MD.
- . 2001. "Nonresponse Bias and Measurement Bias in a Comparison of Face-to-Face and Telephone Interviewing." *Journal of Official Statistics* 17:295–320.
- Bogardus, Emory S. 1933. "A Social Distance Scale." *Sociology and Social Research* 17:265–71.
- Burton, Scot, and Edward Blair. 1991. "Task Conditions, Response Formulation Processes, and Response Accuracy for Behavioral Frequency Questions in Surveys." *Public Opinion Quarterly* 55:50–79.
- Cahalan, Don. 1960. "Measuring Newspaper Readership by Telephone: Two Comparisons with Face-to-Face Interviews." *Journal of Advertising Research* 1:1–6.
- Calsyn, Robert J., Laurie A. Roades, and Dylan S. Calsyn. 1992. "Acquiescence in Needs Assessment Studies of the Elderly." *Gerontologist* 32:246–52.
- Cannell, Charles, Robert M. Groves, and Peter V. Miller. 1981. "The Effects of Mode of Data Collection on Health Survey Data." *Proceedings of the Section on Social Statistics: American Statistical Association*, pp. 1–6. Washington, DC: American Statistical Association.
- Cannell, Charles F., Peter V. Miller, and Lois Oksenberg. 1981. "Research on Interviewing Techniques." *Sociological Methodology* 12:389–437.
- Ceci, Stephen J. 1991. "How Much Does Schooling Influence General Intelligence and Its Cognitive Components? A Reassessment of the Evidence." *Developmental Psychology* 27:703–22.

Mode Effects on Satisficing and Social Desirability

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- Chartrand, Tanya L., and John A. Bargh. 1999. "The Chameleon Effect: The Perception-Behavior Link and Social Interaction." *Journal of Personality and Social Psychology* 76:893-910.
- Colombotos, John. 1965. "The Effects of Personal versus Telephone Interviews on Socially Acceptable Responses." *Public Opinion Quarterly* 29:457-58.
- . 1969. "Personal versus Telephone Interviews: Effects on Responses." *Public Health Reports* 84:773-82.
- Converse, Jean M., and Howard Schuman. 1974. *Conversations at Random*. New York: Wiley.
- Curtin, Richard, Stanley Presser, and Eleanor Singer. 2000. "The Effects of Response Rate Changes on the Index of Consumer Sentiment." *Public Opinion Quarterly* 64:413-28.
- de Leeuw, Edith D. 1992. *Data Quality in Mail, Telephone and Face to Face Surveys*. Amsterdam: TT-Publikaties.
- de Leeuw, Edith D., and Joop J. Hox. 1993. "Mode Effects in Structural Modeling; A LISREL Multi-Group Comparison of Mail, Telephone, and Face-to-Face Survey Data." In *Methodische Grundlagen und Anwendungen von Strukturgleichungsmodellen*, ed. Jost Reinechke and Gaby Krekler. Mannheim: FRG e.V.
- DeMaio, Theresa J. 1984. "Social Desirability and Survey Measurement: A Review." In *Surveying Subjective Phenomena*, vol. 2, ed. Charles F. Turner and Elizabeth Martin, pp. 257-82. New York: Russell Sage Foundation.
- Dohrenwend, Barbara S., John Colombotos, and Bruce P. Dohrenwend. 1968. "Social Distance and Interviewer Effects." *Public Opinion Quarterly* 32(3):410-22.
- Drolet, Aimee L., and Michael W. Morris. 2000. "Rapport in Conflict Resolution: Accounting for How Face-to-Face Contact Fosters Mutual Cooperation in Mixed-Motive Conflicts." *Journal of Experimental Social Psychology* 36:26-50.
- Esaiaasson, Peter, and Donald Granberg. 1993. "Hidden Negativism: Evaluation of Swedish Parties and Their Leaders under Different Survey Methods." *International Journal of Public Opinion Research* 5:265-77.
- Evans, Richard I., William B. Hansen, and Maurice B. Mittlemark. 1977. "Increasing the Validity of Self-Reports of Smoking Behavior in Children." *Journal of Applied Psychology* 62:521-23.
- Fazio, Russell H., Joni R. Jackson, Bridget C. Dunton, and Carol J. Williams. 1995. "Variability in Automatic Activation as an Unobtrusive Measure of Racial Attitudes: A Bona Fide Pipeline?" *Journal of Personality and Social Psychology* 69:1013-27.
- Gfroerer, Joseph C., and Arthur L. Hughes. 1991. "The Feasibility of Collecting Drug Abuse Data by Telephone." *Public Health Reports* 106:384-93.
- Goffman, Erving. 1959. *The Presentation of Self in Everyday Life*. Garden City, NY: Doubleday/Anchor.
- Gordon, Randall A. 1987. "Social Desirability Bias: A Demonstration and Techniques for Its Reduction." *Teaching of Psychology* 14:40-43.
- Greenfield, Thomas K., Lorraine T. Midanik, and John D. Rogers. 2000. "Effects of Telephone versus Face-to-Face Interview Modes on Reports of Alcohol Consumption." *Addiction* 95: 277-84.
- Groves, Robert M. 1977. "An Experimental Comparison of National Telephone and Personal Interview Surveys." *Proceedings of the Section on Social Statistics: American Statistical Association*, pp. 232-41. Washington, DC: American Statistical Association.
- . 1978. "On the Mode of Administering a Questionnaire and Responses to Open-Ended Items." *Social Science Research* 7:257-71.
- . 1979. "Actors and Questions in Telephone and Personal Interview Surveys." *Public Opinion Quarterly* 43:190-205.
- Groves, Robert M., and Robert L. Kahn. 1979. *Surveys by Telephone: A National Comparison with Personal Interviews*. New York: Academic Press.
- Hawkins, Del I., Gerald Albaum, and Roger Best. 1974. "Stapel Scale or Semantic Differential in Marketing Research?" *Journal of Marketing Research* 11:318-22.
- Henson, Ramone, Aleda Roth, and Charles F. Cannell. 1977. "Personal versus Telephone Interviews: The Effects of Telephone Re-interviews on Reporting of Psychiatric Symptomatology." In *Experiments in Interviewing Techniques: Field Experiments in Health Reporting, 1971-1977*, ed. Charles F. Cannell, Lois Oksenberg, and Jean M. Converse, pp. 205-19. Hyattsville, MD: U.S. Department of Health, Education and Welfare, Public Health Service, Health Resources Administration, National Center for Health Services Research.

- Herman, Jeanne B. 1977. "Mixed-Mode Data Collection: Telephone and Personal Interviewing." *Journal of Applied Psychology* 62:399-404.
- Herzog, A. Regula, and Willard L. Rodgers. 1988. "Interviewing Older Adults: Mode Comparison Using Data from a Face-to-Face Survey and a Telephone Re-survey." *Public Opinion Quarterly* 52:84-99.
- . 1999. "Cognitive Performance Measures in Survey Research on Older Adults." In *Cognition, Aging, and Self-Reports*, ed. Norbert Schwarz, D. C. Park, B. Knäuper, and Seymour Sudman. Philadelphia: Psychology Press.
- Herzog, A. Regula, Willard L. Rodgers, and Richard A. Kulka. 1983. "Interviewing Older Adults: A Comparison of Telephone and Face-to-Face Modalities." *Public Opinion Quarterly* 47: 405-18.
- Himmelfarb, Samuel, and Carl Lickteig. 1982. "Social Desirability and the Randomized Response Technique." *Journal of Personality and Social Psychology* 43:710-17.
- Hinkle, Andrew L., and Gary D. King. 1978. "A Comparison of Three Survey Methods to Obtain Data for Community Mental Health Program Planning." *American Journal of Community Psychology* 6:389-97.
- Hochstim, Joseph R. 1962. "Comparison of Three Information-Gathering Strategies in a Population Study of Sociomedical Variables." In *Proceedings of the American Statistical Association, Social Statistics Section*, pp. 154-59. Washington, DC: American Statistical Association.
- . 1967. "A Critical Comparison of Three Strategies of Collecting Data from Households." *Journal of the American Statistical Association* 62:976-89.
- Hox, Joop J., and Edith D. de Leeuw. 1994. "A Comparison of Non-response in Mail, Telephone, and Face-to-Face Surveys." *Quality and Quantity* 28:329-44.
- Johnson, Timothy P., James G. Hougland, Jr., and Richard R. Clayton. 1989. "Obtaining Reports of Sensitive Behavior: A Comparison of Substance Use Reports from Telephone and Face-to-Face Interviews." *Social Science Quarterly* 70:174-83.
- Jordan, Lawrence A., Alfred C. Marcus, and Leo G. Reeder. 1980. "Response Styles in Telephone and Household Interviewing: A Field Experiment." *Public Opinion Quarterly* 44:210-22.
- Kish, Leslie. 1949. "A Procedure for Objective Respondent Selection within Households." *Journal of the American Statistical Association* 44:380-87.
- Klecka, William R., and Alfred J. Tuchfarber. 1978. "Random Digit Dialing: A Comparison to Personal Surveys." *Public Opinion Quarterly* 42:105-14.
- Kormendi, Eszter. 1988. "The Quality of Income Information in Telephone and Face-to-Face Surveys." In *Telephone Survey Methodology*, ed. Robert M. Groves, Paul Biemer, Lars Lyberg, James Massey, William L. Nicholls, and Joseph Waksberg. New York: Wiley.
- Krosnick, Jon A. 1991. "Response Strategies for Coping with the Cognitive Demands of Attitude Measures in Surveys." *Applied Cognitive Psychology* 5:213-36.
- . 1999. "Survey Research." *Annual Review of Psychology* 50:537-67.
- Krosnick, Jon A., and Matthew K. Berent. 1993. "Comparisons of Party Identification and Policy Preferences: The Impact of Survey Question Format." *American Journal of Political Science* 37:941-64.
- Krosnick, Jon A., and Michael A. Milburn. 1990. "Psychological Determinants of Political Opinionation." *Social Cognition* 8:49-72.
- Krosnick, Jon A., Sowmya Narayan, and Wendy R. Smith. 1996. "Satisficing in Surveys: Initial Evidence." *New Directions for Evaluation* 70:29-44.
- Larsen, Otto N. 1952. "The Comparative Validity of Telephone and Face-to-Face Interviews in the Measurement of Message Diffusion by Leaflets." *American Sociological Review* 17:471-76.
- Locander, William, Seymour Sudman, and Norman Bradburn. 1976. "An Investigation of Interview Method, Threat, and Response Distortion." *Journal of the American Statistical Association* 71:269-75.
- Mangione, Thomas W., Ralph Hingson, and Jane Barrett. 1982. "Collecting Sensitive Data: A Comparison of Three Survey Strategies." *Sociological Methods and Research* 10:337-46.
- Mark, Gloria, Jonathan Grudin, and Steven E. Poltrok. 1999. "Meeting at the Desktop: An Empirical Study of Virtually Collocated Teams." In *ECSCW '99: Proceedings of the Sixth European Conference on Computer Supported Cooperative Work, 12-16 September 1999, Copenhagen, Denmark*, ed. Susan Bødker, Morten Kyng, and Kjeld Schmidt. Boston: Kluwer.
- McQueen, David V. 1989. "Comparison of Results of Personal Interview and Telephone Surveys of Behavior Related to Risk of AIDS: Advantages of Telephone Techniques." In *Conference*

Mode Effects on Satisficing and Social Desirability

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- Proceedings Health Survey Research Methods*, ed. Floyd J. Fowler. Washington, DC: U.S. Department of Health and Human Services.
- Midanik, Lorraine T., John D. Rogers, and Thomas K. Greenfield. 2001. "Mode Differences in Reports of Alcohol Consumption and Alcohol-Related Harm." In *Health Survey Research Methods*, ed. M. K. Cynamon and R. A. Kulka. Hyattsville, MD: U.S. Department of Health and Human Services.
- Miller, Peter V. 1984. "Alternative Question Forms for Attitude Scale Questions in Telephone Interviews." *Public Opinion Quarterly* 48:766–78.
- Miller, Peter V., and Charles F. Cannell. 1982. "A Study of Experimental Techniques for Telephone Interviewing." *Public Opinion Quarterly* 46:250–69.
- Morchio, Giovanna, Maria Sanchez, and Santa Traugott. 1985. "Mode Differences: DK Responses in the 1984 Post-Election Study." Unpublished memo submitted to the Board of Overseers of the National Election Study, Ann Arbor, MI.
- Morley, Ian E., and Geoffrey M. Stephenson. 1977. *The Social Psychology of Bargaining*. London: Allen & Unwin.
- Mulry-Liggan, Mary H. 1983. "A Comparison of a Random Digit Dialing Survey and the Current Population Survey." In *Proceedings of the American Statistical Association, Section on Survey Research Methods*, pp. 214–19. Washington, DC: American Statistical Association.
- Narayan, Sowmya, and Jon A. Krosnick. 1996. "Education Moderates Some Response Effects in Attitude Measurement." *Public Opinion Quarterly* 60:58–88.
- Nie, Norman H., Jane Junn, and Kenneth Stehlik-Barry. 1996. *Education and Democratic Citizenship in America*. Chicago: University of Chicago Press.
- Oakes, R. H. 1954. "Differences in Responsiveness in Telephone versus Personal Interviews." *Journal of Marketing* 19:169.
- Oksenberg, Lois, Lerita Coleman, and Charles Cannell. 1986. "Interviewers' Voices and Refusal Rates in Telephone Surveys." *Public Opinion Quarterly* 50:97–111.
- Paulhus, Delroy L. 1984. "Two-Component Models of Socially Desirable Responding." *Journal of Personality and Social Psychology* 46:598–609.
- Pavlos, Andrew J. 1972. "Racial Attitude and Stereotype Change with Bogus Pipeline Paradigm." *Proceedings of the 80th Annual Convention of the American Psychological Association* 7: 291–92.
- Poole, Marshall S., Dale L. Shannon, and Gerardine DeSanctis. 1992. "Communication Media and Negotiation Processes." In *Communication and Negotiation: Sage Annual Reviews of Communication Research*, ed. Linda L. Putnam and Michael E. Roloff, pp. 46–66. Thousand Oaks, CA: Sage.
- Quinn, Robert P., Barbara A. Gutek, and Jeffrey T. Walsh. 1980. "Telephone Interviewing: A Reappraisal and a Field Experiment." *Basic and Applied Social Psychology* 1:127–53.
- Rogers, Theresa F. 1976. "Interviews by Telephone and in Person: Quality of Responses and Field Performance." *Public Opinion Quarterly* 40:51–65.
- Rosenstone, Steven J., Margaret Petrella, and Donald Kinder. 1993. "Excessive Reliance on Telephone Interviews and Short-Form Questionnaires in the 1992 National Election Study: Assessing the Consequences for Data Quality." Unpublished memo submitted to the Board of Overseers of the National Election Study, Ann Arbor, MI.
- Rosenthal, Robert. 1984. *Meta-analytic Procedures for Social Research*. Beverly Hills, CA: Sage.
- Saris, Willem E., and Max Kaase. 1997. *Eurobarometer Measurement Instruments for Opinions in Europe*. Mannheim: ZUMA.
- Schlenker, Barry R., and Michael F. Weingold. 1989. "Goals and the Self-Identification Process: Constructing Desires and Identities." In *Goal Concepts in Personality and Social Psychology*, ed. Lawrence A. Pervin, pp. 243–90. Hillsdale, NJ: Erlbaum.
- Schmiedeskamp, James W. 1962. "Reinterviews by Telephone." *Journal of Marketing* 26:28–34.
- Schuman, Howard, and Stanley Presser. 1981. *Questions and Answers in Attitude Surveys*. New York: Academic Press.
- Schwarz, Norbert. 1996. *Cognition and Communication: Judgmental Biases, Research Methods, and the Logic of Conversation*. Mahwah, NJ: Erlbaum.
- Schwarz, Norbert, Barbel Knauper, Hans-J. Hippler, Elisabeth Noelle-Neumann, and Leslie Clark. 1991. "Rating Scales: Numeric Values May Change the Meaning of Scale Labels." *Public Opinion Quarterly* 55:570–82.
- Shanks, J. Merrill, Maria Sanchez, and Betsy Morton. 1983. "Alternative Approaches to Survey

- Data Collection for the National Election Studies: A Report on the 1982 NES Method Comparison Project." Unpublished memo submitted to the Board of Overseers of the National Election Study, Ann Arbor, MI.
- Shuy, Roger W. 2002. "In-Person versus Telephone Interviewing." In *Handbook of Interview Research Context and Method*, ed. Jaber F. Gubrium and James A. Holstein. Thousand Oaks, CA: Sage.
- Siegel, Jane, Vitaly Dubrovsky, Sara Kiesler, and Timothy W. McGuire. 1986. "Group Processes in Communication." *Organizational Behavior and Human Decision Processes* 37:157–87.
- Siemiatycki, Jack. 1979. "A Comparison of Mail, Telephone, and Home Interview Strategies for Household Health Surveys." *American Journal of Public Health* 69:238–45.
- Sigall, Harold, and Richard Page. 1971. "Current Stereotypes: A Little Fading, a Little Faking." *International Journal of Psychology* 25:1–12.
- Smith, Eliot R., Nyla Branscombe, and Carol Bormann. 1988. "Generality of the Effects of Practice on Social Judgment Tasks." *Journal of Personality and Social Psychology* 54:385–95.
- Smith, Thomas W. 1995. "Trends in Nonresponse Rate." *International Journal of Public Opinion Research* 7:157–71.
- Sudman, Seymour, and Norman M. Bradburn. 1974. *Response Effects in Surveys: A Review and Synthesis*. Chicago: Aldine.
- Sykes, Wendy M., and Martin Collins. 1987. "Comparing Telephone and Face-to-Face Interviewing in the United Kingdom." *Survey Methodology* 13:15–28.
- . 1988. "Effects of Mode of Interview: Experiments in the UK." In *Telephone Survey Methodology*, ed. Robert M. Groves, Paul Biemer, Lars Lyberg, James Massey, William L. Nicholls, and Joseph Waksberg. New York: Wiley.
- Thornberry, Owen T. 1987. *An Experimental Comparison of Telephone and Personal Health Interview Surveys*. Hyattsville, MD: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics.
- Tickle-Degnen, Linda, and Robert Rosenthal. 1990. "The Nature of Rapport and Its Nonverbal Correlates." *Psychological Inquiry* 1:285–93.
- Tourangeau, Roger. 1984. "Cognitive Sciences and Survey Methods." In *Cognitive Aspects of Survey Methodology: Building a Bridge between Disciplines*, ed. Thomas B. Jabine, Miron Straf, Judith Tanur, and Roger Tourangeau, pp. 73–100. Washington, DC: National Academy Press.
- Tourangeau, Roger, Lance J. Rips, and Kenneth Rasinski. 2000. *The Psychology of Survey Response*. New York: Cambridge University Press.
- Turner, Charles F., Barbara H. Forsyth, James M. O'Reilly, Philip C. Cooley, T. K. Smith, S. M. Rogers, and H. G. Miller. 1998. "Automated Self-Interviewing and the Survey Measurement of Sensitive Behaviors." In *Computer Assisted Survey Information Collection*, ed. Mick P. Couper, Reginald P. Baker, Jelke Bethlehem, Cynthia Z. F. Clark, Jean Martin, William L. Nicholis II, and James M. O'Reilly, pp. 455–73. New York: Wiley.
- Turoff, Murray, and Starr Roxanne Hiltz. 1982. "Computer Support for Group versus Individual Decisions." *IEEE Transactions on Communication* 30:82–90.
- Warner, Stanley L. 1965. "Randomized Response: A Survey Technique for Eliminating Evasive Answer Bias." *Journal of the American Statistical Association* 60:63–69.
- Weeks, Michael F., Richard A. Kulka, Judith T. Lessler, and Roy W. Whitmore. 1983. "Personal versus Telephone Surveys for Collecting Household Health Data at the Local Level." *American Journal of Public Health* 73:1389–94.
- Wiggins, Jerry S. 1959. "Interrelationships among MMPI Measures of Dissimulation under Standard and Social Desirability Instructions." *Journal of Consulting Psychology* 23:419–27.
- . 1962. "Definitions of Social Desirability and Acquiescence in Personality Inventories." In *Measurement in Personality and Cognition*, ed. Samuel Messick and John Ross. New York: Wiley.
- Williams, Ederyn. 1977. "Experimental Comparisons of Face-to-Face and Mediated Communication: A Review." *Psychological Bulletin* 84:963–76.
- Wilson, Timothy D., and Jonathan W. Schooler. 1991. "Thinking Too Much: Introspection Can Reduce the Quality of Preferences and Decisions." *Journal of Personality and Social Psychology* 60:181–92.
- Wiseman, Frederick. 1972. "Methodological Bias in Public Opinion Surveys." *Public Opinion Quarterly* 36:105–8.

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- Wolfe, Lee M. 1979. "Characteristics of Persons With and Without Home Telephones." *Journal of Marketing Research* 16:421–25.
- Woltman, Henry F., Anthony G. Turner, and John M. Bushery. 1980. "A Comparison of Three Mixed-Mode Interviewing Procedures in the National Crime Survey." *Journal of the American Statistical Association* 75:534–43.
- Yaffe, Richard, Sam Shapiro, Robert R. Fuchsberg, Charles A. Rohde, and Helen C. Corpeño. 1978. "Medical Economics Survey-Methods Study: Cost Effectiveness of Alternative Survey Strategies." *Medical Care* 16:641–59.

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Screening Consortium in the design of the mammography use and sociodemographic questions included in the survey instruments.

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References

1. Horn-Ross PL. Multiple primary cancers involving the breast. *Epidemiol Rev.* 1993;15:169–176.
2. American Society of Clinical Oncology. Recommended breast cancer surveillance guidelines. *J Clin Oncol.* 1997;15:2149–2156.
3. Loomer L, Brockschmidt JK, Muss HB, Georgia S. Post-operative follow-up of patients with early breast cancer: patterns of care among clinical oncologists and a review of the literature. *Cancer.* 1991;67:55–60.
4. Anderson LM, May DS. Has the use of cervical, breast, and colorectal cancer screening increased in the United States? *Am J Public Health.* 1995;85:840–842.
5. The NCI Breast Cancer Screening Consortium. Mammography: a missed clinical opportunity?

- Results of the NCI Breast Cancer Screening Consortium and National Health Interview Surveys. *JAMA.* 1990;264:54–58.
6. Stomper PC, Gelman RS, Meyer JE, Gross GS. New England mammography survey: public misconceptions of breast cancer incidence. *Breast Disease.* 1990;3:1–7.
7. Taylor VM, Taplin SH, Urban N, White E, Peacock S. Repeat mammography use among women ages 50–75. *Cancer Epidemiol Biomarkers Prev.* 1995;4:409–413.
8. Stoddard AM, Lipkus I, Lane D, et al. Characteristics of under-users of mammogram screening aged 50 to 80. *Prev Med.* 1998;27:478–487.
9. Lerman C, Daly M, Sands C, et al. Mammography adherence and psychological distress among women at risk for breast cancer. *J Natl Cancer Inst.* 1993;85:1074–1080.
10. Kaplan K, Weinberg GB, Small A, Herndon JL. Breast cancer, screening among relatives of women with breast cancer. *Am J Public Health.* 1991;81:1174–1178.
11. Kash KM, Holland JC, Halper MS, Miller DG. Psychological distress and surveillance behaviors of women with a family history of breast cancer. *J Natl Cancer Inst.* 1992;84:24–30.

12. Urban N, Taplin SH, Taylor VM, et al. Community organization to promote breast cancer screening among women ages 50–75. *Prev Med.* 1995;24:477–484.
13. King ES, Rimer BK, Trock B. How valid are mammography self-reports? *Am J Public Health.* 1990;80:1386–1388.
14. Zapka JG, Bigelow C, Hurley T, et al. Mammography use among sociodemographically diverse women: the accuracy of self-report. *Am J Public Health.* 1996;86:1016–1021.
15. Kottke T, Trapp MA, Fores MM, et al. Cancer screening behaviors and attitudes of women in Southeastern Minnesota. *JAMA.* 1995;273:1099–1105.
16. Degnan D, Harris R, Ranney J, Quade D, Earp JA, Gonzalez J. Measuring use of mammography: two methods compared. *Am J Public Health.* 1992;82:1386–1388.
17. Weinberg AD, Cooper HP, Lane M, Kripalani S. Screening behaviors and long-term compliance with mammography guidelines in a breast cancer screening program. *Am J Prev Med.* 1997;13:29–35.

The Gender Gap in Reporting Household Gun Ownership

Jens Ludwig, PhD, Philip J. Cook, PhD, and Tom W. Smith, PhD

ABSTRACT

Objectives. This study examined errors in estimating household gun ownership that result from interviewing only 1 adult per household.

Methods. Data from 2 recent telephone surveys and a series of in-person surveys were used to compare reports of household gun ownership by husbands and wives.

Results. In the telephone surveys, the rate of household gun ownership reported by husbands exceeded wives' reports by an average of 12 percentage points; husbands' reports also implied 43.3 million more guns. The median "gender gap" in recent in-person surveys is 7 percentage points.

Conclusions. Future research should focus on respondents' reports about personally owned guns. (*Am J Public Health.* 1998;88:1715–1718)

How many households contain firearms, and how many guns do members of these households own? This question is of considerable importance given evidence that keeping a firearm in the home is associated with elevated rates of homicide, suicide, and fatal gun accidents.^{1–7}

In this article, we study measurement errors in survey estimates that result from asking only 1 adult from each selected household to report on household gun ownership, a practice motivated by considerations of surveying costs.⁸ While comparisons between self-reported personal gun ownership and data from administrative records reveal low false-negative rates,^{9,10} little is known about the degree to which respondents may misreport about guns kept by other household members.^{11,12}

Methods

In order to learn more about the accuracy of reports on household gun ownership, we compared the responses of husbands and wives using data from 3 recent surveys. Husbands and wives were reporting on the same

event (gun ownership in households containing a married couple), but wives were more likely to be proxy reporters for someone else's gun in the home, since men are more likely to own firearms.^{13–15} Because of social desirability bias,¹⁶ false positives are expected to be rare relative to false negatives; thus, the larger of the 2 estimates is likely to be more accurate.

We also assessed the relative accuracy of husband and wife reports by comparing the gun stocks implied by the responses of each

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Note. Opinions and mistakes are those of the authors alone.

TABLE 1—Gun Ownership Estimated From Reports of Husbands and Wives

Parameter and Survey	Husbands	Wives	Gap
Personal gun ownership, % (95% CI)			
NSPOF	46.8 (43.1, 50.5)	9.3 (7.2, 11.4)	...
Gallup	49.5 (43.7, 55.3)	14.5 (10.2, 18.8)	...
GSS (1994–1996) ^a	54.1 (50.7, 57.5)	13.0 (10.8, 15.2)	...
Household gun ownership, % (95% CI)			
NSPOF	49.1 (45.3, 52.9)	37.0 (33.5, 40.5)	12.1 (6.9, 17.3)
Gallup	52.3 (46.4, 58.2)	40.5 (34.6, 46.4)	11.8 (3.5, 20.1)
GSS			
1980	61.1 (56.2, 66.1)	58.8 (53.0, 64.6)	2.3 (–5.3, 9.9)
1982	58.3 (53.6, 63.0)	54.1 (49.5, 58.7)	4.2 (–2.4, 10.8)
1984	56.7 (51.2, 62.2)	56.9 (52.1, 61.7)	–0.2 (–7.5, 7.1)
1985	61.0 (56.1, 65.9)	53.7 (48.8, 58.6)	7.3 (0.4, 14.2)
1987	60.2 (55.2, 65.2)	56.4 (51.7, 61.1)	3.8 (–3.0, 10.6)
1988	57.9 (50.9, 64.6)	52.3 (46.1, 58.5)	5.6 (–3.6, 14.8)
1989	62.1 (55.9, 68.3)	54.6 (48.7, 60.5)	7.5 (–1.0, 16.0)
1990	58.6 (52.1, 65.1)	51.6 (44.9, 58.3)	7.0 (–2.4, 16.4)
1991	60.9 (54.4, 67.4)	50.4 (44.0, 56.8)	10.5 (1.3, 19.7)
1993	56.4 (50.1, 62.7)	50.6 (44.4, 56.8)	5.8 (–3.0, 14.6)
1994	57.7 (53.1, 62.3)	50.5 (46.1, 54.9)	7.2 (0.1, 13.6)
1996	53.6 (48.7, 58.5)	52.0 (47.3, 56.7)	1.6 (–5.3, 8.5)
Guns per gun household			
NSPOF			
Mean (95% CI)	4.3 (3.8, 4.8)	3.0 (2.7, 3.3)	1.3 (0.7, 1.9)
50th percentile	3.0	2.0	1.0
90th percentile	9.0	6.0	3.0
No.	407	359	...
Gallup			
Mean (95% CI)	4.8 (3.1, 6.5)	4.7 (3.1, 6.3)	0.1 (–2.4, 2.4)
50th percentile	3.0	3.0	0.0
90th percentile	10.0	8.0	2.0
No.	126	93	...
Total gun stock in marital households, ^b millions (95% CI)			
NSPOF	113.7 (97.8, 129.6)	59.8 (51.6, 68.0)	53.9 (18.1, 89.7)
Gallup	135.2 (84.9, 185.5)	102.5 (64.5, 140.5)	32.7 (–30.4, 95.8)

Note. For the NSPOF and GSS, we restricted the sample to married respondents who reported living in a household containing at least 2 adults. For the Gallup, we include the proportion of respondents who reported a gun in the home combined with the proportion of respondents who reported a gun elsewhere on their property, such as in a garage, shed, or car. CI = confidence interval; NSPOF = National Study of the Private Ownership of Firearms; GSS = General Social Survey.

^aRestricted to households with telephones.

^bCalculated as the average number of guns reported by husbands multiplied by the estimated proportion of marital households owning guns, derived from husband reports multiplied by total number of marital households (and a similar method for wives). Standard errors were calculated with approximation for variance of the product of 2 random variables.¹⁷

group with firearms sales data. Gun stocks were calculated as the product of estimated household ownership rates and number of guns per firearm-containing household; standard errors were calculated via the approximation given by the following formula¹⁷:

$$\text{Var}(XY) \approx [(1/N)\sum_i(y_i)]^2\sigma_x^2 + [(1/N)\sum_i(x_i)]^2\sigma_y^2 + \sigma_x^2\sigma_y^2,$$

where X and Y are random variables representing household ownership and the number of guns per firearm-containing households, respectively; $(1/N)\sum_i(x_i)$ and $(1/N)\sum_i(y_i)$ represent the sample averages of X and Y ; and σ_x^2 and σ_y^2 represent the variances of the 2 random variables. Cumulative sales figures may overstate the civilian gun stock because of depreciation, although more than two thirds of all guns sold in the United States

since 1899 were made within the past 40 years.^{12,18}

The 1994 National Study of the Private Ownership of Firearms was a telephone survey of 2568 adults.¹³ Each adult was asked, “Do you or any members of your household 18 years of age or older currently have any firearms in your home, car, or elsewhere around your home? Do not include airguns, toys, models, or starter pistols.”

The July 1997 Gallup telephone survey interviewed 1008 adults, each of whom was asked, “Do you have a gun in your house?” and “Do you have a gun anywhere else on your property such as in your garage, barn, shed, or in your car or truck?”

We also used data from the National Opinion Research Center/University of Chicago’s General Social Survey for the years 1980 through 1996. This survey includes the

question “Do you happen to have in your home (or garage) any guns or revolvers?”¹⁹

Each of these surveys interviewed only 1 adult from each household in the sample, selected by a process designed to be equivalent to random. We excluded from the General Social Survey those households without telephones and focused, in both the General Social Survey and the National Study of the Private Ownership of Firearms, on married respondents living in a household with at least 2 adults.

Results

Each of the surveys allowed estimates of personal gun ownership as well as household possession. This is an important distinction because, in most families, a 27/18 viewed by

TABLE 2—National Household Prevalence and Number of Guns Estimated Directly and With Adjustment for Wives' Underreport

Survey	Estimated Prevalence		Estimated No. ^a (Millions)	
	As Measured, % (95% CI)	Adjusted, % (95% CI)	As Measured (95% CI)	Adjusted (95% CI)
NSPOF (1994) (n = 2568)	34.5 (32.6, 36.4)	38.0 (33.3, 42.7)	121.2 (110.9, 131.5)	150.0 (133.2, 166.8)
Gallup (1996) (n = 1008)	40.8 (37.7, 43.9)	44.0 (36.5, 51.5)	167.6 (133.4, 201.8)	183.7 (131.8, 235.6)
GSS (1994–1996) ^b (n = 3884)	44.3 (42.7, 45.9)	45.7 (41.7, 49.7)

Note. Adjustments applied the prevalence and average number reported by husbands to all marital households. Standard errors were calculated as the square root of the sum of the variance for the estimated ownership rate (or gun stock) for married households, calculated from husbands' responses, and the variance for the estimated ownership rate (or gun stock) for unmarried households, calculated from all unmarried respondents' reports. For the NSPOF and GSS, we restricted the sample to married respondents who reported living in a household containing at least 2 adults. For the Gallup survey, we include respondents who reported a gun in the home and respondents who reported a gun elsewhere on their property, such as in a garage, shed, or car. CI = confidence interval; NSPOF = National Study of the Private Ownership of Firearms; GSS = General Social Survey.

^aEstimated by calculating average number of guns in telephone households multiplied by number of households. Standard errors were calculated with approximation for variance of the product of 2 random variables.¹⁷ The NSPOF stock figures reported are substantially lower than the estimate of 192 million guns derived from self-reported gun ownership.¹³

^bCalculated after excluding households without telephones.

all concerned as the private property of a particular family member. This fact was documented in the Gallup survey, which found that only 5.4% of respondents who reported guns in their home indicated that there was joint ownership for one or more of them.

Table 1 shows that husbands were 4 or 5 times as likely to personally own a gun as their wives. Husbands were also more likely than wives to report household gun ownership, with gaps of approximately 12 percentage points in the 2 telephone surveys. The median gender gap in the General Social Survey since 1988 is 7 percentage points. Our findings are consistent with those reported elsewhere.^{13,20,21}

In the 2 surveys that included a follow-up question on the number of guns in the home, husbands reported more than did wives in the National Study of the Private Ownership of Firearms but not in the Gallup survey, although even the latter showed a gap of 2 guns at the 90th percentile (Table 1). The gun stock in marital households that was indicated by husbands' reports was larger than that reported by wives by an average of 43.3 million.

Table 2 shows the consequences of these differences. Included are national estimates using all households, as well as the results of applying the husband-reported prevalence and average count to all marital households. The adjusted prevalence estimates for the National Study of the Private Ownership of Firearms and the Gallup survey were higher than the unadjusted estimates by 3.5 and 3.2 percentage points, respectively. The adjusted gun stock estimates were also closer to the number of guns (223 million) that entered into private hands in the United States between 1899 and 1993.¹⁸

Yet, even the adjusted gun stock estimates in Table 2 are lower than estimates derived by using self-reports of personal (rather than household) gun ownership and multiplying by the total number of adults (rather than the total number of households). In the National Study of the Private Ownership of Firearms, this implies a gun stock of 192 million.¹³

Discussion

Our results suggest that wives underreport guns in the home and pose a challenge to the assumption, incorporated in most surveys on this subject, that any adult in the household will be a reliable reporter of household gun ownership. Ambiguity in whether the survey questions asked about personal or household ownership could explain some of the gender gap, although the survey with the least ambiguous question (the National Study of the Private Ownership of Firearms) involved the largest gap. Alternatively, gun ownership may be a sensitive behavior subject to social desirability bias, with interview mode effects^{22,23} that may be more pronounced among women because they are more likely than men to be anti-gun.^{13,24} Lack of awareness may also explain part of the gender gap. Some wives may not know about their husbands' guns, either because wives are less interested in guns or because some husbands are reluctant to reveal their gun ownership. This last possibility is suggested by the recent finding that 11% of married respondents recalled a disagreement in their household in which a woman opposed keeping a gun in the home.^{24,25} Sampling does not appear to explain much of the gender gap,

since gaps were small on questions about nonsensitive behaviors.²⁰

We suggest that future survey research on gun-related topics focus, whenever possible, on respondents' reports about their own guns; because of the household misreporting issues noted here, self-reports of gun ownership appear to produce more accurate estimates of America's gun stock than do reports about household guns. □

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References

1. Brent D, Perper J, Allman C, Moritz G, Wartella M, Zelenak J. The presence and accessibility of firearms in the homes of adolescent suicides. *JAMA*. 1991;266:2989–2995.
2. Kellermann A, Rivara F, Somes G, et al. Suicide in the home in relation to gun ownership. *N Engl J Med*. 1992;329:1084–1091.
3. Cummings P, Koepsell T, Grossman D, Savarino J, Thompson R. The association between the purchase of a handgun and homicide or suicide. *Am J Public Health*. 1997;87:974–978.
4. Wintemute G, Teret S, Kraus J, Wright M, Bradfield G. When children shoot children. *JAMA*. 1987;257:3107–3109.
5. Saltzman L, Mercy J, O'Carroll P, Rosenberg M, Rhodes P. Weapon involvement and injury outcomes in family and intimate assaults. *JAMA*. 1992;267:3043–3047.
6. Kellermann A, Rivara F, Rushforth N, et al. Gun ownership as a risk factor for homicide in the home. *N Engl J Med*. 1993;329:1084–1091.

7. Bailey J, Kellermann A, Somes G, Banton J, Rivara F, Rushforth N. Risk factors for violent death of women in the home. *Arch Intern Med.* 1997;157:777-782.
8. Moore J. Self/proxy response status and survey response quality. *J Off Statistics.* 1988;4:155-172.
9. Kellermann AL, Rivara FP, Banton J, Reay D, Fligner CL. Validating survey responses to questions about gun ownership among owners of registered handguns. *Am J Epidemiol.* 1990;131:1080-1084.
10. Rafferty AP, Thrush JC, Smith PK, McGee HB. Validity of a household gun question in a telephone survey. *Public Health Rep.* 1995; 110:282-288.
11. Newton G, Zimring F. *Firearms and Violence in American Life: Staff Report Submitted to the National Commission on the Causes and Prevention of Violence.* Washington, DC: US Government Printing Office; 1969.
12. Kleck G. *Point Blank: Guns and Violence in America.* New York, NY: Aldine de Gruyter; 1991.
13. Cook PJ, Ludwig J. *Guns in America: Results of a Comprehensive National Survey on Firearms Ownership and Use.* Washington, DC: Police Foundation; 1997.
14. Smith TW, Smith RJ. Changes in firearm ownership among women, 1980-1994. *J Criminal Law Criminology.* 1995;86:113-149.
15. Sheley JF, Bradley CJ, Wright JA. Women and handguns: evidence from national surveys, 1973-1991. *Soc Sci Res.* 1994;23:219-235.
16. Sudman S, Bradburn NM. *Response Effects in Surveys: A Review and Synthesis.* Chicago, Ill: Aldine; 1974.
17. Becker G. *Economic Theory.* New York, NY: Alfred A Knopf; 1971.
18. Zawitz MW. Firearms, crime, and criminal justice: guns used in crime. In: *Bureau of Justice Statistics Selected Findings.* Washington, DC: US Government Printing Office; 1995.
19. Davis JA, Smith TW. *General Social Surveys, 1972-1996: Cumulative Codebook.* Chicago, Ill: National Opinion Research Center; 1996.
20. Smith TW. *An Analysis of the Accuracy of Spousal Reports.* Chicago, Ill: National Opinion Research Center/University of Chicago; 1985. GSS methodology report 35.
21. Kleck G. *Targeting Guns: Firearms and Their Control.* New York, NY: Aldine de Gruyter; 1997.
22. De Leeuw E, van der Zouwen J. Data quality in telephone and face to face surveys: a comparative meta-analysis. In: Groves R, Biemer P, Lyberg L, Massey J, Nicholls W, Waksberg J, eds. *Telephone Survey Methodology.* New York, NY: John Wiley & Sons Inc; 1988: 283-299.
23. Aquilino W. Interview mode effects in surveys of drug and alcohol use. *Public Opinion Q.* 1994;58:210-240.
24. Smith TW. *1996 National Gun Policy Survey: Research Findings.* Chicago, Ill: Joyce Foundation; 1997.
25. Haggerty C, Shin H-C. *1996 National Gun Policy Survey: Methodology Report.* Chicago, Ill: Joyce Foundation; 1997.

Nighttime Observations of Safety Belt Use: An Evaluation of California's Primary Law

James E. Lange, PhD, and Robert B. Voas, PhD

On January 1, 1993, California became the first state in the United States to modify an existing safety belt law from a secondary to a primary enforcement law.¹ The primary law gives police the authority to stop a vehicle solely on the basis of their observation of noncompliance with the safety belt law. The secondary law permitted police officers to cite unbelted occupants only when the vehicle was stopped for another violation.

Immediately after implementation of the primary enforcement law, a California statewide telephone survey¹ found that 55% of respondents reported increased use of safety belts. Daytime observation studies at traffic intersections found use rate increases of between 13 and 20 percentage points,^{2,3} and Winnicki's⁴ time-series graph of California's Fatality Analysis Reporting System data indicates an approximately 15 percentage point increase in usage rates among drivers and passengers.

Observation studies in California reported to date have been conducted only during the day. By excluding nighttime weekend drivers, they may be omitting a particularly high-risk segment of the driving population. Analyses of fatal accident statis-

tics are problematic because inclusion in the fatality sample is dependent, in part, on safety belt use. Further, some risky behaviors, such as alcohol use, are correlated both with fatal accidents and with failing to use a safety belt,⁵ so changes in these risk variables may have consequences for safety belt use that are not related to safety belt laws.

Community Roadside Surveys

Oceanside and Salinas in California were sites for an experimental, community-

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ABSTRACT

Objectives. An analysis was conducted to determine what effect California's change to a primary safety belt law had on safety belt use among nighttime weekend drivers.

Methods. Observations of 18 469 drivers in 2 California communities were made during voluntary roadside surveys conducted every other Friday and Saturday night from 9 PM to 2 AM for 4 years.

Results. Rates of safety belt use rose from 73.0% to 95.6% ($P < .0005$). For drivers with blood alcohol concentrations of 0.10 or higher, rates rose from 53.4% to 92.1% ($P < .0005$).

Conclusions. Because substantial improvement in safety belt use was seen even in a group of high-risk drivers, the injury reduction benefits of this law may be high. (*Am J Public Health.* 1998;88:1718-1720)

EXHIBIT 36

Determinants of social desirability bias in sensitive surveys: a literature review

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Abstract Survey questions asking about taboo topics such as sexual activities, illegal behaviour such as social fraud, or unsocial attitudes such as racism, often generate inaccurate survey estimates which are distorted by social desirability bias. Due to self-presentation concerns, survey respondents underreport socially undesirable activities and overreport socially desirable ones. This article reviews theoretical explanations of socially motivated misreporting in sensitive surveys and provides an overview of the empirical evidence on the effectiveness of specific survey methods designed to encourage the respondents to answer more honestly. Besides psychological aspects, like a stable need for social approval and the preference for not getting involved into embarrassing social interactions, aspects of the survey design, the interviewer's characteristics and the survey situation determine the occurrence and the degree of social desirability bias. The review shows that survey designers could generate more valid data by selecting appropriate data collection strategies that reduce respondents' discomfort when answering to a sensitive question.

Keywords Sensitive questions · Social desirability bias · Survey design · Survey Methodology · Measurement error

1 Introduction

An increasing number of survey statisticians and social scientists focus on the investigation of social taboos, illegal behavior and extreme opinions. Different national surveys contain item batteries asking about sensitive information. For example, the German General Social Survey (ALLBUS) 2000 asked interviewees to self-report on following four minor offences: (1) using public transportation without buying a valid ticket, (2) driving a car with more than the permitted level of blood alcohol, (3) taking goods from a department store without paying, and (4) deliberately making false statements on tax forms in order to pay less. Other

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surveys, like the US National Crime Victimization Survey (NCVS) or the European Crime and Safety Survey (EU ICS), ask questions on sensitive topics like experiences with criminal victimization. Recently, a national study on right-wing extremism was conducted in Germany, collecting data on socially undesirable attitudes like anti-Semitism, xenophobia, and chauvinism (Decker and Brähler 2006). In Switzerland, the Swiss Multicenter Adolescent Survey on Health (SMASH) 2002 asked 16–20 years old youths about their use of illicit drugs, and their drinking and smoking habits. To cite a last example, the US General Social Survey (GSS) monitors the sexual activity of the population and also asks about very sensitive topics like prostitution (‘Thinking about the time since your 18th birthday, have you ever had sex with a person you paid or who paid you for sex?’) or infidelity (‘Have you ever had sex with someone other than your husband or wife while you were married?’). Obtaining valid and reliable data on the basis of such items has proven to be a difficult business and the possibilities of doing so continues to be a lively research activity. Survey methodologists’ state-of-the-art knowledge suggests that answers to sensitive questions are often distorted by social desirability bias. The first section of this article reviews the main theoretical explanations regarding the process of self-reporting in sensitive surveys. ‘Sensitivity’ is a complex theoretical concept whose dimensions are identified and discussed. Next, psychological mechanisms are presented, relating ‘sensitivity’ to other theoretical constructs and to different aspects of data quality. The review focuses on the behavior of both main actors of a survey interview, the respondent and the interviewer, and discusses how survey response is affected by (a) perceived gains, risks and losses of the respondent and (b) the behavior of the interviewer. The second section reviews empirical findings on the effectiveness of different survey methods (such as randomized response or the unmatched count technique) on the respondent’s propensity to misreport in sensitive surveys and outlines future research perspectives.

2 Sensitivity and social desirability: defining the concepts

For the term ‘sensitivity’ different conceptualizations can be observed in the survey literature (Lee 1993). One approach is post hoc assessment of sensitivity via empirical indicators of survey quality (Lensvelt-Mulders 2008; Tourangeau and Yan 2007). For example, questions that are supposed to be sensitive are often associated with comparatively higher item non-response rates than non-sensitive questions. Table 1 summarizes item nonresponse rates for selected items, taken from the German General Social Survey (ALLBUS). The questions were administered to a national random sample from all German speaking persons who resided in private households in Germany and were 18 years old or older:

Table 1 shows that some items (household net income and voting intention) have consistently more missing data than other items (religious denomination, educational attainment, membership of a trade union, employment status and age). Against the background of the assumption ‘the more sensitive the item is the higher item nonresponse will be’ it seems apparent that the income question has the highest sensitivity of all items with nonresponse rates ranging from 20.7 to 26.2%. In contrast, questions asking about employment status and age seem to have the lowest sensitivity with proportions of missing data ranging from 0.0 to 0.4% for age and from 0.1 to 0.2% for employment status respectively.

Other empirical approaches ask respondents to assess the sensitivity of survey items on specific rating-scales (Bradburn and Sudman 1979; Coutts and Jann 2011). Recently, Coutts and Jann (2011, p. 184) carried out an online survey study that asked 2,075 respondents from a German access panel to rate several petty offences (keeping to much change, freerid-

Table 1 Rates of item nonresponse (%) for the German general social survey ALLBUS, selected years and items

Topic	ALLBUS 1990 (%)	ALLBUS 2000 (%)	ALLBUS 2006 (%)
Household net-income	26.2	23.5	20.7
Voting intention ^a	14.4	22.7	14.2
Religious denomination	0.4	0.7	0.5
Educational attainment	0.8	0.3	0.2
Membership of a trade union	1.7	0.2	0.4
Employment status	0.1	0.2	0.1
Age	0.4	0.0	0.3

Data was either collected by PAPI—paper and pencil interviewing (ALLBUS 1990 and 2000), CAPI—computer assisted personal interviewing (ALLBUS 2000 and 2006), or CASI—computer assisted self interviewing (ALLBUS 2006)

^a Statistic includes answer category ‘don’t know’

ing, shoplifting, marihuana use and drunk driving) and immoral activities (to cheat on one’s partner). For each item, a total sensitivity score was calculated by adding the proportions of interviewees who stated (1) that the behavior in question is not alright, and (2) that admitting it would be uncomfortable for most. The most sensitive topics turned out to be shoplifting (79%) and infidelity (73%). These were followed by drunk driving (53%) and marijuana use (43%), both with medium sensitivity scores. In contrast, freeriding (22%) and keeping too much change (20%) were considered as topics with lower sensitivity.

Theory-driven approaches try to distinguish different aspects of the theoretical construct ‘sensitivity’. According to Lee and Renzetti a topic labeled ‘sensitive’ is one that “potentially poses for those involved a substantial threat, the emergence of which renders problematic for the researcher and/or the researched, the collection, holding, and/or dissemination of research data” (Lee and Renzetti 1993, p. 5). They argue that research on sensitive topics seems to be linked with risks and costs, such as negative feelings of shame and embarrassment or negative consequences, such as the possibility of sanctions. Finally, they strongly emphasize the social dimension of sensitivity: “In other words, the sensitive character of a piece of research seemingly inheres less in the topic itself and more in the relationship between that topic and the social context within which the research is conducted” (Lee and Renzetti 1993, p. 5).

Another useful specification of the concept ‘sensitivity’ is introduced by Tourangeau and Yan (2007). They distinguish between three distinct aspects of the term ‘sensitivity’:

1. The first dimension is ‘intrusiveness’ and refers to the fact that within a given culture certain questions per se may be perceived as too private or taboo, independent of the respondents’ true status on the variable of interest. Questions asking about the respondents’ sexual preferences, health status or income are often perceived as too intrusive.
2. The second dimension is ‘threat of disclosure’, pertaining to respondents’ concerns about possible risks, costs or negative consequences of truthfully reporting a sensitive behavior should the sensitive answers become known to third persons or institutions beyond the survey setting. Such negative consequences could be: job loss, family upset or even prosecution. Questions asking the respondent to self-report illegal behavior (e.g. employee theft, tax fraud or illegal entry in surveys of immigrants) may fall into this category.
3. The third dimension is ‘social desirability’. This dimension refers to truthfully reporting an attitude or behavior that clearly violates existing social norms and thus is deemed unacceptable by society. To conform to social norms, respondents may present themselves in a

positive light, independent of their actual attitudes and true behaviors respectively. More specifically, ‘social desirability’ refers to the respondents’ tendency to admit to socially desirable traits and behaviors and to deny socially undesirable ones. Finally, socially desirable answers could also be conceptualized as respondents’ temporary social strategies coping with the different situational factors in surveys (e.g. presence of interviewer, topic of question, etc.).

Unlike ‘intrusiveness’, the problem associated with ‘social desirability’ is not the sensitivity of a question but the sensitivity of an answer. Fowler (1995, p. 29) summarizes this issue as follows: “Questions tend to be categorized as ‘sensitive’ if a ‘yes’ answer is likely to be judged by society as undesirable behaviour. However, for those for whom the answer is ‘no’ questions about any particular behaviour are not sensitive.” Whereas answers suggesting deviations from social norms are seen socially undesirable, self-reports suggesting norm-conforming behaviors are considered socially desirable associated with expected gains such as social approval of the interviewer. Given that, respondents tend to underreport socially undesirable behavior and overreport socially desirable behavior. They distort their answers towards the social norm in order to maintain a socially favorable self-presentation (an overview of the literature of social norms can be found in [Rauhut and Krumpal 2008](#)).

Two sub-dimensions of the concept ‘social desirability’ are often distinguished ([Randall and Fernandes 1991](#)): One sub-dimension refers to social desirability as a stable personality characteristic, such as a constant need for social approval and impression management, to cause socially desirable misreporting ([Crowne and Marlowe 1960, 1964](#); [DeMaio 1984](#)). A strong approval motive and an invariant desire to generate a positive image may thus reduce the interviewee’s willingness to disclose self-stigmatizing information. By contrast, the second sub-dimension refers to social desirability as an item characteristic, considering various activities or attitudes to be more or less socially undesirable and thus relates perceived desirability of a behavior to particular items. Thus, effects of social desirability are strongly influenced by characteristics of a specific item ([Groves 1989](#)).

Social desirability refers to making oneself look good in terms of prevailing cultural norms when answering to specific survey questions. However, the general need for social approval and impression management may vary with specific subgroup norms ([Johnson and van de Vijver 2002](#); [Lee and Renzetti 1993](#)). Furthermore, the tendency to give socially desirable responses may vary across cultural orientations like collectivistic cultures that emphasize good relationships with other group members versus individualistic orientations that set value on the pursuit of one’s personal values, attitudes and goals ([Lalwani et al. 2006](#)).

3 Response error and other types of survey errors

Questions asking about sensitive topics are assumed to generate response errors thus having a negative impact on data quality. Before investigating how sensitive questions increase the likelihood of response errors, especially response bias, it is important to define the terms ‘response error’ and ‘response bias’ and distinguish these concepts from other types of survey errors. Useful typologies of survey errors can be seen in [Fox and Tracy \(1986\)](#) and [Groves et al. \(2004\)](#). One fundamental distinction classifies survey errors as either sampling errors or nonsampling errors.

The first class of survey error, sampling error, arises from the fact that only a subset of all potential respondents in the sampling frame is actually measured. The survey method-

ogy literature distinguishes two types of sampling errors: sampling variance and sampling bias (Groves et al. 2004, p. 57). Sampling variance arises from the fact that by a random process many different samples each with different subsets of elements could be drawn from the population under investigation. Each possible sample will produce different estimates on the survey statistic. Sampling bias can result from the possibility that certain subgroups in the target population are not represented (or underrepresented) in the sampling frame thus the selection process excluding them systematically. To the extent that excluded members differ from included members on key variables of the survey, the survey statistics will systematically deviate from the true parameters of the target population.

The second class of error, nonsampling error, is much more relevant in sensitive surveys (Fox and Tracy 1986, p. 8). One type of error in this class is nonresponse error, which refers to differences between the values of statistics computed on the basis of the entire sample and statistical estimates based only on the actual respondent subset of the sample. Another type of nonsampling error is response error. This kind of error arises from an observational gap between the true score of a respondent and the actual answer provided (Marquis et al. 1981, pp. 2–8). Response error is derived from the observation process itself, the term ‘response error’ is often used synonymously with ‘measurement error’. Each specific type of nonsampling error can be separated into a random part, which reduces the reliability of measurements and a nonrandom part introducing bias into survey estimates. The systematic part of nonresponse error is often labeled ‘nonresponse bias’ representing systematic differences between respondents and nonrespondents. Technically, nonresponse bias for the sample mean is defined as the product of the nonresponse rate and the difference between the nonrespondent and the respondent mean. The nonresponse rate is “the proportion of eligible sample elements for which data are not collected” (Groves et al. 2004, p. 59). When nonresponse (e.g. refusals to answer a sensitive question) is related to key variables of the survey (e.g. sensitive behavior to be measured) the results may be no longer valid. Additionally, the standard error of the estimates becomes greater as the sample size becomes smaller.

The basic distinction between random and systematic error can also be applied to response error, the best documented source of error in sensitive surveys. The formal notation of response error on an individual level decomposes an answer A_{it} of respondent i on occasion t into three components (Tourangeau et al. 2000, pp. 266–267):

1. The first is the true score T_i , which represents the respondent’s actual status on the variable in question. Respondents’ true scores can sometimes be determined via external data sources like medical or administrative records.
2. The second reflects any general directional tendency across respondents to misreport, more specifically to underreport socially undesirable activities and to overreport socially desirable activities respectively. This component is called bias b . Response bias is “a systematic tendency to respond to a range of questionnaire items on some other basis than the specific item content” (Paulhus 1991, p. 17).
3. The third component, random error e_{it} , is directionless with an expected value assumed to be zero: $E(e_{it}) = 0$. This error component varies between respondents and between occasions within a single respondent:

$$A_{it} = T_i + b + e_{it}$$

If $b \neq 0$, survey measurements of the respondent’s true status are no longer valid. Whereas random error cancels out over repeated measurements, response bias does not. Rather, the systematic difference between observed scores and true scores persists.

There is ample empirical evidence that respondents systematically overreport socially desirable behaviors and attitudes and systematically underreport socially undesirable ones (Barnett 1998; Lee 1993; Tourangeau et al. 2000; Beyer and Krumpal 2010). For example, underreporting is quite common for socially undesirable behaviors like illicit drug use, smoking, alcohol consumption and abortion. Respondents also underreport crime victimization, certain types of income (e.g. welfare) and unpopular attitudes, like racism and anti-Semitism. By contrast, survey studies on socially desirable behavior found empirical evidence for overreporting including activities such as voting, seat belt use, environmentally responsible action (e.g. energy conservation, recycling) and religious participation. Misreporting increases as the questions become more sensitive and decreases as the conditions of data collection become more private (Ong and Weiss 2000).

For sensitive behavior, social desirability bias on an aggregate level not only depends on the extent of sensitivity and privacy but also on the fraction of the population who are engaged in the sensitive behavior in question: "For socially desirable behaviour (...) the potential for overstatement is greater on library card ownership than for voting since only a minority of adults have library cards" (Sudman and Bradburn 1982, p. 56). After specification of the concepts 'sensitivity' and 'response bias' theoretical explanations and empirical studies on respondents' behavior in sensitive surveys will be discussed.

4 Theoretical explanations of social desirability bias in sensitive surveys

Psychological studies on lying indicate that lying in everyday life is a common social interaction process suggesting relatively low cognitive burden (DePaulo et al. 1996, 2003). People lie to avoid negative emotions of shame, embarrassment and losing face in social interactions (Schaeffer 2000). Cognitive psychologists' research suggest misreporting on sensitive questions being a controlled, deliberate and motivated process at least partly under the respondent's voluntary control, rather than an automatic mental process happening completely outside of the respondent's consciousness (Holtgraves et al. 1997; Holtgraves 2004). Respondents are supposed to edit their answers in a socially desirable way, either because of their inclination to impression management or because of their susceptibility to self-deception (Paulhus 2003): In the case of the impression management mechanism, respondents strive for social approval via selecting the answer that is expected to maximize positive valuations and minimize negative reactions by other subjects. In contrast, the concept of self deception assumes that interviewees want to maintain a positive self-image, to maximize self-worth and to reduce cognitive dissonance resulting from divergence between social norms, self-perception and self-demands on the one hand, and reality on the other hand. According to this perspective, respondents themselves are the main addressees of socially motivated misreporting.

The rational side of answering a sensitive question can be conceptualized within the framework of rational choice theory (RC theory) and subjective expected utility theory (SEU-theory) respectively. Empirical applications of RC theory assume the respondent's likelihood to answer truthfully to be a function of expected risks and losses from answering truthfully (Becker 2006; Becker and Günther 2004). The general assumption of RC theory is that responding to a survey question is a goal-directed, utility-maximizing selection between different response options (Esser 1986; Stocké 2007a,b; Stocké and Hunkler 2007): Interviewees aim to maximize positive feelings of social approval and to avoid dismissive reactions from other individuals. For this purpose, respondents use strategies of impression management such as answering in a socially desirable way. RC theory

postulates three necessary preconditions for social desirability bias (Stocké 2007b): (1) a strong desire for social approval, (2) a nonzero subjective probability of negative sanctions due to a perceived lack of privacy, and (3) respondents beliefs that the choice of one or another response option matters, i.e. that the other subjects' reactions will be clearly different for response option A compared to response option B. A multiplicative combination of all three factors is assumed to affect response behavior and to determine the strength and the direction of social desirability bias (Stocké 2007b, p. 495): "If only one of these conditions is not given, nothing will affect the prevalence of SD-bias [social desirability bias], and subjects are assumed to report their "true scores"." An analysis of a survey study on racial attitudes indicates empirical evidence for the postulated three-way interaction effect on the respondents' propensity to give a socially desirable answer (Stocké 2007b).

The behavioural model of SEU-theory can be applied to study respondents' perceptions in sensitive surveys, by modelling perceived losses and gains in the interview situation and investigating their impact on the respondent's decision of whether to respond truthfully or not (Rasinski et al. 1994, 1999): If respondents have been engaged in some frowned-upon behavior, one can think of the consideration whether to answer a sensitive question truthfully or not as "making a risky decision with incomplete knowledge about the associated risks and losses" (Rasinski et al. 1999, p. 467). The first factor, 'perceived risks', subsumes the respondent's perceptions of the conditional probabilities of alternative outcomes given each possible response option. The second factor, 'perceived losses and gains', associates each possible outcome with the respondent's valuations of this outcome. Applying the perspective of SEU-theory to the survey context, one can view a respondent's decision whether to admit to a sensitive behavior or not, as consideration of different risks, losses and outcomes associated with that decision.

In case of admission to a socially frowned-upon or illegal behavior perceived losses might be negative feelings of embarrassment during the interview, especially if the interviewer visibly showed disapproval. Furthermore, painful or stressful feelings, like guilt and shame, may arise in consequence of remembering and truthfully reporting embarrassing behavior that conflicts with the respondent's own values (Schaeffer 2000, p. 117). Outside the interview situation, repercussions like informal sanctions, harassment or even prosecution may result from disclosure of sensitive answers to persons or agencies other than the interviewer or the survey research institute. The different risks can be linked to potential subjective costs and losses: "These losses include further intrusions or solicitations, embarrassment, painful memories, and threat to the respondent' self-concept." (Schaeffer 2000, p. 118). Besides risks and losses, respondents might also take into account different perceived gains associated with truthful reporting. Subjective gains could motivate respondents to answer truthfully, especially if the survey is perceived as one with high legitimacy. Positive emotions and personal satisfaction may be generated via consistency with internalized norms (e.g. norms of politeness, cooperation, and norms regarding telling the truth) or via the promotion of public institution and social welfare.

There are several empirical applications of SEU-theory to misreporting on sensitive survey questions (Nathan et al. 1990; Rasinski et al. 1994, 1999; Sirken et al. 1991; Willis et al. 1994). Willis et al. (1994) found a significant relationship between evaluations of risks and losses concerning response disclosure and the decision to answer truthfully to a sensitive question. Rasinski et al. (1994, 1999) did a series of experimental studies using vignettes to investigate the impact of perceived risks, losses and variation in survey design and context on the likelihood of telling the truth in sensitive surveys: Survey design (e.g. interviewer- versus self-administered interviews) and context variables (e.g. husband and children are present

or not) were varied via vignettes. Perceived risks¹ and losses² were measured directly via specific items. For different conditions, experimental subjects rated whether the respondents in the hypothetical survey interviews were likely to tell the truth. [Rasinski et al. \(1994\)](#) found some empirical evidence for the SEU-theory's predictions relating respondents' perceived risks and losses to their tendency of responding truthfully to a sensitive survey question. They subjected 96 male and 96 female subjects to written hypothetical scenarios describing an interview situation. In the women's versions, the hypothetical interviewees were asked about abortion and drunk driving. In the men's versions, the interview topics were number of sex partners prior to marriage and drunk driving. The scenarios varied 3 aspects of the interview situation: a) the data collection mode (interviewer- versus self-administered); b) the interviewer's age (20 years versus 50 years); and c) the presence of family members (present versus absent). Subjects were randomly assigned to the scenarios. On a ten-point scale, subjects rated the likelihood of the hypothetical interviewee admitting to the sensitive behavior, and then judged risks and losses of possible outcomes (such as being embarrassed, receiving understanding or respondent's spouse finding out the sensitive information). The results of the vignette study indicate a lower probability of truthful reporting if family members were present and the interviewer was older. Furthermore, female subjects showed the lowest probability to tell the truth if the questions were interviewer-administered and family members were at home. Finally, [Rasinski et al. \(1994, p. 500\)](#) tested the SEU-theory's core prediction of a statistical association between risk/loss perceptions (independent variables) and the likelihood of admitting to a sensitive behavior (dependent variable).³ They found that subjects' decisions whether to tell the truth or not were statistically correlated with perceived risks, such as the risk of embarrassment over the interviewer's reaction or the risk of disclosure to the respondent's spouse. Fear of embarrassment with respect to the interviewer's reactions suggest the value of data collection modes that respondents perceive as more private, especially self-administered procedures without presence of an interviewer. [Rasinski et al. \(1999\)](#) conducted two experiments to test the SEU-model and to further investigate the effect of privacy on the probability of telling the truth in sensitive surveys. Again, context variables and features of the survey design influenced both, the subjective probabilities of negative outcomes and the level of misreporting.

To summarize, SEU-theory turns out to be a useful tool to parsimoniously conceptualize and measure respondent's perceptions of threat and to explain misreporting in sensitive surveys. [Rasinski et al. \(1994, 1999\)](#) showed that respondents are concerned about different risks and losses and that these concerns varied with specific survey conditions. From a practical viewpoint, survey designers may influence respondents' perceptions of different risks and losses. As a baseline, lack of privacy lowers the respondent's willingness to self-report norm-violating behavior. By carefully adjusting different features of the survey design and context, researchers may create a more private and comfortable interview setting. As a consequence of the improved survey conditions, it is assumed that respondents reduce their subjective probabilities of negative outcomes associated with truthfully responding to

¹ E.g. "likelihood the interviewer would show disapproval if respondent told the truth" or "likelihood spouse would learn truth about respondent" ([Rasinski et al. 1999, p. 470](#)).

² E.g. "degree of embarrassment felt if interviewer showed disapproval" or "degree of negative consequences [like family upset] if spouse learned respondent's answer" ([Rasinski et al. 1999, p. 470](#)).

³ The independent variables representing risk/loss perceptions were formed by multiplying each judgment of the probability of an outcome by the perceived costs of an outcome: (a) Embarrassment = interviewer showing disapproval · degree of embarrassment if interviewer showed disapproval; (b) Relief = interviewer showing understanding · degree of feeling better if interviewer showed understanding; (c) Spouse = spouse finds out · degree of negative consequences if spouse found out.

sensitive questions. Fewer concerns about social or legal costs and reduced feelings of jeopardy in turn are expected to improve the accuracy of respondents' self-reports in sensitive surveys.

5 Methods and context variables affecting social desirability bias in sensitive surveys

The development of techniques for eliciting from people what they would prefer to keep secret can be traced back to the fifteenth and sixteenth centuries. Excluding torture, priests in the Western Church were taught, via written manuals, "to probe the mind of penitents in order to bring forth admissions of sinfulness" (Lee 1993, p. 97). Tentler (1977, p. 94) describes rules of conduct, confessors were instructed to follow, like "not to show amazement; exhibit a contorted face; show revulsion (no matter what enormities are confessed); rebuke the penitent; or exclaim 'Oh, what vile sins!'" Furthermore, Archbishop Borromeo invented the confessional box in 1565 in order to create more anonymity, to reinforce social distance and to reduce the unease of the confessor and the sinner. The term 'confessing' refers to revealing intimate, personally threatening or self-discrediting information to another person. Eliciting sensitive information from the informant is a difficult business for the questioner. It becomes less difficult when trust is likely to develop via the establishment of a confidential, non-condemning and private atmosphere reducing the discomfort of the parties involved.

During the twentieth and twenty-first centuries, modern survey research has conducted numerous methodological experiments to study the impact of changes in situational variables and survey design on social desirability bias in sensitive surveys. Two sorts of studies can be distinguished to assess the accuracy of survey reports and to compare two or more different methods to ask the sensitive question: validation studies or record check designs, and comparative studies without validation data (Groves 1989; Marquis et al. 1986; Tourangeau et al. 2000). Validation studies can be considered as the golden standard for testing the value of a method because they enable the researcher to compare individual survey responses with the true status of each individual. They also allow for a comparison of survey estimates to the true means or proportions at the aggregate level. In practice, true scores are sometimes known from external data sources, such as medical or administrative records. To evaluate the effectiveness of alternative methods in reducing response bias, the proportion of correct answers can be calculated for each experimental condition. The method generating the comparatively highest proportion of correct answers can be considered most effective in improving response accuracy. In contrast, comparative studies are experimental surveys comparing different survey conditions without the possibility of external validation with some objective criterion due to strict data protection rules or the simple lack of such data. Survey researchers interpret the results of comparative studies according to the 'more-is-better' assumption for socially undesirable behavior and the 'less-is-better' assumption for socially desirable behavior respectively. When underreporting is expected, a higher survey estimate (mean or proportion) is assumed to be a more valid estimate for the population parameter. When overreporting is plausibly assumed, a lower estimate is interpreted as more valid.

5.1 The data collection mode

The data collection mode is assumed to be one important factor explaining the level of misreporting in sensitive surveys (Des Jarlais et al. 1999; Holbrook et al. 2003; Metzger et al. 2000; Okamoto et al. 2002; Tourangeau et al. 1997; Tourangeau and Yan 2007; Turner et al. 1998, 2005). The main distinction among the different modes is whether the questions

are interviewer- or self-administered. The most common interviewer-administered modes are: paper-and-pencil personal interviews (PAPI), computer-assisted personal interviews (CAPI) and computer-assisted telephone interviews (CATI). Common self-administered modes are: paper-and-pencil self-administered questionnaires (SAQ), walkman-administered questionnaires (audio-SAQ), computer-assisted self-administered interviews (CASI), audio computer-assisted self-interviewing (ACASI), interactive voice response (IVR, the telephone application of ACASI also referred to as T-ACASI) and web-surveys. Typologies of data collection methods and mixed-mode designs can be found in [De Leeuw et al. \(2008\)](#).

Several experimental field studies have investigated and quantified the effects of self-administration (compared to interviewer-administration) on response accuracy in sensitive surveys. In many cases self-administered survey modes increased levels of reporting of socially stigmatizing medical conditions, such as anxiety, depression and other psychiatric disorders. Furthermore, respondents self-reported more socially undesirable activities, illicit drug use (e.g. marijuana and cocaine), alcohol problems, risky sexual behavior and abortions when the questions were self-administered ([Tourangeau and Yan 2007](#), pp. 863–867). In addition, self-administration also decreased social desirability bias in answers to questions about racial attitudes ([Krysan 1998](#)), sexual activity ([Gribble et al. 1999](#)), same-gender sex ([Villarroel et al. 2006](#)) and sexually transmitted diseases ([Villarroel et al. 2008](#)). Empirical studies show that women tend to underreport the number of their past opposite-sex sexual partners, at the same time men tend to overreport the quantity of their sex partners ([Smith 1992](#)). Women seem to be embarrassed to report too many sexual partners and men seem to have difficulties to report little sexual experience. [Tourangeau and Smith \(1996\)](#) showed that the discrepancy between self-reports of men and women diminished when the questions were self-administered. In the absence of an interviewer the average number of self-reported sexual partners increased for women and decreased for men. In summary, methods of self-administration, minimizing the presence of the interviewer, seem to increase respondents' privacy, to reduce feelings of jeopardy and to decrease subjective probabilities of painful emotions like shame and embarrassment associated with the presence of an interviewer thus generating more honest answers to sensitive questions.

5.2 Interviewer effects

In the presence of an interviewer during the data collection, effects of interviewers' characteristics (e.g. gender and socio-economic status) and assumed interviewers' expectations on social desirability bias can be observed. [Katz \(1942\)](#) found increased reporting of pro-labour attitudes when interviews were conducted by working class interviewers. In two experimental surveys, [Robinson and Rhode \(1946\)](#) found fewer anti-Semitic opinions made in front of interviewers of Jewish appearance or name. [Schuman and Converse \(1971\)](#) found lower reporting of racial attitudes (e.g. identification with black militancy or anti-white sentiment) in black respondents depending upon whether the interviewer was black or white. In a nonexperimental validation study comparing self-reported voting with local registration and voting records, [Anderson et al. \(1988\)](#) found black non-voters interviewed by black interviewers to be more likely to incorrectly report that they voted compared to black non-voters who were interviewed by white interviewers. [Fowler and Mangione \(1990, p. 105\)](#) assume such interviewer effects to occur most likely in situations "when the topic of a survey is very directly related to some interviewer characteristics so that potentially a respondent might think that some of the response alternatives would be directly insulting or offensive or embarrassing to an interviewer." In order to avoid conflict in personally insignificant situations the respondent guesses the interviewer's internalized norms and expectations and adjusts his answer

accordingly. In terms of SEU-theory's predictions, heightened subjective costs of a truthful response increase the respondent's tendency to give a socially desirable response.

Besides the respondent's uneasiness facing an interviewer, some researchers also focus on the interviewer's feelings of embarrassment and discomfort associated with asking a specific question (Bradburn and Sudman 1979; Hox and De Leeuw 2002; Schnell and Kreuter 2005). If the interviewer feels uncomfortable about asking a certain question, she may skip the question entirely or deliberately change the wording of the question. Such interviewer effects may seriously distort answers to sensitive questions. Empirical findings suggest a positive association between interviewers' expectations of the study's difficulty and the actual problems they experience in the data collection process: Singer and Kohnke-Aquirre (1979) and Sudman et al. (1977a) gathered empirical evidence indicating lower reports of sensitive behaviors for interviewers expecting a study to be difficult. In the case of asking sensitive questions in face-to-face interviews, researchers often use a method called 'sealed envelope technique' (Barton 1958; De Leeuw 2001; Sudman and Bradburn 1974). In the sensitive questions part of the interview a self-administered questionnaire is handed to the respondent. The interviewer asks the respondent to fill out the separate questionnaire containing the sensitive questions. After that, respondents are requested to put the completed questionnaire into an envelope, seal it and give it to the interviewer. Thus the interviewers do not have to read the embarrassing question and also remain ignorant about the respondents' answers. In spite of the increased privacy, some respondents still refuse to fill out the confidential questionnaire (Becker 2006; Becker and Günther 2004).

5.3 Bystander effects

Another area of research on sensitive topics investigates the impact of bystanders (Aquilino 1997; Aquilino et al. 2000; Hartmann 1995; Reuband 1987, 1992; Smith 1997). Aquilino (1997) formulated a model and derived propositions on third-party effects in the interview situation. According to his considerations, the strength and direction of bystander (e.g. parents, spouse, siblings or children) effects is moderated by the following three factors: (a) the type of question, either asking for subjective (e.g. opinions) versus factual information (e.g. behavior), (b) the bystander's prior knowledge of the information, and (c) the subjective probability of negative consequences as a result of disclosing the sensitive information. If the question is factual and the bystander has no information about the respondent's true status or if the question asks about providing subjective information, the strength of the bystander effect will depend on the subjective probability of negative sanctions as a result of the bystander overhearing the sensitive information. Facing a high subjective probability of negative repercussion, third-party presence will elicit less socially undesirable answers. In contrast, if the survey question is factual and the bystander already knows the true status of the respondent, bystander presence is assumed to not affect self-reports or possibly generate more accurate self-reports. In an experimental study, Aquilino et al. (2000) empirically investigated the impact of the presence of third persons in the interview situation. Their empirical findings were consistent with the predictions of Aquilino (1997).

Several empirical studies focused on the effect of parental presence in surveys of adolescents asking sensitive questions about tobacco, alcohol, drug use, sexual intercourse and violence. They found lower levels of self-reporting of these illegal or socially stigmatized behaviors when the survey questionnaire was completed at home compared to a school setting (Brener et al. 2006; Gfroerer et al. 1997; Kann et al. 2002; Rootman and Smart 1985). Youths tend to deny or downplay drug use when their parents are involved in the survey and

at the same time show the propensity to overreport when the survey is instead conducted at their school and peers are present: “Indeed, one interpretation of consistent prevalence differences across school and home settings over time may be that the school setting fosters exaggeration, while the home setting fosters underreporting” (Fendrich and Johnson 2001, p. 635).

Tourangeau and Yan (2007, pp. 868–869) conducted a meta-analysis to quantify the average effect of bystanders’ presence on sensitive survey reporting. They included 9 non-experimental surveys focusing on either the general population or special populations like adolescents comparing answers given in the presence of a bystander with those given without a bystander’s presence. The empirical studies asked questions on various sensitive topics like drug use, smoking, alcohol consumption, voting behavior and attitudes on cohabitation and separation. Separate mean effects for the presence of the respondent’s spouse and parents respectively were estimated. The results for the presence of a spouse indicated overall lower reporting of sensitive characteristics when the spouse was absent; whereas the estimated mean effect size was not significant. In contrast, the presence of parents generated more socially desirable answers. The findings on the average impact of the parental presence indicate a strong and significant effect. Furthermore, the single effect sizes of the parental presence were consistent in direction and replicable across studies indicating a robust result.

5.4 Question wording and question context

Sensitive surveys often attempt to formulate and to present questions in a neutral way to lower respondents’ concerns about how the admission of a certain behavior will be judged. Researchers often write sensitive questions using unthreatening, euphemistic, familiar and forgiving words or phrases. In his humorous article, “Asking the embarrassing question”, Barton (1958) gives an overview of different possibilities to ask sensitive questions in non-embarrassing ways. Many textbooks on survey research and questionnaire design give general wisdom rules how to write and contextualize sensitive questions (Bradburn and Sudman 1979; Fowler 1995, pp. 28–45; Groves et al. 2004, pp. 230–232; Lee 1993, pp. 75–79; Sudman and Bradburn 1982). Most of these recommendations are based on survey practice. A recent experimental study conducted by Näher and Krumpal (2011) shows inconsistent results. In addition to question wording, appropriateness and question context seems to matter. Fowler (1995) recommends making sure that the sensitive question is appropriate for a certain respondent: “Researchers should be asking people questions only when there is a clear role for the answers in addressing the research questions” (Fowler 1995, p. 34). Other approaches recommend embedding the sensitive question in a series of questions starting with unoffending general questions connected to the topic of interest, and then gradually narrowing the focus to more specific behaviors. Carefully embedding the sensitive question in a carefully constructed context is assumed to lower the respondent’s feelings of jeopardy and to “reduce the focus on a specific behavior question” (Sudman and Bradburn 1982, p. 61).

Other contextual features assumed to affect reporting in sensitive surveys are confidentiality and data protection assurances. Many questionnaire introductions contain such assurances to increase respondents’ trust in data protection and to induce cooperation. Singer et al. (1995) reviewed the experimental literature on the effects of confidentiality assurances. They found lower item nonresponse, higher response rates and higher response accuracy for sensitive items (mostly illegal or socially disapproved behavior, but also income) in studies involving confidentiality assurances, although the average effect size was small. Overall, data protection assurances seem to reduce respondents’ concerns and to improve response quality. However, some positions argue that confidentiality assurances that are too elaborate and sophisticated

might have unintended effects in terms of heightening respondents' suspicions and concerns about who might get access to the data. In three experimental studies on nonsensitive topics, [Singer et al. \(1992\)](#) found higher nonresponse rates for sophisticated data protection assurances compared to shorter assurances or none at all.

5.5 The bogus pipeline procedure

There is some empirical evidence that a data collection strategy called the 'bogus pipeline procedure' increases respondents' motivation to report potentially self-discreditable information more accurately. The term 'bogus pipeline' refers to any methodology, in which respondents believe that an objective procedure (e.g. lie detector, biochemical test) will be used to reveal false self-reports independent of whether such verification actually takes place or not ([Akers et al. 1983](#); [Campanelli et al. 1987](#); [Jones and Sigall 1971](#); [Roese and Jamieson 1993](#)). In terms of SEU-theory, the rationale of bogus pipeline is to increase the respondent's subjective costs of misreporting. Being unmasked as a liar involved in some socially undesirable activities is assumed to generate more embarrassment than simply admitting to a frowned-upon behavior like using drugs or stealing. For the measurement of sensitive attitudes [Roese and Jamieson \(1993, p. 364\)](#) argue: "Hence, the BPL [bogus pipeline] was predicated on the motivational assumption that a desire to avoid appearing to be a liar or to be self-unaware would supersede the typically assumed tendency to exaggerate possession of favourable traits (...)." The empirical evidence in many cases supports the assumed effectiveness of bogus pipeline, although some studies show unexpected results: In the context of an experimental school study in Michigan, [Campanelli et al. \(1987\)](#) randomly assigned 291 students to either a bogus pipeline (173 students) or control condition (118 students). In addition to the questionnaire completion, saliva samples were collected from each student in the bogus pipeline condition. Furthermore, the same students were announced that the experimental results would enable a check on how accurate their alcohol consumption self-reports were. Contrary to their expectations, [Campanelli et al. \(1987\)](#) found no significant bogus pipeline effect; students in the bogus pipeline condition did not self-report more alcohol use and misuse compared to students in the control condition. [Aguinis et al. \(1993\)](#) conducted a meta-analysis to test whether the use of a bogus pipeline methodology generated more valid self-reports, compared to self-report measures alone, for the assessment of cigarette smoking behavior. The results of the quantitative literature review indicate that, overall, a larger fraction of respondents admitted to smoke frequently, compared to respondents interviewed in the control condition. [Aguinis et al. \(1995\)](#) conducted two meta-analyses of experimental studies on the effectiveness of the bogus pipeline procedure in improving the veracity of adolescents' marijuana and alcohol self-reports. They found no evidence for the bogus pipeline methodology to generate more self-disclosure of marijuana and alcohol consumption compared to the control condition. They explained their unexpected findings partly with the post hoc assumption that adolescents might have perceived the behaviors in question as not socially undesirable. In a meta-analysis of opinion studies, [Roese and Jamieson \(1993\)](#) investigated the impact of bogus pipeline use on self-reporting socially undesirable attitudes like racism and sexism. The research synthesis of 31 experimental studies indicates that the bogus pipeline procedure, overall, reduced socially desirable responding.

5.6 The randomized response technique

The randomized response technique (RRT) guarantees the respondent to maintain privacy via the possibility of randomizing his answer ([Warner 1965](#)). The technique has been refined

and several variants of the original method have been developed and implemented.⁴ All of these variants rely on the principle that the respondent uses a randomizing device, which is ideally under her control, to select which of two (or more) questions she will answer. Only the respondent knows the outcome of the randomizing device (e.g. cards, coins, dice) and whether they answered to the sensitive question or a surrogate. Since the interviewer is unaware of the outcome of the random experiment, a given answer does not reveal anything definite about the respondent's true status. Given the assumption that respondents understand the RRT scheme and comply with the RRT procedure, more accurate self-reports to sensitive questions are expected compared to direct questioning.

In the following, Warner's original scheme is described to illustrate the rationale of RRT schemes in general: The respondent is confronted with two statements, the socially undesirable one (e.g., 'I sometimes smoke marijuana') and its negation (e.g., 'I never smoke marijuana'). The interviewer asks 'Do you agree with the following statement?' Using a randomizer, the respondent determines which of the two statements he will answer. For example, the respondent may be given a box of 9 coloured marbles, 5 yellow and 4 blue marbles, and told to take one marble out of the box and to respond to the first statement if a yellow marble is selected, but to respond to the second statement if a blue marble is selected. Without revealing the outcome of the random experiment to the interviewer, the respondent answers with either a 'yes' or a 'no' according to his marijuana smoking habits.

In Warner's design, the prevalence of the socially undesirable behavior can be estimated on the basis of elementary probability theory: The expected value ϕ of observing a 'yes' answer can be modelled as $\phi = p\pi + (1 - p)(1 - \pi)$, where π is the unknown proportion of marijuana smokers in the population, and p ($p \neq 0.5$) is the probability that the statement 'I sometimes smoke marijuana' is selected. Since the observed sample proportion of 'yes' answers is an estimate of ϕ , and the selection probability p is given by design, the population prevalence of the socially undesirable behavior π can be estimated. Such probabilistic link between the observed answer and the respondent's true status is also at the heart of alternative RRT schemes (overviews of proportion and variance estimators for different RRT schemes can be found in [Fox and Tracy 1986](#)). Furthermore, the relationship between explanatory variables and the socially undesirable characteristic is of interest. Adapted logistic regression models allow for the analysis of the relationship between a response variable measured by the RRT and background variables ([Maddala 1983](#); [Scheers and Dayton 1988](#)).

Several experimental studies comparing results generated by the RRT with alternative data collection methods indicate that the RRT provides more valid estimates of stigmatized, illegal or socially undesirable behavior like drug use (RRT versus direct questioning; [Goodstadt and Gruson 1975](#)), child abuse (RRT versus self-administered interview using the sealed-envelope technique versus classical mail survey; [Zdep and Rhodes 1976](#)), premature sign-offs on audits (RRT versus self-administered questionnaire; [Buchman and Tracy 1982](#); [Reckers et al. 1997](#)), academic cheating behavior among students (RRT versus self-administered questionnaire; [Scheers and Dayton 1987](#)) and abortion (RRT versus face-to-face interview versus audio computer-assisted self-interview versus self-administered questionnaire; [Lara et al.](#)

⁴ Development of RRT schemes in chronological order: (1) Warner's original method: statement and negation of the statement procedure ([Warner 1965](#)); (2) the unrelated question technique with unknown population prevalence of the innocuous attribute ([Greenberg et al. 1969, 1971](#); [Horvitz et al 1967](#)); (3) the forced response technique ([Boruch 1971](#)); (4) Moor's procedure ([Moors 1971](#)); (5) Kuk's 'two packs of cards' technique ([Kuk 1990](#)); (6) two-stage RRT formats ([Mangat 1994](#); [Mangat and Singh 1990](#)).

Also, another body of statistical literature shows considerable progress in the optimization and enhancement (e.g. improving efficiency) of RRT estimators: [Bellhouse \(1980\)](#), [Bourke and Moran \(1988\)](#), [Dowling and Shachtman \(1975\)](#), [Folsom et al. \(1973\)](#), [Liu and Chow \(1976\)](#), [Loynes \(1976\)](#), [O'Hagan \(1987\)](#), [Pollock and Bek \(1976\)](#), [Sen \(1974\)](#) and [Tamhane \(1981\)](#).

2004). In addition, validation studies comparing responses generated by different methods to individual ‘true scores’ determined from administrative or medical records, confirm the effectiveness of the RRT in reducing response bias in socially sensitive self-reports like self-reported arrests (RRT versus direct questioning; Tracy and Fox 1981) and welfare benefit fraud (RRT versus computer-assisted self-interview versus face-to-face direct questioning; Van der Heijden et al. 2000). Lensvelt-Mulders et al. (2005) conducted a meta-analysis of 6 validation studies and 32 experimental studies without validation data comparing the RRT with other interview methods such as computer-assisted self-interviews or face-to-face direct questioning. Overall, their results indicate that self-reports on sensitive issues are more accurate and more socially undesirable answers are elicited when RRT is employed.

However, other studies have found no superiority of the RRT and standard direct questioning sometimes elicited more socially undesirable answers than did the RRT (for an overview see Holbrook and Krosnick 2010a). Furthermore, some studies yielded evidence suggesting difficulties in making the RRT practical (McAuliffe et al. 1991; Stem and Steinhorst 1984; Weissman et al. 1986). RRT questions impose a higher cognitive burden on the question-and-answer process compared to more conventional data collection methods (Lensvelt-Mulders and Boeije 2007). Some respondents assume a trick and therefore may be confused and distrustful (Boeije and Lensvelt-Mulders 2002; Landsheer et al. 1999; Wiseman et al. 1976). Empirical evidence indicates that a substantial proportion of respondents do not comply with the RRT instructions. They give self-protective ‘no’-answers regardless of the outcome of the random device. New developments in the analysis of RRT data account for such self-protective response behavior (Cruyff et al. 2007; Ostapczuk et al. 2009; Coutts and Jann 2011). Alternatively, the crosswise model was proposed to overcome some of the drawbacks of the RRT (Yu et al. 2008; Jann et al. 2011; Coutts et al. 2011).

5.7 The unmatched count technique

The unmatched count technique (UCT) was developed as an alternative to the RRT to protect the respondent’s privacy in sensitive surveys. Several other labels, which all refer to the same method, can be found in the literature: ‘Block total response’ (Raghavarao and Federer 1979; Smith et al. 1974), ‘item count technique’ (Chaudhuri and Christofides 2007; Droitcour et al. 1991; Tsuchiya 2005), ‘unmatched count technique’ (Dalton et al. 1994; Coutts and Jann 2011) or ‘unmatched block count’ (Dalton et al. 1997).

Two subsamples of respondents are generated via randomization. One group of respondents is asked to answer to a short list (SL) of items including only a set of innocuous items (j). The other group of respondents is requested to respond to a long list (LL) of items including the same set of innocuous items plus the sensitive item ($j + 1$). For example, to estimate the prevalence of bilking the following list of items could be used:

1. Have you been to a restaurant, café or bar during the last year? (SL and LL)
2. Have you had dinner in a three-star restaurant during the last four years? (SL and LL)
3. Have you ever left a restaurant or café without paying the bill on purpose? (sensitive item, LL only)
4. Have you run a restaurant by yourself during the last five years? (SL and LL)

Without telling the interviewer which specific items were answered ‘yes’, respondents in both groups count the number of ‘yes’-answers and report solely the sum of items with ‘yes’-answers. Since only the number of items in which the respondent was involved is reported, it is not possible to infer whether the respondent engaged in the stigmatized behavior unless ‘yes’-answers were given to all or none of the items in the list. The procedure is expected to heighten

the respondents' sense of privacy thus eliciting more socially undesirable answers compared to standard direct questioning. An unbiased estimate of the population's proportion involved in the norm-violating behavior can be obtained by calculating the difference between the two subsample means $\hat{\pi} = \bar{x}_{j+1} - \bar{x}_j$, where \bar{x}_{j+1} is the observed sample mean of 'yes'-responses in the group answering to the long list (LL) and \bar{x}_j is the observed sample mean of 'yes'-responses in the subsample answering to the short list (SL). A double-lists variant of the UCT produces a more efficient estimator compared to the basic procedure (overviews of proportion and variance estimators for different UCT schemes can be found in [Biemer et al. 2005](#); [Droitcour et al. 1991](#); [Tsuchiya et al. 2007](#)).

In several empirical studies, the UCT was applied to estimate the proportion of persons involved in socially undesirable activities (for an overview see [Holbrook and Krosnick 2010b](#)). Some studies found significantly higher proportions of stigmatizing self-reports in the UCT condition compared to direct questioning for behaviors like employee theft ([Wimbush and Dalton 1997](#)), sexual risk behavior after drinking among college students ([LaBrie and Earleywine 2000](#)), hate crime victimization among college students ([Rayburn et al. 2003](#)), eating disordered behavior and attitudes ([Anderson et al. 2007](#)), and shoplifting ([Tsuchiya et al. 2007](#)). However, studies on cocaine use prevalence found significantly lower survey estimates for the UCT compared to standard direct questioning ([Biemer and Brown 2005](#); [Biemer et al. 2005](#)). The reason for failure of the UCT to yield more accurate estimates of cocaine use could have resulted from measurement errors due to problems in cognitive processing: "Deciding which items apply and keeping a running tally of these as the list is read has proven difficult for some respondents." ([Biemer et al. 2005](#), p. 150).

5.8 The nominative technique

The 'nominative technique' (NT) is a variant of the multiplicity methods developed by Sirken ([Sirken 1970, 1975](#); [Sirken et al. 1975](#)). The NT requires the interviewee to serve as an informant by reporting about threatening or illegal behaviors of other persons (e.g. relatives or friends) which are 'nominated' by the interviewee. The anonymity of the persons whose behavior is reported is guaranteed because the interviewer is ignorant about whom the incriminating information is being provided ([Lee 1993](#)). One attempt to estimate the prevalence of socially undesirable behavior ('being intoxicated' and 'smoking marijuana') via NT can be seen in [Sudman et al. \(1977b\)](#). Furthermore, the National Surveys on Drug Abuse 1977, 1979, and 1982 (conducted in the U.S.) used a variant of the NT to estimate the lifetime prevalence of heroin use. As a result, the NT yielded higher estimates of lifetime heroin prevalence compared to the corresponding self-report estimates. The NT version asked the respondent to report, first, how many of his or her close friends have ever used heroin, and second, how many other close friends of each reported heroin user also knew that he or she used heroin. The second question estimates the number of persons which could also report that heroin user and thus allows for the calculation of weights that correct for multiple reports/counts of a particular heroin user ([Droitcour 1985](#), p. 108). Each reported heroin user is weighed inversely to his probability of being reported: The reporting weight is defined as the inverse of the total number of subjects T in the population who are eligible to report a specific heroin user i : $\frac{1}{1+T_{ij}}$.

For each respondent j , the reporting weight must be attached to each report of a heroin-using friend i . In the case of a complete census of the population, weighted individual reports of heroin users could simply be added for all users in the population, so that the total sum of weighted counts of heroin users would equal the total number of heroin users in

the population. In order to obtain the population's proportion of heroin users, the total sum of weighted counts has to be divided by the total population size. The same logic could be applied to the calculation of survey estimates from sample data.

One advantage of the NT is smaller sampling error of estimates compared to estimates based on self-reports. Reported clusters of x 'nominated' friends provide an effective sample size between one and x times the individual sample size. The intra-cluster correlation ρ among reports i within respondents j will determine the decrease in sampling variance of survey estimates based on NT. A decreasing ρ , measuring the degree of homogeneity of reports within respondents, increases the effective sample size and decreases the sampling variance of survey estimates based on clusters (Kish 1965). However, sampling error is only one dimension of total response error. Response accuracy is questionable because many respondents don't know the number of persons who also know about the heroin use of the respondent's close friends: "In fact, the nominative approach might tend to produce over-estimates, because of the potential for undercounts of the numbers of others who 'know' (Droitcour 1985, p. 116). Future survey studies should conduct additional validity tests of the NT by comparing sensitive behaviors with non-sensitive behaviors. The assumption 'higher validity in the NT condition' would be supported if the NT estimates yielded higher prevalence rates for sensitive behaviors and prevalence estimates similar to results based on self-reporting for non-sensitive behaviors.

6 Summary and perspectives

The review of the theoretical and empirical literature on the determinants of social desirability bias identified several factors assumed to affect the respondent's propensity to self-report accurately on sensitive topics. On the one hand, the concept 'sensitivity' refers to certain behaviors that are taboo, illegal or socially sanctioned. On the other hand, the term also encompasses unsocial attitudes and opinions. A respondent's confession of being involved in activities that clearly violate social norms could either cause embarrassment in the interview situation or result in legal or social sanctions in the case that the sensitive information would become public. Anticipating such risks and threats, survey respondents often choose to misreport on sensitive topics or not to answer at all. The respondent's need for social approval, self-presentation concerns and impression management strategies yield socially desirable responses on the individual level and a predictable bias in survey estimates on the aggregate level. In the case of socially undesirable activities, sample proportions will underestimate the true prevalence and frequency of the frowned upon activities in question. In the case of socially desirable behavior, an overestimation of the true level will occur. The degree of social desirability bias in sensitive surveys depends on the perceived items' sensitivity, the degree of privacy in the interview situation, the fraction of the population who have behaved in the socially undesirable manner, and on specific aspects of the survey design.

Improving the validity of answers to sensitive questions has proved a difficult task. Social desirability bias could be reduced by appropriately tailoring the survey design. The literature review of the recent research indicates that cognitive psychologists, social scientists and survey statisticians have made some progress in reducing measurement errors due to deliberate misreporting on sensitive topics, principally by increasing the anonymity of the question-and-answer process (e.g. via the randomized response technique or self-administered interviews), by decreasing the respondent's concerns in admitting to some taboo (e.g. via confidentiality assurances or clever wording and framing of the sensitive item), by increasing the respondent's subjective probability of being caught as a liar (e.g. via the bogus pipeline procedure),

by heightening the respondent's subjective benefit of telling the truth (e.g. via emphasizing the importance and scientific character of the survey), or by manipulating the survey situation (such as reducing the presence of the interviewer and bystanders).

Future research on sensitive topics could investigate the interaction effect between psychological variables and design aspects on survey response in more detail. Such research would deepen our understanding of the cognitive mechanisms underlying the link between survey design and survey response. For example, the literature review shows that the effectiveness of the bogus pipeline procedure is still controversial. Psychological variables such as the perceived level of the items' sensitivity or trust in the institution conducting the survey could moderate the effectiveness of these methods. Therefore, prospective survey studies are encouraged to advance the approaches of Bradburn and Sudman (1979) and Rasinski et al. (1994, 1999) and to include rating-scales measuring the respondents' and the interviewers' perceived sensitivity of the overall survey situation and the perceived sensitivity of specific items. It would be possible to identify specific subgroups which are characterized by different degrees of sensitivity perceptions and to study the complex interactions between these perceptions and the survey design.

Finally, a stronger foundation of the research on sensitive topics in a general theory of human action could further illuminate the social mechanisms operating in the interview situation. The survey interview involves social interactions between several actors (respondents, interviewers, bystanders, and data collection institutions). The impact of varying degrees of anonymity in interactive social situations could be analyzed by means of rational choice theory (e.g. Levitt and List 2007). A clearer understanding of the social interactions in the data collection process and the effects of these interactions on data quality could provide applied researchers with a substantiated basis for designing better data collection instruments and conducting high quality surveys.

References

- Aguinis, H., Pierce, C.A., Quigley, B.M.: Conditions under which a bogus pipeline procedure enhances the validity of self-reported cigarette-smoking—a meta-analytic review. *J. Appl. Soc. Psychol.* **23**, 352–373 (1993)
- Aguinis, H., Pierce, C.A., Quigley, B.M.: Enhancing the validity of self-reported alcohol and marijuana consumption using a bogus pipeline procedure—a metaanalytic review. *Basic Appl. Soc. Psychol.* **16**, 515–527 (1995)
- Akers, R.L., Massey, J., Clarke, W., Lauer, R.M.: Are self-reports of adolescent deviance valid? Biochemical measures, randomized response, and the bogus pipeline in smoking behavior. *Soc. Forc.* **62**, 234–251 (1983)
- Anderson, B.A., Silver, B.D., Abramson, P.R.: The effects of race of the interviewer on measures of electoral-participation by blacks in SRC national elections studies. *Publ. Opin. Q.* **52**, 53–83 (1988)
- Anderson, D.A., Simmons, A.M., Milnes, S.M., Earleywine, M.: Effect of response format on endorsement of eating disordered attitudes and behaviors. *Int. J. Eat. Disord.* **40**, 90–93 (2007)
- Aquilino, W.S.: Privacy effects on self-reported drug use: interactions with survey mode and respondent characteristics. In: Harrison, L., Hughes, A. (eds.) *The Validity of Self-Reported Drug Use: Improving the Accuracy Of Survey Estimates*. National Institute on Drug Abuse Monograph 167, NIH, DHHS, Washington (1997)
- Aquilino, W.S., Wright, D.L., Supple, A.J.: Response effects due to bystander presence in CASI and paper-and-pencil surveys of drug use and alcohol use. *Subst. Use Misuse* **35**, 845–867 (2000)
- Barnett, J.: Sensitive questions and response effects: an evaluation. *J. Manag. Psychol.* **13**, 63–76 (1998)
- Barton, A.H.: Asking the embarrassing question. *Publ. Opin. Q.* **22**, 67–68 (1958)
- Becker, R.: Selective response to questions on delinquency. *Qual. Quant.* **40**, 483–498 (2006)
- Becker, R., Günther, R.: Selektives Antwortverhalten bei Fragen zum delinquenten Handeln—Eine empirische Studie über die Wirksamkeit der „sealed envelope technique“ bei selbstberichteter Delinquenz mit Daten des ALLBUS 2000. *ZUMA-Nachrichten* **54**, 39–59 (2004)

- Bellhouse, D.R.: Linear models for randomized response design. *J. Am. Stat. Assoc.* **75**, 1001–1004 (1980)
- Beyer, H., Krumpal, I.: “Aber es gibt keine Antisemiten mehr”: Eine experimentelle Studie zur Kommunikationslansatz antisemitischer Einstellungen. *Kölner Z. für Soziol. und Sozialpsychol.* **62**, 681–705 (2010)
- Biemer, P., Brown, G.: Model-based estimation of drug use prevalence using item count data. *J. Off. Stat.* **21**, 287–308 (2005)
- Biemer, P., Jordan, B.K., Hubbard, M.L., Wright, D.: A test of the item count methodology for estimating cocaine use prevalence. In: Kennet, J., Gfroerer, J. (eds.) *Evaluating and Improving Methods Used in the National Survey on Drug use and Health, Substance Abuse and Mental Health Service Administration, Office of Applied Studies, Rockville* (2005)
- Boeije, H., Lensvelt-Mulders, G.J.L.M.: Honest by chance: a qualitative interview study to clarify respondents’ (non-)compliance with computer-assisted randomized response. *Bull. Methodol. Sociol.* **75**, 24–39 (2002)
- Boruch, R.F.: Assuring confidentiality of responses in social research: a systematic analysis. *A. Psychol.* **26**, 413–430 (1971)
- Bourke, P.D., Moran, M.A.: Estimating proportions from randomized response using the EM algorithm. *J. Am. Stat. Assoc.* **83**, 964–968 (1988)
- Bradburn, N.M., Sudman, S.: *Improving Interview Method and Questionnaire Design*. Jossey-Bass, San Francisco (1979)
- Brener, N.D., Eaton, D.K., Kann, L., Grunbaum, J.A., Gross, L.A., Kyle, T.M., Ross, J.G.: The association of survey setting and mode with self-reported health risk behaviors among high school students. *Publ. Opin. Q.* **70**, 354–374 (2006)
- Buchman, T.A., Tracy, J.A.: Obtaining responses to sensitive questions: conventional questionnaire versus randomized response technique. *J. Account. Res.* **20**, 263–271 (1982)
- Campanelli, P.C., Dielman, T.E., Shope, J.T.: Validity of adolescents self-reports of alcohol-use and misuse using a bogus pipeline procedure. *Adolescence* **22**, 7–22 (1987)
- Chaudhuri, A., Christofides, T.C.: Item Count Technique in estimating the proportion of people with a sensitive feature. *J. Stat. Planning Infer.* **137**, 589–593 (2007)
- Coutts, E., Jann, B.: Sensitive questions in online surveys: experimental results for the randomized response technique (RRT) and the unmatched count technique (UCT). *Sociol. Methods Res.* **40**, 169–193 (2011)
- Coutts, E., Jann, B., Krumpal, I., Näher, A.-F.: Plagiarism in student papers: prevalence estimates using special techniques for sensitive questions. *J. Econ. Stat.* **231**, 749–760 (2011)
- Crowne, D., Marlowe, D.: A new scale of social desirability independent of psychopathology. *J. Consult. Psychol.* **24**, 349–354 (1960)
- Crowne, D., Marlowe, D.: *The Approval Motive*. John Wiley, New York (1964)
- Cruyff, M.J.L.F., van den Hout, A., van der Heijden, P.G.M., Bockenholt, U.: Log-linear randomized-response models taking self-protective response behavior into account. *Sociol. Methods Res.* **36**, 266–282 (2007)
- Dalton, D.R., Wimbush, J.C., Daily, C.M.: Using the unmatched count technique (UCT) to estimate base rates for sensitive behavior. *Pers. Psychol.* **47**, 817–828 (1994)
- Dalton, D.R., Daily, C.M., Wimbush, J.C.: Collecting “sensitive” data in business ethics research: a case for the unmatched count technique (UCT). *J. Bus. Ethics* **16**, 1049–1057 (1997)
- De Leeuw, E.D.: Reducing missing data in surveys: an overview of methods. *Qual. Quant.* **35**, 147–160 (2001)
- De Leeuw, E.D., Hox, J.J., Dillman, D.A.: Mixed mode surveys: when and why? In: De Leeuw, E.D., Hox, J.J., Dillman, D.A. (eds.) *The International Handbook of Survey Methodology*, Erlbaum/Taylor & Francis, New York (2008)
- Decker, O., Brähler, E.: *Vom Rand zur Mitte: Rechtsextreme Einstellungen und ihre Einflussfaktoren in Deutschland*. Friedrich-Ebert-Stiftung, Forum Berlin (2006)
- DeMaio, T.J.: Social desirability and survey measurement: a review. In: Turner, C.F., Martin, E. (eds.) *Surveying Subjective Phenomena*, pp. 257–281. Russel Sage, New York (1984)
- DePaulo, B.M., Kirkendol, S.E., Kashy, D.A., Wyer, M.M., Epstein, J.A.: Lying in everyday life. *J. Pers. Soc. Psychol.* **70**, 979–995 (1996)
- DePaulo, B.M., Lindsay, J.J., Malone, B.E., Muhlenbruck, L., Charlton, K., Cooper, H.: Cues to deception. *Psychol. Bull.* **129**, 74–118 (2003)
- Des Jarlais, D.C., Paone, D., Milliken, J., Turner, C.F., Miller, H., Gribble, J., Shi, Q.H., Hagan, H., Friedman, S.R.: Audio-computer interviewing to measure risk behaviour for HIV among injecting drug users: a quasi-randomised trial. *Lancet* **353**, 1657–1661 (1999)
- Dowling, T.A., Shachtman, R.H.: On the relative efficiency of randomized response technique. *J. Am. Stat. Assoc.* **70**, 84–87 (1975)
- Droitcour, J.: The nominative technique: a new method of estimating heroin prevalence. In: Rouse, B.A., Kozel, N.J., Richards, L.G. (eds.) *Self-Report Methods of Estimating Drug Use: Meeting Current Challenges to Validity*, Fishers Lane, pp. 104–124. National Institute on Drug Abuse (NIDA), Rockville (1985)

- Droitcour, J., Caspar, R.A., Hubbard, M.L., Parsely, T.L., Visscher, W., Ezzati, T.M.: The item count technique as a method of indirect questioning: a review of its development and a case study application. In: Biemer, P., Groves, R.M., Lyberg, L., Mathiowetz, N., Sudman, S. (eds.) *Measurement Errors in Surveys*, pp. 85–210. Wiley, New York (1991)
- Esser, H.: Können Befragte lügen?—Zum Konzept des “wahren Wertes” im Rahmen der handlungstheoretischen Erklärung von Situationseinflüssen bei der Befragung. *Kölner Zeitschrift für Soziologie Und Sozialpsychologie* **38**, 314–336 (1986)
- Fendrich, M., Johnson, T.P.: Examining prevalence differences in three national surveys of youth: impact of consent procedures, mode, and editing rules. *J. Drug Issues* **31**, 615–642 (2001)
- Folsom, R.E., Greenberg, B.G., Horvitz, D.G., Abernathy, J.R.: The two alternate questions randomized response model for human surveys. *J. Am. Stat. Assoc.* **68**, 525–530 (1973)
- Fowler, F.J. Jr.: *Improving Survey Questions: Design and Evaluation*. Sage, Thousand Oaks (1995)
- Fowler, F.J. Jr., Mangione, T.W.: *Standardized Survey Interviewing: Minimizing Interviewer-Related Error*. Sage, Newbury Park (1990)
- Fox, J.A., Tracy, P.E.: *Randomized Response: A Method for Sensitive Surveys*. Sage, Beverly Hills (1986)
- Gfroerer, J., Wright, D., Kopstein, A.: Prevalence of youth substance use: the impact of methodological differences between two national surveys. *Drug Alcohol Depend.* **47**, 19–30 (1997)
- Goodstadt, M.S., Gruson, V.: The randomized response technique: a test of drug use. *J. Am. Stat. Assoc.* **70**, 814–818 (1975)
- Greenberg, B.G., Abul-El, A.-L.A., Simmons, W.R., Horvitz, D.G.: The unrelated question randomized response model for human surveys. *J. Am. Stat. Assoc.* **64**, 520–539 (1969)
- Greenberg, B.G., Kuebler, R.R. Jr., Abernathy, J.R., Horvitz, D.G.: Application of the randomized response technique in obtaining quantitative data. *J. Am. Stat. Assoc.* **66**, 243–250 (1971)
- Gribble, J.N., Miller, H.G., Rogers, S.M., Turner, C.F.: Interview mode and measurement of sexual behaviors: methodological issues. *J. Sex Res.* **36**, 16–24 (1999)
- Groves, R.M.: *Survey Errors and Survey Costs*. Wiley, New York (1989)
- Groves, R.M., Fowler, F.J. Jr., Couper, M.P., Lepkowski, J.M., Singer, E., Tourangeau, R.: *Survey Methodology*. Wiley, Hoboken (2004)
- Hartmann, P.: Response behavior in interview settings of limited privacy. *Int. J. Publ. Opin. Res.* **7**, 383–390 (1995)
- Holbrook, A.L., Krosnick, J.A.: Measuring voter turnout by using the randomized response technique: evidence calling into question the method’s validity. *Publ. Opin. Q.* **74**, 328–343 (2010a)
- Holbrook, A.L., Krosnick, J.A.: Social desirability bias in voter turnout reports: tests using the item count technique. *Publ. Opin. Q.* **74**, 37–67 (2010b)
- Holbrook, A.L., Green, M.C., Krosnick, J.A.: Telephone versus face-to-face interviewing of national probability samples with long questionnaires - Comparisons of respondent satisficing and social desirability response bias. *Publ. Opin. Q.* **67**, 79–125 (2003)
- Holtgraves, T.: Social desirability and self-reports: testing models of socially desirable responding. *Pers. Soc. Psychol. Bull.* **30**, 161–172 (2004)
- Holtgraves, T., Eck, J., Lasky, B.: Face management, question wording, and social desirability. *J. Appl. Soc. Psychol.* **27**, 1650–1671 (1997)
- Horvitz, D.G., Shah, B.V., Simmons, W.R.: The unrelated question randomized response model. In: *Proceedings of the Social Statistics Section*, pp. 65–72. ASA (1967)
- Hox, J.J., De Leeuw, E.D.: The influence of interviewers’ attitude and behavior on household survey nonresponse: an international comparison. In: Groves, R.M., Dillman, D.A., Eltinge, J.L., Little, R.J.A. (eds.) *Survey Nonresponse*, pp. 103–120. Wiley, New York (2002)
- Jann, B., Jerke, J., Krumpal, I.: Asking sensitive questions using the crosswise model: an experimental survey measuring plagiarism. *Publ. Opin. Q.* (2011). doi:[10.1093/poq/nfr036](https://doi.org/10.1093/poq/nfr036)
- Johnson, T., Vijver, F.J. van de: Social desirability in cross-cultural research. In: Harness, J., Vijver, F.J. van de, Mohler, P. (eds.) *Cross-Cultural Survey Methods*, pp. 193–202. Wiley, New York (2002)
- Jones, E.E., Sigall, H.: Bogus pipeline—new paradigm for measuring affect and attitude. *Psychol. Bull.* **76**, 349–354 (1971)
- Kann, L., Brener, N.D., Warren, C.W., Collins, J.L., Giovino, G.A.: An assessment of the effect of data collection setting on the prevalence of health risk behaviors among adolescents. *J. Adolesc. Health* **31**, 327–335 (2002)
- Katz, D.: Do interviewers bias poll results? *Publ. Opin. Q.* **6**, 248–268 (1942)
- Kish, L.: *Survey Sampling*. Wiley, New York (1965)
- Krysan, M.: Privacy and the expression of white racial attitudes—a comparison across three contexts. *Publ. Opin. Q.* **62**, 506–544 (1998)
- Kuk, A.Y.C.: Asking sensitive questions indirectly. *Biometrika* **77**, 436–438 (1990)

- 2802

- Randall, D.M., Fernandes, M.F.: The social desirability response bias in ethics research. *J. Bus. Ethics* **10**, 805–817 (1991)
- Rasinski, K.A., Baldwin, A.K., Willis, G.B., Jobe, J.B.: Risk and Loss Perceptions Associated with Survey Reporting of Sensitive Topics. pp. 497–502. National Opinion Research Center (NORC), Chicago (1994)
- Rasinski, K.A., Willis, G.B., Baldwin, A.K., Yeh, W.C., Lee, L.: Methods of data collection, perceptions of risks and losses, and motivation to give truthful answers to sensitive survey questions. *Appl. Cogn. Psychol.* **13**, 465–484 (1999)
- Rauhut, H., Krumpal, I.: Die Durchsetzung sozialer Normen in low-cost und high-cost situationen. *Z. für Soziol.* **37**, 380–402 (2008)
- Rayburn, N.R., Earleywine, M., Davison, G.C.: Base rates of hate crime victimization among college students. *J. Interpers. Violence* **18**, 1209–1221 (2003)
- Reckers, P.M.J., Wheeler, S.W., Wong-On-Wing, B.: A comparative examination of auditor premature sign-offs using the direct and the randomized response methods. *Audit. J. Pract. Theory* **16**, 69–78 (1997)
- Reuband, K.H.: Unerwünschte Dritte beim Interview: Erscheinungsformen und Folgen. *Zeitschrift Für Soziologie* **16**, 303–308 (1987)
- Reuband, K.H.: On 3rd persons in the interview situation and their impact on responses. *Int. J. Publ. Opin. Res.* **4**, 269–274 (1992)
- Robinson, D., Rhode, S.: 2 experiments with an anti-semitism poll. *J. Abnorm. Soc. Psychol.* **41**, 136–144 (1946)
- Roese, N.J., Jamieson, D.W.: 20 years of bogus pipeline research—a critical-review and metaanalysis. *Psychol. Bull.* **114**, 363–375 (1993)
- Rootman, I., Smart, R.G.: A comparison of alcohol, tobacco and drug-use as determined from household and school surveys. *Drug Alcohol Depend.* **16**, 89–94 (1985)
- Schaeffer, N.C.: Asking questions about threatening topics: a selective overview. In: Stone, A., Turkkan, J., Bachrach, C., Cain, V., Jobe, J., Kurtzman, H. (eds.) *The Science of Self-Report: Implications for Research and Practice*, pp. 105–121. Erlbaum, Mahwah (2000)
- Scheers, N.J., Dayton, C.M.: Improved estimation of academic cheating behavior using the randomized-response technique. *Res. Higher Educ.* **26**, 61–69 (1987)
- Scheers, N.J., Dayton, C.M.: Covariate randomized response models. *J. Am. Stat. Assoc.* **83**, 969–974 (1988)
- Schnell, R., Kreuter, F.: Separating interviewer and sampling-point effects. *J. Off. Stat.* **21**, 389–410 (2005)
- Schuman, H., Converse, J.M.: Effects of black and white interviewers on black responses in 1968. *Publ. Opin. Q.* **35**, 44–68 (1971)
- Sen, P.K.: On unbiased estimation for randomized response models. *J. Am. Stat. Assoc.* **69**, 997–1001 (1974)
- Singer, E., Kohnke-Aquirre, L.: Interviewer expectation effects—replication and extension. *Publ. Opin. Q.* **43**, 245–260 (1979)
- Singer, E., Hippler, H.J., Schwarz, N.: Confidentiality assurances in surveys—reassurance or threat. *Int. J. Publ. Opin. Res.* **4**, 256–268 (1992)
- Singer, E., Vonthurn, D.R., Miller, E.R.: Confidentiality assurances and response—a quantitative review of the experimental literature. *Publ. Opin. Q.* **59**, 66–77 (1995)
- Sirken, M.: Household surveys with multiplicity. *J. Am. Stat. Assoc.* **65**, 257–266 (1970)
- Sirken, M.: Network surveys of rare and sensitive conditions. In: *Advances in Health Survey Research Methods*. National Center on Health Statistics Research Proceedings Series, pp. 31–32 (1975)
- Sirken, M., Indefurth, G.P., Burnham, C.E., Danchik, K.M.: Household sample surveys of diabetes: design effects of counting rules. In: *Proceedings of the American Statistical Association*, pp. 659–663. Social Statistics Section (1975)
- Sirken, M., Willis, G.B., Nathan, G.: Cognitive aspects of answering sensitive survey questions. *Bull. Int. Stat. Inst.* **48**, 628–629 (1991)
- Smith, T.W.: Discrepancies between men and women in reporting number of sexual partners - a summary from 4 countries. *Soc. Biol.* **39**, 203–211 (1992)
- Smith, T.W.: The impact of the presence of others on a respondent's answers to questions. *Int. J. Publ. Opin. Res.* **9**, 33–47 (1997)
- Smith, L.L., Federer, W.T., Raghavarao, D.: A comparison of three techniques for eliciting truthful answers to sensitive questions. In: *Proceedings of the American Statistical Association*, pp. 447–452. Social Statistics Section (1974)
- Stem, D.E., Steinhorst, R.K.: Telephone interview and mail questionnaire applications of the randomized response model. *J. Am. Stat. Assoc.* **79**, 555–564 (1984)
- Stocké, V.: Determinants and consequences of survey respondents' social desirability beliefs about racial attitudes. *Methodology* **3**, 125–138 (2007a)
- Stocké, V.: The interdependence of determinants for the strength and direction of social desirability bias in racial attitude surveys. *J. Off. Stat.* **23**, 493–514 (2007b)

- Stocké, V., Hunkler, C.: Measures of desirability beliefs and their validity as indicators for socially desirable responding. *Field Methods* **19**, 313–336 (2007)
- Sudman, S., Bradburn, N.M.: *Response Effects in Surveys: A Review and Synthesis*. Aldine, Chicago (1974)
- Sudman, S., Bradburn, N.M.: *Asking Questions: A Practical Guide to Questionnaire Design*. Jossey-Bass, San Francisco (1982)
- Sudman, S., Bradburn, N.M., Blair, E., Stocking, C.: Modest expectations—effects of interviewers prior expectations on responses. *Sociol. Methods. Res.* **6**, 171–182 (1977a)
- Sudman, S., Blair, E., Bradburn, N., Stocking, C.: Estimates of threatening behavior based on reports of friends. *Publ. Opin. Q.* **41**, 261–264 (1977b)
- Tamhane, A.C.: Randomized response techniques for multiple sensitive attributes. *J. Am. Stat. Assoc.* **76**, 916–923 (1981)
- Tentler, T.N.: *Sin and Confession on the Eve of the Reformation*. Princeton University Press, Princeton (1977)
- Tourangeau, R., Smith, T.W.: Asking sensitive questions—the impact of data collection mode, question format, and question context. *Publ. Opin. Q.* **60**, 275–304 (1996)
- Tourangeau, R., Rasinski, K.A., Jobe, J., Smith, T.W., Pratt, W.F.: Sources of error in a survey on sexual behavior. *J. Off. Stat.* **13**, 341–365 (1997)
- Tourangeau, R., Rips, L.J., Rasinski, K.A.: *The Psychology of Survey Response*. Cambridge University Press, Cambridge (2000)
- Tourangeau, R., Yan, T.: Sensitive questions in surveys. *Psychol. Bull.* **133**, 859–883 (2007)
- Tracy, P.S., Fox, J.A.: The validity of randomized response for sensitive measurements. *Am. Sociol. Rev.* **46**, 187–200 (1981)
- Tsuchiya, T.: Domain estimators for the item count technique. *Survey Methodol.* **31**, 41–51 (2005)
- Tsuchiya, T., Hirai, Y., Ono, S.: A study of the properties of the item count technique. *Publ. Opin. Q.* **71**, 253–272 (2007)
- Turner, C.F., Ku, L., Rogers, S.M., Lindberg, L.D., Pleck, J.H., Sonenstein, F.L.: Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science* **280**, 867–873 (1998)
- Turner, C.F., Villarroel, M.A., Rogers, S.M., Eggleston, E., Ganapathi, L., Roman, A.M., Al-Tayyib, A.: Reducing bias in telephone survey estimates of the prevalence of drug use: a randomized trial of telephone audio-CASI. *Addiction* **100**, 1432–1444 (2005)
- Van der Heijden, P.G.M., Gils, G. van, Bouts, J., Hox, J.J.: A comparison of randomized response, computer-assisted self-interview, and face-to-face direct questioning – eliciting sensitive information in the context of welfare and unemployment benefit. *Sociol. Methods Res.* **28**, 505–537 (2000)
- Villarroel, M.A., Turner, C.F., Eggleston, E., Al-Tayyib, A., Rogers, S.M., Roman, A.M., Cooley, P.C., Gordke, H.: Same-gender sex in the United States—impact of T-ACASI on prevalence estimates. *Publ. Opin. Q.* **70**, 166–196 (2006)
- Villarroel, M.A., Turner, C.F., Rogers, S.M., Roman, A.M., Cooley, P.C., Steinberg, A.B., Eggleston, E., Chromy, J.R.: T-ACASI reduces bias in STD measurements: the national STD and behavior measurement experiment. *Sex. Transm. Dis.* **35**, 499–506 (2008)
- Warner, S.L.: Randomized response: a survey technique for eliminating evasive answer bias. *J. Am. Stat. Assoc.* **60**, 63–69 (1965)
- Weissman, A.N., Steer, R.A., Lipton, D.S.: Estimating illicit drug use through telephone interviews and the randomized response technique. *Drug Alcohol Depend.* **18**, 225–233 (1986)
- Willis, G.B., Sirken, M., Nathan, G.: The cognitive aspects of responses to sensitive survey questions. In: *Working Paper Series 9*. Hyattsville, MD: National Center for Health Statistics, Cognitive Methods Staff (1994)
- Wimbush, J.C., Dalton, D.R.: Base rate for employee theft: convergence of multiple methods. *J. Appl. Psychol.* **82**, 756–763 (1997)
- Wiseman, F., Moriarty, M., Schafer, M.: Estimating public-opinion with randomized response model. *Publ. Opin. Q.* **39**, 507–513 (1976)
- Yu, J.W., Tian, G.L., Tang, M.L.: Two new models for survey sampling with sensitive characteristic: design and analysis. *Metrika* **67**, 251–263 (2008)
- Zdew, S.M., Rhodes, I.N.: Making the randomized response technique work. *Publ. Opin. Q.* **40**, 513–537 (1976)

EXHIBIT 37

Validity of a Household Gun Question in a Telephone Survey

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Synopsis

The validity of self-reported data on the presence of guns in the home obtained in a telephone survey was assessed in samples of households where a

hunting license had been purchased or a handgun registered.

The survey was conducted among a random sample of Ingham County, MI, residents who had purchased a hunting license between April 1990 and March 1991 and among those registering a handgun during 1990. A third study sample was selected from the county's general adult population using a random digit dialing method. The interviews were conducted between November 1991 and January 1992.

The proportion of respondents who reported that at least one gun was kept in their household was 87.3 percent among handgun registration households and 89.7 percent among hunting license households. In the survey of the general population of the county, approximately one-third of the respondents reported keeping a gun in the household, 67 percent of them for hunting and 23 percent for safety.

Despite some limitations, the data indicate that a question on gun presence in a household can be used in a telephone survey.

GUNS ARE INVOLVED in more than 33,000 deaths each year in the United States, second only to motor vehicles as a major cause of injury-related deaths (1). The age-adjusted rate of firearm-related mortality during 1991 in the United States was 15.2 deaths per 100,000 population; in Michigan it was 16.2 deaths per 100,000 (2).

In 1992, guns played a role in 3 of the 10 leading causes of death in both Michigan and the United States—accidents and adverse effects, suicide, and homicide (3). In Michigan in 1992, there were 728 firearm-related homicides, 597 firearm-related suicides, and 34 unintentional firearm-related deaths, according to the unpublished data of the Michigan Department of Public Health. Nationally, however, self-destructive use of guns claims more lives than either criminal assaults or accidents (4).

Household ownership of guns increased significantly through the 1960s and 1970s, as did the proportion of all suicides committed with guns (4). During this period, the number of females committing suicide using firearms more than doubled, and firearm suicides among children ages 5–19 years increased 299 percent (5).

Nationally, firearms are the fourth leading cause of unintentional injury deaths among children ages 5–14 years and the third leading cause among 15–24-year-olds (6). Most unintentional firearm-related deaths occur in or around the home, and most involve handguns (6).

Researchers at the Centers for Disease Control and Prevention of the Public Health Service predict that within a few years firearms will surpass motor vehicles as the leading cause of injury deaths (7).

According to a study by the U.S. General Accounting Office, one-quarter of the unintentional fatal injuries occur with the victim's own gun; another 20 percent with the gun of a parent, sibling, or other relative; and 12 percent with the gun of a friend or neighbor (8). Researchers also estimate that there are four to seven nonfatal injuries for every fatal unintentional shooting (9).

Since easy access to firearms is considered to be a risk factor for suicides (10), homicides in the home (11), and unintentional firearm-related injury and death (12), data on the presence of guns in the home are needed to guide public policy. To address this data need in Michigan, questions on gun presence and

storage practices were added to the 1992 Michigan Behavioral Risk Factor Survey (BRFS) of households.

The Household Gun Question

Kellermann and coworkers conducted a landmark study validating responses to the question, "Are guns of any kind kept in your household?" in a face-to-face survey in Memphis, TN, and Seattle, WA (13). A sample of 75 names and addresses of people who had recently registered handguns was selected; people in 53 of these households were contacted, and those in 35 agreed to be interviewed. Of the 35 responses to the household gun question, 34 were considered valid, 31 responding in the affirmative and 3 reporting that previously there had been a gun in the household.

Prior to the inclusion of a series of questions on the presence, characteristics, and storage practices of guns in the home in the Michigan BRFS, a pilot study was conducted to validate within a telephone survey the same question that was used by Kellermann and colleagues (13), that is, "Are guns of any kind kept in your household?" Validation of this question was repeated because of the small sample used in the Kellermann study, the concern that the validity of this question might vary by region, and because of the inconsistency in the literature concerning the impact of the survey mode on the responses to sensitive questions.

In comparisons between the results from face-to-face surveys and those conducted by telephone, underreporting in telephone surveys has been observed for drug use (14), mental health symptoms (15), and unlawful union campaign practices (16). Other studies dealing with questions about alcohol (17,18), however, have not observed underreporting by telephone mode as compared with face-to-face. A review of surveys on physical abuse of women (19) found conflicting results concerning the possibility of a mode effect. The results of a meta-analysis covering a range of subject areas indicated a small tendency for higher social desirability effects in telephone versus face-to-face surveys (20). Aquilino has hypothesized that the inconsistency in mode effect may be related to the degree of threat associated with the question (14).

Methods

Ingham County, MI, was selected as the study site. It is located in south central Michigan, includes the State capital of Lansing, and has a population of

approximately 281,900. Data from the 1990 census indicate that Ingham County, compared with the State as a whole, has a similar proportion of whites (84.1 percent versus 83.5 percent), but a slightly smaller proportion of African Americans (9.9 percent versus 13.9 percent) and a higher proportion of "other" racial groups (6.0 percent versus 2.6 percent). The age distribution of county residents is similar to the State's, with approximately 30 percent of the residents being younger than age 20 and approximately 60 percent ages 20–64. Ingham County has a higher proportion of urban residents than the State (86 percent versus 70 percent) and a higher proportion of residents who have graduated from college (29 percent versus 17 percent). The proportion of the population living below the poverty line, however, is somewhat higher in the county than in the State as a whole (16.6 percent versus 13.1 percent), and the average per capita income in Ingham County is slightly lower than the State average (\$13,740 versus \$14,154).

Despite these differences, Ingham County was thought to be similar enough to the State as a whole to make it an appropriate geographic area in which to conduct a study validating questions for use in the statewide BRFS.

Random samples were selected from two populations in Ingham County thought likely to have guns in their households—(a) people who had purchased a hunting license and (b) people who had registered a handgun. The samples were selected systematically from among those who had purchased a hunting license (which would allow hunting of deer, small game, and waterfowl) between April 1990 and March 1991 and among those who had registered a handgun during 1990.

To legally purchase and possess a handgun in Michigan, a person must be at least 18 years old and must first obtain a license to purchase signed by an authorized local law enforcement official. Within 10 days after purchase, the handgun must be presented to the local police agency to be registered and have a safety inspection certificate issued, at which point a copy of the registration is forwarded to the State police. This process allows the handgun to be kept in a home or business and allows for limited transportation. License to carry a concealed handgun is an entirely different process. A person must obtain a special license to carry a concealed handgun or to transport a handgun in a motor vehicle. Although a license is not required to purchase or possess long guns (that is, rifles and shotguns) in Michigan, they cannot be sold to anyone younger than age 18.

Telephone numbers were obtained by matching last

Table 1. Item nonresponse to household gun and income questions by three study samples, in percentages with 95 percent confidence interval (CI) limits, in Ingham County, MI, telephone survey

Samples	Gun presence ¹			Income ²			
	Don't know	Refused	95 percent CI	Don't know	95 percent CI	Refused	95 percent CI
General population.....	0.0	5.7	(±4.0)	1.5	(±2.3)	11.7	(±6.8)
Likely ownership households ³ ...	0.0	8.3	(±3.9)	1.6	(±1.8)	8.3	(±3.9)
Handgun registrants.....	0.0	9.2	(±6.1)	0.0	...	10.3	(±6.4)
Hunting licensees.....	0.0	7.6	(±5.1)	2.9	(±3.2)	6.7	(±4.8)

¹Nonresponses to the question, "Are guns of any kind kept in your household?"

²Nonresponses to the household income question, "Which of the following categories best describes your annual household income from all sources: less than \$10,000, \$10,000 to less than \$15,000, \$15,000 to less than \$20,000,

\$20,000 to less than \$25,000, \$25,000 to less than \$35,000, \$35,000 to \$50,000, or over \$50,000?"

³Combined sample of handgun registrant households and hunting licensee households.

Table 2. Percentages and 95 percent confidence interval (CI) limits of respondents from likely gun households who reported the presence of a gun in the home, overall and by age group¹, Ingham County, MI, telephone survey

Samples	Age (in years) ²							
	Total	95 percent CI	18–34	95 percent CI	35–54	95 percent CI	55 and older	95 percent CI
Likely gun households ³	88.6	(±4.7)	79.7	(±10.3)	94.1	(±5.0)	90.6	(±10.2)
Hunting licensees.....	89.7	(±6.1)	84.4	(±12.6)	93.5	(±7.2)	89.5	(±13.8)
Handgun registrants.....	87.3	(±7.3)	74.1	(±16.6)	94.9	(±6.9)	92.3	(±15.5)

¹Respondents who refused to answer the question were not included in this analysis.

²Age of respondent reflects the age of the oldest person in the household of

the same sex as the registrant or licensee.

³Combined sample of handgun registrant households and hunting licensee households.

names and addresses with telephone directory listings. All personal identifiers were then purged from the samples, except for sex as determined by first names. After matching, 188 telephone numbers were retained in the hunting license sample and 193 in the handgun registration sample. Within each household contacted, the oldest person of the same sex as the hunting licensee or gun registrant was selected to be interviewed. This intrahousehold selection procedure represented a compromise between interviewing the person most likely to know whether a gun was present in the household and the BRFs method of using a household level question and maintaining anonymity of the respondent.

The third study sample was selected from the general adult population of Ingham County using a random digit dialing method. Within each household, the adult age 18 or older with the most recent birth date was selected to be interviewed.

Interviewing was conducted by telephone between November 1991 and January 1992. The same questionnaire was used with all three samples. Prior to the interview, respondents were assured that all responses were confidential and participation was voluntary. The introduction described the survey as a "survey of Ingham County residents' attitudes about safety in their community." Since one purpose of the survey

was to validate the household gun presence question, respondents were not told that the survey included questions on guns, nor were they informed that their telephone number had been obtained through a sample of hunting licensees or gun registrants.

The survey instrument contained 35 questions, beginning with eight about neighborhood crime and crime prevention. Following these introductory questions was the transitional statement and gun question—"Some people keep guns in their household. Are guns of any kind kept in your household?" After this filter question, additional questions were asked of respondents who answered yes, that is, questions about primary reason for the gun, number of guns in the household, types of guns, and storage practices. All respondents were then asked a set of four attitudinal questions about gun acquisition.

The data from the Ingham County general population survey were weighted by the number of adults in the household and a poststratification weighting factor reflecting the age-sex population structure of Ingham County. SUDAAN software was used to calculate the prevalence estimates and confidence intervals (21).

A subset of these same questions was included in the 1992 Michigan BRFs. The survey protocol of the BRFs was similar to that used in the general

population survey for Ingham County and is described elsewhere (22).

Results

Eighty-seven completed interviews were obtained from handgun registrant households, 105 from hunting licensee households, and 148 from the general adult population. Telephone numbers in the samples that did not result in an interview can be accounted for by households and eligible respondents who could not be contacted, nonworking numbers, ineligible numbers (for example, business numbers, residences outside of Ingham County), and refusals. The unit (or participant) refusal rate, defined as the percent of all eligible respondents contacted who refused to be interviewed, was 23.7 percent among the handgun registrant sample, 26.9 percent among the hunting licensee sample, and 18.2 percent for the general population survey. The item refusal rate (that is, refusal to respond to "Are guns of any kind kept in your household?") was 9.2 percent among the handgun registrant sample, 7.6 percent among the hunting licensee sample, and 5.7 percent among the general population (table 1). Although the item refusal rate was slightly higher in the two samples likely to have guns than in the Ingham County general population sample, the differences were not statistically significant. None of the respondents reported that they did not know whether there was a gun in their household. For comparison, item refusal rates for the household income question are also presented.

The proportion of respondents who reported that guns were kept in their households was 87.3 percent of handgun registrant households and 89.7 percent of hunting licensee households (table 2). Approximately 11 percent of these two samples combined answered no to the household gun presence question. Among respondents from the likely gun households, there were no statistically significant associations (at the $P = .05$ level with a χ^2 -test) in the proportion reporting no to the household gun presence question by household income (\$20,000 or less, more than \$20,000), education of the respondent (high school graduate or less, more than high school graduate), or age of respondent (18–34 years, 35–54 years, 55 years or older), although the test of the age variable approached the ($P = .055$) level of significance.

Attitudes towards policies relating to gun ownership or increased regulation appeared to be similar among the likely gun household samples who responded yes to the household gun presence question and those who responded no or refused to answer, as measured by the proportion who either disagreed or

'Researchers at the Centers for Disease Control and Prevention of the Public Health Service predict that within a few years firearms will surpass motor vehicles as the leading cause of injury deaths.'

strongly disagreed with four statements about gun ownership restrictions (table 3). Responses from the general population survey of Ingham County indicated a lower level of disagreement with three of these four attitudinal statements than the responses from the likely gun households.

Approximately one-third—34.7 percent (± 7.9)—of the Ingham County general population sample reported that a gun or guns were kept in their household. The primary reason given by the majority of respondents in Ingham County for keeping a gun in their household was hunting (66.8 percent), followed by safety (22.8 percent) (table 4). Thirty percent kept one gun in the household, 52.7 percent kept 2–4 guns, and 17.3 percent kept 5 or more guns. The majority (79.5 percent) kept long guns (rifles or shotguns or both) but no handguns, 5.9 percent kept handguns only, and 14.5 percent kept both handguns and long guns.

Hunting was reported as the primary reason for keeping a gun by the majority of likely gun households (90.6 percent of the hunting licensee sample; 50 percent of the handgun registrant sample). Ten out of the 60 handgun registrant sample respondents who reported the type of guns in the household also reported that only rifles or shotguns or both were kept in their household, reflecting a possible inconsistency.

Discussion

The prevalence of guns in households was found to be lower in Ingham County, at 34.7 percent, than in the State as a whole, at 46.2 percent. This statewide prevalence was similar to the results of a Cable News Network-USA Today-Gallup poll in December 1993 that produced a national estimate of 49 percent (23). Results from Behavioral Risk Factor Surveys in other States indicate a generally similar prevalence of household gun presence; 40 percent of households in New Mexico reported having one or more guns in the home (24), as did 53 percent of households in Louisiana (25).

Table 3. Proportion of respondents who disagreed or strongly disagreed with four statements concerning restrictions to gun possession among the combined likely gun households (by response to household gun question) and among the Ingham County, MI, general population sample

Statement ¹	Likely gun households disagreeing with 4 statements						Ingham County sample disagreeing with 4 statements	
	Yes ²		No-refused ²		Total ²		Percent	CI
	Percent	CI	Percent	CI	Percent	CI		
Criminal record check	4.5	(±3.3)	8.3	(±9.0)	5.2	(±3.2)	5.5	(±3.9)
2-week waiting period	39.7	(±7.7)	36.1	(±15.7)	39.1	(±6.9)	9.9	(±5.3)
Handgun ban	92.3	(±4.2)	82.4	(±12.8)	90.5	(±4.2)	56.8	(±9.4)
Require safety course	22.6	(±6.6)	19.4	(±13.0)	22.0	(±5.9)	5.0	(±3.1)

¹Respondents were read the following instructions: "Next I will read four separate statements and then ask whether you strongly agree, agree, disagree, or strongly disagree." 1."Everyone buying a gun should be checked to see if they have a prior criminal record." 2."There should be a 2-week waiting period for

anyone purchasing a gun." 3."Handguns should be banned." 4."Everyone buying a firearm should be required to attend a gun safety course."

²Response to the question, "Are guns of any kind kept in your household?"

Table 4. Gun characteristics and reasons for gun ownership reported by likely gun sample, Ingham County, MI, general population sample, and statewide 1992 Michigan Behavioral Risk Factor Survey (BRFS)

Characteristics	Likely gun samples						General populations			
	Handgun ¹	95 percent CI	Hunting ²	95 percent CI	Combined ³	95 percent CI	Ingham ⁴	95 percent CI	BRFS ⁵	95 percent CI
Primary reason for gun:										
Safety	18.2	(±9.3)	4.7	(±4.5)	10.6	(±4.9)	22.8	(±17.1)	18.6	(±2.8)
Hunting	50.0	(±12.1)	90.6	(±6.2)	72.8	(±7.1)	66.8	(±17.5)	61.4	(±3.4)
Other	31.8	(±11.3)	4.7	(±4.5)	16.6	(±5.9)	10.4	(±12.5)	20.0	(±2.6)
Number of guns:										
1	20.5	(±11.9)	6.8	(±5.7)	11.9	(±5.8)	30.0	(±17.0)	26.9	(±3.2)
2-5	27.3	(±13.2)	55.4	(±11.4)	44.9	(±9.0)	52.7	(±17.1)	44.8	(±3.4)
6 or more	52.3	(±14.8)	37.8	(±11.1)	43.2	(±9.0)	17.3	(±10.2)	28.2	(±3.3)
Type of gun:										
Handguns	15.0	(±9.1)	0.0	...	6.4	(±4.1)	5.9	(±9.4)	10.0	(±2.1)
Rifles, shotguns	16.7	(±9.5)	76.3	(±9.3)	50.7	(±8.3)	79.5	(±14.5)	60.3	(±3.4)
Both	68.3	(±11.8)	23.8	(±9.3)	42.9	(±8.2)	14.5	(±13.3)	29.7	(±3.1)

¹79 responses to household gun question; 87.3 percent (±7.3) reported that guns were kept in their household.

²97 responses to household gun question; 89.7 percent (±6.1) reported that guns were kept in their household.

³176 responses to household gun question; 88.6 percent (±4.7) reported that

guns were kept in their household.

⁴140 responses to household gun question; 34.7 percent (±7.9) reported that guns were kept in their household.

⁵2,365 responses to household gun question; 46.2 percent (±2.4) reported that guns were kept in their household.

Primary reason for the gun presence in the household appeared to be similar in Ingham County and the State as a whole. There did appear, however, to be a higher proportion of households with only long guns in Ingham County compared with the State. Among the combined likely gun households, the reason for gun presence was similar to the results from the statewide and county-level population samples. A higher proportion of likely gun households, however, kept five or more guns, and a higher proportion kept both handguns and long guns.

Since the respondents were not told during the introduction to the survey that questions about guns were included, the unit refusal rate reflects a general unwillingness to participate in a survey concerned with attitudes about safety in the community rather than an unwillingness to answer questions about guns. Although higher than optimal, these refusal

rates fall within the range of refusal rates in telephone surveys of the general population, which Dillman and coworkers note range from 9 to 36 percent (26), and Steeh (27) has concluded are tending to increase. Item refusal rates do, however, reflect an unwillingness to answer questions specifically about guns. Among the likely gun households, the item refusal rate for the household gun question was similar to the rate for the income question, which is also thought to be sensitive (28). Among the general population of Ingham County, the lower item refusal rate for the gun presence question compared with the item refusal rate for the income question (although the difference was not statistically significant) was hypothesized to reflect the possibility that the gun presence question may be sensitive only among those who do have a gun in their household.

If it can be assumed that all of the people who

purchased a hunting license owned a gun and that all of the persons who registered a handgun were still in possession of the handgun and kept it in their household, then 11.4 percent of the responses were invalid and would result in an underreporting of household gun presence. These validation results, however, cannot be generalized to the general population. They relate only to those households in which someone purchased a handgun through the legal registration process in Michigan and those households in which someone had purchased a hunting license. It could be hypothesized that persons who acquire handguns through an illegal process might be less likely to report the presence of a gun in their household in a telephone interview. Data to this effect are not available, however, and it would be difficult to attempt a validation study among this group.

There were several limitations to this study. The likely ownership samples were limited to those listed in the telephone directory. Studies have indicated that people living in households with unlisted telephone numbers may tend to have different characteristics such as being younger, having less education, and more likely to be divorced (29). A second limitation, also related to the survey methodology, is the noncoverage of households that do not have telephones, which is a limitation of the survey mode itself. In Michigan as a whole, only 4.1 percent of households do not have a phone. In Ingham County, 3.6 percent of households do not have one. Telephone noncoverage is not evenly distributed across socioeconomic groups, however, with education and income being two of the most important correlates; telephone noncoverage is highest among those with lower educational status and income (30). The State health department's unpublished results from the 1992 Michigan BRFS indicate that households with lower income report a lower prevalence of household gun presence, which in combination with the undercoverage among households with lower income could tend to overestimate household gun presence. However, results from this study do not indicate that the validity of responses is related to household income.

If a gun was owned by a household member but kept outside the household, "no" would have, in fact, been a valid response to the household gun presence question. A question about keeping a gun outside of the household was not asked in this study. However, in the CNN-USA Today-Gallup national poll, 1.7 percent of the total respondents reported to have a gun on their property but not in their home (23). Two other possibilities where "no" would have been a valid response are that some of those who

'Within the context of the limitations . . . it appears that the household gun question is relatively valid in a telephone survey mode among registered handgun owners and hunting licensees.'

purchased a hunting license may not have owned a gun and some of those who registered a handgun may no longer have been in possession of it at the time of the interview. Nearly 9 percent of the handgun registrant households interviewed by Kellermann and coworkers (13) reported that, although guns were not currently kept in the household, guns had recently been kept in their homes. This was considered to be a valid response in the Kellermann study. All three of these scenarios might tend to inflate the estimate of the underreporting of gun presence from this study.

Another potential limitation of this study is that the word gun in the household gun presence question might not have been interpreted as the developers of this questionnaire intended, that is, as a powder firearm, since a definition of the word was not given. It appears unlikely, however, that gun was interpreted by respondents to mean a toy gun or a pellet or BB gun. Oral responses to the question "What is the primary reason that there is a gun in your household?" were recorded for those responses that fell into the precoded "other" category. An examination of these responses did not reveal any indication that the gun to which the respondent was referring was not a powder firearm.

An interesting inconsistency that arose from these data was the 16.7 percent of the handgun registrant sample that reported they did have guns in the household then subsequently reported that they had no handguns. Again, a valid scenario might be that truly the handgun was no longer kept in the household, or it might conceivably indicate the possibility of an underreporting of handgun as the type of gun in the household.

Within the context of the limitations discussed previously, it appears that the household gun question is relatively valid in a telephone survey mode among registered handgun owners and hunting licensees. In comparison with the results from Kellermann and coworkers' face-to-face validation (13), however, the results from this study do indicate that a mode effect may exist for this household gun presence question, although the magnitude of the mode's effect cannot be estimated.

References

1. National Center for Injury Prevention and Control: Injury mortality: national summary of injury mortality data. Centers for Disease Control and Prevention, Atlanta, GA, 1993.
2. 1991 mortality data tapes. National Center for Health Statistics, Hyattsville, MD.
3. Eyster, J. T., Barone, M. C., and Humphrys, K. S.: Michigan statistics 1992. Office of the State Registrar and Division of Health Statistics, Michigan Department of Public Health, Lansing, 1993.
4. Zimring, F.: Policy research on firearms and violence. *Health Aff* 12: 109-122 (1993).
5. Zimring, F., and Hawkins, G.: *The citizen's guide to gun control*. Macmillan, New York, 1987.
6. Kellermann, A. L., Lee, R. K., Mercy, J. A., and Banton, J.: The epidemiologic basis for the prevention of firearm injuries. *Ann Rev Public Health* 12: 17-40 (1991).
7. Deaths resulting from firearm- and motor-vehicle-related injuries—United States, 1968-1991. *MMWR Morbid Mortal Wkly Rep* 43: 37-42, Jan. 28, 1994.
8. Accidental shootings: many deaths and injuries caused by firearms could be prevented. U.S. General Accounting Office, Washington, DC, 1991.
9. Rivara, F. P., and Stapleton, F. B.: Handguns and children: a dangerous mix. *J Dev Behav Pediatr* 3: 35-38 (1992).
10. Kellermann, A. L., et al.: Suicide in the home in relation to gun ownership. *N Engl J Med* 327: 467-472, Aug. 13, 1992.
11. Kellermann, A. L., et al.: Gun ownership as a risk factor for homicide in the home. *N Engl J Med* 329: 1084-1091, Oct. 7, 1993.
12. Wintemute, G. J., et al.: When children shoot children. *JAMA* 257: 3107-3109, June 12, 1987.
13. Kellermann, A. L., et al.: Validating survey responses to questions about gun ownership among owners of registered handguns. *Am J Epidemiol* 131: 1080-1084 (1990).
14. Aquilino, W. S.: Interview mode effects in surveys of drug and alcohol use. *Public Opinion Q* 58: 210-240 (1994).
15. Henson, R., Cannell, C. F., and Roth, A.: Effects of interview mode on reporting of moods, symptoms, and need for social approval. *J Soc Psychol* 105: 123-129 (1978).
16. Herman, J. B.: Mixed-mode data collection: telephone and personal interviewing. *J App Psychol* 62: 399-404 (1977).
17. Sykes, W., and Collins, M.: Effects of mode of interview: experiments in the UK. *In Telephone survey methodology*, edited by R. M. Groves, et al. John Wiley and Sons, New York, 1988, pp. 301-320.
18. Mangione, T. W., Hingson, R., and Bartlett, J.: Collecting sensitive data: a comparison of three survey strategies. *Sociol Methods Res* 10: 337-346 (1982).
19. Smith, M. D.: Woman abuse: the case for survey by telephone. *J Interpersonal Violence* 4: 308-324 (1989).
20. de Leeuw, E. D., and van der Zouwen, J.: Data quality in telephone and face to face surveys: a comparative meta-analysis. *In Telephone survey methodology*, edited by R. M. Groves, et al. John Wiley & Sons, New York, 1988, pp. 283-299.
21. Shah, B. V., et al.: SUDAAN user's manual release 5.50. Research Triangle Institute, Research Triangle Park, NC (1991).
22. Rafferty, A. P., and McGee, H. B., editors. *Health risk behaviors 1992*. Michigan Department of Public Health, Lansing, 1993.
23. *Guns in the United States*. The Gallup Organization, Lincoln, NE, 1993.
24. Firearm ownership and storage practices in New Mexico. *Epidemiology report*. New Mexico Department of Health, Santa Fe, April 1992.
25. Wall, J. L., and Gupte, R.: Firearm ownership and storage in Louisiana. Louisiana's behavioral health risks, special report 1994. Center for Business & Economic Research, Northeast Louisiana University, Monroe, 1994.
26. Dillman, D. A., Gallegos, J. G., and Frey, J. H.: Reducing refusal rates for telephone interviews. *Public Opinion Q* 40: 66-78 (1976).
27. Steeh, C. G.: Trends in nonresponse rates. *Public Opinion Q* 45: 40-57 (1981).
28. Kormendi, E.: The quality of income information in telephone and face to face surveys. *In Telephone survey methodology*, edited by R. M. Groves, et al. John Wiley and Sons, New York, 1988, pp. 341-356.
29. Brunner, J. A., and Brunner, G. A.: Are voluntarily unlisted telephone subscribers really different? *J Marketing Res* 8: 121-124 (1971).
30. Thornberry, O. T., and Massey, J. T.: Trends in the United States telephone coverage across time and subgroups. *In Telephone survey methodology*, edited by R. M. Groves, et al. John Wiley & Sons, New York, 1988, pp. 25-49.

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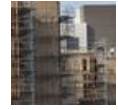
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OP-ED OP-ED OPINION

Why banning assault rifles won't reduce gun violence

By ADAM WINKLER
DEC 11, 2015 | 5:00 AM



An employee checks the chamber of an assault-style rifle at a shooting range in Randolph, N.J. on Dec. 9. (Jewel Samad / AFP/Getty Images)

The gun control movement in America has been reinvigorated, and at the top of its agenda are bans on assault weapons. "The killers in San Bernardino used military-style assault weapons — weapons of war," President Obama said Saturday, calling for a ban on these guns. Gun control proponents were also emboldened by the Supreme Court's decision Monday to allow an Illinois ban on assault rifles to stand.

Yet we already know that banning assault weapons won't reduce gun crime or deaths. Worse, the bans may make it harder to enact more effective gun control laws.

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The problem starts with the term itself. The "assault weapons" for sale in the U.S. now aren't really weapons of war. Many people mistake these firearms for machine guns capable of shooting multiple rounds of ammunition with a single pull of the trigger. The federal government banned the sale of machine guns to civilians in 1986. (The National Rifle Assn. likes to claim that gun laws never work, but the machine gun ban has worked just fine. Such guns are almost never used in criminal activity, and none of the recent mass shootings in the U.S. involved a machine gun. The San Bernardino terrorists tried to modify one of their guns to turn it into a machine gun.)

Around the same time the machine gun ban went into effect, gun makers started marketing ordinary rifles that look like military machine guns. Colt's AR-15, for example, mirrored the U.S. Armed Forces' M-16: matte black finish,

These rifles are easy to use, even for beginners. They are accurate, have little kick and are highly customizable with add-ons such as special sights and grips. In part because of these attributes, and in part because of their sleek military styling, these guns have become hugely popular among law-abiding gun owners.

As a matter of functionality, these guns are just like other rifles. They're more powerful than some handguns and rifles, and less powerful than others.

They're "semiautomatic" — a technical term that applies to the way rounds are chambered, not to the way the guns shoot. Many handguns are semiautomatic too. Military-style rifles fire only one round for each pull of the trigger, just like a revolver, a shotgun, a hunting rifle or any other of the 300 million legal guns in America.

Horror in San Bernardino: The U.S. infatuation with guns is bordering on a society-wide suicidal impulse

DEC 02, 2015 | 4:05 PM

It's true that these rifles are often sold with detachable high-capacity ammunition magazines that increase their lethality, enabling a shooter to fire more than a dozen rounds quickly. (Such magazines are illegal to sell in California.) But again, these firearms are not unique in this. About half the handguns in the U.S. also have detachable high-capacity magazines.

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The only thing unique about assault rifles is their menacing name and look, and it is these elements that make them such an appealing — if not particularly sensible — target of gun control advocates.

California was the first state to ban the weapons. It happened in 1989, after a shooter used one to kill five schoolchildren in Stockton. A federal ban went into effect in 1994 and then "sunsetted" in 2004. Today, eight states, including California and New York, have assault weapon bans on their books.

The laws, however, are largely ineffectual. Because these guns are really just ordinary rifles, it is hard for legislators to effectively regulate them without banning half the handguns in the country (those that are semiautomatic and/or have detachable magazines) and many hunting rifles as well.

Lawmakers have instead focused on cosmetics. The federal ban applied to all semiautomatic rifles with detachable magazines and two or more military-style features, like flash suppressors and a bayonet attachment. California law tightens the rules a bit; even one of the military-style features is prohibited.

But gun makers have been able to easily skirt these laws. They just sell the same semiautomatic rifle, with the same lethality, but without the military-style features.

Little wonder then that a 2004 study commissioned by the Department of Justice found that the federal ban didn't lead to any decrease in gun crime or gun deaths. For starters, rifles, assault or otherwise, are rarely used in gun crime. Notwithstanding the two rifles used in San Bernardino (and a few other memorable mass killings), rifles account for only about 3% of criminal gun deaths. Gun crime in the United States, including most mass shootings, is overwhelmingly handgun crime.

The nationwide federal ban on assault weapons did accomplish one thing: According to the 2004 study, fewer of the banned guns were found at crime scenes (down from 2% of guns recovered to 1%). Although this suggests that gun laws affect the inventory of guns in the marketplace — again, contrary to the claims of the NRA — the study's authors concluded that criminals had just switched to other guns.

America's gun debate suffers because of unreasonable, extreme positions taken by the NRA. But gun control advocates who push for bans on one kind of rifle primarily because it looks scary also contribute to the problem. Such bans don't reduce gun crime, but they do stimulate passionate opposition from law-abiding gun owners: Gun control advocates ridicule the NRA's claim that the government is coming to take away people's guns, then try to outlaw perhaps the most popular rifle in the country.

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There are approaches to gun control, such as universal background checks and cracking down on rogue gun dealers, that can reduce the daily death toll from guns. It may seem like a victory for the forces of good to ban assault weapons, but such laws aren't the answer. Assault weapon bans are bad policy and bad politics.

Adam Winkler is a law professor at the UCLA School of Law and the author of "Gunfight: The Battle Over the Right to Bear Arms in America."

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by Weapon, 2013–2017

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Weapons	2013	2014	2015	2016	2017
Total	12,253	12,270	13,750	15,296	15,129
Total firearms:	8,454	8,312	9,778	11,138	10,982
Handguns	5,782	5,673	6,569	7,204	7,032
Rifles	285	258	258	378	403
Shotguns	308	264	272	261	264
Other guns	123	93	177	187	187
Firearms, type not stated	1,956	2,024	2,502	3,108	3,096
Knives or cutting instruments	1,490	1,595	1,589	1,632	1,591
Blunt objects (clubs, hammers, etc.)	428	446	450	479	467
Personal weapons (hands, fists, feet, etc.) ¹	687	682	659	669	696
Poison	11	10	8	13	13
Explosives	2	7	1	1	0
Fire	94	71	84	114	103
Narcotics	53	70	75	122	97
Drowning	4	14	14	9	8
Strangulation	85	89	99	99	88
Asphyxiation	95	102	120	93	105

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Weapons	2013	2014	2015	2016	2017
Other weapons or weapons not stated	850	872	873	927	979

- ¹ Pushed is included in personal weapons.

EXHIBIT 40

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Rational Basis Analysis of "Assault Weapon" Prohibition

David B. Kopel*

I. INTRODUCTION

One evening, a gang brawl broke out in the street next to the northwest Denver home of a young woman named Sharon Deatherage. A police car happened upon the scene, and sped away without taking any action, never to return. As a result of this experience, the young woman, who lived alone, decided that she would have to take measures to protect herself because she could not rely on the Denver City government for protection. Because of an injury to her wrist, she was unable to use a handgun. At the suggestion of a firearms instructor, she bought an M-1 carbine, which is a relatively small, low-powered semiautomatic rifle, and which has been commercially available for nearly half a century.¹ Not long after she bought the weapon, the City of Denver turned Ms. Deatherage into a criminal by declaring her M-1 carbine and its attached 30-round ammunition magazine an illegal "assault weapon."

Three states—California,² New Jersey,³ and Connecticut⁴—have enacted "assault weapon" prohibitions, as have over two dozen cities or counties.⁵ At the federal level, the Bureau of Alcohol, Tobacco and Firearms has used its authority over the import of "non-sporting" weapons to impose a 1989 import ban on certain rifles, and a 1993 import ban on certain pistols. As of August 1994, Congress had not enacted a comprehensive federal "assault weapon" prohibition. The Congressional (pg.382) prohibition is the "Feinstein Amendment," which outlaws 184 "assault weapons."⁶

Scholarly legal analysis of the "assault weapon" issue consistently puts "assault weapon" prohibition in the context of "gun control." Scholars have asked whether outlawing "assault weapons" would violate either the right to arms guarantee of the Second Amendment to the United

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¹ Deposition of Sharon Deatherage, State of Colo. ex. 60, at 3, 5-8, *Robertson v. Denver*, no. 90CV603 (Denver Dist. Ct. Feb. 26, 1993).

² CAL. PENAL CODE §§ 12275-12290 (West 1992).

³ N.J. STAT. ANN. §§ 2C:39-1 to 39-12, 43-6 to 43-7, 58-5 to 58-11 (West 1982 & Supp. 1993).

⁴ 1993 Conn. Legis. Serv. 93-306 (West).

⁵ See, e.g., New York City, N.Y. Local Law 78-88-823 (1991); HAW. REV. STAT. §§ 134-1, 134-4, 134-8 (West 1988 & Supp. 1993).

⁶ Peter G. Kokalis, *Feinstein Amendment Could Ban 184 Firearms, Not 19*, GUN WEEK, Jan. 14, 1994, at 7.

States Constitution,⁷ a state constitutional right to arms,⁸ or the militia clauses of the United States Constitution.⁹ Although such scholarship has been valuable, this Article suggests that the first, and perhaps dispositive, question in analyzing "assault weapon" prohibition is whether such legislation passes the rational basis test.

Employing the rational basis test, before analyzing the of right to bear arms provisions, is useful for several reasons. For example, the Second Amendment is of limited use in analyzing prohibitions enacted by states or subdivisions of states. Despite some recent Supreme Court dicta suggesting that the individual right to keep and bear arms is incorporated in the Fourteenth Amendment,¹⁰ federal courts have been unwilling to apply the Second Amendment to non-federal action.¹¹ Further, forty-three states have their own state constitutional right to bear arms. In all of these states, except Massachusetts, the right is considered to inhere in individuals, rather than the state government.¹² But seven states, including California and New Jersey, do not (pg.383) have a state constitutional right to bear arms. And even in states that do have a constitutional right, right to arms jurisprudence is not as fully developed as, for example, free speech or search and seizure jurisprudence. Thus, use of a right to arms guarantee to test the Constitutionality of "assault weapon" prohibition will involve the judiciary analyzing a Constitutional right with which many judges have little prior professional experience. In contrast, almost every judge with Constitutional law experience will have some familiarity with a rational basis analysis. To the extent that a right to bear arms analysis does become necessary, analysis of "assault weapon" prohibition under the rational basis test can help clarify the issues relevant to the right to arms.

This Article begins in Part II, with a brief summary of rational basis jurisprudence. Next, Part III applies the rational basis test to various characteristics that are said to distinguish "assault weapons" from other firearms. These characteristics include the weapons' rate of fire, ammunition capacity, ammunition lethality, design history, and the presence of features such as a folding stock and a barrel thread for a muzzle brake, or a bayonet lug. In Part IV, the article examines another basis for treating "assault weapons" differently from other weapons—the frequency with which "assault weapons" are used in crime. Finally, this Article discusses the rationality of a prohibition on firearms based on their suitability for sports.

⁷ See Eric C. Morgan, Note, *Assault Rifle Legislation: Unwise and Unconstitutional*, 17 AM. J. CRIM. L. 143 (1990); Robert A. O'Hare, Jr. & Jorge Pedreira, *An Uncertain Right: The Second Amendment and the Assault Weapon Controversy*, 66 ST. JOHN'S L. REV. 179 (1992).

The Second Amendment states: "A well regulated Militia, being necessary to the security of a free State, the right of the People to keep and bear Arms, shall not be infringed." U.S. CONST. amend. II.

⁸ Glenn Harlan Reynolds, *The Right to Keep and Bear Arms under the Tennessee Constitution*, 61 TENN. L. REV. (forthcoming 1994).

⁹ Keith R. Fafarman, *State Assault Rifle Bans and the Militia Clauses of the United States Constitution*, 67 IND. L.J. 187 (1991).

¹⁰ "[T]he full scope of liberty guaranteed by the Due Process Clause cannot be found in or limited by the precise terms of the specific guarantees elsewhere provided in the Constitution ... [such as] the freedom of speech, press, and the religion; the right to keep and bear arms" *Planned Parenthood v. Casey*, 112 S. Ct. 2791, 2805 (1992) (quoting with approval *Poe v. Ullman*, 367 U.S. 497, 543 (1961) (Harlan, J., dissenting)); *Moore v. East Cleveland*, 431 U.S. 494, 502 (1976) (quoting *Poe*, 367 U.S. at 543).

¹¹ *E.g.*, *Fresno Rifle Club v. Van de Kamp*, 965 F.2d 723 (9th Cir. 1992).

¹² The most thorough discussions of state constitutional guarantees may be found in Robert Dowlut, *Federal and State Constitutional Guarantees to Arms*, 15 U. DAYTON L. REV. 59 (1989); Robert Dowlut & Janet A. Knoop, *State Constitutions and the Right to Keep and Bear Arms*, 7 OKLA. CITY U. L. REV. 177 (1982).

II. TAKING RATIONAL BASIS SERIOUSLY

When legislation impinges on fundamental constitutional rights, judicial review of the legislation employs the "strict scrutiny" test. The legislation is declared constitutional only if the legislation is "narrowly tailored" to achieve a "compelling state interest," and there is no "less restrictive means" to achieve the same goal. In contrast, legislation which does not involve fundamental rights is usually reviewed under the "rational basis" standard; the court will not declare the law unconstitutional unless the court finds that the law lacks a rational basis.

This Article is based on the controversial presumption that the rational basis test actually matters. This presumption has clearly been false during most of the decades since the rational basis test was created. Many courts have treated the rational basis test as little more than a requirement that the law in question be defended by a government (pg.384) attorney who communicates in English and makes at least the attempt to provide a rationale for the law. In the days of the common law of contracts, it was said that "a peppercorn would suffice" to provide consideration. Many courts have been willing to find that a peppercorn's worth of argument will suffice for a law to pass the rational basis test.¹³

However, such is not necessarily, the proper application of the rational basis test. In recent years, the United States Supreme Court has sometimes applied the test seriously.¹⁴ As the court announced in 1976, the rational basis test "is not a toothless one."¹⁵ Since then, the Court has repeatedly used rational basis to strike down laws which the Court found to involve irrational discrimination, even though there was no protected class or specific constitutional right involved.¹⁶

Of particular significance is the case of *Cleburne v. Cleburne Living Center*,¹⁷ a case which illustrates some of the analytic techniques a court may use in rejecting purported rational bases of a law. The city of Cleburne had denied a special use zoning permit to a home for the mentally retarded. The Supreme Court overturned the holding of the lower federal court, and held that the mentally retarded were *not* a suspect or quasi-suspect class. Accordingly, the rational basis test was appropriate. In applying the rational basis test, the Court carefully examined each of the city's three stated justifications for its decision. One basis—fears of local residents—was found to be illegitimate. The Court found another basis—the building's location in a floodplain—was inconsistent with other city actions that had allowed other group care homes to be built in floodplains. Further, the Court found that the city (pg.385) had insufficiently demonstrated its concern

¹³ E.g., *United States v. Marshall*, 908 F.2d 1312 (7th Cir. 1990).

¹⁴ See generally Gayle Lynn Pettinger, Note, *Rational Basis with Bite: Intermediate Scrutiny by any Other Name*, 62 IND. L.J. 779 (1986-87).

¹⁵ *Mathews v. De Castro*, 429 U.S. 181, 185 (1976); *Mathews v. Lucas*, 427 U.S. 495, 510 (1976). See also *Young v. Haines*, 718 P.2d 909, 917 (Cal. 1986).

¹⁶ See, e.g., *Williams v. Vermont*, 472 U.S. 14 (1985) (holding that a tax credit for purchasers of out-of-state cars that only state residents could receive violates the Fourteenth Amendment's Equal Protection Clause; as in *Zobel v. Williams*, 457 U.S. 55 (1982), the decision was not based on the right to interstate travel); *Hooper v. Barnalillo County Assessor*, 472 U.S. 612 (1985) (rejecting tax exemptions for person who is a resident before a particular date); *Metropolitan Life Ins. Co. v. Ward*, 470 U.S. 869, 883 (1985) (eliminating statute that gave tax preference to domestic insurance industries); *Zobel v. Williams*, 457 U.S. 55 (1982) (holding that payment of benefits to state residents based on length of residence violated Equal Protection Clause); *Miller v. Carter*, 547 F.2d 1314, 1316 (7th Cir. 1977), *aff'd by an equally divided court*, 434 U.S. 356 (1978) (remanding Equal Protection Clause claim for further consideration). See also *Mahone v. Addicks Util. Dist.*, 836 F.2d 921, 937 (5th Cir. 1988).

¹⁷ 473 U.S. 432 (1985).

that the home would be overcrowded. Accordingly, the Court found that the statute violated the Equal Protection Clause.

The Court's willingness to declare every one of the government's purported rationales to be illegitimate, inconsistent, or insufficiently demonstrated suggests a new vigor in application of the rational basis test. The *Cleburne* decision also suggests three prongs for rational basis analysis: Illegitimacy, inconsistency, and insufficient demonstration.¹⁸ Although these three prongs are not necessarily the only reasons that a statute may fail the rational basis test, the three *Cleburne* prongs do suggest a framework for analyzing bases asserted to justify governmental actions. This Article, by employing the *Cleburne* framework, attempts in a small way to advance the analytic systemization and rigor of rational basis analysis.

Under state constitutions, state courts have sometimes forcefully applied their own state's version of the rational basis test.¹⁹ Under many state constitutions, it is no innovation for legislation to be declared unconstitutional after rational basis review.²⁰

While the rational basis test does not impose the very high burdens associated with the strict scrutiny test—such as the shifting of the burden of proof to the government and the requirement that the legislation be "necessarily" related to a "compelling" government interest—the rational basis test, if taken seriously, does not give the government a free ride.

It is true that, even after *Cleburne*, many courts consider a law's enactment to be tantamount to proof of its rationality. But, unless *Cleburne* and other Supreme Court rational basis cases from recent years are to be ignored, the rational basis should be taken seriously. (pg.386)

III. INCONSISTENT: PROHIBITION BASED ON THE CHARACTERISTICS OF "ASSAULT WEAPONS"

"Assault weapons" are said by gun prohibition advocates to possess certain unique features which render them far more dangerous than other firearms. This Part examines each of the various physical characteristics said to be unique to "assault weapons," and analyzes whether any of them creates a classification that can survive meaningful rational basis scrutiny.

At this point, it should be stated that this Article will not discuss assault rifles. As the United States Defense Department's Defense Intelligence Agency book *Small Arms Identification and Operation Guide* explains, "assault rifles" are "short, compact, selective-fire weapons that fire a

¹⁸ *Id.*

¹⁹ In Colorado, a classification "must be reasonable and not arbitrary and must be based on substantial differences" having a reasonable relation to public purpose to be achieved. *Dunbar v. Hoffman*, 468 P.2d 742, 744 (Colo. 1970). In California, it is required that "the court conduct 'a serious and genuine judicial inquiry into the correspondence between the classification and the legislation goals.'" *Elysium Inst., Inc. v. County of Los Angeles*, 283 Cal. Rptr. 688, 698 (Cal. Ct. App. 1991) (citing *Fein v. Permanente Medical Group*, 695 P.2d 665 (Cal. 1985)).

²⁰ *People v. Instawhip Denver, Inc.*, 490 P.2d 940, 943 (1971) (voiding regulation of dairy products because it lacked "a real and substantial relation to the public health, safety, morals and welfare"); *Branson v. City and County of Denver*, 707 P.2d 338, 340 (Colo. 1985) (voiding as irrational statute giving widows of firefighters in cities with more than 100,000 population less benefits than widows in smaller cities); *Gallegos v. Phipps*, 779 P.2d 856, 860-61 (Colo. 1989) (holding that it is irrational to make tavern owner's duty of care to a licensee higher than duty of care to an invitee).

cartridge intermediate in power between submachine gun and rifle cartridges."²¹ In other words, assault rifles are battlefield rifles which can fire automatically.²²

Weapons capable of fully automatic fire, including assault rifles, have been regulated heavily in the United States since the National Firearms Act of 1934.²³ Taking possession of such weapons requires paying a \$200 federal transfer tax and submitting to an FBI background check, including ten-print fingerprints.²⁴

Many civilians have purchased semiautomatic-only rifles that look like military assault rifles. These civilian rifles are, unlike actual assault rifles, incapable of automatic fire. For example, the AK-47 is an assault rifle formerly used by the Russian military, which now uses the AKM-74. Only a few hundred AK-47 firearms have been imported into the United States. On the other hand, tens of thousands of AKS (pg.387) firearms (a Chinese semiautomatic rifle which looks like the AK-47, but cannot fire automatically) have been imported into the United States and sold to civilians.²⁵ Similarly, the semiautomatic Colt Sporter rifle, of which tens of thousands have been sold, looks like the automatic U.S. Army M-16 assault rifle. "Assault weapon" legislation involves semiautomatic firearms, like the AKS and the Colt Sporter, but not automatic firearms, like the AK-47 or the M-16.

Other firearms manufacturers produce guns that do not look like an assault rifle, but that have a military appearance that some people find repugnant. Such guns typically have black plastic components, in contrast to the brown wood components found on more familiar firearms. The Calico M-900 carbine is an example of a gun which, although not related in design to any military firearm, has a military appearance. The TEC-9 handgun, not resembling a military gun, also has futuristic styling. Guns such as the Calico and the TEC-9 with futuristic styling are also singled out for prohibition by "assault weapon" legislation.

While the Defense Intelligence Agency's term of art "assault rifle" has a precise and technical meaning, the phrase "assault weapon" has a less certain meaning. No "assault rifle" (by Defense Intelligence Agency definition) is an "assault weapon" because all "assault rifles" are automatic, while no "assault weapons" are automatic.²⁶ "Assault rifles" are used by the military, whereas no "assault weapon" is used by the military.²⁷ "Assault rifles" are all rifles, but "assault weapons" include semiautomatic rifles, semiautomatic shotguns, revolver-action shotguns, semiautomatic handguns, and semiautomatic airguns.

²¹ DEFENSE INTELLIGENCE AGENCY, SMALL ARMS IDENTIFICATION AND OPERATION GUIDE - EURASIAN COMMUNIST COUNTRIES 105 (Washington: Government Printing Office, 1988).

²² Because the guns are "selective fire," the shooter can flip a selector switch to choose between automatic and semiautomatic fire, sometimes with the additional option of tri-burst fire.

²³ National Firearms Act, ch. 757, 48 Stat. 1236 (1934).

²⁴ 26 U.S.C. §§ 5811-5812, 5845 (1988).

As of May 1986, production of new automatics (including assault rifles) for the civilian market became completely illegal, although there have been some disputes among the lower federal courts about the constitutionality of the prohibition. *See Farmer v. Higgins*, 907 F.2d 1041 (11th Cir. 1990), *rev'g* 1:87-CV-440-JOF (1989), *cert. denied*, 498 U.S. 1047 (1991); *but cf.* *United States v. Dalton*, 990 F.2d 1166 (10th Cir. 1993); *United States v. Rock Island Armory, Inc.*, 773 F. Supp. 117 (C.D. Ill.), *app. dismissed*, 1991 U.S. App. LEXIS 19505 (7th Cir. Aug. 13, 1991).

²⁵ Stockton murderer Patrick Purdy did not use an AK-47. He used a Chinese, semiautomatic gun known as the AKM-56S. *See* 135 CONG. REC. 19, S1871 (1989) (Testimony of James J. Baker).

²⁶ A few guns labeled "assault weapons" are revolver-type guns (such as the Striker 12 shotgun), while others are single-shot (able to fire only a single shot before reloading), such as the Encom CM-55 shotgun.

²⁷ Again, there are a few exceptions. The Uzi Pistol is used by the Israeli army.

Not surprisingly, attempted legislative definitions of "assault weapons" have varied widely. Some definitions are simply a list of guns.²⁸ Other definitions may involve a set of various characteristics. Still others may involve a list and a set of characteristics.²⁹ The discussion below examines the various purported characteristics of (pg.388) "assault weapons."³⁰

A. Rate of Fire

Foremost among the features which are said to make "assault weapons" different from other firearms is their "high rate of fire."³¹ If "assault weapons" were actually automatic firearms, such as machine guns, then the claim would clearly be true. With an automatic weapon, if the shooter squeezes and holds the trigger, bullets will fire automatically and rapidly until the trigger is released.

Semiautomatic firearms, however, are by definition not automatic. With a semiautomatic, pressing the trigger fires one, and only one bullet.³² To fire another bullet, the shooter must release the trigger, and then press it again. Thus, a semiautomatic can shoot only as fast as a person can squeeze the trigger. So, although gun prohibition advocates sometimes use the catch-phrase "spray-fire," a semiautomatic firearm, unlike a machine gun, cannot "spray fire," because the shooter must press the trigger for each shot.

The "semi" in "semiautomatic" comes from the fact that the energy created by the explosion of gunpowder, used to force the bullet down the barrel, is diverted away from the shooter. The energy is directed forward, and is used to reload the next cartridge into the firing chamber. Thus, in semiautomatic action firearms the shooter does not need to perform an additional step, such as cocking a lever ("lever action") or operating a slide ("slide action"), in order to load the next round. Although a semiautomatic firearm does not require a separate (pg.389) step to load the next round into the firing chamber, the semiautomatic is not unique in this regard. In a revolver or a double-barreled shotgun or rifle, the shooter can also fire the next shot as fast he can squeeze the trigger.

How does the actual rate of fire of a semiautomatic compare to the rate of other guns? The Winchester Model 12 pump action shotgun can fire six "00 buckshot" shells, each containing twelve .33 caliber pellets, in three seconds. Each of the pellets is larger than the bullet fired by an AKS. In other words, the Winchester Model 12 pump action shotgun can, in three seconds, unleash seventy-two separate projectiles, each capable of causing injury or death. The Remington Model 1100 shotgun (which is a common duck-hunting gun) fires semiautomatically and is not usually labeled an "assault weapon." It can unleash the same seventy-two projectiles in 2.5 seconds. In

²⁸ CAL. PENAL CODE, *supra* note 2; Conn. Legis. Serv., *supra* note 4.

²⁹ N.J. STAT ANN., *supra* note 3; Kokalis, *supra* note 6, at 7.

³⁰ The phrase "assault weapon" is used in quotes because, as will be detailed below, the phrase is not a legitimate definition of firearms that are in any meaningful way different from other firearms. In contrast, the phrase "assault rifle" is generally used without quotation marks, because "assault rifle" clearly defines a set of firearms that are distinguishable from other firearms.

³¹ CAL. PENAL CODE, *supra* note 2. Similarly, Bridgeport, Connecticut police chief Thomas Sweeney asserted: "World War II-era semi-automatics are not included in the ban [recently enacted by Connecticut] because they don't fire as fast as modern semi-automatics." *Cop Out*, SHOOTING INDUSTRY, at 173 (Shot Show Issue 1994).

³² A bullet is the single lead projectile that is fired from a rifle or handgun. Before being fired, the bullet is contained in a shell (usually made of brass) that also contains gunpowder and a primer. When the trigger is pulled, a firing pin strikes the primer, igniting the gunpowder, pushing the bullet out of the shell, and down the barrel.

The operation of a shotgun is essentially similar, except that the shotgun shoots a set of pellets, or shot, rather than a single bullet, and the shell is made of plastic (sometimes paper), rather than brass.

A "round" is a single unit of rifle, handgun, or shotgun ammunition, fully assembled.

contrast, an AKS would take about a minute to fire forty aimed shots, or perhaps twice that many without aiming and the AKS rounds would be slightly smaller than the pellets from the Winchester or Remington.³³ Similarly, an old-fashioned .357 revolver can fire six shots in as little as two seconds.

If one tests a firearm under highly artificial conditions—such as bolting the gun to heavy platform and squeezing the trigger by jerking one's arm back and forth—a semiautomatic will "cycle" slightly faster than other firearms. But the only meaningful rate of fire for a weapon is how fast a person, shooting at actual targets, can hit those targets. In terms of actually hitting a target, a study conducted by the United States Navy Seals is revealing. According to the Navy study, at close (pg.390) range, a bolt-action gun³⁴ cycles only one-tenth of a second slower than a semiautomatic; at longer ranges, the cyclic rate is the same for both types of guns. The Navy studies also confirmed something that most gun-owners understand—but something which persons whose familiarity with weapons is limited to "Rambo" movies do not—shooters who fire without aiming virtually never hit their target. It is nearly impossible for even trained shooters to fire on target at much faster than one shot per second.³⁵

Because, under highly artificial conditions, a semiautomatic can be shown to fire slightly faster than other guns, a prohibition of all semiautomatics might pass a lenient version of the rational basis test. Under this test, any distinction, no matter how slight or meaningless, would be held sufficient. Most "assault weapon" legislation, however, cannot clear even this low hurdle, at least in regard to rate of fire. The legislation almost always bans some, but not all, semiautomatics. All semiautomatics have one of three types of action design—recoil-operated, blowback, or gas operated³⁶—and the guns typically selected for prohibition are not exclusively of one type or another. Thus, some semiautomatics are prohibited because of their alleged high rate of fire, while other semiautomatics, with an identical rate of fire, are not prohibited. Accordingly, "rate of fire," standing alone, provides no more than a shred of a rational basis for prohibiting all semiautomatics, and provides no rational basis at all for banning only some semiautomatics.

³³ See Morgan, *supra* note 7, at 149; William R. McGrath, *An Open Letter to American Politicians*, POLICE MARKSMAN, May/June 1989, at 19; EDWARD EZELL, THE AK-47 STORY, (Smithsonian Institution 1986). See also Kent Jenkins, Jr., *Calls for Ban Boost Assault Rifle Sales*, WASH. POST, Mar. 6, 1989, at B1 ("[BATF] weapons experts say that the guns' firing mechanisms are no different from those of other rifles.").

According to testimony of the Bureau of Alcohol, Tobacco and Firearms:

The AK-47 is a select fire weapon capable of firing 600 rounds per minute on full automatic and 40 rounds per minute on semiautomatic. The AKS and AK-47 are similar in appearance. The AK-47 is an NFA [National Firearms Act of 1934] type weapon, having been manufactured as a machine gun. The AKS is difficult to convert, requiring additional parts and some machinery The AKS is a semiautomatic that, except for its deadly military appearance, is no different from other semiautomatic rifles. As a matter of fact, the identical firearm with a sport stock is available and, in appearance, no different than other so-called sporting weapons.

Morgan, *supra* note 7, at 148 n.29 (quoting Assault Weapon Import Control Act of 1989, 1989: Hearings on H.R. 1154 before Subcomm. on Trade of the House Comm. on Ways and Means, 101st Cong., 1st Sess. 70 (1989).)

³⁴ In a bolt-action gun, after one cartridge is fired, the shooter pulls on the bolt handle to load the next cartridge into the chamber. R.A. STEINDLER, THE FIREARMS DICTIONARY 15 (1970). The bolt-action rifle was the military firearm of the U.S. Army during World War I, and of military forces in other parts of the world for decades thereafter.

³⁵ Affidavit of Ron Phillips, Colo. ex. 29, at 2, Robertson v. Denver, *supra* note 1; Johnson aff., Colo. ex. 51, at 3, Robertson v. Denver, *supra* note 1 (Defense Intelligence Agency expert in assault weapons classification).

³⁶ STEINDLER, *supra* note 34, at 20.

B. Magazine Capacity

A second feature, supposedly unique to "assault weapons," is their high ammunition capacity.³⁷ In fact, most semiautomatic firearms, both banned and nonbanned, store their ammunition in detachable boxes or tubes called "magazines." The number of rounds a gun can fire without reloading depends on the size of magazine, an interchangeable, removable part that can be purchased separately. Thus, ammunition (pg.391) capacity has nothing to do with the gun itself. The magazine, not the gun, is the variable. Any gun that accepts detachable magazines can accept a magazine of any size.³⁸

It follows that the rational way to ban guns based on potential large ammunition capacity would be to outlaw all guns which can accept detachable magazines. Alternatively, a rational ban might apply only to guns in which large capacity magazines (however one defines "large") are actually inserted. Another approach to controlling ammunition capacity would be to regulate or outlaw magazines that hold more than a certain number of rounds. Such proposals have been made by former President Bush (fifteen rounds),³⁹ Senator Diane Feinstein (ten rounds),⁴⁰ and the lobby Handgun Control, Inc. (six rounds).⁴¹ This prohibition is at least minimally rational.

Whether such regulation would pass a rationality test is, however, debatable. Changing a magazine takes only a second or two.⁴² A person simply hits the magazine release button and the empty magazine falls to the ground. A new magazine is then inserted. In one firearms demonstration, a police shooter emptied a thirty round magazine attached to a banned Colt rifle in 5.9 seconds. The officer then fired a fifteen round magazine attached to an unbanned Glock pistol, changed magazines (2.25 seconds), and then fired another 15 rounds. The same thirty rounds were fired by the Glock in 8.92 seconds.⁴³ Does the difference between six and nine seconds to fire thirty shots constitute "a real and substantial" difference?

Certainly not in the Stockton, California schoolyard where mass murderer Patrick Purdy killed five children, and wounded twenty-nine in January 1989. Using a Chinese semiautomatic rifle with large capacity magazines, Purdy fired approximately 110 rounds in four to six minutes. The rate of fire could be duplicated by virtually every gun currently manufactured. Even including time for reloading, a simple (pg.392) revolver or a bolt-action hunting rifle can easily fire that fast.⁴⁴

C. Conversion to Full Automatic

One of the most widely-asserted claims about semiautomatic "assault weapons" is that they can easily be converted into fully automatic weapons. According to the Bureau of Alcohol, Tobacco

³⁷ CAL. PENAL CODE, *supra* note 2.

³⁸ Morgan, *supra* note 7, at 149; GARY KLECK, POINT BLANK: GUNS AND VIOLENCE IN AMERICA 79 (1992).

³⁹ N.Y. Times, May 16, 1989, at A1.

⁴⁰ Kokalis, *supra* note 6, at 7.

⁴¹ Richard M. Aborn, Testimony before the Committee on Codes of the Assembly of the State of New York (Jan. 3, 1991).

⁴² See James B. Jacobs, *Assault Rifles are Bad Targets*, NEWSDAY, May 28, 1993, at 58 ("[a] spent magazine can be popped out and a new one inserted in an instant.")

⁴³ Malcolm Gladwell, *Irrational Bans on "Assault Weapons" Draw False and Ignorant Distinction*, DISPATCH (Columbus, Oh.), Mar. 27, 1993, at 7.

⁴⁴ Phillips aff., *supra* note 35 at 2.

and Firearms (BATF), all so-called "assault weapons" are "difficult to convert to automatic fire."⁴⁵ The conversion requires several hours work by a skilled gunsmith willing to commit a major felony.⁴⁶ The (pg.393) gunsmith must also have access to expensive equipment, such as precision lathes. The origin of the easy convertability myth may lie with the semiautomatic M10 pistol. Versions of the pistol built during the early 1980s were easy to convert, requiring no technical skill and only five minutes of work. The BATF, using administrative authority, classified those early M10s as machine guns, requiring a federal license for possession.⁴⁷ Subsequent models of the M10 have been produced without the easy convertability.

D. Lethality of Ammunition

"Assault weapons" are also said to fire "high-power" or "high-velocity" bullets which are unusually destructive. Elementary ballistics show this claim to be false.

As detailed above, ammunition for genuine assault rifles (battlefield weapons such as the AK-47 or M-16) is classified as being "intermediate" in power. The ammunition for semiautomatic rifles which look like, but do not fire like, automatic rifles is the same. This ammunition uses bullets which weigh the same or less than bullets used for big-game hunting. For example, a 9mm bullet, used in the Uzi pistol, weighs between 88 and 147 grains (depending on the manufacturer and model); a 7.62 x 39 bullet, used in Kalashnikov rifles, weighs 110 to 125 grains; while the bullet for

⁴⁵ Statement of Edward D. Conroy, Deputy Associate Director, Law Enforcement, BATF, before U.S. Senate Subcommittee on the Constitution, Feb. 10, 1989, at 1; Charles Mohr, *Firearms Market Thrives Despite an Import Ban*, N.Y. TIMES, Apr. 3, 1989, at A14.

⁴⁶ S. REP. NO. 160, 101st Cong., 1st sess. 3 (1989) (testimony of Detective Jimmy L. Trahin of the Los Angeles Police Department Firearms/Forensics Ballistics Unit, stating that: "99% of these so-called assault weapons are not easily converted.")

A machine gun expert explains the complexity of converting a semiautomatic rifle to automatic:

If time and effort are of no consequence, any firearm, even a lever-action rifle, can be converted to fully automatic fire. Converting a semiautomatic-only AK to automatic fire requires a great deal of skill and knowledge and no small amount of effort and equipment. Without being too specific, the procedure is more or less as follows:

- 1) A portion of the receiver must be modified. A hole through each side of the receiver (larger on one side than the other) must be precisely located (to within 0.0015) and drilled to accept the axis pin for the auto safety sear and its coil spring. This special coil spring also retains the hammer and trigger pins. If not installed correctly, the hammer and trigger axis pins will not be retained, and these components will fall out of the receiver. A slot must also be carefully milled into the rightside bolt-carrier rail to accept the auto safety sear. The three new components required are not easily procured or fabricated.

- 2) The hammer must be built up by welding and then with great skill re-shaped to provide a notch not present on the semiautomatic-only version.

- 3) An extension must be added at the rear of the sear by welding and then re-shaped to contact the selector lever.

- 4) A portion of the selector-lever stop on the rightside exterior of the receiver must be removed and another detent milled into the receiver for the new semiauto position.

- 5) The bolt carrier must be built up by welding and then re-shaped to actuate the auto safety sear.

If welded components are not subsequently and properly heat-treated, wear will be accelerated and these parts will fail in a short period of time, often with dangerous consequences. Furthermore, if this conversion is performed on an AKM type with a sheet-metal receiver, failure to install a completely unavailable five-component, anti-bounce mechanical drag device on the hammer (especially if the firing pin is not spring-retracted) will probably result in a disastrous ignition out of battery.

Peter G. Kokalis, *Full Auto*, SOLDIER OF FORTUNE, Dec. 1989, at 16.

⁴⁷ Michael Hancock, *The Convertible Submachine Gun Boondoggle*, N.Y. TIMES, June 15, 1985, at A22.

the popular 30-06 hunting rifle ranges from 55 to 250 grains (twenty-one of the twenty-two bullet types for the 30-06 are 100 grains or above); the bullet for the ubiquitous Colt .45 pistol weighs 185 to 230 grains; and bullets for the 458 Winchester magnum weigh between 300 and 510 grains.⁴⁸

One of the reasons that the ammunition for the military-style rifle is smaller, and hence less powerful, is that it was created for soldiers who would have to carry large quantities of ammunition over long distances.⁴⁹ In contrast, standard hunting ammunition can be heavier, because a hunter will carry only a few rounds on a trip that is usually completed in a single day, or at most a few days.

The second major factor in the force of a bullet's impact is its velocity. Other things being equal, a bullet traveling at high velocity (pg.394) will be more destructive than a bullet traveling at lower velocity. The muzzle velocities for the ammunition types listed above are: For the 9mm, between 975 and 1,500 feet per second (fps); for the 7.62 x 39, from 2,100 to 2,500 fps; for the 30-06, from 2,100 to 4,080 fps; for the Colt pistol, 770 to 1140 fps; and for the 458 Winchester magnum, from 2,100 to 2,500 fps.⁵⁰

A bullet's power to damage its target depends mainly on the kinetic energy delivered by the bullet. Kinetic energy is produced by the combination of bullet weight and velocity.⁵¹ A typical 7.62 x 39 bullet for the AKS rifle (a Kalashnikov variant) achieves 1,445 foot-pounds of kinetic energy per second. In contrast, the 30-06 hunting rifle bullet carries 2,820 foot-pounds of energy.⁵²

The claim that the ammunition for semiautomatic pistols and shotguns is uniquely destructive is even less plausible than is the claim regarding semiautomatic rifles. Most "assault pistols" fire ammunition in the .45 or 9mm calibers, and have the same velocity as any other pistol in those common calibers.⁵³ The shotguns labeled "assault weapons" also fire shells identical to those fired by all other shotguns.

The great irony of the claim that the rifles dubbed semiautomatic "assault weapons" are uniquely destructive is that they are the only rifles that have ever been designed *not* to kill. The semiautomatic rifles use the same ammunition as battlefield weapons such as the M-16, which deliberately use intermediate power ammunition intended to wound rather than to kill. The theory is that wounding an enemy soldier uses up more of his side's resources (to haul him off the battlefield and then care for him) than does killing an enemy.⁵⁴

Colonel Martin L. Fackler, M.D., former Director of the United (pg.395) States Army Wound Ballistics Lab, the only research center in the world which studies wound ballistics, states:

⁴⁸ FRANK C. BARNES, CARTRIDGES OF THE WORLD 59, 92, 110, 231, 249 (7th ed. 1993).

⁴⁹ Gladwell, *supra* note 43, at 7.

⁵⁰ BARNES, *supra* note 48, at 46.

⁵¹ If the bullet enters and exits the target's body, only part of the kinetic energy is transferred to the target. If the bullet does not exit, all the kinetic energy will be transferred. Accordingly, bullets which are designed to deform on impact, and not exit the body, will generally do more damage than will other bullets. Bullets designed not to exit the target's body are available for virtually all types of firearms.

⁵² See Lindsey, *The Idolatry of Velocity, or Lies, Damned Lies, and Ballistics*, 20 J. TRAUMA 1068 (1980).

⁵³ The videotape produced by Handgun Control, Inc. as a part of the lobbying campaign for prohibition acknowledges that "assault weapon" bullets are nothing special. The tape includes an interview with Dr. Hermann, Director of the Institute for Forensic Sciences. Dr. Hermann explains that the Uzi bullet is "slightly larger and slightly faster than the .38 special [a medium-sized handgun bullet]. It does not produce a large cavitary destructive wound through the body." HANDGUN CONTROL, INC., *THE DEADLY DISTINCTION* (1989).

⁵⁴ Martin L. Fackler, *Getting Your Guns Straight*, WASH. POST, Apr. 24, 1993, at A25.

Military bullets are designed to limit tissue disruption—to wound rather than kill. The full-metal-jacketed bullet is actually more effective for most warfare; it removes the one hit and those needed to care for him ... newspaper descriptions comparing their effects with a grenade exploding in the abdomen ... must cause the thinking individual to ask: ... how is it possible that 29 children and one teacher out of 35 hit in the Stockton schoolyard survived? If producers of "assault rifles" had advertised their effects as depicted by the media, they would be liable to prosecution under truth-in-advertising laws.⁵⁵

Assertions that the bullets from Kalashnikov rifles will tumble as they travel through the body, thereby greatly increasing the size of the wound channel, are nonsense. Dr. Fackler writes: "As a combat surgeon in Da Nang in 1968, I operated on many who had been wounded by AK-47 bullets. The typical wound was no more disruptive than that caused by many common handgun bullets."⁵⁶ The .223 rifle round, used in many of the rifles dubbed "assault weapons" is described as producing wounds "less severe than those produced by hunting ammunition such as the 30-30."⁵⁷

E. Accessories

The more recent efforts at banning "assault weapons" focus on whether a firearm has two or more of a certain set of accessories.⁵⁸ Unlike classifications based on the false assertion that "assault weapons" fire faster, have more ammunition capacity, or use more (pg.396) destructive ammunition, the accessory-based definitions do pass the most minimal levels of rationality, because an "assault weapon" is defined as a firearm with a particular set of accessories. Likewise, a law which prohibited only pool tables which have bumpers in the playing area ("bumper pool") would likewise achieve minimal rationality. The classification would accurately separate certain guns from other guns. But, do the accessory-based classifications create a distinction without a difference? Let us examine the accessories which are usually used in defining an "assault weapon."

1. Pistol Grips

The major purpose of a pistol grip on a long gun is to stabilize the firearm while firing from the shoulder. By holding the pistol grip, the shooter keeps the barrel from rising after the first shot, and thereby stays on target for a follow-up shot. The defensive application is obvious, as is the public safety advantage in preventing stray shots.

It is true that a pistol grip allows a rifle to be fired without resting against the shoulder. Does this provide a rational basis for making the rifle illegitimate? Only if one also bans handguns; for every handgun, because it has a pistol grip, can be fired without resting against the shoulder.

⁵⁵ Martin L. Fackler, WALL ST. J., Apr. 10, 1989, at A15, col. 1 (letter to the editor).

⁵⁶ Fackler, *supra* note 54. See also EMERGENCY WAR SURGERY, SECOND UNITED STATES REVISION OF THE EMERGENCY WAR SURGERY HANDBOOK, UNITED STATES DEPARTMENT OF DEFENSE 24 (Thomas E. Bowen, M.D. & Ronald F. Bellamy, M.D., eds., 1988) ("[M]any wounds from this weapon resemble those caused by much lower velocity handguns."); Martin L. Fackler et al., *Wounding Effects of the AK-47 Rifle Used by Patrick Purdy in the Stockton Schoolyard Shooting of Jan. 17, 1989*, 11 AM. J. FORENSIC MED. & PATHOL. 185 (1990); Martin L. Fackler, *Wounding Patterns of Military Rifle Bullets*, 22 INTL. DEF. REV. 59 (1989); Martin L. Fackler, *Wound Ballistics: A Review of Common Misconceptions*, 259 JAMA 2730 (1980).

⁵⁷ VINCENT C. DiMAJO, GUNSHOT WOUNDS: PRACTICAL ASPECTS OF FIREARMS, BALLISTICS AND FORENSIC TECHNIQUES 146 (1985).

⁵⁸ Kokalis, *supra* note 6.

Unless self-defense is considered illegitimate (see discussion part V, *infra*), a pistol grip is a legitimate defensive tool. With a pistol grip, a rifle can be held with one hand while the other hand dials 911 or opens a door.⁵⁹ The application in a home defense situation is obvious, because burglary victims will not always have time to raise their gun to their shoulder, and may not even be in a position to take a shot from the shoulder.

2. Muzzle Brakes

A gunsmith can attach a muzzle brake to any gun. However, many semiautomatic rifles dubbed "assault weapons" have a threaded barrel for easy attachment of the brake. A muzzle brake reduces the gun's recoil and makes it easier to control.

Recoil vibrations look, mathematically, like a sine wave; as the (pg.397) recoil sine waves travel from the firing chamber toward the muzzle end of the barrel, the waves will "whip" the muzzle around slightly. As a result, accuracy is diminished; a bullet that exits the muzzle when the muzzle is being whipped in one direction, at the top of a sine wave, will travel in a different direction from a bullet that leaves when the muzzle is whipped in a different direction, at the bottom of the sine wave. A new muzzle brake, the Browning "Ballistic Optimizing Shooting System," allows the shooter to "tune" the barrel vibrations produced by recoil. Different types of ammunition will produce different recoil vibration waves. For example, in the 270 Winchester rifle caliber a 160 grain bullet with 51 grains of gunpowder will produce different vibrations from a 130 grain bullet with 55 grains of gunpowder. The Browning muzzle brake can be adjusted by the shooter based on different types of ammunition, to optimize the recoil vibration for each particular type. One reviewer described the results of the tuning allowed by the Browning muzzle brake as, "[t]he most significant advancement in rifle accuracy in my lifetime."⁶⁰ Other reviewers have been equally positive. They note that the Browning brake significantly reduces felt recoil to the shooter, and thereby reduces the "flinch" that causes shooters to jerk the rifle off-target.⁶¹

Clearly, a gun with a muzzle brake is different than one without. It is both significantly more accurate because the muzzle and the shooter are both less likely to move out of position, and more comfortable to shoot. Improved accuracy and shooting comfort seem a dubious basis for classifying a firearm as uniquely suitable for prohibition.

3. Flash Hiders

Another common accessory is the flash suppressor, which reduces the flash of light from a rifle shot. Reduced flash decreases shooter's blindness—the momentary blindness caused by the sudden flash of light from the explosion of gunpowder. The flash reduction is especially important for shooting at dawn or at dusk. Additionally, reduced flash means that a person shooting at an attacker at night will less markedly reveal his own position. The flash hider also adds about one to three inches to the barrel length, thus making the firearms more difficult to (pg.398) conceal.

In the summer of 1993, a Virginia Governor's Task Force held meetings on "assault weapons." Mr. Ed Owens, a senior official with BATF was asked "if the flash suppressor, the

⁵⁹ THE GUN DIGEST BOOK OF ASSAULT WEAPONS 46 (1st ed. 1986).

⁶⁰ Jon R. Sundra, *The Most Significant Advancement in Rifle Accuracy in my Lifetime*, SHOOTING INDUSTRY 36 (Shot Show Super Issue 1994).

⁶¹ Peter Maxwell, *Meet the "BOSS,"* NEW ZEALAND GUNS, Mar./Apr. 1994, at 56-57.

bayonet mount and the grenade launcher are features that affect the fire power?" Owens replied "it doesn't have a thing to do with it." Owens was then asked "if you had to pick the characteristics that give these weapons their killing power, what would be the main features?" Owens replied, "killing power is the cartridge, the larger the cartridge, the more deadly the weapon."⁶² (As noted above, "assault weapons" fire a smaller cartridge than standard hunting rifles.)

4. Night Sights

Another purported rational basis of "assault weapons" prohibition has been that many of the guns are said to be configured to allow easy attachment of night sights. It should be noted, however, that a mounting attachment which is perfectly configured to attach night sights is also perfectly configured to attach sights which work only during the daytime.

In any case, there is nothing illegitimate about night sights. While it is generally illegal to hunt at night, it is legal to defend home, person, and property at night. Turning on a light to try to find an attacker's position would reveal one's own position, and thereby give the criminal the first shot.

5. Folding Stocks

Guns with folding stocks are sometimes singled out for harsh treatment. For example, the New Jersey legislature's "assault weapon" ban outlaws the Ruger Mini-14 rifle, but only the model with a folding stock.⁶³ A folding stock makes a gun shorter and easier to carry, thus making it useful to hunters. A folding stock also makes a gun more maneuverable in a confined setting such as a home, and hence harder (pg.399) for an attacker to take away.⁶⁴ The reduced size makes the gun easier to conceal, for legitimate or illegitimate purposes. Unless all handguns are also deemed illegitimate, because they are far more concealable than rifles in any configuration, there is no rational claim that a rifle's folding stock makes it less legitimate than other firearms.

6. Bayonet Lugs

⁶² Memorandum from Richard E. Gardiner, NRA Legislative Counsel to James J. Baker, NRA Executive Director, regarding Virginia Governor's Task Force (transcript of Meeting on Assault Firearms Definition, July 8, 1993).

⁶³ N.J. STAT. ANN. § 2C:39-1(w)(3) (West 1993).

⁶⁴ Another useful defensive configuration is the ability to select different types of ammunition "on the fly." Imagine a parent confronted with a violent burglar. Shooting the burglar might be the only way to protect nearby children. But a conventional hunting rifle cartridge would penetrate the criminal, then a wall, and might hit a child. The parent would be better off with a shotgun loaded with light birdshot—to knock the burglar down, but not penetrate a wall.

On the other hand, suppose the burglar's entry had transpired a little differently. The whole family might be huddled in one room, while the burglar kicked and banged at the creaking door. Then the optimal self-defense shot would be a slug from a shotgun—to crash through the thick door and into the burglar.

In short, different home family defense situations require different ammunition. An excellent gun for home defense, then, would be a shotgun for which the shooter could rapidly select different loads. There is such a gun. The shotguns which are singled out by name in most "assault weapon" legislation, such as the Striker 12, are the only long guns with such beneficial features. The Striker 12 is so named because it is a shotgun with an external rotating cylinder. The shooter can quickly dial any of 12 different rounds.

Under legislation sponsored by Representative William Hughes in 1990, any gun which could accept a bayonet could be considered an illegal "assault weapon."⁶⁵ Bayonets are obviously of no sporting utility, although they could be marginally useful in the personal and civil defense contexts. The major problem with the bayonet-ban, however, is that *any* rifle barrel can be a bayonet mount. Moreover, how many, if any, criminals have ever charged their victims with a bayonet.

7. Grenade Launchers

Some guns are selected for prohibition because they have an attachment that allows for the easy mounting of a grenade launcher. A gun which launches grenades is distinguishable from a gun which does not. The explosion from a grenade is much more powerful, and much less discriminating than is a bullet from a firearm. But possession of grenades, as well as the components necessary to assemble grenades, is already strictly regulated by federal law, under terms (pg.400) similar to those applicable to machine guns. Possession of grenade launchers is similarly regulated.⁶⁶

Given the existing rational regulation of grenades, grenade components, and grenade launchers, it must then be asked whether the fact that a grenade launcher could be attached to a particular gun has any genuine impact on public safety. When asked by a *Wall Street Journal* reporter, neither the BATF nor the Department of Justice was able to indicate a single instance of a grenade launcher (or a bayonet attached to a rifle) being used in a crime in the United States.⁶⁷

F. Design History

The features discussed above all relate to the physical characteristics of a firearm. Besides physical traits, having a particular design history may also make a gun into an "assault weapon." A common statutory definition of an "assault pistol" is:

All semiautomatic pistols that are modifications of rifles having the same make, caliber and action design but a shorter barrel and no rear stock or modifications of automatic weapons originally designed to accept magazines with a capacity of twenty-one (21) or more rounds.⁶⁸

The definition raises serious problems regarding vagueness. Gun owners are required to know details of the design history of their gun, and of the models which preceded the gun they own.⁶⁹ Even assuming (pg.401) that small details of firearms design history were common knowledge

⁶⁵ Kokalis, *supra* note 6.

⁶⁶ 18 U.S.C. §§ 841-844 (1993).

⁶⁷ James Bovard, *The Assault on Assault Weapons*, WALL ST. J., Jan. 6, 1994, at A12. Grenade launchers were used by the ATF in its attack on the Branch Davidian compound in Waco, but it is not at this point clear whether the ATF's actions were criminal. *Id.*

⁶⁸ DENVER REV. MUN. CODE § 38-130(b)(1)(c) (1991).

⁶⁹ There is no reasonable way for a person of common intelligence to know if a particular pistol was originally based on a rifle design, or based on the design of an automatic weapon. Persons attempting to comply with this language must also learn not only from what guns their pistol was designed, but also learn the design history of the ancestor guns themselves—whether the ancestor automatic firearm was "originally designed to accept magazines with a capacity of twenty-one (21) or more rounds." DENVER REV. MUN. CODE § 38-130(b)(1)(c) (1991). It is irrationally burdensome to require citizens who wish to learn if their pistols are legal to research both how their pistol was designed, and how the ancestors to that pistol were "originally designed."

Having somehow discovered the design history of a pistol, a person must then attempt to discover its design mechanics—if

among ordinary gunowners, there is no rational basis for outlawing a gun based on its design history.⁷⁰ To whatever extent guns with an allegedly pernicious design history have common physical traits making them more dangerous, legislation can be drafted on the basis of those traits. To hold that a firearm's military design history creates a rational basis for prohibition would be the same as authorizing a prohibition on "CJ" Jeeps, which, although operationally similar to other civilian jeeps, have a military design history.

Moreover, to prohibit an object based on a mere historical relation to the military could, under *Cleburne's* illegitimacy prong, reflect an illegitimate bias against the military, and hence fail to survive careful rational basis scrutiny.⁷¹

G. Positive Operational Characteristics

Given the above discussion, which has pointed out how the guns labeled "assault weapons" are similar to other guns, one may wonder why anyone would want to own such a gun. Although a person's choice of firearms model, like their choice of automobiles, may reflect emotional or aesthetic values rather than practical ones, there are two significant reasons why many practical gun owners would choose an "assault weapon."

1. The Guns are Reliable, Rugged, and Simple

Most of the rifles dubbed "assault weapons" have a greater immunity to weather conditions and abuse than more traditional hunting rifles.⁷² A semiautomatic AKS can be dropped in the mud, (pg.402) dragged through brush, and can withstand the rigors of extremely cold or hot climes. Although the guns are not military arms, they do share many common components with the automatic assault rifles that they resemble. As a result, they share an imperviousness to rough conditions and a lack of cleaning with military guns. The ruggedness stems in part from the fact that the guns have fewer moving parts than specialized sports guns, and are hence easier for persons who are not firearms hobbyists to maintain.

In addition, many "assault weapons" have large trigger guards which are designed so that the shooter can press the trigger while wearing gloves. Plastic stocks (found on many "assault weapons") are superior because wood stocks, when cold and wet, may swell, thereby degrading the accuracy of the firearm. Plastic stocks are also less likely than wood stocks to break if the gun is dropped.

the pistol has the same action as the ancestor rifle. In redesigning a rifle into a pistol, the designer will often modify the action (such as by shortening the piston stroke). It is irrational to require ordinary persons to reconstruct the technical development of a complex part of their firearms.

⁷⁰ Cf. *Zobel v. Williams*, 457 U.S. 55 (1982) (conferring state benefits based on historical pattern of residence, rather than current residency status, is irrational).

⁷¹ The fact that the prohibited guns are descendants of military designs is often listed as a basis for the prohibition by prohibition advocates. DENVER REV. MUN. CODE § 38-130(a). It is true that many of the banned guns are related in design history to military guns, but so are most other guns. Civilian guns have always been derivative of, and often identical to, military guns. Morgan, *supra* note 7, at 155. Thus, a prohibition on "assault weapons" because of their military design history inconsistently, and irrationally, excludes the vast majority of firearms, which are also based on military design.

⁷² Steven R. Myers, *The Legitimate Uses of Assault Weapons*, WASH. POST, Mar. 4, 1989 (letter to the editor); Patrick Mott, *In Defense of the AK-47*, L.A. TIMES, Feb. 24, 1989, at V1, col. 1 (discussing design attributes and adaptability to field use).

The statements about reliability in this section do not of course apply to every single gun that is sometimes denominated an "assault weapon." The TEC-9 pistol, for example, is often criticized for jamming at the wrong moment.

The simplicity of design and ease of use of these weapons—only revolvers are easier to load and shoot—also makes them suited as weapons of self-defense for persons who are not gun aficionados. However, this ease of use is no advantage from the viewpoint of gun prohibitionists. Councilwoman Cathy Reynolds, sponsor of Denver's "assault weapon" prohibition, has complained that the guns "are very easy to use."⁷³

2. The Guns are Very Accurate

The firing of any gun produces recoil or kick. Recoil makes it more difficult to aim and control a shot. Guns with less recoil are easier to fire safely, and better-suited for self-defense. People without a great deal of upper body strength may find a low-recoil gun to be the only kind they can successfully use for self-defense. In a semiautomatic, the energy from the gun-powder explosion is directed forward, rather than backwards towards the shooter. This energy is used to load the next cartridge into the firing chamber, ready for a new trigger press. As a result, semiautomatics have less recoil than other guns, and are therefore quite appropriate for use in situations where accuracy is crucial for safety, such as self-defense in an urban environment.^(pg.403)

As discussed above, some rifles or shotguns dubbed "assault weapons" have a pistol grip in front of the trigger guard. The pistol grip helps stabilize the firearm, to keep the barrel from rising after the first shot, and thereby stay on target for a follow-up shot. Also enhancing the accuracy of a follow-up shot is the fact that in many "assault weapons" the stock is relatively level with the barrel—a configuration which helps the barrel stay on target after the first shot.

It would be rather irrational to ban a firearm because it was particularly accurate and, hence, posed a smaller danger of stray shots.⁷⁴ Public safety is enhanced if persons using guns for personal and civil defense hit their targets. The defensive use of firearms will sometimes involve more than a single shot. Of what rational benefit to public safety is a law that encourages citizens to use guns with high recoil that fire wildly, thereby endangering every person in the vicinity?

H. Conclusion Regarding Physical Characteristics

Can "assault weapon" legislation survive a careful rational basis test? In some cases, as in Connecticut, a legislative body defines "assault weapon" simply by listing particular guns, while other nearly identical guns are left uncontrolled.⁷⁵ In California, the model for many of the subsequently-enacted "assault weapon" prohibitions, the banned guns were selected by persons thumbing through a picture book of guns.⁷⁶ The incoherence of a picture-book-based firearms law was pointed out in a confidential memorandum from the California Attorney General's chief firearms

⁷³ Cathy Reynolds, *Headlines*, Summer 1989 (newsletter).

⁷⁴ The accuracy advantage is maintained only out to distances of about 200 yards. Above that distance, the tighter chambering of bolt-action rifles, despite the bolt-action's higher recoil, results in greater accuracy.

⁷⁵ Lolita C. Baldor, *New Gun Ban Has Loophole*, CONN. POST, Sept. 20, 1993, at A1, A4.

⁷⁶ Richard Gardiner, testimony at Florida Assault Weapon Commission hearings. Bovard, *supra* note 67, at A12 (stating that "San Francisco lawyer Don Kates suggested that legislators, in compiling the list of prohibited guns, appeared to have selected from 'some picture book ... of mislabeled firearms they thought looked evil.'").

expert, which observed that "[a]rtificial distinctions were made between semi-automatic weapons.... We can effectively control *all* semi-automatic weapons or leave them all alone."⁷⁷

Nor can the purported physical differences between "assault weapons" and other firearms form the basis of a rational classification. (pg.404) Contrary to the imagery promoted by the gun control lobby, so-called "assault weapons" do not fire faster and do not have a greater ammunition capacity than many other firearms. Some "assault weapons" do possess features or accessories such as pistol grips or muzzle brakes, but these features do not make "assault weapons" illegitimate. If it is assumed that accuracy, particularly in a self-defense context, is not a negative feature on a gun, then the accessories on "assault weapons" cannot form a basis for prohibition. The firearms commonly dubbed "assault weapons" are generally more rugged and reliable, and easier to shoot accurately than are many other firearms.

Indeed, Professor Jacobs, of New York University, observes that there is less of a rational basis for banning "assault weapons" than there would be for almost any other firearm:

Pistols are dangerous because they are easily carried and concealed; shotguns because they spray metal projectiles over a wide area; certain hunting rifles because they fire large caliber bullets, and certain "sniper rifles" because they are accurate over great distances. Assault rifles are not remarkable by any of these criteria.⁷⁸

Because the rational basis test precludes "discriminations which are entirely arbitrary,"⁷⁹ the physical characteristics of so-called "assault weapons" cannot survive careful rational basis review.

IV. INSUFFICIENTLY DEMONSTRATED USE IN CRIME

An alternative rational basis for the prohibition of "assault weapons" might be the frequency of their use in crime. After all, even if brown dogs are physically like black dogs, the fact that black dogs are ten times more likely to bite would form a rational basis for greater regulation of black dogs.

Whether the frequency of use in crime provides a rational basis for an "assault weapon" prohibition depends largely on the fact-finder's depth of inquiry. If the fact-finder unquestionably accepts the legislative findings that accompany an "assault weapon" prohibition, the legislative statement that "assault weapons" are frequently used in (pg.405) crime becomes a fact, and would form a rational basis for prohibition.⁸⁰ Likewise, if at an evidentiary hearing, the fact-finder accepted

⁷⁷ Memorandum from S.C. Helsley, Asst. Dir., Invest. & Enforcement Branch, Calif. Dept. of Justice, to Patrick Kenday, Asst. Atty. Gen. 3-4, Feb. 14, 1991 (emphasis in original).

⁷⁸ Jacobs, *supra* note 42.

⁷⁹ State v. Reed, 473 A.2d 775, 781 (Conn. 1984).

⁸⁰ In contrast to the rational basis test, application of the strict scrutiny/fundamental rights test would suggest that even compelling proof that "assault weapons" are frequently used in crime would not provide a constitutional basis for prohibition. See American Booksellers Assoc. v. Hudnut, 771 F.2d 323, 329-30 (7th Cir. 1985), *aff'd*, 475 U.S. 1001 (1986):

[W]e accept the premises of this legislation [against sexualized depictions of women as subordinate]. Depictions of subordination tend to perpetuate subordination. The subordinate status of women in turn leads to affront and lower pay at work, insult and injury at home, battery and rape on the streets ... Yet all is protected as speech, however insidious.

Similarly, the Colorado Supreme Court has explained that even the most urgent needs of law enforcement do not rise above

without question the statements of government officials who supported prohibition, a rational basis for prohibition would exist.

But such blind deference is not appropriate for application of the rational basis test. *Cleburne* found the city's fears about the risks of crowding caused by the location of a group home to be irrational because the purported harms had been "insufficiently demonstrated."⁸¹

The *Cleburne* approach appears consistent with what Justice Stone wrote in *Carolene Products*:

Where the existence of a rational basis for legislation whose constitutionality is attacked depends upon facts beyond the sphere of judicial notice, such facts may properly be made the subject of judicial inquiry, and the constitutionality of a statute predicated upon the existence of a particular state of facts may be challenged by showing to the court that those facts have ceased to exist.⁸² (pg.406)

State court jurisprudence also suggests that judges should not blindly accept the government's allegations regarding the factual basis for legislation.⁸³

If the assertions of government officials are subjected to any judicial scrutiny, then it rapidly becomes clear that the factual basis for prohibition is built on a foundation of sand. In Denver, for example, Chief of Police Ari Zavaras testified to the City Council that "assault weapons are becoming the weapons of choice for drug traffickers and other criminals."⁸⁴ In a lawsuit resulting from the prohibition that the Chief had endorsed, the Colorado Attorney General's office examined the Chief's *ipse dixit*. The State of Colorado inventoried every single firearm in Denver police custody as of March 1991. Of the 232 shotguns seized by the police, not a single one was covered by the ordinance. Of the 282 rifles in the police inventory, nine (3.2%) were covered by the ordinance. Of the 1,248 handguns in the police inventory, a mere eight (0.6%) were so-called

the Constitution: "[N]o matter how necessary to law enforcement a legislative act may be, if it materially infringes upon personal liberties guaranteed by the constitution, then that legislation must fall. Grim as it may be, if effective law enforcement must be dependent upon unconstitutional statutes, then the choice of the way ahead is for the people to act or fail to act under the amendatory processes of the constitution." *Arnold v. City and County of Denver*, 464 P.2d 515, 517-18 (Colo. 1970) (striking vagrancy ordinance although city argued "forcefully and quite compellingly" that ordinance was necessary to fight crime. *Id.* at 517.).

⁸¹ See *Cleburne*, 473 U.S. at 447-50.

⁸² *United States v. Carolene Prods. Co.*, 304 U.S. 144, 153 (1938) (citations omitted). Justice Stone had earlier written:

In ascertaining whether challenged action is reasonable, the traditional common law technique does not rule out but requires some inquiry into the social and economic data to which it is to be applied ... The judge, then, must open his eyes to all those conditions and circumstances within the range of judicial knowledge, in the light of which reasonableness is to be measured.

Harlan Stone, *The Common Law in the United States*, 50 HARV. L. REV. 4, 24 (1936).

⁸³ See *Englewood v. Apostolic Christian Church*, 362 P.2d 172 (Colo. 1961) (stating: "It is well established that whether [a law] has a reasonable connection [to its purpose] "is a question of the determination of the judiciary." *Id.* at 174.).

In *Colorado Springs v. Grueskin*, a city imposed a number of safety restrictions on the delivery of gasoline. There was no suggestion that the fundamental rights test should be used; and the city Fire Chief testified as to the safety advantages of the restrictions. Nevertheless, challengers of the ordinance provided expert testimony that convinced the trial court that the restrictions did not effectively promote public safety. The Colorado Supreme Court upheld the trial court's striking of the ordinance, notwithstanding the Fire Chief's arguments about fire safety. 422 P.2d 384 (1967).

⁸⁴ Affidavit of Avi Zavaras, Colo. ex. B., at 6, *Robertson v. Denver*, *supra* note 1.

"assault pistols" covered by the ordinance.⁸⁵ Of the fourteen banned guns in Denver police custody, only one had been used in a crime of violence. Half had been seized from persons who were never charged with any offense.⁸⁶

A. "Assault Weapons" are Used in Only About One Percent of Gun Crime

The following statistics summarize the findings of official governmental statistical surveys. Because different governments reported data for different years, or reported different types of data (e.g. (pg.407) homicides vs. gun seizures), the raw figures reported from each jurisdiction are sometimes not directly comparable.

Akron. Of the 669 guns seized by the Akron police in 1992, fewer than 1% were "assault weapons."⁸⁷ The 1% figure represents a decline from 1988, when about 2% of seized guns were "assault weapons."⁸⁸

Baltimore County. During the first nine months of 1990, out of 644 weapons logged in to the Baltimore County Police Property Room, only two were "assault weapons." Out of 305 murders in the city of Baltimore in 1990, only seven (2.3%) involved rifles and shotguns of any kind, much less any subset of those firearms labeled "assault weapons."⁸⁹

Bexar County, Texas (including San Antonio). From 1987 to 1992, "assault weapons" were used in 0.2% of homicides and 0.0% of suicides. From 1985 to 1992, they constituted 0.1% of guns seized by the police, according to Vincent DiMaio, the county's Chief Medical Examiner.⁹⁰

California. In 1990, "assault weapons" comprised thirty-six of the 963 firearms involved in homicide or aggravated assault and analyzed by police crime laboratories, according to a report prepared by the California Department of Justice, and based on data from police firearms laboratories throughout the state. The report concluded that "assault weapons play a very small role in assault and homicide firearm cases."⁹¹ Of the 1,979 guns seized from California narcotics dealers in 1990, fifty-eight were "assault weapons."⁹²

⁸⁵ Police Firearms Data, Colo. ex. 65, Robertson v. Denver, *supra* note 1. Even the low percentage of "assault weapons" was artificially inflated by police weapons retention policies initiated at the request of the City Attorney. Stipulation, Colo. ex. 66., Robertson v. Denver, *supra* note 1.

The author of this article represented Colorado in the trial court.

⁸⁶ Colo. ex. 64, Robertson v. Denver, *supra* note 1.

⁸⁷ *Assault Weapons Seized in Akron Last Year*, AKRON BEACON JOURNAL, Jan. 6, 1993 (quoting police Major Leonard Strawderman).

⁸⁸ Robert Hiles, *Police Gunning to Boost Odds*, AKRON BEACON-JOURNAL, March 13, 1989, at A9.

⁸⁹ Letter from Thomas E. Hickman, State's Attorney for Carroll County, to the Hon. John S. Arnick, Chairman of the House Judiciary Committee 2 (Feb. 14, 1991) (citing Ronald Banks, BALTIMORE EVENING SUN, Feb. 11, 1991 (letter to the editor)).

⁹⁰ Vincent C. DeMaio et al., *Assault Weapons as a Public Health Hazard*, 268 JAMA 3073 (1992) (letter to the editor).

⁹¹ David Alan Coia, *Assault Rifles Said to Play a Small Role in Violent Crimes*, WASH. TIMES, June 27, 1992 (quoting Torrey D. Johnston, REPORT ON A SURVEY OF THE USE OF "ASSAULT WEAPONS" IN CALIFORNIA IN 1990, Office of the Attorney General, California Department of Justice, (1991)) (the report, prepared in response to a request by a California State Senator, was suppressed by the California Attorney General's Office, which claimed that the report did not exist. A leaked copy was released to the media). See also Alan W. Bock, *Statistical Overkill on Banned Rifles*, ORANGE COUNTY REG., June 28, 1992, at K4; Mike McNulty, *The War on Gun Ownership Still Goes On!*, GUNS & AMMO, Dec. 1992, at 30-31, 90.

⁹² David Freed, *Assault Rifles are Not Heavily Used in Crimes*, L.A. TIMES, Apr. 21, 1992, at A18.

Chicago. From 1985 through 1989, only one homicide was (pg.408) perpetrated with a military caliber rifle.⁹³ Of the 17,144 guns seized by the Chicago police in 1989, 175 were "military style weapons."⁹⁴

Chicago suburbs. From 1980 to 1989, "assault weapons" totaled 1.6% of seized drug-related guns.⁹⁵

Connecticut. "Assault weapons" constituted 198 of the 11,002 firearms confiscated by police in the years 1988 through 1992.⁹⁶

Denver. A gun-by-gun examination of the firearms in Denver police custody as of March 1991 found fourteen "assault weapons" among the 1,752 crime guns. Only one of those guns had been used in a crime of violence (an aggravated assault).⁹⁷

Florida. The Florida Assault Weapons Commission found that "assault weapons" were used in seventeen of 7,500 gun crimes for the years 1986 to 1989.⁹⁸

Los Angeles. Of the more than 4,000 guns seized by police during one year, only about 3% were "assault weapons."⁹⁹

Maryland. In 1989-90, there was only one death involving a "semiautomatic assault rifle" in all twenty-four counties of the State of Maryland.¹⁰⁰

Massachusetts. Of 161 fatal shootings in Massachusetts in 1988, three involved "semiautomatic assault rifles."¹⁰¹ From 1985 to 1991, the guns were involved in 0.7% of all shootings.¹⁰²

Miami. The Miami police seized 18,702 firearms from January 1, (pg.409) 1989 to December 31, 1993. Of these, 3.13% were "assault weapons."¹⁰³

Minneapolis. From April 1, 1987 to April 1, 1989, the Minneapolis police property room received 2,200 firearms, nine of which were "assault weapons."¹⁰⁴

⁹³ Jay Edward Simkin, *Control Criminals, Not Guns*, WALL ST. J., March 25, 1991, at A10.

⁹⁴ Gene O'Shea, *Chicago Police Back Assault Weapons Ban Approved by Senate*, SOUTHTOWN ECONOMIST, June 12, 1990.

⁹⁵ KLECK, *supra* note 38, at 130 (discussing J.G. Mericle, *Weapons Seized During Drug Warrant Executions and Arrests*, unpublished report of Metropolitan Area Narcotics Squad, Will and Grundy Counties, Illinois (1989)).

⁹⁶ Letter from Major Kenneth H. Kirschner, Commanding Officer, Bureau of Police Support, to Lt. Col. George H. Moore, Commanding Officer, Off. of Admin. Serv., (Mar. 11, 1993) (on file with author).

⁹⁷ Reply Brief of State of Colorado, at 13-15, *Robertson v. Denver*, No. 90CV603 (Denver Dist. Ct., Feb. 26, 1993).

⁹⁸ FLORIDA ASSAULT WEAPONS COMMISSION, ASSAULT WEAPONS/CRIME SURVEY IN FLORIDA FOR YEARS 1986, 1987, 1988, 1989 (1990).

⁹⁹ S. REP. NO. 160, 101st Cong., 1st sess. 3 (1989) (testimony of Detective Jimmy L. Trahin of the Los Angeles Police Department Firearms/Ballistics Unit).

¹⁰⁰ Letter from Thomas E. Hickman, State's Attorney for Carroll County, Maryland, to Rep. John S. Arnick, Chair of the Maryland Senate Judicial Proceedings Committee, 2 (February 14, 1991) (on file with author).

¹⁰¹ M. Arnold, Massachusetts State Police, Firearms Identification Section, *Massachusetts State Police Ballistics Records*.

¹⁰² M. Arnold, Massachusetts State Police, Firearms Identification Section, *Massachusetts State Police Ballistic Records*, March 14, 1990 & April 11, 1991.

¹⁰³ Letter from Jess I. Galan, Criminalist, Crime Laboratory Bureau, to Richard Gardiner, Legislative Counsel, National Rifle Association.

¹⁰⁴ Memorandum from Sgt. W. Reins to Chief John T. Laux, 1 (April 3, 1989) (on file with author); MINNESOTA MEDICAL ASSOC. FIREARM INJURY PREVENTION TASK FORCE, *Firearm Mortality in Minnesota*, MINN. MED., Mar. 1994, at 23.

Nashville. Of the 190 homicides perpetrated in Nashville in 1991-92, none were committed with an "assault weapon."¹⁰⁵

Newark. According to surgeons at the University Hospital in Newark, in the 1980s there was one wounding in the city in that decade in which the bullet removed was the type found in "semiautomatic assault rifles."¹⁰⁶

New Jersey. According to the Deputy Chief Joseph Constance of the Trenton New Jersey Police Department, in 1989, there was not a single murder involving any rifle, much less a "semiautomatic assault rifle," in the State of New Jersey.¹⁰⁷ No person in New Jersey was killed with an "assault weapon" in 1988.¹⁰⁸ Nevertheless, in 1990 the New Jersey legislature enacted an "assault weapon" ban that included low-power .22 rifles, and even BB guns. Based on the legislature's broad definition of "assault weapons," in 1991, such guns were used in five of 410 murders in New Jersey; in forty-seven of 22,728 armed robberies; and in twenty-three of 23,720 aggravated assaults committed in New Jersey.¹⁰⁹

New York City. Of 12,138 crime guns seized by New York City police in 1988, eighty were "assault-type" firearms.¹¹⁰

New York State. Semiautomatic "assault rifles" were used in (pg.410) twenty of the 2,394 murders in New York State in 1992.¹¹¹

San Diego. Of the 3,000 firearms seized by the San Diego police in 1988-90, nine were "assault weapons" under the California definition.¹¹²

San Francisco. Only 2.2% of the firearms confiscated in 1988 were military-style semiautomatics.¹¹³

Virginia. Of the 1,171 weapon analyzed in state forensics laboratories in 1992, 3.3% were "assault weapons."¹¹⁴

¹⁰⁵ Letter from Sgt. Brooks Harris, Crime Analysis Section, Nashville P.D. to Sen. Harlan Matthews (June 2, 1993) (on file with author).

¹⁰⁶ Nicholas Veronis, *Newark Survey Finds Assault Rifle Used in only One Shooting in '80s*, STAR-LEDGER (Newark, N.J.), May 16, 1990, at 15.

¹⁰⁷ Testimony of Dept. Chief Joseph Constance, before the Maryland Senate Judicial Proceedings Committee 3 (March 7, 1991).

¹⁰⁸ Dan Weissman, *Florio Urges Ban on Assault Rifles, Stresses His Support for Abortion*, STAR-LEDGER (Newark, N.J.), July 18, 1989, at 15.

¹⁰⁹ Iver Peterson, *Both Sides Say Trenton's Ban on Assault Rifles Has Little Effect on Crime*, N.Y. TIMES, June 20, 1993.

¹¹⁰ *Handguns, not Assault Rifles, are NYC Weapon of Choice*, WHITE PLAINS REPORTER-DISPATCH, Mar. 27, 1989, at A8-A9.

¹¹¹ Frederic Dicker, *Real Story on Assault Weapons is Hit & Myth*, N.Y. POST, Jan. 10, 1994, at 14 (discussing unpublished data from New York State Division of Criminal Justice Services).

¹¹² Joe Hughes, *Smaller Guns are 'Big Shots' with the Hoods*, SAN DIEGO UNION, Aug. 29, 1991.

¹¹³ Morgan, *supra* note 7, at 151.

¹¹⁴ Margaret Edds, *Assault Weapons Rarely Used in Crimes, Gun-control Panel Told*, VIRGINIA PILOT & LEDGER-STAR, Aug. 4, 1993.

Washington, D.C. The *Washington Post* reports: "[L]aw enforcement officials say that the guns have not been a factor in the area's murder epidemic."¹¹⁵ "Assault weapons" were 3% of guns seized in 1990.¹¹⁶

National statistics. Less than four percent of all homicides in the United States involve any type of rifle.¹¹⁷ No more than .8% of homicides are perpetrated with rifles using military calibers. (And not all rifles using such calibers are usually considered "assault weapons.") Overall, the number of persons killed with rifles of any type in 1990 was lower than the number in any year in the 1980s.¹¹⁸

B. Police Shootings

Although people reading newspapers might infer that police officers by the score are being murdered by "assault weapons," police officer deaths in the line of duty are at the lowest level in decades.¹¹⁹ From 1975 to 1992, out of 1,534 police officers feloniously murdered in the (pg.411) United States, sixteen were killed with firearms defined as "assault weapons" by California law.¹²⁰ The *Journal of California Law Enforcement* wrote: "It is interesting to note, in the current hysteria over semi-automatic and military look-alike weapons, that the most common weapon used in the decade to murder peace officers was that of the .38 Special and the .357 Magnum revolver."¹²¹ The *Journal* found that "calibers which correspond to military-style shoulder weapons" accounted for 8% of total firearms used to murder police officers in California.¹²²

The impression conveyed by some television programs is that shoot-outs between police and criminals involve steadily escalating amounts of fire-power. However, according to the New York City police department study of shootings at police in 1989, the average number of shots fired at the police per encounter was 2.55, and this number represented a decline from previous years.¹²³

C. The Cox Newspapers Study

In contrast to the evidence discussed above, there is one report, from the Cox Newspapers chain, which finds that "assault weapons" are disproportionately used in crime.¹²⁴ If the rational basis test means "a shred of evidence," the Cox report would suffice as a shred. But if judicial analysis is

¹¹⁵ Kent Jenkins, Jr., *Calls for Ban Boost Assault Rifle Sales: Weapons not Considered Factor in Killings*, WASH. POST, Mar. 6, 1989, at B1.

¹¹⁶ K. BEA, CONG. RESEARCH SVC. REPORT FOR CONGRESS—"ASSAULT WEAPONS:" MILITARY STYLE SEMIAUTOMATIC FIREARMS FACTS AND ISSUES 18, table 5 (Cong. Research. Svc., May 13, 1992) (rev. ed. June 4, 1992) (citing G.R. Wilson, Chief, Firearms Section, Metropolitan Police Dept., Jan. 21, 1992).

¹¹⁷ Morgan, *supra* note 8, at 152.

¹¹⁸ In 1990, 3.7% of homicides were perpetrated with rifles. UNIFORM CRIME REPORTS 17 (1991).

¹¹⁹ Telephone Interview with L. Behn, FBI Technical Information Specialist (Mar. 25, 1993) (on file with author).

¹²⁰ ALAN S. KRUG, THE "ASSAULT WEAPON" ISSUE 16-17 (National Rifle Assoc. Publications, 1993 ed.) (using FBI, state and local police agency data).

¹²¹ GEORGE T. WILLIAMS & CHARLES B. MOORMAN, *A Decade of Peace Officers Murdered in California: The 1980s*, 46 J. CALIF. LAW ENF. 1, 6 (Feb. 1991).

¹²² *Id.*

¹²³ KLECK, *supra* note 38, at 78-79.

¹²⁴ Jim Stewart & Andrew Alexander, *Assault Guns Muscling in on Front Lines of Crime*, ATLANTA JOURNAL-ATLANTA CONSTITUTION, May 21, 1989, at A1, A8.

to be as searching as Justice Stone's opinion in *Carolene Products*¹²⁵ suggests, the Cox report may not bear close scrutiny.

The Cox reporters examined records of gun traces conducted by BATF and found that for drug offenses, "assault weapons" were involved in approximately 12% of the traces. Because "assault weapons" amount to less than 12% of all firearms and if they are used in 12% of all drug crimes, then assault weapons are disproportionately involved in drug crimes.¹²⁶ (pg.412)

Extrapolating from the trace data, the Cox Newspaper reporters asserted that "assault weapons" were used in ten percent of all firearms crime, and that because "assault weapons" were (by Cox's estimate) 0.5% of the total gun supply, "assault weapons" are "20 times more likely to be used in a crime than a conventional firearm."¹²⁷ Yet when asked about the figure, BATF wrote: "[C]oncluding that assault weapons are used in 1 of 10 firearms related crimes is tenuous at best since our traces and/or the UCR [Uniform Crime Reports] may not truly be representative of all crimes."¹²⁸

Police reports from major cities support the BATF viewpoint. As detailed below, the police statistics for the major cities report far less prevalence of "assault weapons" than the Cox report claimed to find. For example, the percentage of "assault weapons" reported by Cox newspapers, based on the BATF traces, was 10% for Chicago, 19% for Los Angeles, 11% for New York City, and 13% for Washington. In each of those cities, police departments conducted complete counts of all guns which had been seized from criminals (not just the guns for which the police department requested a BATF trace). According to the actual police department counts of crime guns in each city, the percentage of assault weapons were only 3% for Chicago, 1% for Los Angeles, 1% for New York City, and 0% for Washington, D.C.¹²⁹

Cox's problem may be that BATF traces are not an accurate indicator of which guns are used in crime. In an average year, there are about 360,000 violent crimes committed with firearms. Of those 360,000 crimes, BATF is asked to trace about 5,600 crime guns (less than 2% of total crime guns).¹³⁰ It is statistically likely that there would be a difference between the 2% of guns traced and crime guns as a whole. The 2% of guns selected for a trace request are not a random sample, but rather a select group chosen by local police departments. (pg.413) According to basic statistics theory, a non-random sample of 2% is unlikely to accurately represent the larger whole. A non-random sample becomes statistically valid only when 60% to 70% of the total relevant population is sampled. As the Congressional Research Service explains:

[T]he firearms selected for tracing do not constitute a random sample and cannot be considered representative of the larger universe of all firearms used by criminals, or any

¹²⁵ See *supra* note 82 and accompanying text.

¹²⁶ "Assault weapons" were also involved in 11% of traces relating to the Gun Control Act of 1968 (which criminalizes non-violent behavior such as the sale of a handgun to a person from another state, and imposes various record-keeping requirements on firearms dealers), and in 30% of the very small number of organized crime traces conducted by BATF. See Stewart, *supra* note 130.

¹²⁷ See Stewart, *supra* note 124.

¹²⁸ Letter from Daniel M. Hartnett, Bureau of Alcohol, Tobacco and Firearms, Letter to Rep. Richard T. Schulze 3 (Mar. 31, 1992) (on file with author).

¹²⁹ KLECK, *supra* note 38, at 75. To many people, it may seem surprising that the use of "assault weapons" in Washington, D.C. is so low. It should be noted that since Washington, D.C. passed its "assault weapon" liability law in 1990, which allows anyone who is injured by an "assault weapon" in Washington (even a criminal) to sue the manufacturer, not a single suit has been brought.

¹³⁰ KLECK, *supra* note 38, at 75 (citing 1990 BATF Report).

subset of that universe. As a result, data from the tracing system may not be appropriate for drawing inferences such as which makes or models of firearms are used for illicit purposes.¹³¹

There are a number of possible reasons why "assault weapons" would be more likely be selected for a trace request than other guns. Most "assault weapons" were manufactured relatively recently, and newer guns are easier to trace. Moreover, many "assault weapons" have an unusual appearance, which might pique curiosity (and, hence, generate a trace request) more than an old-fashioned, common crime gun such as a Smith & Wesson .38 Special. The vast publicity surrounding "assault weapons" may also have increased police interest in these guns, and hence increase the likelihood of trace requests.

D. Planning for the Future

Faced with evidence that, contrary to the legislative findings which underlay a prohibition, "assault weapons" are rarely used in crime, some courts have concluded that prohibition is still legitimate because "[t]he prohibition of a harmful act need not be postponed until it occurs."¹³² Because the future is unknowable, the courts' concerns about future criminal use of the guns is at least more plausible than some legislators' plainly erroneous claims that the guns are currently the "weapon of choice" for criminals. Nevertheless, for a law to pass a rational basis test, there must be at least credible evidence that the guns in question could become increasingly used in crime. Yet, semiautomatics are more than a century old, and large capacity (pg.414) magazines are older still.¹³³ If semiautomatics and large capacity magazines, after a century of availability, remain rarely used in crime, it is not rational to ban them based on the theory that they might one day become crime guns.¹³⁴ Any gun could become a crime gun in the future, but the possibility hardly means that a legislative body can ban any gun that it wrongly considers to be a criminal's "weapon of choice."

Consider, for example, the big-game hunting rifles that the gun control lobbies currently appear to approve. These rifles are extremely powerful, and are capable of being used at very long distances. The rifles are, after all, designed to kill animals such as an 800 pound elk with a single shot at a distance of a third of a mile or more. Accordingly, the big-game rifles would be well-suited for assassinations. Suppose that a future legislature bans these big-game rifles by calling them "assassination weapons," and a court reviewing the ban was presented with extensive evidence that big-game rifles (a/k/a "assassination weapons") are used in only about 1% of assassinations, and that there is no persuasive evidence of a trend towards increased use. Surely the court would not uphold the "assassination weapon" prohibition merely based on a legislature's self-inflicted and unfounded fear that big-game rifles at some point could become frequently used in assassinations.

V. ILLEGITIMATE: BANNING PROTECTIVE GUN OWNERSHIP

¹³¹ See BEA, *supra* note 116.

¹³² Arnold v. Cleveland, 616 N.E.2d 163, 172 (Ohio 1993) (citations omitted).

¹³³ See Fafarman, *supra* note 9, at 189 (first Winchester semiautomatic in 1903 and first Remington semiautomatic in 1906); HAROLD F. WILLIAMSON, WINCHESTER: THE GUN THAT WON THE WEST 13 (1952) (Volcanic Company was producing carbines which could fire 30 rounds without reloading in 1856).

¹³⁴ It should not be surprising that the guns are rarely used in crimes. All rifles and shotguns are difficult to conceal. So-called "assault pistols," which are quite large for handguns, are also difficult to conceal.

A. The Legitimacy of Self-Defense

"Assault weapons" are also said to be appropriate for prohibition because they are not suitable for sports—because they are, as the Denver City Council put it, "designed primarily for military or antipersonnel use."¹³⁵ Consistent with these findings, BATF exercised its (pg.415) authority to ban the import of certain "assault weapons" because the Bureau found that they were not "particularly suitable" for sports.¹³⁶ The Bureau also noted that several of the non-importable guns were well-suited for defensive purposes. Firearms expert Jack Lewis, whose two books on "assault weapons" are cited as authoritative by gun control advocates in their briefs defending "assault weapon" bans, likewise writes that almost all of the guns dubbed "assault weapons" are well-suited for defensive purposes, although some of the guns are too heavy and cumbersome for field sports.¹³⁷

A ban based on a weapon's utility for antipersonnel or defensive purposes fails the *Cleburne* consistency prong because virtually all guns (except for a few highly specialized models such as those used by biathletes) are designed primarily for anti-personnel use. Guns are generally made for injuring and killing people. It is irrational to ban particular guns based on a characteristic that they share with almost all guns. A law might as well assert that "assault weapons" are uniquely pernicious because they share the characteristic of using gunpowder.

But even assuming that there is a real line between sporting guns and defensive guns and that the "assault weapon" bans draw that line correctly,¹³⁸ drawing the line as prohibiting defensive guns fails the (pg.416) *Cleburne* legitimacy prong. Without reference to a particular right to keep and bear arms, use of deadly physical force for self-defense and the defense of others is lawful in every state. In fact, many state constitutions guarantee a right of self-defense, and American common law recognizes a self-defense right of very long standing.¹³⁹ Because self-defense is a recognized, lawful activity everywhere, prohibiting an object simply because it is useful for self-defense rather than for

¹³⁵ DENVER, COLO. REV. MUN. CODE, § 38-130(a) (1989). Similarly, the city of Cleveland's ban on "assault weapons" was predicated on the finding that "the primary purpose of assault weapons is antipersonnel...." *Arnold*, 116 N.E.2d at 172 (citing CLEVELAND, OHIO ORD. No. 415-89, § 628.01). California's ban includes the legislative finding: "The Legislature has restricted the assault weapons ... based upon the finding ... that its function as a legitimate sports or recreational firearm is substantially outweighed by the danger that it can also be used to kill or injure human beings." CAL. PENAL CODE § 12275.5 (Deering 1994).

¹³⁶ BUREAU OF ALCOHOL, TOBACCO AND FIREARMS, REPORT AND RECOMMENDATION OF THE ATF WORKING GROUP ON THE IMPORTABILITY OF CERTAIN SEMIAUTOMATIC RIFLES (1989).

¹³⁷ Of the semiautomatics evaluated by Lewis, virtually every one was praised for its utility in survival, law enforcement, or other civil defense type situations. The guns were also touted for day-to-day home defense, in part because of their reliability, in part because of their simplicity and ruggedness (meaning that persons who are not experts in gun care can maintain the firearms safely), in part because of their low recoil (making them easier for persons without great upper body strength to control), and in part because of their intimidating appearance, which could convince an attacker to flee or surrender without a fight. For example, the Steyr AUG-SA has "excellent bio-engineering," a superior and innovative safety, is easy to maneuver for self-defense, and hard for an attacker to take away. Its barrel is so well made that no amount of target practice will wear it out. The gun never needs cleaning, even if thrown in mud or snow. THE GUN DIGEST BOOK OF ASSAULT WEAPONS 46-49 (Jack Lewis ed., 1st ed., 1986).

The SIG SG-551 SP carbine works "like a fine Swiss watch" and does not have "any notable recoil." Its "fast second shot" is useful for defending livestock from coyotes, and is "perfectly suitable" for police and civilian defensive roles. THE GUN DIGEST BOOK OF ASSAULT WEAPONS 201-13 (Jack Lewis ed., 2d ed., 1989).

The M11 pistol finds its "best role as a home defense weapon," in part because its intimidating appearance would force "most burglars and intruders to consider instant surrender." *Id.* at 71.

¹³⁸ Most of the banned rifles are used in target competition. Some of these rifles, such as the Colt Sporter and the Heckler & Koch HK-91 are generally regarded as among the finest target rifles in the world.

¹³⁹ See e.g., RICHARD M. BROWN, NO DUTY TO RETREAT (1991).

sport cannot be legitimate. Hence, that prohibition cannot pass the "illegitimacy" prong of the *Cleburne* rational basis test.

B. Police Exemption

In response to the above analysis regarding the legitimacy of lawful self-defense, it might be suggested that "assault weapons" are not defensive weapons, instead they are offensive weapons, better suited for killing large numbers of innocent people than for protecting innocent life. The analysis of the physical characteristics of "assault weapons"¹⁴⁰ suggests that claims regarding the extraordinary offensive capabilities of "assault weapons" are incorrect. But the rationality of the offensive/defensive distinction can be addressed more directly by examining the inconsistency of the claim within the very legislation that makes the claim.

Every "assault weapon" prohibition ever enacted or proposed in the United States (or any other nation) includes an exception for police possession of these weapons. Yet, the only reason for police to possess firearms is for protection activities. It is irrational to ban firearms on the grounds that they are not suitable for protection, and to simultaneously allow the police to use them. Unlike police officers, ordinary citizens cannot make a radio call for backup that will bring a swarm of police officers within seconds. The lives of ordinary citizens are just as valuable as the lives of police officers, and ordinary citizens are just as entitled to use the best firearms available for protection.¹⁴¹

Conversely, are "assault weapon" only useful for massacring the innocent? If so, then such weapons have no rational place in the hands of domestic law enforcement. Unlike the security forces in other, less (pg.417) free countries, the American police do not need highly destructive weapons allegedly designed for killing large numbers of people at once.

VI. CONCLUSION

"Equal protection of the laws requires that statutory classifications be based on differences that are real in fact...."¹⁴² The classification of "assault weapons" is not based on differences that are real in fact. The banned firearms do not fire faster than many guns that are not banned. The banned firearms do not have a larger ammunition capacity than many guns that are not banned. In fact, the number of rounds a semiautomatic can fire without reloading has nothing to do with the gun. Rather, that capacity is determined solely by the magazine, a separate, detachable, and interchangeable part. All the other physical characteristics of "assault weapons" which might form a rational basis for prohibiting them are simply not valid (such as claims about ammunition lethality), are trivial (such as bayonet lugs), or make the gun more accurate (such as a muzzle brakes). Official statistics prove that so-called "assault weapons" are rarely involved in criminal activity, and hence the use of "assault weapons" in crime is insufficiently demonstrated to pass the rational basis test.

Banning "assault weapons" has been justified on the basis that these weapons are better suited for personal protection than they are for recreation. However, this justification is illegitimate because the use of deadly force for protection from grave, imminent harm is lawful in the United States.

¹⁴⁰ *Id.* at 6.

¹⁴¹ Such an exemption could not be defended on the grounds that the guns can only used by persons with special training; "assault weapon" prohibitionists may complain that the guns are "very easy to use." Reynolds, *supra* note 73.

¹⁴² *People v. Montoya*, 647 P.2d 1203, 1205-06 (Colo. 1982).

The demand for "assault weapon" prohibition is often accompanied by a self-righteous insistence that only a criminal or a maniac would oppose prohibiting extremely dangerous firearms which have no legitimate use and are the criminal weapon of choice. But the closer one looks at the reasons given for "assault weapon" bans the less one sees. The prohibition is no more rational than a prohibition on beer based on legislative "findings" that beer grows on trees, that a single sip always causes instant physical addiction, and that beer is more dangerous than other alcohol because it is stored in aluminum containers. If the rational basis test means anything, it means that an "assault weapon" prohibition is unlawful.

EXHIBIT 41

Assault Weapon Bans: Can They Survive Rational Basis Scrutiny?

Clayton E. Cramer¹

ABSTRACT: In the last two decades, legislatures and courts have been increasingly willing to argue that a certain class of firearms termed “assault weapons” are not protected by the Second Amendment, and may be regulated or banned even though functionally identical firearms are not generally subject to such laws. Do such underinclusive bans survive even the lowest level of scrutiny: rational basis?

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I. Introduction

The U.S. Supreme Court has long recognized that distinctions in laws must be rationally related to a legitimate state interest.² Do AW bans meet this standard, or are they panic driven responses to fear of gang violence and random mass murders?

II. What Is An “Assault Weapon”?

Starting in 1989, with passage of California’s Roberti-Roos Assault Weapons Control Act³ a new term has entered American legal vocabulary: “assault weapon” (AW). What are they? Generally, these are semiautomatic rifles and pistols which use detachable magazines. The rifles are functionally identical to sporting arms that have been in use for decades in America (although AWs usually fire a less powerful cartridge than hunting rifles), with a somewhat military appearance (black plastic stocks, pistol grips, and bayonet lugs being common components). The handguns are functionally indistinguishable from handguns used for more than a century by civilians in the U.S. (semiautomatic, detachable magazine fed).

Most statutes have combined a ban based on maker and model name with a prohibition on weapons that are “substantially identical”⁴ to those on the named list. These named lists in different laws, while similar, tend to vary slightly. New Jersey’s named list

² *Cleburne v. Cleburne Living Center, Inc.*, 473 US 432, 436, 440 (1985) (“The general rule is that legislation is presumed to be valid and will be sustained if the classification drawn by the statute is rationally related to a legitimate state interest.”)

³ Carl Ingram, *Assault Gun Ban Wins Final Vote: Deukmejian's Promised Approval Would Make It 1st Such U.S. Law*, TIMES, May 19, 1989, http://articles.latimes.com/1989-05-19/news/mn-112_1_assault-weapons-ban-military-style-assault-types-of-semiautomatic-rifles/2, last accessed February 27, 2016.

⁴ N.J.S.A. 2C:39-1(w)(2) (“Any firearm manufactured under any designation which is substantially identical to any of the firearms listed above.”)

bans the “Demro TAC-1 carbine” which is not named by California’s similar statute.⁵ Yet many guns appear on both lists (sometimes with very slight differences in name): FN-FAL, FN-LAR, or FN-FNC type semiautomatic firearms (in New Jersey’s list);⁶ Fabrique Nationale FAL, LAR, FNC (in California’s list).⁷

That most such laws choose to ban AWs primarily by name and model number, and not by functional characteristics, should be a tipoff that whatever the public safety hazards of these weapons, those interested in banning them had a hard time finding the common risk factors that would have enabled them to write a functional definition of an AW.

Comparing the lists of named weapons and functional characteristics leads to some startling conclusions. The weapons in most cases were derived from full automatic military weapons and bear a strong resemblance to their full automatic ancestors. There are some exceptions, such as the Calico M-950, which has no military origins. None of these weapons are readily convertible to full automatic fire; if they were, they would already be considered machineguns (“machinegun” is one word in federal law, but two words everywhere else) under federal law⁸ and subject to the much stricter federal⁹ and state licensing laws regulating machine guns.¹⁰

⁵ Cal. Penal Code § 30510 (2014).

⁶ N.J.S.A. 2C:39-1(w)(1).

⁷ Cal. Penal Code § 30510 (2014).

⁸ 26 USC § 5845(b) (2014)(“The term ‘machinegun’ means any weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading, by a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machinegun, and any combination of parts from which a machinegun can be assembled if such parts are in the possession or under the control of a person.”) See 27 Code of Federal Regulations §179.11, ATF Rul. 82-3, 82-8, 83-5, and 81-4 for regulations redefining previously semiautomatic guns or parts into machineguns.

⁹ Generally see 26 USC §§ 5801-5872.

¹⁰ Cal. Penal Code § 32650(a)(2014).

III. Named Lists As Careless Bills of Attainder

American laws usually prohibit or regulate items not by name but by functional characteristics. As an example, California defines a number of items as “destructive devices.” One clearly describes a Molotov cocktail, by functional characteristics, not by name: “Any breakable container that contains a flammable liquid with a flashpoint of 150 degrees Fahrenheit or less and has a wick or similar device capable of being ignited, other than a device which is commercially manufactured primarily for the purpose of illumination.”¹¹ This clearly matches the dictionary definition: “a crude incendiary grenade consisting of a glass container filled with flammable liquid and a wick for ignition.”¹² The California Penal Code definition is clearly legally superior to a dictionary definition for the following reasons: a defendant could argue that he did not know what the phrase “Molotov cocktail” meant and was therefore ignorant that he was violating the law; minor non-functional changes (such as substituting an electrical ignitor instead of a wick) might create questions as to whether a named prohibition of a “Molotov cocktail” was insufficiently precise.

While most AW bans also have functional definitions of the banned weapons, named list definitions based on manufacturer’s name and model number are a common part of these laws. These are similar to “bills of attainder,” in which legislative acts punish persons by name for alleged crimes instead of specifying a crime and allowing due process by the courts to determine guilt. While Colt Industries is not a person, and Colt’s AR-15 is not a person, it is clear that a law banning sale of a named product made by Colt, with

¹¹ Cal. Penal Code § 16460(5) (2016).

¹² Christopher G. Morris, Academic Press Dictionary of Science and Technology 1404 (1991).

no similar ban on sales by another manufacturer would effectively deny Colt equal protection of the law. To make these distinctions in an arbitrary manner is contrary to existing case law.¹³

Not only does the named list approach lead to equal protection problems, but it makes it very easy to subvert these laws. As an example of the defective nature of named lists, California's Assault Weapons Control Act (AWCA) banned the Intratec TEC-9 by name. The manufacturer responded by making minor non-functional changes to the gun and giving it a new model number: DC9¹⁴ (presumably "Designed for California"). The TEC-9 and TEC-DC9 are otherwise identical.¹⁵ When the 1994 federal ban took effect listing the TEC-9: "Intratec... manufactured an AB-10 ('after ban') model that does not have a threaded barrel or a barrel shroud but is identical to the TEC-9 in other respects, including the ability to accept an ammunition magazine outside the pistol grip." While the federal AW ban prohibited new manufacture of 32 round magazines, ones made before the new law work in the AB-10.¹⁶

The U.S. Constitution's Art. I, sec. 10 prohibition on states passing bills of attainder only limits the legislative branches of state government.¹⁷ In the past, clever state governments have worked around this by executive orders, such as Missouri Governor

¹³ *Cleburne v. Cleburne Living Center, Inc.*, 473 U.S. 432, 439 (1985) ("The Equal Protection Clause of the Fourteenth Amendment commands that no State shall "deny to any person within its jurisdiction the equal protection of the laws," which is essentially a direction that all persons similarly situated should be treated alike.")

¹⁴ Bruce H. Kobayashi and Joseph E. Olson, In Re 101 California Street: A Legal and Economic Analysis of Strict Liability for the Manufacture and Sale of "Assault Weapons", *STANFORD LAW & POLICY REVIEW*, 8:41, 46, 47 (1997).

¹⁵ Christopher S. Koper, An Updated Assessment of the Federal Assault Weapons Ban: Impacts on Gun Markets and Gun Violence, 1994-2003, 10 <https://www.ncjrs.gov/pdffiles1/nij/grants/204431.pdf>, last accessed March 14, 2016. This report was funded by the Department of Justice in response to a request by Congress.

¹⁶ *Id.*.

¹⁷ U.S. Const., Art I, § 9., cl 1. ("No State shall ... pass any Bill of Attainder...")

Boggs' 1838 order to the militia that Mormons be driven from the state or killed.¹⁸ As a recent work on constitutional law described the problem of bills of attainder:

[T]he paradigmatic example of legislation whose violation of equality and due process contravenes the rule of law. It denies the separation of powers between legislature and judiciary, and the related distinction between legislative and judicial process, and so removes the protection that law is meant to provide from governmental hostility and arbitrary power.¹⁹

In the 1990s, the 6th Circuit Court of Appeals struck down named list “assault weapon” bans for vagueness.²⁰ Even when the ordinance was amended to prohibit “assault weapons” based on functional characteristics, the 6th Circuit ruled that such definitions were vague, because they may require more knowledge than a person of “average intelligence [possesses] to determine whether a particular firearm is included within its prohibition.”²¹

IV. What Makes “Assault Weapons” So Dangerous?

The California Department of Justice examined the issue of AWs and public safety both before and after passage of the AWCA in 1989. These reports were not part of the legislative process. They demonstrate that there was no rational basis for the law. Steve

¹⁸ W. Paul Reeve, Ardis E. Parshall, ed., *Mormonism: A Historical Encyclopedia* 330 (2010).

¹⁹ T.R.S. Allen, *Constitutional Justice: A Liberal Theory of the Rule of Law* 148 (2001).

²⁰ *Springfield Armory, Inc. v. City of Columbus*, 29 F. 3d 250, 251 (6th Cir. 1994) (Striking down a city ordinance for vagueness and not reaching bill of attainder question because of vagueness: “The ordinance defines “assault weapon” as any one of thirty-four specific rifles, three specific shotguns and nine specific pistols, or “[o]ther models by the same manufacturer with the same action design that have slight modifications or enhancements....” The weapons are specified by brand name and model, not generically or by defined categories.... Plaintiffs challenge the ordinance as an unconstitutional bill of attainder because it constrains only the named manufacturers while other manufacturers are free to make and sell similar products. Plaintiffs also contend that the ordinance is unconstitutionally vague.”)

²¹ *Peoples Rights Organization v. City of Columbus*, 152 F. 3d 522, 535 (6th Cir. 1998) (“Therefore, anyone who possesses a semiautomatic center fire rifle or carbine that accepts a detachable magazine is subject to prosecution so long as a magazine exists with a capacity of twenty rounds or more. Since the ordinance contains no scienter requirement, an owner's complete lack of knowledge as to the magazine's existence is of no consequence.”)

Helsley, Acting Assistant Director of the Investigation and Enforcement Branch wrote a memo on October 31, 1988, a year before the bill passed, answering the question “whether a definition could be formulated which would allow legislative control of ‘assault rifles’ without infringing on sporting weapons. I do not think that the necessary precision in possible.”²² Helsley also pointed out that,

Obviously, there have been some high visibility crimes which involved semi-automatics UZI’s and AK-47’s, but I suspect a close analysis would put that frequency at or slightly above the statistical aberration level. Last year, I surveyed the firearms used in violent crimes which were submitted to BFS [Bureau of Forensic Services] analysis (Attachment 18). I believed that this would provide a good picture of what criminals use when they want to hurt someone. The figures are self-explanatory and confirmed our intuition that assault type firearms were the least of our worries. It’s really the .22 and .38 Caliber handguns and 12 gauge shotguns that inflict the majority of the carnage.

Consequently, I believe that assault weapons cannot be defined in a workable way, by size, caliber, action type or magazine capacity. ... Unless a realistic definition can be developed for “assault weapons”, we should leave the issue alone.²³

After passage of the law in 1989, the California Criminalistics Institute (a unit of the California Department of Justice),²⁴ studied the use of “assault weapons” in 1990 based on information from crime labs throughout the state. Their conclusions?

It is clear from this data that assault weapons play a very small role in assault and homicide cases submitted to city and county labs. This data shows that in the neighborhood of less than 5% of homicide and assault weapons fall into the §12276 PC list. This is in agreement with previous data collected on firearms submitted to CA DOJ labs prior to the enactment of the AWCA [Assault Weapons Control Act] as well as for the year following the effective date of that law.²⁵

²² S.C. Helsley to G.W. Clemons, Assault Rifles, October 31, 1988, 1. Because this document required a Public Records Access request to pry loose, you can read it at <http://www.claytoncramer.com/primary/other/Helsley88AWCa.pdf>, last accessed April 6, 2016.

²³ *Id.* at 3.

²⁴ California Criminalistics Institute, <https://oag.ca.gov/ccci>, last accessed April 5, 2016.

²⁵ Torrey D. Johnson, Report on a Survey of the Use of “Assault Weapons” in California in 1990, 1, available at <http://www.claytoncramer.com/primary/other/Johnson91AWCa.pdf>.

The report explains that they counted “4844 guns which included 45 ‘assault weapons’ (>1% assault weapons).” (Assault weapons were actually 0.9% of this total.) As the report further explained, the Los Angeles Sheriff’s Office destroyed 3881 guns, preventing their identification. “If the LASO data is ignored, the total number of guns is 963 which includes 36 ‘assault weapons’ (~3.7%) which is probably a more accurate reflection of numbers of ‘assault weapons’ actual[ly] encountered in homicides and assaults.” Even with this significant loss of data, the report explained why relying on crime labs for determining frequency of criminal use of assault weapons likely overstated their presence:

First, if all guns are not being examined by forensic laboratories, many of those not seen will be the usual pistols and revolvers which make up the bulk of guns used in violent crimes thus maintaining the proportions. It is likely that, if there is a skewing of the data, that it is to accentuate the apparent use of “assault weapons”. This because these weapons are infrequently seen by law enforcement so they are unfamiliar with them as a group and there is frequently a question of whether the firearm is or has been converted to full automatic fire (machine gun). This results in an increased likelihood that a recovered ‘assault weapon’ will be examined by a forensic specialist.²⁶

The report also acknowledges that there were difficulties determining whether a particular firearm was actually a weapon regulated by the AWCA, and they used the “most generous interpretation... This will give the worst case results.”²⁷ The report concludes: “The incidence of the use of ‘assault weapons’ is very much lower than the media and law makers seem to represent.”²⁸

²⁶ *Id.* at 2.

²⁷ *Id.* at 3.

²⁸ *Id.* at 7.

So with so much agreement within the California Department of Justice that assault weapons constituted only a tiny fraction of criminal misuses, why did California Attorney-General John van de Kamp assert the importance of passing the AWCA? His speech to California police chiefs suggests that he saw this as a wedge issue for breaking open the gates to more restrictive gun control laws:

"It can win, but the margin of victory will be narrow at best," he said. Past defeats have resulted from debate deteriorating "into a pitched battle between those who would ban all guns and those who would regulate none of them," he said.

This time, Van de Kamp said, the debate should be limited to law enforcement issues. He said there are many members of the NRA, among them police officers, who do not agree with the association's consistent opposition to all forms of gun control.²⁹

Other evidence suggests the AWCA was based not on public safety but political expedience: "Sponsors of the AWCA, including Senator Roberti, Assemblyman Roos, Attorney General Van de Kamp, and law enforcement administrators, held a strategy session at which they decided that 'certain weapons probably had too large a constituency to ever be worth the risk of including, Ruger Mini 14, M1 Carbine, M1 Garand, etc.'³⁰ and that "[i]nformation on assault weapons would not be sought from forensic laboratories as it was unlikely to support the theses [that assault weapons were the preferred choice of drug-trafficking organizations and violent criminals] on which the legislation would be based."³¹ [bracketed material in original] Helsley also explained the very odd named list

²⁹ Steve Emmons, Van de Kamp Asks Police Chiefs for Support in Outlawing Assault Rifles, LOS ANGELES TIMES, Feb. 9, 1989.

³⁰ Steve Helsley to Steve Patrick Kenady, <https://web.archive.org/web/20081201093921/http://www.hoboes.com/pub/Politics/United%20States/Trust%20the%20Government/Insight%20into%20Anti-Legislation>, last accessed April 9, 2016.

³¹ Bruce H. Kobayashi and Joseph E. Olson, In Re 101 California Street: A Legal and Economic Analysis of Strict Liability for the Manufacture and Sale of "Assault Weapons", STANFORD LAW & POLICY REVIEW, 8:41, 44 (1997).

this way: “[T]he list had become an odd collection of firearms which range from the long out of production, to exorbitantly expensive, to the ‘evil’ AK 47. As no specifically defined problem drove our efforts, such an odd collection should not be surprising. ... Most if not all of the principal players in crafting the legislation had absolutely no knowledge of firearms. Most of the weapons on the list are low production or long out of production items that constitute absolutely no conceivable threat.”³² In some cases, non-firearms have been added to the list: the Knight’s Armament RAS was on the list in 2000³³ even though the RAS is only a rail adapter system for attaching sights, flashlights, and the like.³⁴

The clear intent was to go after a small minority of guns and their owners, a group unlikely to have the political power to defend their interests. The relevance of this will appear when we examine the Romer decision. Excluding data that would argue against their claims demonstrates a lack of rational basis and intellectual honesty.

Also, Van de Kamp was widely considered an unannounced candidate for governor at the time³⁵ and likely was using his support for this law as an opportunity to have a high public profile. While seeking higher public office is not intrinsically problematic, it is not an adequate justification to avoid rational basis. The percentages of AWs criminally used were so low that a ban on handguns or knives would have had a far stronger effect in reducing murders, but this would have been a bridge too far in the California of 1989. Failure to pass it would have done nothing to raise van de Kamp’s visibility for higher office.

³² *Op cit.*, n. 35.

³³ <http://oag.ca.gov/sites/all/files/agweb/pdfs/firearms/infobuls/kaslist.pdf>, last accessed April 13, 2016.

³⁴ <https://www.knightarmco.com/portfolio/m4-carbine-ras/>, last accessed April 13, 2016.

³⁵ Ken Hoover, California Attorney General Urges Assault Rifle Ban, UPI, Feb. 13, 1989.

Other studies also demonstrate that AW bans were politicians' irrational responses to public safety concerns. In 1994, the federal government passed an assault weapon ban similar to those passed by many of the states in years before and after 1994, based on named lists and functional specifications.³⁶ The federal ban also prohibited new manufacture for civilian use of Large Capacity Magazines (LCMs) (those holding more than 10 rounds).³⁷ This law was passed with a sunset clause, causing its automatic repeal in 2004.³⁸

One part of the federal law directed the U.S. Attorney-General to "to study the ban's impact and report the results to Congress within 30 months of the ban's enactment ..."³⁹ That first report on the effectiveness of the federal law found very little measureable result. The authors (Roth and Koper) admitted on the very first page that they had a hard time "discerning the effects of the ban" at least partly because "the banned weapons and magazines were rarely used to commit murders in this country" before the 1994 ban.⁴⁰

Roth and Koper tried to figure out if the ban reduced the number of victims per mass murder.⁴¹ If the public safety hazard associated with AWs was because of high capacity magazines with the ability to spray bullets everywhere, you would expect to see mass murders decline.

So what did the report find? They found a 6.7% reduction in murder rates in the 15 states where the federal ban *could* have made a difference. But this reduction was not statistically significant. Because assault weapons had been used in a tiny percentage of

³⁶ *Op cit.* n. 11 at 4-6.

³⁷ *Id.*, 6.

³⁸ *Id.*, 4.

³⁹ *Id.*, 20.

⁴⁰ Jeffrey A. Roth and Christopher S. Koper, "Impacts of the 1994 Assault Weapons Ban: 1994-96," INCIJ 173405, (Washington: National Institute of Justice, 1999), <https://www.ncjrs.gov/pdffiles1/173405.pdf>, last accessed Mar. 17, 2016.

⁴¹ *Id.*, at 7.

murders before the ban, "it is highly improbable that the assault weapons ban produced an effect this large...."⁴² "The ban did not produce declines in the average number of victims per incident of gun murder or of gun murder victims with multiple wounds."⁴³

What about "protecting police officers?" This was a reason offered repeatedly for the ban. There was a decline in assault weapons used to murder police officers, but Roth and Koper also admitted that "such incidents are sufficiently rare" that it was impossible to determine whether or not the law reduced gun murders of police officers.⁴⁴

Koper's 2004 final report on the effect of the federal ban on crime rates observes the ban was so narrowly written as to be easily subverted: "Relatively cosmetic changes, such as removing a flash hider or bayonet mount, are sufficient to transform a banned weapon into a legal substitute, and a number of manufacturers now produce modified, legal versions of some of the banned guns"⁴⁵ One recent reminder was the 2015 San Bernadino terrorist attack in which the shooter purchased one of these slightly altered guns, and modified it to be functionally equivalent to a banned AW.⁴⁶ Emphasizing the cosmetic nature of both the named list and functional irrelevance of the specification lists, Koper observes:

The gun ban provision targets a relatively small number of weapons based on outward features or accessories that have little to do with the weapons' operation. Removing some or all of these features is sufficient to make the weapons legal. In other respects (e.g, type of firing mechanism, ammunition fired, and the ability to accept a detachable

⁴² *Id.* at 8-9.

⁴³ *Id.* at 9.

⁴⁴ *Id.*

⁴⁵ *Op cit.* note 11 at 10.

⁴⁶ Josh Richman, San Bernardino shooting stirs gun debate, San Jose Mercury-News, Dec. 4, 2015, http://www.mercurynews.com/california/ci_29204710/san-bernardino-shoots-reignites-californias-gun-debate, last accessed Mar. 17. 2016.

ASSAULT WEAPON BANS: CAN THEY SURVIVE RATIONAL BASIS SCRUTINY?

magazine), AWs do not differ from other legal semiautomatic weapons.⁴⁷

If these bans were so easily subverted in ways that did not involve any significant functional change to the firearms available for sale, can such laws qualify as rationally based?

Along with how easily these laws were subverted, Koper summarized other studies showing that the banned guns were used in a tiny percentage of crimes. While the definition of AWs varied across different studies:

According to these accounts, AWs typically accounted for up to 8% of guns used in crime, depending on the specific AW definition and data source used A compilation of 38 sources indicated that AWs accounted for 2% of crime guns on average. Similarly, the most common AWs prohibited by the 1994 federal ban accounted for between 1% and 6% of guns used in crime according to most of several national and local data sources examined for this and our prior study ...⁴⁸

By comparison, “knives and other cutting instruments” in 2014 caused 13.1% of U.S. murders.⁴⁹ Yet knives can be purchased over the Internet or mail order with no questions asked, even when the search phrase is, “combat knives military” (roughly analogous to “assault weapons”) which returns 1,625 results on Amazon.com with prices starting at \$3.⁵⁰

Unlike AWs, knives are silent, and can be used without neighbors calling 911 to report gunshots. Even publications long supportive of AW bans have sometimes admitted that there was no rational basis for such laws:

⁴⁷ *Op cit.* note 11 at 11.

⁴⁸ *Id.*, at 15.

⁴⁹ FBI, Crime in the United States 2014, Table 7.

⁵⁰ http://www.amazon.com/s/ref=sr_pg_3?fst=as%3Aoff&rh=n%3A3375251%2Cn%3A10971181011%2Cn%3A706813011%2Cn%3A3222111011%2Cn%3A3222119011%2Ck%3Acombat+knives+military&page=3&sort=price-asc-rank&keywords=combat+knives+military&ie=UTF8&qid=1457994371. Last accessed March 14, 2016.

But in the 10 years since the previous ban lapsed, even gun control advocates acknowledge a larger truth: The law that barred the sale of assault weapons from 1994 to 2004 made little difference.

It turns out that big, scary military rifles don't kill the vast majority of the 11,000 Americans murdered with guns each year. Little handguns do.

In 2012, only 322 people were murdered with any kind of rifle, F.B.I. data shows.

The continuing focus on assault weapons stems from the media's obsessive focus on mass shootings, which disproportionately involve weapons like the AR-15, a civilian version of the military M16 rifle. This, in turn, obscures some grim truths about who is really dying from gunshots....

One reason: The use of these weapons may be rare over all, but they're used frequently in the gun violence that gets the most media coverage, mass shootings.

The criminologist [James Alan Fox](#) at Northeastern University estimates that there have been an average of 100 victims killed each year in mass shootings over the past three decades. That's less than 1 percent of gun homicide victims.⁵¹

"We spent a whole bunch of time and a whole bunch of political capital yelling and screaming about assault weapons," Mayor Mitchell J. Landrieu of New Orleans said. He called it a "zero sum political fight about a symbolic weapon."⁵²

So, if the guns prohibited were a tiny fraction of criminally misused guns, and a tiny fraction of far more commonly used and available murder weapons, why was so much political capital spent on these laws? As Koper's study observes, their use in the highly publicized but rare mass murders gave them a high profile:

Early studies of AWs, though sometimes based on limited and potentially unrepresentative data, also suggested that AWs recovered by police were often associated with drug trafficking and organized crime (Cox Newspapers, 1989; also see Roth and Koper, 1997, Chapter 5),

⁵¹ Lois Beckett, The Assault Weapon Myth, N.Y. Times, Sep. 14, 2015, http://www.nytimes.com/2014/09/14/sunday-review/the-assault-weapon-myth.html?_r=0, last accessed March 14, 2016.

⁵² *Id.*

fueling a **perception** that AWs were guns of choice among drug dealers and other particularly violent groups.⁵³ [emphasis added]

As Koper points out: “Looking at the nation’s gun crime problem more broadly, however, AWs and LCMs were used in only a minority of gun crimes prior to the 1994 federal ban, and AWs were used in a particularly small percentage of gun crimes.”⁵⁴ It hardly needs saying that perception is not reality, although reality is certainly a requirement for an action being reasonable.

Underlying all of the “assault weapon” statutes and ordinances is the explicitly stated belief that they are a public safety hazard. California’s Roberti-Roos Assault Weapons Control Act (AWCA) justified its need by: “The Legislature hereby finds and declares that the proliferation and use of assault weapons poses a threat to the health, safety, and security of all citizens of this state.”⁵⁵ While the statement might well be true, the same could be said for handguns, knives, and automobiles, all of which caused more deaths than the rarely criminally misused named AWs as we discussed above. In light of the apparent suppression of contrary data on criminal misuse, can this statement of need be adjudicated as rational?

So, AW bans seem to be a strong reaction to a category of weapons that are used far less often for murder than the relatively lightly regulated category of knives. The statutes also seem to be easily subverted by functionally irrelevant changes to firearms.

⁵³ *Op cit.* n. 11 at 14.

⁵⁴ *Id.*

⁵⁵ Cal. Penal Code § 12275.5(a)(1990).

V. Sentence Length As An Indicator of Irrationality

Looking at the minimum sentences provided for AW violations relative to other crimes gives a pretty clear picture of what the legislatures considered the level of public safety hazard associated with AWs. California's minimum sentence for possession of an unlicensed machine gun⁵⁶ is substantially shorter than the minimum sentence for sale or importation of an "assault weapon."⁵⁷ Even more curiously, possession of a hand grenade is even a lighter sentence than either.⁵⁸ (This is a prohibition on functional hand grenades; possession or importation of a "metal military practice handgrenade or metal replica handgrenade" is prohibited elsewhere.⁵⁹) Adding to this strange disparity, the minimum sentence for forcible rape⁶⁰ is less than the minimum sentence for import or transfer of an "assault weapon." Clearly, the California legislature considers "assault weapons" a greater public safety hazard than machine guns, grenades, or rapists, if the severity of the sentence is any indicator. This suggests a panic reaction, not a rational decision.

⁵⁶ Cal. Penal Code § 32625(a) and 1170 (h)(1) ("a felony punishable pursuant to this subdivision where the term is not specified in the underlying offense shall be punishable by a term of imprisonment in a county jail for 16 months, or two or three years.").

⁵⁷ Cal. Penal Code § 30600 (2014) ("[U]pon conviction shall be punished by imprisonment pursuant to subdivision (h) of Section 1170 for four, six, or eight years.")

⁵⁸ Cal. Penal Code § 12301(a)(2) (defines grenade as "destructive device") and 12301(b) (2014) ("shall be punished by imprisonment in the county jail for a term not to exceed one year, or in state prison, or by a fine not to exceed ten thousand dollars (\$10,000) or by both such fine and imprisonment.")

⁵⁹ Cal. Penal Code § 12020(a)(1)(2014) ("Any person in this state who does any of the following is punishable by imprisonment in a county jail not exceeding one year or in the state prison: . . . Manufactures or causes to be manufactured, imports into the state, keeps for sale, or offers or exposes for sale, or who gives, lends, or possesses any metal military practice handgrenade or metal replica handgrenade. . .")

⁶⁰ Cal. Penal Code § 264(a)(2014) (" [R]ape, as defined in Section 261 or 262, is punishable by imprisonment in the state prison for three, six, or eight years.

VI. Rational Basis Scrutiny

Can AW laws survive “rational basis” scrutiny? What is the legitimate state interest rationally related to AW bans? They affect weapons that are a small minority of criminally misused guns, and which are already subject to substantial federal and state regulations because they are firearms. Weapons that are more commonly used for murder are available for mail order purchase with no similar level of restrictions.

What is the “rational basis” test? In *Cleburne v. Cleburne Living Center* (1985), the U.S. Supreme Court held that, “The general rule is that legislation is presumed to be valid and will be sustained if the classification drawn by the statute is rationally related to a legitimate state interest.”⁶¹ Preventing mentally delayed people from living a residential neighborhood was not a legitimate state interest.

Many of the existing Equal Protection Clause cases have involved not criminal prosecutions, but administrative actions for which, while there might be genuine concerns about inequality in results, no one would be going to prison. In *Plyer v. Doe* (1977), the Court struck down a law that denied public school education to illegal alien children, upholding a District Court opinion that the discrimination lacked “rational basis.”⁶² In *Cleburne v. Cleburne Living Center* (1985), the city of Cleburne denied a special use permit for a group home for the retarded in a residential neighborhood.⁶³ In *FCC v. Beach Communications, Inc.* (1993) the Court held that a cable TV company was subject to city

⁶¹ *Cleburne v. Cleburne Living Center, Inc.*, 473 US 432, 436, 437 (1985).

⁶² *Plyer v. Doe*, 457 US 202, 208 (1977).

⁶³ *Cleburne v. Cleburne Living Center, Inc.*, 473 US 432, 436, 437 (1985).

franchise rules because “transmission lines interconnect separately owned and managed buildings or if its lines use or cross any public right-of-way.”⁶⁴

Worse, the minimum sentences associated with some of these AW bans (such as California’s) are far more severe than those for possession of machine guns and hand grenades, both of which would seem at least as severe a public safety hazard as AWs. That violation of the AW bans is more serious than forcible rape also shows a certain disproportionate reaction by the legislature.

The AW bans impose prison sentences on violators—far more serious a consequence than the largely economic injuries struck down in many of the previously mentioned cases. But there are Supreme Court decisions where there was no “reasonable” connection between the statute and legitimate governmental end⁶⁵ and where jail time was the penalty.⁶⁶ By comparison, the Supreme Court’s decision *D.C. v. Heller* (2008) explicitly rejects “rational basis” as the standard of scrutiny concerning “the right to keep and bear arms ...” pointing to *U.S. v. Carolene Products* (1938) n. 4.⁶⁷

In *Romer v. Evans* (1996) the Court overruled an amendment to the Colorado State Constitution because:

⁶⁴ *FCC v. Beach Communications, Inc.*, 508 US 307, 311 (1993).

⁶⁵ *Meyer v. Nebraska*, 262 U.S. 390, 399, 400 (1923) (“The established doctrine is that this liberty may not be interfered with, under the guise of protecting the public interest, by legislative action which is arbitrary or without **reasonable** relation to some purpose within the competency of the State to effect.”); *Pierce v. Society of Sisters*, 268 US 510, 536 (1925) (“Plaintiffs asked protection against arbitrary, **unreasonable** and unlawful interference with their patrons and the consequent destruction of their business and property.”).

⁶⁶ *Meyer v. Nebraska*, 262 US 390, 397 (1923) (“Any person who violates any of the provisions of this act shall be deemed guilty of a misdemeanor and upon conviction, shall be subject to a fine of not less than twenty-five dollars (\$25), nor more than one hundred dollars (\$100) or be confined in the county jail for any period not exceeding thirty days for each offense.”)

⁶⁷ *D.C. v. Heller*, 128 S. Ct. 2783, 2817 n. 27 (“If all that was required to overcome the right to keep and bear arms was a rational basis, the Second Amendment would be redundant with the separate constitutional prohibitions on irrational laws, and would have no effect.”)

First, the amendment has the peculiar property of imposing a broad and undifferentiated disability on a single named group, an exceptional and, as we shall explain, invalid form of legislation. Second, its sheer breadth is so discontinuous with the reasons offered for it that the amendment seems inexplicable by anything but animus toward the class it affects; it lacks a rational relationship to legitimate state interests.⁶⁸

Similarly,

A second and related point is that laws of the kind now before us raise the inevitable inference that the disadvantage imposed is born of animosity toward the class of persons affected. "[I]f the constitutional conception of 'equal protection of the laws' means anything, it must at the very least mean that a bare . . . desire to harm a politically unpopular group cannot constitute a *legitimate* governmental interest."⁶⁹

The AW bans impose a “broad and undifferentiated disability on a single named group,” a category of firearms that have very little in common except for a somewhat menacing appearance, as well as creating a risk of arrest and prison for their owners. (Those who register them are losing privacy rights even if the AWs remain in their owner’s home.)

Like homosexuals (the protected group in *Romer*), gun owners and sometimes AW owners have been subject to ferocious, often religiously based criticism, comparing them to sexual deviants: “Why can't they stand up and be proud and let the rest of the world know about their guns? Why all this shame over being ‘outed’?”⁷⁰ While many of the Tweets below are not specific to AW owners, it is a pretty good assumption that the authors of these bigoted statements would apply them even more to AW owners. Other comments continue in that same frame of denigrating gun owners as sexually confused, inadequate, or terrorists, although often more vulgarly:

⁶⁸ *Romer v. Evans*, 517 US 620, 632 (1996).

⁶⁹ *Id.* at 634.

⁷⁰ Comment by honoredcitizen on Noah Rothman, Jeanine Pirro Rips Into Newspaper That Outed Her As A Gun Owner In ‘Pedophile-Like’ Online Map, Mediaite, Jan. 7, 2013, <http://www.mediaite.com/tv/jeanine-pirro-rips-into-newspaper-that-outed-her-as-a-gun-owner-in-pedophile-like-online-map/>, last access Mar. 16, 2016.

- The Coalition to Stop Gun Violence Tweeted about the gun industry:
“You’d be hard-pressed to imagine a more degenerate, immoral industry.”⁷¹
- “[W]hat kind of a pussyboy needs a gun at a bbq. ... “[N]o, they have the gun because their sausage is so small, they might have to defend themselves from the pig.”
- With reference to the magazine whose article CSGV was insulting: “Well what do you expect from a porn rag?”⁷²
- An article about guns intended for younger or smaller shooters included these comments: “Gun owners are terrorists ...” “They’re nuts.” “How is this different from ISIS sending kids out with bombs strapped to their bodies.” “Like they want them to be terrorists?”⁷³
- A poster from CSGV showing Satan has the headline: “If the devil did exist, he’d certainly fetishize weapons designed to take human life.”
- CSGV’s responses to criticism of the religious angle of the poster certainly shows the religious-like fanaticism that drives the contempt.⁷⁴ This is another parallel to the assumptions the Romer decision made about the reasons why Coloradoans passed Amendment 2.

⁷¹ CSGV BBQ Guns 1, <http://gunfreezone.net/index.php/2015/11/20/csgv-discovers-bbq-guns-bigotry-and-stupidity-ensues/csgv-bbq-guns-1/>, last accessed Mar. 17, 2016. The gunfreezone.net web page is archive of Tweets by CSGV and its followers who understandably would not want most of this preserved.

⁷² Comments, *Id.*

⁷³ Comments, <http://gunfreezone.net/index.php/2016/02/24/latest-gun-outrage-is-late/csgv-cricket-2/>, last accessed Mar. 17, 2016.

⁷⁴ <http://gunfreezone.net/index.php/2015/07/31/csgv-ratchets-up-the-rhetoric-some-followers-are-not-amused/csgv-devil-1/>, last accessed Mar. 17, 2016.

In response to the CSGV question, “What’s the first word that comes to your mind when you hear ‘Gun Culture’?”⁷⁵ Comments again included sexual perversion and bigoted attacks:

- “Probably ammosexual. But the vision that comes to mind is more powerful – a bunch of fat, unkempt, white guys walking around with guns in their belts and dangling off their shoulders, in public places attempting to intimidate others, but claiming they aren’t.”
- “[C]oward, fear mongering, disrespectful, misogynist, racist redneck white men that run around with physical penis limitations armed with their penis extensions and their low i.q. scaring me and my friends.”
- “Insecure, bullying rednecks.”
- “Stench.”
- “Hill billies[sic]”
- “IDIOTS REDNECKS STUBBORN UNKIND SELFISH”
- “Under-endowed”
- “Fear of death by intellectually challenged yahoos.”
- “Small dicks”
- “Terrorist”.⁷⁶

One would hope that these will be recognized as bigoted descriptions, much like describing gay men as effeminate child molesters. These comments by gun control

⁷⁵ <http://gunfreezone.net/index.php/2015/07/15/csgv-hitting-every-branch-of-the-bigot-tree-on-their-way-down/csgv-gun-culture-2/>, last accessed Mar. 17, 2016.

⁷⁶ Comments, *Id.*

organizations and activists are probably not typical of Americans, in the same way that the Westboro Baptist Church of “God Hates Fags!” is hardly typical of the support for Colorado’s Amendment Two at the heart of the Romer decision, but it certainly shows the same irrational bigotry.

Others have been less anonymous in their comparisons and denigration.

If you own multiple guns or feel the need to possess a military-style assault weapon, it's because you have a small penis. ... But owning lots of guns or pseudo-machine guns means you have a tiny wiener and you're incredibly self-conscious about it. That's the plain and simple truth, even if it's not true.⁷⁷

That last sentence can be read several different ways, but when your claim is that is that something is truth even though not true, you have defined “not rational.”

Another problem with AW bans is that owners of assault weapons are rejected as legitimate citizens. After New York passed the SAFE Act in 2013, Governor Cuomo made it very clear that people who disagreed with the SAFE Act should leave the state, albeit on less severe conditions than Gov. Boggs’ order to the Mormons in 1838:

Are they these extreme conservatives who are right-to-life, pro-assault-weapon, anti-gay? Is that who they are? Because if that's who they are and they're the extreme conservatives, they have no place in the state of New York, because that's not who New Yorkers are.⁷⁸

Cuomo essentially told AW owners that they were outside the legitimate membership of the polity of New York, almost like they were illegal aliens (the parallel to Plyer). While journalists and gun control advocates might properly be considered outside the mainstream, the elected governor of New York is not.

⁷⁷ Todd Hartley, I’m With Stupid, ASPEN TIMES, Dec. 28, 2012, <http://www.aspentimes.com/article/20121228/COLUMN/121229911>, last accessed Mar. 16, 2016.

⁷⁸ Jesse McKinley, Comment by Cuomo Outrages Republicans, N.Y. TIMES, Jan. 22, 2014, http://www.nytimes.com/2014/01/23/nyregion/cuomo-comment-elicits-retort-from-republicans.html?_r=0, last accessed March 16, 2016.,

Court decisions have also demonstrated an irrational basis for such laws.

Upholding an Illinois city AW ban, Judge Easterbrook wrote:

If it has no other effect, Highland Park's ordinance may increase the public's sense of safety. Mass shootings are rare, but they are highly salient, and people tend to overestimate the likelihood of salient events. ... If a ban on semiautomatic guns and large-capacity magazines reduces the perceived risk from a mass shooting, and makes the public feel safer as a result, that's a substantial benefit.⁷⁹

The same reasoning could have been applied to uphold the constitutional provision struck down in *Romer*: “Colorado voters may be irrational in their bigotry against homosexuals, but if it reduces their perceived risk of homosexuals being given free rein to molest children, that’s a substantial benefit.” Clearly, when the courts argue that *feeling* safer is a legitimate reason to do something that makes no *real* difference in public safety, this is the definition of irrational. It makes people feel better, but without any actual basis in fact.

VII. AW Bans Fail Rational Basis Analysis

The evidence is clear that AW bans fail rational basis scrutiny because AWs are seldom criminally misused relative to more readily accessible weapons. The disproportionate minimum sentences in California’s AWCA law relative to much more dangerous weapons suggests a panic reaction that is hardly rational. The comments of journalists, elected officials, and gun control activists reveal bigotry that makes Colorado Amendment 2 seem pretty calm by comparison. Even the courts are reduced to arguing that *perceived* benefit as opposed to *actual* benefit is a sufficient reason to uphold bans.

⁷⁹ *Friedman v. City of Highland Park, Illinois*, 784 F. 3d 406, 412 (7th Cir. 2015).

ASSAULT WEAPON BANS: CAN THEY SURVIVE RATIONAL BASIS SCRUTINY?

There is no way to hold that AW bans which deny a fundamental right, as Heller determined the Second Amendment to protect, survives the “rational basis” standard of scrutiny.

EXHIBIT 42



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Promoting firearms safety training!

M1 Carbine

Inland M1A1 Carbine 6630815

Listing # 4842

Bidder or Seller? Sign in for your status.

Listing Format: Auction
Current price : \$1,201.00
Starting bid: \$1.00
of bids: 13
Closes: 4 Days, 3 Hours
Location: Alabama, United States
Started: 3/18/2019
Ends: 3/30/2019
Seller: cmp2
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High Bidder(s): CMPUser5612
☒ Ask the listing owner a question
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Watch this item!



IMAGE THUMBNAILS





DESCRIPTION

Inland M1A1 Carbine 6630815

Carbine has an N stamped front sight on an Inland MFG Div General Motors 10-44 barrel, with an ME of 2+. It has a type II barrel band stamped KI. The Inland Trigger housing has an M magazine catch, a J.A. O. rotary safety, an I-I straight hammer and an unmarked hole in sear. The rear adjustable stamped sight is marked I.R. CO. The type V slide is stamped 7160091. The low wood, with "Slim Jim" pistol grip, is all foreign wood, including the 2 rivet hand guard. The leather is in good condition with a minor cut on the top. The butt plate is missing the springs.

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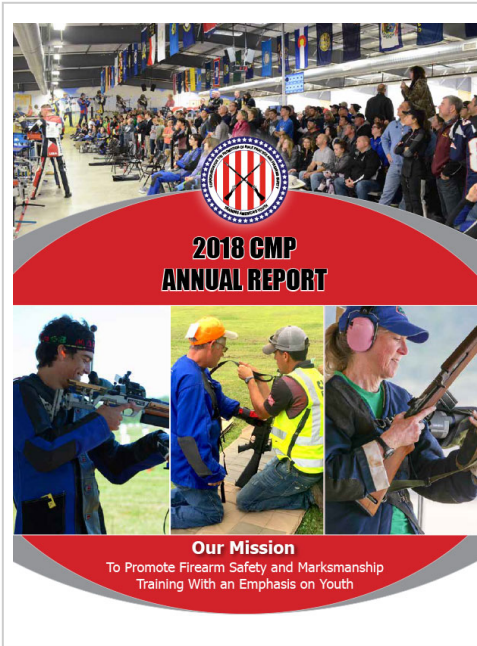
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EXHIBIT 43

ABOUT THE CMP

The Civilian Marksmanship Program (CMP) is a national organization dedicated to training and educating U. S. citizens in responsible uses of firearms and airguns through gun safety training, marksmanship training and competitions. The CMP is a federally chartered 501(c)(3) corporation that places its highest priority on serving youth through gun safety and marksmanship activities that encourage personal growth and build life skills. Links on this



(<http://thecmp.org/wp-content/uploads/CMPAnnualReport18w.pdf>)

page will lead you to more detailed information about the CMP and its programs.

Statutory mission. The federal law enacted in 1996 (*Title 36 U. S. Code, 40701-40733*) that created the Corporation for the Promotion of Rifle Practice and Firearms Safety, Inc. (CPRPFS, *the formal legal name of the CMP*) mandates these key “functions for the corporation:

1. To instruct citizens of the United States in marksmanship;
2. To promote practice and safety in the use of firearms;
3. To conduct competitions in the use of firearms and to award trophies, prizes, badges, and other insignia to competitors.

The law specifically states: *In carrying out the Civilian Marksmanship Program, the corporation shall give priority to activities that benefit firearms safety, training, and competition for youth and that reach as many youth participants as possible.*

([HTTP://THECMP.ORG/WP-CONTENT/UPLOADS/2019CMPBROCHURE_W.PDF](http://thecmp.org/wp-content/uploads/2019CMPBROCHURE_W.PDF)) CMP GOVERNANCE AND LEADERSHIP

The CMP is governed by a Board of Directors (<http://thecmp.org/about/board/>) made up of eleven members who have extensive experience and leadership credentials in military and business. The Chairman of the Board serves as the Chief Executive Officer. The Chief Operating Officer (<http://thecmp.org/about/coo/>) directs CMP sales programs at CMP South headquarters in Anniston, Alabama and oversees day-to-day operation of CMP training and competition programs at CMP North headquarters at Camp Perry, Ohio. The DCM Emeritus (<http://thecmp.org/about/director/>) is a part-time consultant who works on several projects for the CMP.



MORE INFO IN ABOUT THE CMP

EXHIBIT 44

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BRAVO COMPANY

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CENTRAL DISTRICT OF CALIFORNIA
SOUTHERN DIVISION

Case Name: *Rupp, et al. v. Becerra*
Case No.: 8:17-cv-00746-JLS-JDE

IT IS HEREBY CERTIFIED THAT:

I, the undersigned, am a citizen of the United States and am at least eighteen years of age. My business address is 180 East Ocean Boulevard, Suite 200, Long Beach, California 90802.

I am not a party to the above-entitled action. I have caused service of:

**EXHIBITS 28-44 TO DECLARATION OF SEAN A. BRADY IN SUPPORT OF
PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

on the following party by electronically filing the foregoing with the Clerk of the District Court using its ECF System, which electronically notifies them.

Xavier Becerra
Attorney General of California
Peter H. Chang
Deputy Attorney General
E-mail: peter.chang@doj.ca.gov
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Deputy Attorney General
E-mail: john.echeverria@doj.ca.gov
455 Golden Gate Ave., Suite 11000
San Francisco, CA 94102

I declare under penalty of perjury that the foregoing is true and correct.

Executed March 25, 2019.

/s/Laura Palmerin
Laura Palmerin