

How News Exposure and Trust in Law Enforcement Relate to Defensive Gun Ownership

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Objective: According to a recent psychological model of defensive gun ownership, the perceived need to own a gun for self-defense corresponds with two independent construals of threat: specific threats, namely the Perceived Lifetime Risk of Assault (PLRA), and diffuse threats, namely the Belief in a Dangerous World (BDW; Stroebe et al., *Personality and Social Psychology Bulletin*, 2017, 43(8), 1071). The present study assessed how these threats correspond with two factors known to influence gun ownership: frequency of mass media news exposure and trust in law enforcement to protect citizens from violent crime. These factors represent social information on which people may base their threat perceptions, which could, in turn, influence defensive gun ownership. **Method:** The proposed indirect effects model was tested using structural equation modeling (SEM) over two independent online survey samples of U.S. handgun owners (total N = 1,691). The defensive gun ownership concept included measures of self-reported reasons for gun ownership, gun-use beliefs, as well as behavioral self-reports. **Results:** Both news exposure and trust in law enforcement indirectly related to defensive gun ownership, via their effects on specific and diffuse threat perceptions. News exposure indirectly related to higher reports of defensive gun ownership, whereas trust in law enforcement was indirectly associated with lower reports of defensive gun ownership. **Conclusions:** The results indicate that social information variables relate to defensive gun ownership via threat perceptions.

Keywords: defensive gun ownership, trust in law enforcement, news exposure, threat perceptions, social information

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Stroebe, Leander, and Kruglanski (2017) recently developed and tested a model of Defensive Gun Ownership which postulated that handgun ownership is motivated not only by specific fears of crime victimization but also by a diffuse fear that the world is a dangerous place, full of people who might hurt them without reason. This article reports a further empirical test of this model. Given that the model claims to explain the safety-related fears underlying American gun ownership, it should account for the influence of other variables known to affect defensive gun ownership. The two

variables considered in this study are gun owners' trust in the ability of law enforcement to protect them against violent crime and their exposure to mass media news. Whereas mass media news exposure – a common source of information about violence – should increase people's fear of crime, trust in law enforcement to offer effective protection should reduce such fear. These effects on people's fears should, in turn, correspond with people's tendencies towards defensive gun ownership. The present research aims to test how defensive gun ownership is indirectly linked to different types of social information—namely, trust in law enforcement and news exposure, through their mutual associations with individuals' threat perceptions.

Subjective Threat Perceptions and Defensive Gun Ownership

The development of the original model of defensive gun ownership was stimulated by the finding that sixty-seven percent of American gun owners report owning their gun for self-defense (Pew Research Center, 2017).

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This finding is puzzling, because if defensive gun ownership were driven only by a specific “fear of crime” or “perceived risk of victimization”, as suggested by criminological theories (e.g., Cao et al., 1997; DeJong, 1997; Kleck et al., 2011; Stroebe, 2013, 2015; Williams & McGrath, 1976), one would expect a close relationship between individuals’ threat perceptions and the objective risk of violent crime victimization. This is not the case. In 1999, self-defense was only mentioned by 26% of gun owners (Yamane, 2017); by 2013, the rate had increased to 48% of gun owners. Yet, over the same period, crime rates have *decreased* substantially and have been at a historical low (FBI [UCR], 2014; Zimring, 2006).

This divergence suggests that people who own a gun for self-defense are not responding to an *objective* but a *subjective* (perceived) risk of victimization. Stroebe et al. (2017) therefore postulated that there might also be a more diffuse, nonspecific sense of threat feeding the need for protection/self-defense – namely, the belief in a dangerous world (Altemeyer, 1988; Duckitt, 2001). Stroebe et al. (2017) tested their theory across two samples of more than 800 male U.S. gun owners. Subjective risk of a *specific* threat was assessed through gun owners’ Perceived Lifetime Risk of Assault (PLRA): They were asked to estimate the likelihood of being mugged or violently attacked during their lifetime. Their perception of a *diffuse* threat was measured with the Belief in a Dangerous World scale (BDW). The BDW – originally developed by Altemeyer (1988) and later modified by Duckitt (2001) – reflects a “worldview” or a system of beliefs about the social world. The items of the BDW scale range from one extreme (the view that the world is inherently dangerous, unpredictable, and threatening) to the opposite extreme (the view that the world is a secure, stable, and basically safe place).

BDW has also been associated with an array of variables suggesting readiness to defend against threats, including right-wing authoritarianism (Altemeyer, 1988) and negative attitudes towards minorities (Duckitt, 2001). Consistent with this latter association, data from the American National Election Study suggest that symbolic racism correlates with gun ownership among U.S. Whites (O’Brien et al., 2013), as well as with their opposition to gun control policies (Filindra & Kaplan, 2016; O’Brien et al., 2013). Thus, BDW may be a useful indicator of social and cultural concerns that indirectly link to gun ownership but are not focused on the specific fear of (or perceived risk of) an attack.

Testing their model with a path analysis using structural equation modeling (SEM), Stroebe and colleagues (2017) found that both BDW and PLRA predicted the reported need of a gun for self-defense, which in turn predicted handgun ownership (a defensive weapon), but not long gun ownership (which was instead linked to hunting). Focusing on handgun owners in further analyses, Stroebe and colleagues (2017) also found that high scores on BDW and PLRA were associated with more extensive interpretations of the rights of gun owners to use their guns, for example in shooting home intruder scenarios, even if the intruder no longer constituted a threat. However, Stroebe et al. (2017) did not study likely antecedents of these predictors such as exposure to news and trust in law enforcement. The present study was conducted to provide this information and thereby test likely social antecedents of threat driven defensive gun ownership.

Sources of Social Information about Threat: News Exposure and Trust in Law Enforcement

The present research examines the association of trust in law enforcement and of exposure to mass media news, with PLRA and BDW, and consequently defensive gun ownership. We selected these variables because they have both been empirically shown to relate to gun ownership, but in *opposite* directions. Whereas trust in law enforcement should reduce threat perceptions and, therefore, reduce defensive gun ownership, mass media news exposure should increase threat perceptions and consequently increase defensive gun ownership.

Trust in law enforcement and defensive gun ownership

In most societies, it is the responsibility of law enforcement and of the criminal justice system to safeguard the security of its citizens. When citizens perceive these efforts as successful, they feel little need for actions or “self-help” to achieve security. However, when trust in law enforcement and the justice system is low, citizens are motivated to take their own initiative and turn to individually-based means of achieving security (Black, 1983). Most studies of the association between trust in the police and self-protection focus on tests of the “collective security hypothesis” (McDowall & Loftin, 1983). According to this hypothesis, the demand for handguns “is a response not only to factors,

which reduce collective security, such as crime and disorder but also to factors which increase it, such as better police protection or higher levels of social control” (McDowall & Loftin, 1983, p. 1147). Thus, the model predicts that trust in the ability of the police, to protect citizens against violence, should be inversely associated with buying handguns. To test this prediction, McDowall and Loftin (1983) conducted a time series analysis on the number of handgun licenses issued between 1951 and 1977 in the city of Detroit. As a determinant of satisfaction with the police, they used the number of uniformed police officers employed by the city. Controlling for other variables, they found that a 1% increase in police strength was associated with a 3.3% decrease in applications for handgun licenses. Although this inverse association supports their model, their theoretical constructs were not directly assessed, and they tested their individualist model with aggregate data.

They amended these methodological weaknesses in a second study. White male respondents were asked whether anybody in their household owned a gun, and if so, whether it was intended for protection. To assess trust in law enforcement and the justice system respondents had to indicate their confidence in the police and the courts.¹ In support of model predictions, confidence in the police and law enforcement were negatively associated with protective gun ownership, a finding replicated by Smith and Uchida (1988).

More recent studies also supported the collective security model (e.g., Jiobu & Curry, 2001; Kelsay et al., 2018). Jiobu and Curry (2001) used data from the General Social Survey for the years 1982 to 1996. Rather than measuring confidence in the police, they assessed respondents’ level of confidence in the “executive branch of the government”, “Congress” and in the “Supreme Court” and related these responses to answers about whether they “personally owned a gun”. The authors found a significant association between a lack of confidence in the federal government and gun ownership. The less confidence individuals had in the federal government, the more likely they were to own a gun. The study of Kelsay et al. (2018) extended the findings of Jiobu and Curry (2001) in two important ways: Firstly, Kelsay et al. (2018) related gun ownership directly to trust in law enforcement rather than to the general measure of satisfaction with the executive branch used by Jiobu and Curry (2001). As a second important refinement, they related satisfaction with the police to

owning a gun for home security purposes (i.e., one form of self-protection).

There are also some non-supportive findings. For example, Cao, Cullen, and Link (1997) found no association between gun ownership for self-protection and a multi-item measure of confidence in the police (e.g., “the police do a good job in protecting me against crime”). Similarly, Luxenburg, Cullen, Langworthy, and Kopache (1994) found no association between gun ownership for self-protection and satisfaction with the overall quality of the police services in their neighborhood. In another study, the confidence of New York Subway riders in the ability of the transport police to provide protection did not relate to their decision to carry self-protection devices (Ziegenhagen & Brosnan, 1990).

To summarize, the evidence for the collective security model is mixed. Several studies suggest an inverse association between police protection and defensive gun ownership (Jiobu & Curry, 2001; Kelsay et al., 2018; McDowall & Loftin, 1983; Smith & Uchida, 1988; Young et al., 1987); other studies fail to find any such association (Cao et al., 1997; Luxenburg et al., 1994; Ziegenhagen & Brosnan, 1990). Unfortunately, we are unable to identify differences between supportive and non-supportive studies, at least with regards to the types of measures they used to assess trust in the police.

Exposure to mass media news and fear of crime

What other factors might contribute to the perceived threats that drive defensive gun ownership? With the exception of people living in high crime areas, citizens are likely to derive most of their information about crime from news reports in the mass media. Frequency of news exposure might, therefore, bias viewers’ perception of social reality and could explain why nearly two-thirds of handgun owners claim self-defense as their reason for gun ownership.

Cultivation theory has been a major theory to account for the impact of mass media exposure on people’s conception of the social reality (Gerbner, 1969). Although cultivation theory aims to account for a multitude of sources and messages, the historical focus has been on television portrayals of violence (Shrum, 2017). Gerbner and colleagues, originally, argued that exposure to television violence increases perceived risk

¹ There appears to be a fault in the manuscript. In the variable description of “Confidence in the police” the authors erroneously list the same items as later for “Police Power” (p. 60/61)

of crime victimization (Gerbner & Gross, 1976). According to the theory, frequent viewers of (TV) news may develop a general mistrust of people and a view that the world is mean. Gerbner, Gross, Morgan, and Signorelli (1980) found a relationship between the frequency of viewing TV and what they call, a “Mean World Index” a measure of the degree to which people agree that “most people are just looking out for themselves”, that “you can’t be too careful in dealing with people”, and that “most people would take advantage of you, if they got a chance” (p. 11).

Yet, the hypothesis that frequency of TV exposure is associated with an increased fear of - or worry about - crime has been examined in a multitude of studies and research has not always been supportive, at least not for general exposure to television (e.g., Hawkins & Pingree, 1981; Potter & Chang, 1990). One reason for this inconsistency is the type of program viewed (e.g., Callanan & Rosenberger, 2015; Chiricos et al., 1997; Eschholz et al., 2003; Romer et al., 2003; Weitzer & Kubrin, 2004). The most consistent predictors of fear of - or worry about - crime appear to be *news* programs, particularly local news (Chiricos et al., 2000; Eschholz et al., 2003; Kort-Butler & Habecker, 2018; Ray & Kort-Butler, 2019; Romer et al., 2003; Weitzer & Kubrin, 2004). This might indicate that it is the amount of crime-related reporting in a program that is most relevant. To summarize, it is not general exposure to mass media that corresponds with fear of crime, but rather the frequency of watching *news* programs, which report actual crimes.

The Present Research

Two Internet-based surveys were conducted with U.S. handgun owners. Both surveys had similar procedures and used identical measurements of the key variables.² The first survey was conducted in mid-2017 (May 21st – June 30th), about a year since the last high-profile mass shooting in Orlando; the second survey was conducted in October 2017 (October 10th – October 25th), in the wake of the Las Vegas shooting. Each study received ethical approval by the institutional review board of the principal investigator and included informed consent and debriefing.

Hypothesis 1: In the Stroebe et al. (2017) study, BDW and PLRA predicted various indicators of

defensive gun ownership, including (1) whether protection/self-defense was a main reason for gun ownership, (2) justification to shoot a home intruder, (3) the right to kill in self/home defense, and (4) gun rights advocacy. These were all considered core features of a latent construct “defensive gun ownership”. In the present analysis, we *extend* the dependent variable list by adding willingness to engage in gun-related vigilantism (Leander et al., 2019) and behavioral reports of gun carry habits. We then *simplify* the model by aggregating the different indicators into a single latent variable construct. We expect the latent construct to correspond with belief in a dangerous world and perceived lifetime risk of assault, replicating the original model by Stroebe et al. (2017).

Hypothesis 2: According to Stroebe et al.’s (2017) model of defensive gun ownership, the need to own a gun for self-defense is predicted by both specific and diffuse subjective threats. Thus, to the extent that trust in law enforcement relates to defensive gun ownership, it should do so through one or both types of threat. People who report higher trust in the ability of law enforcement to protect them should perceive a lower lifetime risk of being victimized, relative to people who have little trust in law enforcement. They should also perceive the world as a less dangerous place. In turn, these lower threat perceptions should correspond with lower tendencies toward defensive gun ownership (also see Figure 2, ‘Trust’).

Hypothesis 3: Frequent consumers of news should perceive the likelihood of becoming crime victims higher than people who rarely follow the news; and they should also be more likely to own a gun for self-defense. We predict a positive association between frequency of news exposure and PLRA, which in turn should be positively associated with tendencies toward defensive gun ownership. The association reported between frequent TV viewing and a “Mean World Index” (comparable to BDW), suggests a link between frequency of news exposure and BDW. Given that BDW is one of the two threat determinants of owning a gun for self-defense (Stroebe et al., 2017), frequency of news ex-

² Procedural differences pertain to some additional measures, which were placed after our key variables. We discuss further, technology inclusion, differences of studies in the method section. The full surveys are available in Supplementary Materials B.

posure should also be indirectly linked to defensive gun ownership through its effect on BDW (also see Figure 2, ‘News’).

Hypothesis 4: The model of defensive gun ownership is a theoretical model based on basic motivational and social cognitive assumptions. We, consequently, assume that the model is largely robust to differences in social context. In the current study, we, therefore, address three important contextual factors.

1. In our model we argue that the role of social information can be independent of personal experiences of violent crimes and other relevant information. We, consequently, also accounted for the effects of personal experiences of violent crimes and regional rates of violent crimes and expect the threat driven model to hold merit independently of personal experiences with violent crimes (Hypothesis 4.1.).
2. The original study by Stroebe et al. (2017) focused on men only because men make up the majority of gun owners in the United States (Jones, 2013). This time we explicitly recruited women owning handguns and expect the model to also apply to women (Hypothesis 4.2.).
3. The original study by Stroebe et al. (2017) included samples just prior to and just after a high-profile mass shooting (i.e., the Orlando club shooting). Given that news exposure, trust in law enforcement, and threat perceptions could be influenced by high profile acts of mass violence, we compare two independent samples, of which one was collected following the Las Vegas Strip Shooting in 2017. Although there may be differences in variable means between the samples, we expect the associations between variables to remain largely the same (Hypothesis 4.3.).

Method

Participants

We recruited 1,691 (785 women, 906 men) U.S. handgun owners in two independent studies via the market research firm Qualtrics Panels on May 21st – June 30th, 2017 ($n_1 = 867$) and October 10th – October 25th, 2017 ($n_2 = 824$).³ In addition to prescreening for gun ownership, we also sought to stratify the samples in accordance with 2013 U.S. Census data with regards to age, education, income, and region of residence (no more than 48.5% from Southern U.S. States, mean age: 46.68 years, mean income: \$62,034, with most participants reporting some college education [33.5%], finished high school education [27.5%], or a college degree [27.1%]; for a full overview of sample demographic characteristics see Supplemental Material C, Table S10).

Procedure

Both studies used the same panel company to recruit participants, but whereas the first questionnaire only allowed desktop/laptop respondents, the second questionnaire allowed for the use of mobile devices (for specific differences in questionnaires, see Supplemental Materials A and B). Nevertheless, the measurement of the key variables was identical; therefore, we describe the scales and items jointly.

Participants first provided their demographic information and gave informed consent. The informed consent stated that the studies would be about attitudes towards gun ownership and gun use, as well as the study-specific tasks. Subsequently, participants reported on all relevant measures. Participants finished with a series of study-specific tasks and questionnaires unrelated to this paper’s research question.

Below we describe the measures in more detail. When available we refer to the original development and assessment of the scale. The measure of lifetime violent crime experiences is a novel measure.

News exposure frequency

Given that we were only interested in the general frequency of news exposure, not effects of different sources of news, we combined the information across

³ An additional $n = 201$ participants were excluded due to straightlining on multiple scales ($n = 136$), duplicate IPs ($n = 41$), random free text entry ($n = 12$), or missing data ($n = 12$). Note that participants in the first study were only invited if they used a desktop device with a physical keyboard (i.e., no outdated hardware or browsers).

different sources (as validated by Stroebe et al., 2020). Frequency of news exposure was assessed with three items: “How many days per week do you follow:” (1) “TV/radio/newspaper reports of *local* news”, (2) “TV/radio/newspaper reports of *national* news”, and (3) “Online news / news websites” [emphasis as in original]. Participants rated each item on a seven-point scale ranging from “0 (*almost never*)” to “7 (*almost daily*)”. Reliability of the scale was acceptable ($\alpha = .72$). The combined scale was slightly left-skewed due to higher reports of daily news consumption (36.8% to 53.9% reported “7 (*almost daily*)” on the individual items).

Trust in law enforcement

To measure trust in law enforcement we used three previously validated items: (1) “Do you trust the police to prevent crime in your community?”, (2) “Do you trust the police to generally protect you and your family against acts of violence?”, (3) “Do you trust federal law enforcement agencies to prevent mass shootings and other acts of terrorism?” (see, Stroebe et al., 2020 for full details on a validation study among Canadian men). Participants answered each item on a five-point scale ranging from “Not at all” to “A great deal”. Reliability of the scale was good ($\alpha = .89$) and the scale was normally distributed ($M = 3.11$, $SD = 1.12$).

Belief in a dangerous world

BDW was assessed with the revised 10-item scale of Duckitt (2001). For example, “Any day now, chaos and lawlessness could erupt around us. All the signs are pointing to it”. Participants answered the items on a five-point scale ranging from “Disagree strongly” to “Agree strongly”. Reliability of the scale was good ($\alpha = .84$) and normally distributed ($M = 3.43$, $SD = 0.74$).

Perceived lifetime risk of assault

PLRA was assessed with a measure developed by Stroebe et al. (2017). Participants were asked: “What do you estimate is the **likelihood** the following will happen in your lifetime (in your future)?” [emphasis as in original]. Participants were then asked to answer four items (“Likelihood you will be mugged.”, “Likelihood you will be violently attacked.”, “Likelihood your home will be invaded by an armed burglar.”, and “Likelihood you will be present during a mass shooting.”). Participants answered the items on a five-point scale ranging from “Not at all” to “Extremely likely”. The scale was reliable ($\alpha = .88$) and normally distributed ($M = 2.65$, $SD = 0.96$).

Defensive Gun Ownership

The latent construct, *defensive gun ownership*, was indicated by one explicit self-attribution (protection/self-defense as a major reason for owning a gun), three gun-use beliefs (justification to shoot, right to kill, and vigilantism), as well as a self-reported behavioral indicator (gun carry habit). Each measure is detailed below.

Protection/Self-defense as a Self-Reported Reason for Owning a Gun. Early in the survey, participants were asked the reasons why they owned a gun, using the most commonly cited reasons from a Pew survey (2014): (1) Protection/Self-defense, (2) Hunting, (3) Sport/Target shooting, (4) Like guns/wanted one/enjoy using, (5) Have always owned/Raised with guns/Tradition, and (6) Family heirloom/Gift. The item of interest was “Protection / Self-Defense”. Participants gave their ratings on a five-point scale ranging from: “1: Not a Reason” to “5: Major Reason” with the possibility to choose “0: Not applicable” ($M = 4.43$, $SD = 1.05$). The scale showed a ceiling effect, with many participants (68.8%) choosing protection and self-defense as a “5: Major Reason” for owning a handgun. Polling by Pew (2017) similarly showed that 67% of gun owners report that protection is a major reason they personally own a gun.

Justification to shoot. Participants were presented with a vignette examining in which type of situation they would feel justified to shoot an intruder (Stroebe et al., 2017). The vignette read, “If you encounter an intruder, in your home, in the middle of the night, how justified is it to...” and on separate screens, participants rated the justification of three actions “...shoot the intruder”; “...shoot the intruder, even if the intruder is already trying to flee the home”; and “...shoot the intruder, even if you are otherwise alone and can get out safely” (rated “1: Not at all justified” to “5: Totally justified”, $\alpha = .74$, $M = 3.71$, $SD = 1.02$). About one-fifth of the participants rated the scale on the highest possible level (“Totally justified”, $n = 360$, 21.3%).

Right to kill. The next set of questions focused directly on situations in which participants felt that they had the right to kill another person (Cohen & Nisbett, 1997): “I have a right to kill another person in self-defense,” “I have a right to kill another person to defend my family,” and “I have a right to kill another person to defend my home” (rated “1: Disagree strongly” to “5: Agree strongly”, $\alpha = .75$; $M = 4.52$, $SD = 0.66$). Again, a larger portion of participants rated the scale on the highest possible level (“Agree strongly”, $n = 811$, 48.0%).

Vigilantism. We measured willingness to engage in gun-related vigilantism with a scale developed by Leander et al. (2019). Participants read “*Might you ever consider drawing or discharging a firearm to...*”, and then rated each of three items, “*Save a vulnerable stranger in distress*”, “*Stop an active shooter situation*”, and “*Deter intimidation by troublemakers*,” on a five-point scale (from “*Definitely not*” to “*Definitely yes*”). Scale reliability ($\alpha = .67$) was slightly undermined by the more modest item (“*Deter intimidation by troublemakers*,” $\alpha_{(if\ item\ were\ deleted)} = .73$). Yet, in a subsequent confirmatory factor analysis all items loaded significantly on the latent factor ($.31 < r < .81$, all $p < .001$). The combined scale was normally distributed ($M = 3.75$, $SD = 0.83$).

Gun Carry Habit. People who own guns for personal protection are more likely to carry a gun outside the home and to maintain easy access to a loaded gun (Bankston et al., 1990; for a review, see Buttrick, 2020). We measured such a gun-carrying habit by presenting participants with the question: “*With regards to carrying a gun outside the home...*”: (1) “*I often keep a handgun in my vehicle*”, (2) “*I often carry a handgun on my person*”, (3) “*I would feel vulnerable or exposed if I did not carry a gun*” (rated “*1: Disagree strongly*” to “*5: Agree strongly*”, $\alpha = .88$; $M = 2.87$, $SD = 1.37$). A larger portion of participants fell into the lowest (“*Disagree strongly*”) category ($n = 330$, 19.5%).

Covariates

Violent Crime Victimization Experience. To assess personal experiences with violent crimes, we asked participants to indicate: “*Do you know of a specific instance in which someone close to you was the victim of a violent crime?*” (dummy-coded, $n_{yes} = 708$; 41.87%) and “*Have you ever been a victim of a violent crime?*” (dummy-coded, $n_{yes} = 300$; 17.74%).

Regional violent crime rates. We added crime rates based on state-level public data (FBI [UCR], 2017). We used the state total rate per 100,000 inhabitants of the year the data was collected (2017) and matched the data to the participant’s self-reported state of residence. We added the overall rate of violent crimes in the state as well as the rates of the different types of violent crimes (as defined by the FBI; murder or non-negligent manslaughter, rape, robbery, and aggravated assault).

Analysis plan

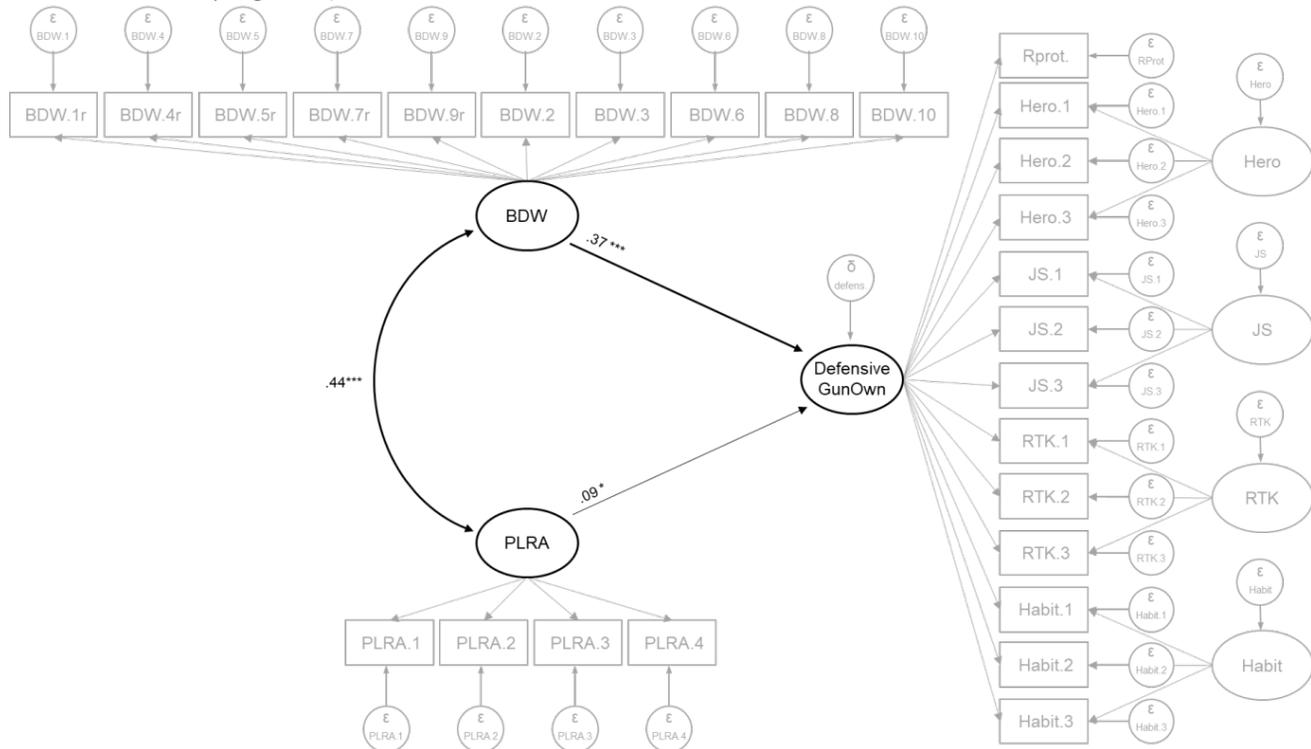
To thoroughly test our full model, we adopted a two-stage procedure: We first pooled the two samples using latent SEM to replicate the original model and offer a robust test of the overall extended model. We then conducted multi-group analyses and covariate analyses to test for contextual differences (i.e., study- and gender differences) and to protect against possible misspecifications (e.g., Simpson’s paradox or potential third variables).

We tested our models using SEM. As some of our variables are not normally distributed, we also report bootstrap bias-corrected confidence intervals (5,000 bootstrap samples). We also use bias-corrected bootstrap sampling of multiplied paths to statistically test indirect effects (as suggested by Hayes, 2013). All analyses were performed with AMOS-SPSS (v.25). The sample sizes for the individual samples were determined using an *a-priori* power analysis based on the smallest standardized effect of the original Stroebe et al. (2017) study ($B = .14$), with 80% power of finding a true result, a 5% alpha level, five main latent concepts, and 33 observed items. The power analysis (Soper, 2017; Westland, 2010), indicated a minimum sample of $n = 308$ for the model structure and a minimum sample size of $n = 800$ participants for the specified effect. With 1,691 participants, we had sufficient power (in our subgroups) and met sample size requirements for highly complex models (Wolf et al., 2013).

Unless noted otherwise, all samples were independent and statistical tests are two-tailed. Next to parametric test results, we report robust or bootstrapped model estimates in Supplementary Material A. As suggested by Kline (2015), we used four complementary goodness of fit measurements to judge the adequacy of the models (RMSEA, SRMR, Chi-Squared, CFI). All models showed adequate to good fit (all fit measures and full SEM results are reported in Supplementary Material A – Tables S1-S9). All data were collected prior to analysis and the present model has not been

Figure 1

Replication Original Model. The path diagram shows the standardized structural coefficients of PLRA and BDW predicting defensive gun ownership. (Hero = Vigilantism; JS = Justification to kill; RTK = Right to kill; Habit = Gun carrying habit)



previously tested⁴. Full data analytic details are available in Supplementary Information A. The full survey information is available in Supplementary Information B.

Results

Replicating the Model of Defensive Gun Ownership

In a first step, we sought to replicate the original model of defensive gun ownership (Stroebe et al., 2017) – namely, that BDW and PLRA independently correspond with tendencies towards defensive gun

ownership. The key difference in the present study is that we modeled *defensive gun ownership* as a latent variable construct. The SEM is illustrated in Figure 1 (model fit: $\chi^2(309, N = 1,691) = 2,457.21, p < .001$, RMSEA = 0.064, 90%CI [.062, .067], SRMSR = 0.07, CFI = 0.89).

Altogether, the pattern of the data effectively replicated the original model. Similar to Stroebe et al. (2017), BDW and the PLRA were moderately correlated ($r = .44$) and both measures positively corresponded with the defensive gun ownership latent variable with effect sizes ranging from small (PLRA) to medium (BDW), $R^2_{defensive} = 17\%$; PLRA: $b = 0.04, SE = 0.01, p = .008, \beta = .09$; BDW: $b = 0.25, SE = 0.03, p$

⁴ The model test is unique to this report, but certain portions of the data are reported elsewhere (Leander et al., 2019, 2020; Stroebe et al., 2020). Although Leander and colleagues (2019) also reported a single item from PLRA, as well as justification to shoot and vigilantism (from our aggregated dependent variable), their research questions, analyses, and findings are unrelated to the present research. Stroebe and colleagues (2020) use the male subsample of the first survey for a cross-cultural comparison of defensive gun ownership, where they focus on antecedent variables that are exclusively relevant to male gun owners (e.g., masculinity beliefs). Leander and colleagues (2020) did not use any of the same variables reported here.

$< .001, \beta = .37$.⁵ Stroebe et al. (2017) similarly observed that BDW was a stronger predictor of defensive gun ownership than PLRA.

Adding Antecedent Effects of Trust and News Exposure

The focal aim of the present paper was to test the indirect effects of news exposure and trust in law enforcement (hypotheses 1 and 2; also see Table S2, for latent correlations). To test our hypotheses, we added the latent concepts of *Trust in Law Enforcement* and *News Exposure* as antecedents of PLRA and BDW and tested their direct and indirect paths to the defensive gun ownership latent variable. The extended model explained a sufficient variance of defensive gun ownership, $R^2_{defensive} = 17.5\%$. The SEM is illustrated in Figure 2 (model fit: $\chi^2(473, N = 1,691) = 2,956.10, p < .001, RMSEA = 0.056, 90\%CI [.054, .058], SRMSR = 0.07, CFI = 0.90$).

With regards to direct effects, the antecedent variables, trust and news exposure, did not directly correspond with defensive gun ownership: that is, in the full model, there were no direct effects of defensive gun ownership on trust in law enforcement ($b = 0.002, SE = 0.01, p = .87, \beta = .01$), nor by news exposure frequency ($b = 0.01, SE = 0.01, p = .06, \beta = .06$).⁶ There were, however, direct effects of news exposure and trust on BDW and PLRA; and, whereas trust had a relatively stronger direct effect was a stronger predictor on BDW, $b = -0.11, SE = 0.02, p < .001, \beta = -.21$ (small to medium effect size), news exposure had a relatively stronger direct effect on PLRA, $b = 0.08, SE = 0.02, p < .001, \beta = .14$ (small to medium effect size). There were no other reliable direct effects at a 5% alpha level (Table S3).⁷

With regards to indirect effects (using bias-corrected bootstrap sampling of the multiplied paths, as suggested by Hayes, 2013), there was an indirect effect of *Trust* \rightarrow *BDW* \rightarrow *defensive gun ownership*, $\beta = -.03, 95\%BootCI [-0.04, -0.02], p < .001$. There was also an indirect effect of *news exposure* \rightarrow *BDW* \rightarrow *defensive gun ownership*, $\beta = .01, 95\%BootCI [0.004, 0.014], p =$

$.001$. The indirect effects via PLRA were only marginally significant (see Supplementary Table S4).⁸ Thus, consistent with predictions derived from Stroebe et al.'s (2017) model of defensive gun ownership, news exposure and trust in law enforcement have indirect (but not direct) effects on defensive gun ownership, via their effects on threat perceptions. This suggests a basis for an extended model whereby news exposure and trust are antecedents of the threat perceptions that drive defensive gun ownership.

Covariate analyses: Past victimization and state-level crime rates

In a final step, we added potential confounders to the model: objective state-level crime rates and personal experiences – that is, whether oneself or a member of one's social network had been a victim of a violent crime.⁹ The overall model remained stable when controlling for these variables (having been a victim, knowing a victim, violent crime rate, model fit: $\chi^2(557, N = 1,691) = 3,105.82, p < .001, RMSEA = 0.052, 90\%CI [.050, .052], SRMSR = 0.06, CFI = 0.90$; see supplementary Table S8).

The covariates could not explain the effects mentioned earlier, but they did yield their own independent effects: having *been a victim* and *knowing a victim* both predicted BDW and PLRA, leading to higher ratings on both specific and diffuse threat perceptions (all β s $> .06, p$ s $< .09$, see Table S8). State-level rates of violent crimes had no statistical effects on any endogenous variables in the model. Given that the violent crime rate variable was a composite variable (based on rates of murder or non-negligent manslaughter, rape, robbery, and aggravated assault), we also analyzed the model with each individual form of violent crime in the model. The results virtually mirrored the null results of the combined indicator, but with one exception—namely, state-wide murder rates predicted BDW, $b = 0.04, SE = 0.01, p < .001, \beta = .15$ (small to medium effect size, see Table S8). In sum, the theoretical model was stable even after considering personal experiences and objective crime rates.

⁵ Given that there was some evidence against multivariate normality (some items were not normally distributed), we also tested the paths with a bias-corrected percentile bootstrap method (5,000 re-samples). The effects of PLRA and BDW stayed significant even without the assumption of multivariate normality (also see supplementary information, Table S1).

⁶ It should be noted that with the bootstrap method the small direct *news exposure* effect reached statistical significance, $b = 0.01, 95\%BootCI [0.002, 0.03], p = .05, \beta = 0.06, 95\%BootCI [0.008, 0.11], p = .05$, for a full overview see Table S3.

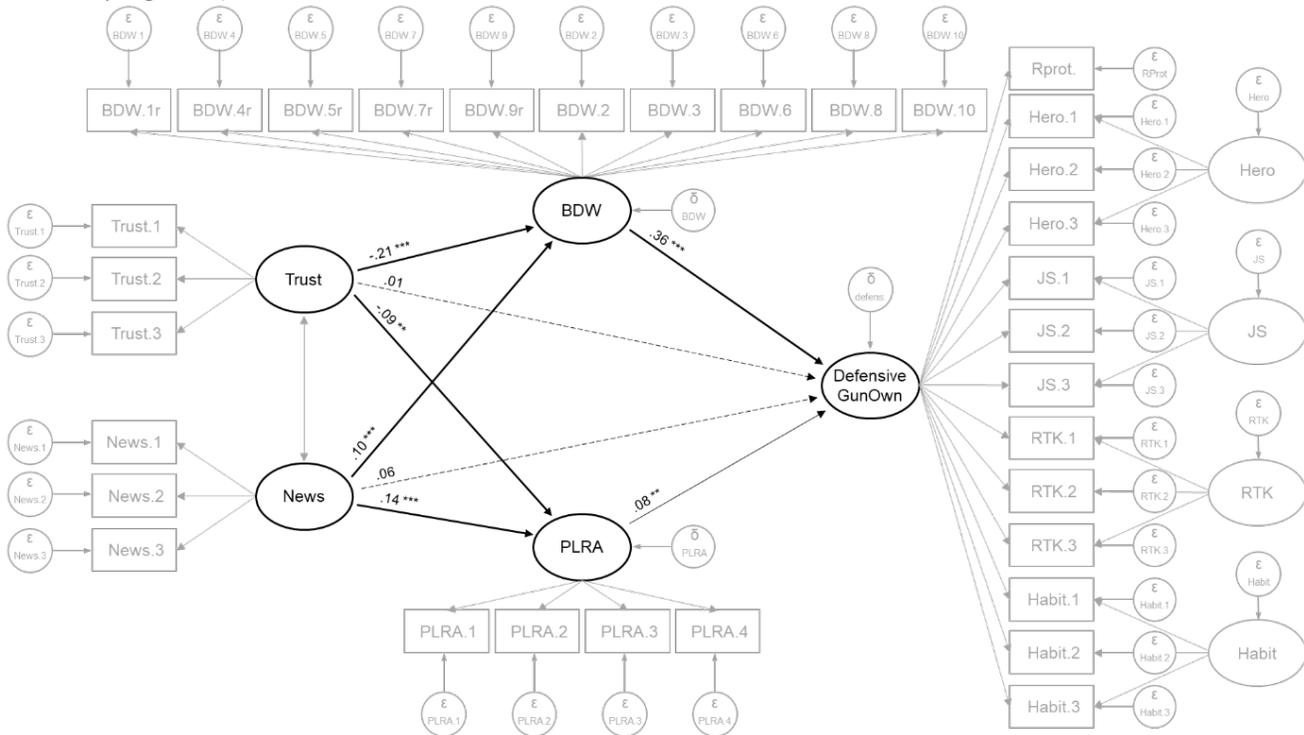
⁷ All effects of the antecedent variables on the perception reports were also significant with bootstrap sampling methods.

⁸ This path was only marginally significant using bootstrap sampling within the extended model. The marginal effects were presumably due to the small effect of PLRA on defensive gun ownership.

⁹ Six participants had missing data on past victimization experience. For the bootstrap analysis, we used 40 multiple imputation datasets to impute their most likely value.

Figure 2

Extended Model of Defensive Gun Ownership. The path diagram shows the structural equation model with standardized path coefficients. (Hero = Vigilantism; JS = Justification to kill; RTK = Right to kill; Habit = Gun carrying habit)



Robustness and Context Differences

We subsequently tested for potential group differences. We particularly assessed how the model performed between the two studies (May-June 2017 vs. October 2017), and between the main self-identified gender groups (women vs. men; Hypotheses 4.2 and 4.3).

Examining survey differences

The first survey occurred in May-June 2017, whereas the second survey occurred in October 2017 – shortly after one of the largest mass shootings in modern U.S. history (the Las Vegas Strip shooting, Oct. 1, 2017). We tested whether the model differed between the two studies via multigroup analysis. We specifically tested whether the two surveys (“groups”) differed in terms of item means and factor loadings (measurement model), and in terms of the relationships between the constructs (structural model; overall model fit: $\chi^2(946, N = 1,691) = 3,525.76, p < .001, RMSEA = 0.040, 90\%CI [.039, .042], SRMSR = 0.08, CFI = 0.90$).

In the measurement model, there were some differences in the item means between the studies, $\chi^2(33, N = 1691) = 136.16, p < .001, TLI = .001$. Against our expectations, item means on threat perceptions and news exposure were lower after the Las Vegas shooting, yet the differences were relatively small (all *Cohen’s d* < 0.27, see Table S9) and hence are difficult to interpret *post-hoc* given that statistical significance can be misleading for simple item differences in studies with large sample sizes. Moreover, the factor loadings were not significantly different between the surveys ($\chi^2(36, N = 1691) = 44.35, p = .16, TLI = -.004$). So, even though the post-Las Vegas survey showed slightly different ratings on individual items, the individual items still combined into the latent constructs in a similar way.

For the structural model (the latent regressions), there were statistically significant differences between the surveys, $\chi^2(8, N = 1,691) = 20.25, p = .009, TLI = 0.00$. Specifically, the post-Las Vegas survey yielded a slightly smaller relationship between news exposure and PLRA (*difference in β* = -0.101, *p* = .03), yet a stronger effect of PLRA on defensive gun ownership (*difference in β* = 0.13, *p* = .03; for full results see Table

S5). This resulted in the emergence of significant indirect effects of both news exposure and trust on defensive gun ownership via PLRA, that were not observed in the first survey (see Table S7). These differences might suggest that specific threats (PLRA) become important to defensive gun ownership after a relevant mass shooting. However, the differences were, again, relatively small and might be due to history effects. In sum, despite some minor differences, the general theoretical model was largely robust to sample differences.¹⁰

Examining gender differences

We assessed differences in the measurement- as well as the structural model (overall model fit: χ^2 (946, $N = 1,691$) = 3,453.93, $p < .001$, RMSEA = 0.040, 90%CI [.038, .041], SRMSR = 0.07, CFI = 0.90). We did find some differences in the measurement model, where men and women differed on the importance of individual items to the latent factors (χ^2 (36, $N = 1691$) = 51.79, $p = .04$, $TLI = -.004$) and on mean levels of the individual items (χ^2 (33, $N = 1691$) = 321.41, $p < .001$, $TLI = .009$). For example, women reported slightly higher BDW and PLRA (all subgroup means are reported in the Table S9). However, there was no significant difference in the *relationships* of the variables (structural model; χ^2 (8, $N = 1691$) = 12.01, $p = .15$). In sum, despite some differences in mean levels of the individual items and their loadings on the latent factors, the theoretical model is robust to gender differences.

Discussion

The results replicate the model of Stroebe et al. (2017) by indicating that both specific and diffuse threat perceptions (PLRA and BDW) corresponded with our latent variable construct reflecting defensive

gun ownership (Hypothesis 1). The results also extend the model by indicating that two antecedent social factors – trust in law enforcement and news exposure – indirectly relate to defensive gun ownership via BDW and PLRA (Hypotheses 2 and 3). Our model was largely robust to past victimization and gender (Hypotheses 4.1 and 4.2) but was not robust to social context—the specific threat perception (PLRA) varied by whether a high-profile mass shooting had recently occurred (Hypothesis 4.3).

With regards to replication, expansion, and simplification, of Stroebe et al. (2017), BDW and PLRA were moderately correlated and both measures predicted the latent construct of defensive gun ownership. The finding that the association of BDW and defensive gun ownership was considerably stronger than that of PLRA is also consistent with Stroebe et al. (2017). With regards to the antecedent factors, the indirect effects of news exposure and trust in law enforcement, on defensive gun ownership, were largely consistent with predictions. First, and importantly, news exposure and trust in law enforcement were only indirectly related to defensive gun ownership. Although the model predicted such indirect effects, this is not an obvious pattern because one might have expected direct effects from some of the previous literature. Nevertheless, the model predictions of the antecedent predictors on defensive gun ownership were mainly indirect through BDW and PLRA, which are consistent with Stroebe et al.'s (2017) model.

Our findings also support predictions regarding the negative association of trust in law enforcement with our expanded measure of defensive gun ownership (Hypotheses 1 and 2). Low trust is not only (indirectly) associated with individuals' explicit attributions of defensive gun ownership, but also with more expansive beliefs about gun freedoms and gun-carry habits. The

¹⁰ In the first survey, we additionally assessed participants' ethnicity (because the study included a race-based shooter simulation in later parts of the study). In a tentative exploratory analysis, black participants ($n = 61$) had less trust in law enforcement than white participants ($n = 704$, *difference* = -0.44, 95% CI [-0.03, -0.85], *p*_{adjusted} = .031). In a follow-up SEM, we observed that ethnicity (white [$n = 704$] vs. non-white [$n = 158$]) independently predicted threat perceptions as well as defensive gun ownership. Yet, the ethnicity effects were independent of the current model test pertaining to social information and threat perceptions in defensive gun ownership (i.e., core coefficients were virtually unchanged before and after controlling for ethnicity, see SI-A Table S5 and SI-D Table 10). Full details of the ethnicity analyses are provided in Supplementary Materials D.

less individuals trusted that law enforcement can protect them, the more threat they perceived, and hence, the more justified they felt to kill others to defend their property and to shoot intruders, in scenarios analogous to recent Castle Doctrine and Stand-Your-Ground laws. They were also more likely to report keeping their gun nearby and being willing to use it in public threat scenarios (e.g., in an active shooter situation). Thus, people who have little trust in the ability of the police to protect them also showed a willingness to act as vigilantes – to assume the protective responsibilities usually associated with the police.

With regards to news exposure, there was a positive, indirect association with defensive gun ownership through BDW and PLRA (Hypothesis 3). Gun owners, who report more exposure to news, report a stronger belief in a dangerous world and higher perceived lifetime risk of assault, which in turn corresponds with higher defensive gun ownership. Notably, the indirect effect appeared to be stronger via BDW than PLRA, which potentially replicates a finding reported by Gerbner et al. (1980), wherein frequent news watchers are more likely to develop a general mistrust of people and a view that the world is a mean place.

Limitations

Before we discuss the research and practical implications, we must note the limitations of our measurement and sampling approaches. Although the data were collected from two independent samples of U.S. handgun owners, all the data are cross-sectional, and using SEM does not turn correlational data into causal data. However, the data fit the theoretical assumptions of the Model of Defensive Gun Ownership, a model that makes causal assumptions. Another limitation is our use of a multidimensional concept of defensive gun ownership: although this approach affords a general test of how social information relates to a threat-driven model of defensive gun ownership, it does not afford tests of unique effects on individual cognitive and behavioral components. Future research could consider differing effects on defensive self-attributions, gun beliefs, or gun carry habits.

With regard to the sample, it is not well suited to investigate experiential differences due to ethnicity or race. We had initially decided not to assess the role of ethnicity because it is prohibitively expensive to recruit balanced samples of ethnic minority gun owners, and difference tests based on small cell counts can be underpowered and misleading. However, given the social relevance of ethnic identity and race when it comes to

perceptions of policing and threat, we decided to conduct a tentative *post-hoc* analysis of ethnicity in one of our surveys. Even our unbalanced and underpowered results indicate that a gun owner's ethnicity might play an important role when it comes to social information, threat perceptions, and potentially defensive gun ownership. However, such a conclusion is tentative at best, and more robust tests, using balanced participant recruitment, are necessary to make definitive statements about the role of ethnicity in the social motivations of defensive gun ownership.

Research Implications

The results mainly point to an indirect link between social information and defensive gun ownership, via individuals' threat perceptions. The lack of a direct link between trust in law enforcement and defensive gun ownership fits with Stroebe et al.'s (2017) psychological model of defensive gun ownership, which assumes that the antecedent factors should increase defensive gun ownership to the extent that they increase threat perceptions. It is also consistent with the studies reported earlier that did not find a direct relationship between these two variables (Cao et al., 1997; Luxenburg et al., 1994; Ziegenhagen & Brosnan, 1990). However, the lack of a direct link between trust and defensive gun ownership is inconsistent with studies that did observe a direct link (Jiobu & Curry, 2001; Kelsay et al., 2018; McDowall & Loftin, 1983; Smith & Uchida, 1988; Young et al., 1987). The reason for this inconsistency could be that our study differs in its operationalization of both trust in law enforcement and defensive gun ownership. Whereas those prior studies used items from surveys designed for other purposes, our study was specifically planned as a test of the model of defensive gun ownership. As such, our measure of trust in law enforcement explicitly and specifically assessed people's trust that the police would protect them against crime and were thus more focused than prior trust measures. We also asked whether a gun was owned for protection and self-defense, in context to various other potential reasons for gun ownership. Future research might consider whether our increased specificity failed to capture variance that was picked up by the more general measures used in prior research.

Moreover, in the full model that included the new antecedents, the test of differences between studies suggested variation in the indirect effects involving PLRA—the specific fear of violent crime victimization. PLRA was a more reliable predictor of defensive gun ownership in the post-Las Vegas study. Although the difference between studies was small—and could

simply be due to history effects, one can speculate on whether the Las Vegas mass shooting qualitatively altered the social information (news exposure) and social beliefs (trust in law enforcement) in ways that made PLRA more relevant to defensive gun ownership. Despite the variation in PLRA, the more diffuse fear (BDW) was stable across contexts. This speaks to the insidiousness of diffuse fears: they predict defensive gun ownership independently of context and of any specific fears that may exist in those contexts.

Else, the model was largely robust to gender and other possible confounds. Men and women differed in some of their mean item ratings, in a manner consistent with past work suggesting that women have a higher fear of crime than men (Collins, 2016). Despite these mean differences, gender did not moderate our tests of the theoretical model. Whereas Stroebe et al. (2017) only examined male gun owners, the present results suggest that a threat-driven model of defensive gun ownership may apply to men and women.

Policy Implications

Speculating on the potential policy implications of this research, it is useful to consider that the effect size of trust in law enforcement on defensive gun ownership was three times larger than that of new exposure. This suggests that a social-psychological intervention, to reduce subjectively perceived threats, might focus on increasing gun owners' trust in law enforcement (e.g., local police or FBI). Unfortunately, however, the indirect effect of trust is via BDW; a general ideological belief that is difficult to change. Belief in a Dangerous World is embedded in a belief system that links BDW to conservative political beliefs, right-wing authoritarianism, and negative attitudes towards minorities. Social-psychological theories have long argued that beliefs that are embedded in extensive belief systems are difficult to change (e.g., McGuire, 1981). Nevertheless, it would be interesting to examine whether strategies of community policing might increase trust in the police and – at the same time – decrease the belief in a dangerous world.

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