The apparent coziness between video game producers and firearms manufacturers came to a head with *Medal of Honor: Warfighter*, a military-style first-person-shooter much like the bestselling *Call of Duty* series. *Warfighter*’s marketing made much of the purported authenticity of the game’s content, featuring settings taken from real-world American military operations. However, the most novel feature of the game’s marketing campaign was the development of a page within the *Warfighter* website that listed all the guns the player could use in the game and linked to their real-world manufacturers. Players could order special editions of knives and a tomahawk licensed with the *Warfighter* brand, or even order a particular gun to be shipped to their local federally-licensed gun dealer. (Smith, 2012, <http://gameological.com/2012/08/partners-in-arms/>, “Partners in Arms”, The Gameological Society) *Warfighter* faced criticism over the explicit association between in-game violence and the promotion of real-world weapons, and later the special-edition tomahawk and online gun store were taken down (<http://www.eurogamer.net/articles/2012-08-14-the-medal-of-honor-tomahawk>, http://kotaku.com/5935328/medal-of-honor-website-ends-tomahawk-promo-and-pulls-links-to-weapons--gear-manufacturers).

<http://www.nytimes.com/2012/12/25/business/real-and-virtual-firearms-nurture-marketing-link.html>

<http://www.polygon.com/2012/12/26/3804144/ea-removes-links-on-marketing-partners-website-to-real-life-weapons>

This event lead the media to more closely scrutinize the associations between the marketing of real-world and virtual firearms. Some media outlets argued that in-game representations of real-world guns were a powerful marketing force. Not only were such licensing arrangements often very lucrative for gun manufacturers, it was claimed, but the manufacturers would often inspect the game to make sure that the in-game portrayal is appropriately powerful and attractive. <http://www.eurogamer.net/articles/2013-02-01-shooters-how-video-games-fund-arms-manufacturers>

In light of this phenomenon, we wanted to study the process by which in-game representations of firearms could influence perceptions of their real-world counterparts. To do this, we designed four versions of a single video game. In the game, participants would use either a real-world rifle or a science-fiction plasma weapon, which was further modified to be either powerful and attractive or ineffective and undesirable.

Being, as we were, two young graduate students in need of a hot phenomenon to build our careers upon, we were very excited to run this experiment, but a little nervous that we wouldn’t find anything to report. We therefore included a whole battery of dependent measures to give ourselves as many chances at statistical significance as possible. We are now older and soberer; we write this study as the exploratory initial project it was, with an eye to the way we might have reported it in a more juvenile scientific culture.

Hypothesis: Playing a video game featuring a powerful, attractive rendition of a real-world firearm will increase perceptions that the real-world firearm is powerful, effective, and desirable. Furthermore, it will increase the perceived normativity of owning a firearm. Therefore, we hypothesized a 2 Gun × 2 Power interaction such that participants in the strong AR-15 condition would like the AR-15 more, and participants in the weak AR-15 condition would like the AR-15 less, relative to the plasma rifle conditions, which would act as control conditions.

Method:

The study design was a 2 (Character’s gun: AR-15 or plasma rifle) × 2 (Gun power: strong or poor) between-subjects design.

Participants played one of four modified versions of the first-person-shooter video game *Doom*. Players had to make their way through a series of levels, fighting through zombies and demons. Enemies would try to bit the player or shoot the player with guns or fireballs. The player had to shoot the enemies, pick up health and ammo power-ups, and make it to the end of each level. If the player took too many wounds, the player’s health would be depleted and the level would have to be attempted again.

Character’s gun: In each version of the game, the player-character had only a single gun. In the AR-15 condition, this was a realistic rendition of the AR-15 Bushmaster rifle, a popular home-defense and general-purpose rifle. Like its real-world counterpart, the virtual AR-15 was a semi-automatic rifle (e.g. it fired one round at a time, but did not need to be manually rechambered between rounds) with a 20-round magazine. When the player fired the rifle, it would fire at a steady pace; after 20 rounds, it would have to be reloaded.

In the plasma rifle condition, the player-character instead had a science-fiction rifle we called the “Martian ZQ-5 Plasma Rifle.” Its properties (e.g., rate of fire, damage per bullet, rounds per magazine, accuracy) were kept identical to the virtual AR-15.

To strengthen the manipulation, a description of the assigned gun was given in the cover story. Moreover, a picture-in-picture icon of the gun and its name was presented bilaterally on the game screen (see Figure).

Gun power: To make the player’s gun more or less desirable, its in-game properties were manipulated. In the strong gun condition, the gun fired with perfect accuracy, the bullets dealt substantial damage, and the rate of fire was moderate and steady. To augment the player’s perception of the gun’s strength, the gun had a deep, strong report and would shake the screen slightly when fired. Furthermore, enemies shot by the rifle would sometimes burst into gore, losing chunks of flesh or even limbs.

In the weak gun condition, the gun fired with rather less accuracy, the bullets dealt substantially less damage, and the rate of fire was slower. The gun did not shake the screen when fired, and its report was anemic. Enemies shot by the rifle always died with the same, less dramatic animation, and did not lose chunks or parts.

A full table of statistics for the weak and strong guns is provided in Table X. The .wad game files for all four conditions are available online at XXXXXX.

**Outcomes**

After playing the game, participants filled out a paper survey (attached in supplementary materials, Survey.docx). This being our first experiment in this area, we were afraid we would miss some relevant construct that might yield statistical significance. In an attempt to prevent this, we drafted many new scales and items for use as outcomes.

**1st and 2nd Amendment Rights Advocacy.** Participants rated nine items on a 7-point Likert scale (1-Strongly disagree, 7-Strongly agree). Four items asked about the importance of the 2nd amendment and the utility of private firearm ownership. The other five items, intended as a screen, asked about the importance of freedom of speech in violent media.

**AR-15 desirability**. At the top of the scale, participants were instructed that the following questions reference the AR-15 semi-automatic rifle. A picture of the rifle accompanied the text. Five questions measured the utility of the AR-15 (fun, useful, would feel safer, accurate, powerful). Another three questions measured buying intentions. A last question asked “What is the MOST you would be willing to pay, in dollars, for the AR-15?” Participants wholly uninterested in owning an AR-15 were instructed to write “blank” for this item.

**In-game gun desirability.** Participants rated two items for how desirable their in-game gun was (“I feel I *want* the gun that I used in the video game today” and “I feel I *need* the gun I used in the video game today”)

**Public policy.** Five items measured attitudes towards gun control laws and the permissibility of carrying firearms in public.

**Normative gun safety and utility.** Participants were asked what percent of gun owners would ever experience a gun-related accident (e.g. accidental discharge), what percent would ever have a gun stolen from them, and what percent would ever use their gun in an act of self-defense.

**Magazine restrictions.** Participants were asked what should be the maximum number of bullets in a magazine, that is, how many bullets a gun should be able to fire before needing to be reloaded.

**Individual differences.** Participants were asked whether they owned a gun, whether they played violent video games, and which political party they supported.

**Analysis**

**Manipulation check.** We tested how assignment to the 2 × 2 ANOVA influenced participants’ in-game performance, as measured by the number of times the player died and the number of monsters the player killed. Count of player deaths was Poisson-distributed. Participants in the powerful-gun condition died significantly fewer times than those in the weak-gun condition (b = -.376, SEb = .129, *p* = .004), while the type of gun (realistic vs. sci-fi) did not significantly influence this outcome (*b* = .028, SEb = .046, *p* = .539), nor did gun type and gun power significantly interact (*b* = .017, SEb = .046, *p* = .715). Similarly, participants in the powerful-gun condition killed substantially more enemies than did those in the weak-gun condition. Unexpected effects of gun type and a gun type × power interaction were detected such that participants in the AR-15 condition killed fewer monsters than their ZQ-5 counterparts, particularly in the powerful-gun condition. Regrettably, we did not ask participants directly about how fun, powerful, satisfying, etc. the in-game gun was.

**Gun desire.** We conducted a 2 (Gun) × 2 (Power) ANOVA.

**Purchasing intentions.**

**Discussion**

Results indicate that brief exposure to a violent game with an attractive or unattractive representation of a real-world firearm does little to influence attitudes towards that firearm or to firearms more generally. In all the models for all the outcomes we considered, the Gun × Power interaction explained very little variance. Participants’ political orientation strongly accounted for their views of firearms; the best models retained this factor while eschewing effects of the video game.

There are a number of possible reasons we did not detect an effect. The simplest explanation, of course, is that no such effect exists: product placement in violent games might have only a minimal influence on attitudes towards those products. This seems a little incongruous with the broader phenomenon as reported in news outlets and summarized in our introduction. It is possible that experimental and personological factors obscured the anticipated effect. First, it is likely that fifteen minutes is not enough to influence attitudes towards a gun. Second, it is possible that the game’s setting was not conducive to product-placement effects, being too fantastic for the real-world weapon. Perhaps a more realistic setting such as an urban neighborhood or American countryside would influence attitudes moreso than an unrealistic hellish landscape populated by zombies and demons.

We remember thinking that we might find the sort of nuanced and surprising effect that was typical of top journals at the time, something like “Product placement does not make players want the gun more, but it makes them think gun ownership is more normative.” We recognize today that such effects, as presented, are often the result of some amount of Hypothesizing After Results are Known with a bit of interpreting the difference between “statistically significant” and “not statistically significant” as being statistically significant. It is scary to think that one’s experiment might miss an important outcome, but we recognize now that it is important to report initial exploratory work as being, indeed, exploratory.