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Gun Culture: Mapping a Peculiar Preference for Firearms in the Commission of Suicide

Ryan P. Brown,¹ Mikiko Imura,¹ Lindsey L. Osterman²

¹The University of Oklahoma, ²Roanoke College

Author Note

Correspondence should be directed to Ryan P. Brown, Department of Psychology, The University of Oklahoma, 445 W. Lindsey St., DHT 705, Norman, OK 73019. Email: rpbrown@ou.edu

Abstract

Research has shown how honor cultures promote aggression against others (e.g., homicide) and the self (e.g., suicide). Two studies examine the connection between honor and a predilection for guns in the commission of suicide. Study 1 shows that Whites living in honor states are especially likely to use guns to commit suicide, controlling for gun accessibility. Study 2 reveals that a “gun access gap” in honor states—a positive difference between the proportion of all suicides that involve a gun and the gun ownership rate—predicts outcomes linked previously to honor cultures: homicides and accidental deaths.

To understand a variety of social trends, including violent crime rates and the effects of changes in government policies regarding violent video games, community policing, or stand-your-ground laws, being able to measure the accessibility of firearms is extremely important. To take just one example, Oklahoma recently made it legal for citizens with concealed handgun licenses to carry firearms openly in most public places (Oklahoma is now the 44th state in the US with some variation of an open-carry law). To determine the impact of this law, social scientists might attempt to assess whether homicides increase subsequently in Oklahoma, relative to neighboring states without such freedoms, such as Texas and Arkansas. Among the many control variables that would be central to such an analysis is the relative availability of guns, which might be higher in Oklahoma to begin with, or might even increase following passage of the open-carry law. However, estimates of gun ownership rates, especially within

geographical units smaller than census regions, are typically imprecise and uncertain, in part because no national registry of gun owners exists, and because obtaining representative local samples for survey research is so costly.

In an attempt to assess up-to-date levels of firearm accessibility for all 50 states (or even smaller regions within states, such as counties), social scientists have used a variety of proxies, such as the number of guns used in local homicides (Cook, 1979), or subscriptions to magazines targeting gun owners (Duggan, 2001). Such proxies, however, vary in their reliability and can also lead to circular arguments about the causal role of firearms in facilitating violent crimes, which can occur if researchers use crime-based gun data to estimate gun accessibility, and then argue from these data that greater accessibility of guns leads to more violent crime. Among these proxy measures, the number of all suicides that involve a firearm divided by the total number of suicides—the

firearm suicide ratio—has been used successfully in recent studies to assess the *relative* accessibility of guns across geographic regions (e.g., Miller, Azrael, & Hemenway, 2002). This proxy for relative gun accessibility is based on the assumption that when guns are more readily available, they are more likely to be used by people wanting to end their own lives. When examined alongside other measures of gun ownership, the firearm suicide ratio has demonstrated strong convergent and predictive validity (Azrael, Cook, & Miller, 2004). An important benefit of this proxy is that it does not rely on self-report, so it can be used to estimate changes in the relative availability of guns in each state without the need for researchers to conduct an expensive national survey.

Although the firearm suicide ratio might be a useful proxy for the relative accessibility of firearms, this index might be contaminated by cultural influences—in particular, the influence of the culture of honor, which is prevalent in the US South and West (Nisbett & Cohen, 1996). It has been shown that suicide rates are higher in so-called honor states than in non-honor states (Osterman & Brown, 2011). If suicide rates committed with firearms are *proportionately* higher in honor states, the firearm suicide ratio should still be a reliable indication of relative firearm prevalence across regions. However, in this paper, we argue that people who reside in honor regions might be *disproportionately* prone to use firearms when committing suicide compared to people living in non-honor regions. Consequently, estimates of gun accessibility for the states dominated by honor norms might be inflated when those estimates utilize the firearm suicide ratio. Furthermore, if the firearm suicide ratio is inflated because of the influence of honor-culture dynamics, then the *discrepancy* between the firearm suicide ratio and the actual gun ownership rate might serve as a valid statistical signal for regional differences in honor culture and be associated with other outcomes linked in previous research to honor culture norms.

What Is a Culture of Honor?

Honor cultures are societies in which defense of reputation is a central organizing theme (Leung & Cohen, 2011; Nisbett & Cohen, 1996; Peristiany, 1966). People (especially men) in honor cultures strive to create and maintain reputations for strength and toughness, and they are allowed, or even expected, to do so aggressively when their honor has been threatened (Nisbett & Cohen, 1996).

Failure to retaliate for a reputational threat can have particularly negative effects on men's sense of masculinity in an honor culture. As a consequence, when honor-culture men are faced with a reputational threat, such as a public insult, they tend to experience a spike in their cortisol and testosterone levels, and they exhibit behaviors that reveal their readiness to aggress, apparently to restore their threatened sense of masculinity (Cohen, Nisbett, Bowdle, & Schwarz, 1996).

This emphasis on reputation defense leads to greater vigilance to status threats by honor-culture men, with serious social consequences. Research on southern and western honor subcultures in the US has documented a number of such consequences, including elevated argument-based homicide rates (Nisbett, 1993), school violence (Brown, Osterman, & Barnes, 2009), and accidental deaths related to excessive risk-taking (Barnes, Brown, & Tamborski, 2012). Women in honor cultures might also strive to be seen as tough and brave, but for them, maintaining a reputation for loyalty and purity is even more important (Vandello & Cohen, 2003; Vandello, Cohen, Grandon, & Franiuk, 2009).

Cultures of Honor and Suicide

Cultures of honor are known for their high levels of interpersonal violence (e.g., argument-related homicides). In addition, recent research has also shown that people in honor regions of the US might also experience a heightened risk of *intrapersonal* violence, specifically suicide (Osterman & Brown, 2011). According to Joiner (2005), suicidality is primarily produced by three factors: a thwarted need to belong and a sense of burdensomeness (which together foster a desire to commit suicide), and an acquired ability to harm the self (which is necessary to carry out a suicidal act; Kaplan, Huguet, McFarland, & Newsom, 2007; Van Orden, Witte, Cukrowicz, Braithwaite, Selby, & Joiner, 2010). Osterman and Brown (2011) found that suicide rates among men and (to a lesser extent) women living in honor states in the US South and West were higher than rates among men and women living in non-honor states. The authors argued that this elevation might be due to the enhanced likelihood of experiencing isolation, burdensomeness, and inoculation to self-harm. For instance, because gender-role prescriptions are especially pronounced in honor cultures, a major failure or humiliation experience could threaten people's sense of masculinity or femininity and

increase their sense of being an embarrassment or burden to their loved ones. Baumeister's escape theory (1990) complements this view. This theory posits that suicide attempts are motivated by the wish to escape the self, rather than by a desire for death itself. Thus, individuals may be more likely to attempt suicide when they fail to meet important self-standards. Some empirical research likewise shows that being reminded of a personal failure increases implicit suicidal thoughts (Tang, Wu, & Miao, 2013), and being reminded of extremely high standards also makes suicide-related thoughts more cognitively accessible (Chatard & Selimbegović, 2011). Thus, living in the shadow of powerful and rigid gender-role expectations in an honor culture, and failing to meet those expectations, might facilitate suicidal thoughts and tendencies.

Furthermore, the *ability* to enact lethal self-injury—a necessary precursor to suicide—might be acquired through experiencing the sorts of painful, risky behaviors that seem to be common to rights-of-passage and social proof of bravery in honor cultures (Barnes et al., 2012). People in cultures of honor might also have greater exposure to firearms (Cohen, 1996), and this familiarity could similarly reduce the fear that might otherwise be associated with handling a weapon.

Of course, elevated suicide rates alone would not influence the firearm suicide *ratio*. However, if people in honor regions are especially inclined to use a gun to commit suicide, that inclination *would* have an impact on this ratio and would contaminate any estimate of gun accessibility that uses it. One reason to expect an association between honor culture and preference for guns among suicidal people is that the use of a gun increases the likelihood of successfully completing the suicidal act (Garland & Zigler, 1993). Indeed, the greater use of guns in suicides by men has been posited as a reason for the paradox that although women tend to be higher in depression and suicidal ideation, men die by suicide at much higher rates than women do (e.g., Denning, Convell, King, & Cox, 2000). If people in honor cultures experience a greater sense of shame and burdensomeness following failures or other instigating events, these feelings might enhance their desire to be certain that their suicidal act is successful (indeed, a failed attempt at suicide might further enhance their sense of shame). Consistent with this reasoning, Joiner, Pettit, Walker, Voelz, Cruz, Rudd, and Lester (2002) found that people who expressed a greater sense of burdensomeness in their suicide notes also

chose particularly lethal means to commit suicide. Another reason to suspect that people in honor cultures might be especially drawn toward the use of guns in their suicide attempts is that committing suicide in such a violent way might be seen as proof of their courage and strength. Thus, even after deviating from the cultural ideal and shaming themselves (and perhaps their reference group), committing suicide with a gun might be perceived as a way to restore at least part of their lost honor.¹

In Study 1 of the present investigation, we examine whether people who reside in honor states in the US, compared to people in non-honor states, are especially likely to use firearms when committing suicide. If there is a cultural contribution to the preference for firearms as we have proposed, then we should observe a higher rate of firearm-based suicides in honor states, even after controlling for self-reported gun ownership rates. This preference should be especially strong among Whites, and smaller or non-existent among non-Whites, in keeping with previous studies on regional differences in honor-culture dynamics in the US (e.g., Nisbett & Cohen, 1996).² Such a finding would be strong evidence that the firearm suicide ratio is indeed overestimating the prevalence of firearms in the honor-oriented regions of the US. Expanding upon this predicted regional pattern, in Study 2 we investigate whether the *gap* between estimates of relative gun accessibility using the firearm suicide ratio and estimates based upon self-reported gun ownership is uniquely associated with behaviors linked previously with the honor-culture syndrome.

Study 1

In Study 1, we examine regional differences in the rate of suicides committed with firearms. US regional differences in honor culture, according to Nisbett and Cohen (1996), originate in the beliefs and values of Scotch-Irish immigrants who settled in the South and, later, the Southwest, bringing with them the ideology they had incubated in southern Scotland over hundreds of years (Brown & Osterman, 2012). Prior research on honor dynamics in the US has indicated that geographic region predicts honor-related behaviors most strongly among Whites; these regional differences tend to be weak or absent for other demographic groups (e.g., Barnes et al., 2012; Nisbett & Cohen, 1996; Osterman & Brown, 2011). We hypothesized that the culture of honor would uniquely predict the firearm-based suicide rate among Whites (but not

among non-Whites), even after controlling for self-reported gun ownership rates and other relevant covariates.

Method and Data

Culture of honor. For state culture-of-honor (CH) status, we coded states using Cohen's (1998) classification system, which categorizes Western and Southern states (census divisions 5-9) as CH states, with the exception of Hawaii and Alaska, which, along with all other states, are coded as non-CH states.

Covariates: Temperature, access to medical care, economic deprivation, and firearm ownership rate. Because suicide is a form of aggression, and aggression has been linked in numerous studies to temperature (e.g., Bushman, Wang, & Anderson, 2005), we thought it prudent to control for statewide differences in mean annual temperature. We obtained mean state temperature data from the National Oceanic and Atmospheric Administration (2000). An outlier (Alaska) was discovered that was creating strong negative skew for this variable, so we winsorized this point (bringing it up from 25 degrees Fahrenheit to the next lowest temperature, 40.4 degrees). Death rates (from any cause) can be influenced by the availability of emergency medical services. Thus, as in Osterman and Brown (2011), we included an estimate of the percentage of the population in each state living in a health professional shortage area for the year 2000 (HPSA). To create an index of economic deprivation, we obtained poverty rates (US Census Bureau, 2001a), unemployment rates (US Bureau of Labor Statistics, 2005), median state income (US Census Bureau, 2008), and the percentage of the state population that had obtained at least a high school diploma for the year 2000 (US Census Bureau, 2001b). We reverse-coded income and education, and standardized and averaged all four variables for each state into a single economic deprivation composite. Finally, we obtained the self-reported gun ownership rate (per 100,000) for each state from the Behavioral Risk Factor Surveillance System survey (BRFSS; CDC, 2008a, 2008b), which included a question regarding firearm ownership in the 2001 and 2002 versions of the survey ($r = .99$ for statewide estimates across the two years).³ We obtained separate firearm ownership rates for Whites and non-Whites for each state.

Firearm suicide rates. We obtained age-adjusted suicide rates (per 100,000) involving a

firearm for each state from data compiled by the Centers for Disease Control and Prevention (CDC, 2013).⁴ We obtained separate rates for non-Hispanic Whites and non-Whites from 1999 to 2010 (the most recent year for which data were available) and averaged rates across these years. Firearm suicide rates for New Hampshire and Vermont were missing for non-Whites (the CDC does not report statistics for states with fewer than 10 cases during a specified time period). So as not to lose NH and VT completely, we substituted their missing data with the mean from the neighboring states of Maine and Massachusetts, both in this study and Study 2 (in which NH and VT were likewise missing data for non-White total homicides; these states' homicide rates were similarly computed using data from their geographical neighbors). The distribution of non-White firearm suicide rates was strongly and positively skewed because of the particularly high firearm suicide rate in Alaska. We winsorized this point to reduce skew by reducing it from 15.25 to the next highest firearm suicide rate, 10.08.

Results

To test our claim that culture of honor would uniquely predict firearm suicide rates among Whites but not among non-Whites, we analyzed firearm suicide rates according to whether they occurred among White or Non-White residents in a two-way, repeated measures analysis of covariance, with state CH status as the between-groups factor. After controlling for temperature, access to medical care, economic deprivation, and self-reported gun ownership rates across all residents (regardless of their race), the interaction between the White/Non-White firearm suicide rates (within-factor) and state CH status (between-factor) was significant, $F(1, 44) = 26.69, p < .001$. As Figure 1 shows, White firearm suicide rates were higher in honor states than in non-honor states, but this difference did not occur among non-Whites.⁵ Significant covariates in the model included temperature, $F(1, 44) = 4.25, p = .05$, and the overall gun ownership rate $F(1, 44) = 4.76, p = .04$. Thus, Whites and non-Whites do show different patterns of firearm suicide rates, consistent with previous honor research in the US. Below, we examine White and non-White residents separately, to allow for greater precision in the use of race-specific gun ownership rates as a control variable.

White residents. Following the significant interaction between race and CH status, we next

examined the extent to which state CH status predicts higher firearm suicide rates just among Whites. In this analysis, along with other statewide covariates, we also included the self-reported gun ownership rate among non-Hispanic Whites as a control variable. As hypothesized, a regression analysis revealed that CH status accounted for unique variance in White firearm suicide rates, $\beta = .45$, $t(44) = 5.17$, $p < .001$, along with self-reported White gun ownership rates, $\beta = .68$, $t(44) = 6.28$, $p < .001$. None of the other statewide covariates significantly contributed to the model (see Table 1). The covariate-adjusted mean firearm suicide rate (per 100,000 Whites) was significantly higher in honor states ($M = 9.15$, $SE = 0.31$) compared to non-honor states ($M = 6.46$, $SE = 0.34$). This mean difference indicates that approximately 3,673 more Whites committed suicide with firearms per year in honor states than in non-honor states, above and beyond what would be expected from gun accessibility (and other statewide differences) alone.

Non-White residents. For non-Whites, CH status was not a significant predictor ($\beta < .01$, $p > .99$) in the regression model; indeed, the covariate-adjusted mean firearm suicide rate was equal, within rounding error, across honor states ($M = 3.39$, $SE = 0.26$) and non-honor states ($M = 3.39$, $SE = 0.28$). The non-White gun ownership rate, $\beta = .73$, $t(44) = 6.34$, $p < .001$, and temperature, $\beta = -.26$, $t(44) = -2.13$, $p = .04$, emerged as significant predictors in this analysis of non-White firearm suicides.⁶ Thus, consistent with past findings, CH status only predicts the firearm-based suicide rate among Whites, supporting the interpretation that an enhanced preference for the use of firearms in the commission of suicide is influenced in part by regional differences in honor-culture beliefs and values, and not just by other local characteristics (e.g., climate) that are more or less shared by all demographic groups within a region.

Discussion

These results are consistent with the hypothesis that White residents of honor states might show a special preference for the use of firearms when committing suicide. Indeed, the strong association between state CH status and the firearm suicide rate that we observed among Whites was totally absent among non-Whites. It could be argued that this apparent preference is simply the result of increased access to weapons in honor states, but this seems unlikely for two reasons. First,

in the current analyses, we controlled for group-specific gun ownership rates. These rates were calculated based on a representative household phone survey that directly asked respondents whether or not they had any kind of firearm in their home. Of course, there are social desirability problems with self-reports, and it has been noted that women sometimes are unaware of the existence of a firearm in their household (Ludwig, Cook, & Smith, 1998). However, this self-reported gun ownership rate is the most direct measure of gun accessibility at the state level. In fact, self-reported gun ownership rates were associated very strongly with firearm suicide rates in our analyses ($\beta = .68$ and $.73$ for Whites and non-Whites, respectively). Even with this powerful predictor in the model, however, the CH status of each state was significantly associated with firearm suicide rates among Whites.

Second, the regional preference for firearms emerged among Whites but not among non-Whites. This finding is consistent with a culture-of-honor explanation of the results, in that US regional differences in honor ideology are most pronounced and consistent among Whites, according to many previous studies. In contrast, it is not apparent why any such *demographic* difference should be observed in the present analysis if the preference for firearms in committing suicide were simply due to an increased prevalence of guns, rather than a culturally-driven preference for the use of firearms in suicide.

The results of Study 1 raise questions about the validity of the firearm suicide *ratio* (the *percentage* of all suicides in which a gun is used) as a proxy for estimating gun accessibility, in that our results suggest that a cultural influence might inflate the preference for using firearms to commit suicide in certain parts of the country. This inflation would lead to an overestimation of the relative number of firearms in a state via the firearm suicide ratio. If the firearm suicide ratio is influenced by honor-culture norms, then the *discrepancy* between the firearm suicide ratio and the actual gun ownership rate—which we refer to as the “gun access gap”—might serve as a statistical signal for the influence of honor ideology within a state. If so, then this gun access gap ought to be associated with behaviors linked in previous research to honor-related dynamics. We should note that we are not claiming that this gap is *only* due to honor-related influences. Rather, we are simply suggesting that (1) the gun access gap is *partly* a manifestation of

honor-based beliefs and values, and (2) that this gap might therefore serve as an effective predictor of behaviors that are themselves influenced by honor-based concerns.

Study 2

As noted earlier, Azrael and colleagues (2004) demonstrated the strong convergence of the firearm suicide ratio with self-reported gun ownership rates (they reported correlations between these two variables ranging from .81 to .93). Consequently, the gun access gap might seem like nothing more than statistical noise or random error; however, if part of the gun access gap is systematically influenced by honor motives, then this gap should predict behaviors shown in prior research to be associated with honor-related dynamics.

In Study 1, as hypothesized, we found an inflation of the firearm suicide *rate* in honor states, but only among Whites. This is consistent with theory and past evidence suggesting that the honor syndrome is regionally distributed in the US primarily among Whites, although honor-related values and behaviors can also be found among other demographic groups (just not regionally distributed in the way they are among Whites in the US). Thus, in Study 2, we focus on the gun access gap among Whites to examine whether it predicts homicide rates and accidental death rates within this demographic group. We chose these two variables, which on the surface seem to have little in common, because they are important behavioral variables shown in previous studies to be associated with honor concerns (Barnes et al., 2012; Nisbett, 1993)—the former through the schemas and scripts that the honor code promotes for handling interpersonal conflict, and the latter through schemas and scripts related to displays of bravery and fearlessness. To the extent that honor norms underlie an enhanced predilection for guns in the commission of suicide, as Study 1 suggests, then this same predilection should be predictive of both homicides and accidental deaths. This might be especially true for *argument-related* homicides, which Nisbett and Cohen (1996) have argued is the primary type of homicide that is elevated by honor-based concerns. Showing that the gun access gap strongly predicts White homicide rates would support our claim, but extending this finding to an outcome unrelated to interpersonal aggression would lend even greater support to our honor-culture interpretation. Accidental death rates should

be driven more by personal recklessness than by interpersonal aggression (Barnes et al., 2012), and there is little reason to connect such recklessness to the gun access gap *outside of the cultural link to honor concerns*. Thus, if the gun access gap is influenced by honor-culture dynamics, it should be able to predict the seemingly unrelated variable of accidental deaths.

Method

Computing the gun access gap. Our first task was to compute the gun access gap, which we defined as the discrepancy between the *standardized firearm suicide ratio* and the *standardized self-reported gun ownership rate*. As in Azrael et al. (2004), we defined the firearm suicide ratio as the proportion of all suicides in each state that involved a firearm. We obtained age-adjusted total suicide rates (across all methods) and age-adjusted suicide rates involving a firearm among non-Hispanic Whites from 1999 to 2010 from data compiled by the CDC (2013). Dividing the latter by the former for each state gave us the firearm suicide ratio. We used the same self-reported gun ownership rates among Whites as in Study 1 (BRFSS; CDC, 2008a, 2008b) and calculated the gun access gap by subtracting the standardized self-reported gun ownership rate from the standardized firearm suicide ratio for each state. Thus, a positive discrepancy indicates that the firearm suicide ratio is higher than expected from the survey-based estimate of gun ownership rates, which we argue reflects an inflation in the firearm suicide ratio that is driven in part by honor-related cultural norms.

Outcome variables. We obtained total homicide death rates for Whites and non-Whites from 1999 to 2010 using data compiled by the CDC (2013). The number of argument-related homicide cases was obtained from the FBI's Uniform Crime Reports (Fox, 2005). Following Cohen (1998), we focused on homicides committed by young White males between 15 and 34 years old.⁷ We aggregated these homicides across the years 1979 to 2002 to increase the reliability of our estimates. Although Cohen (1998) included only known non-Hispanic Whites in his analyses, the FBI no longer tracks Hispanic or Latino ethnicity in their homicide rates. Thus, we were not able to make the Hispanic/non-Hispanic distinction in our analyses. Consequently, when analyzing argument-related homicide rates, we used the gun access gap for Whites that included Hispanic Whites.⁸ To calculate argument-related

homicide rates per 100,000, we obtained the population values for 1979-2002 from the CDC (2013) and calculated argument-related homicide rates per 100,000 White males aged 15 to 34. Further, we log transformed the rates to eliminate the positive skew of this variable, which often occurs with homicide statistics.⁹ Following Barnes et al. (2012), we also obtained accidental death rates associated with *unintended, external causes*, excluding deaths caused by exposure to forces of nature and by firearm-related accidents (e.g., handgun discharge), from 1999 to 2010 (CDC, 2013).

Covariates. We also included a host of statewide covariates that seemed relevant based on past research. For all analyses, we used many of the same covariates described in Study 1, including the composite index of economic deprivation, the proportion of the state population in 2000 living in an HPSA, and the mean annual temperature of each state. Nisbett (1993) found rurality to be an important factor when determining the influence of honor culture on homicide, such that regional differences in homicide rates are larger among people living in rural areas than in urban areas. Thus, we also included an index of rurality (the percentage of the total state population living in a rural area in 2000, according to the US Census Bureau).

In our analyses of total homicides and accidental deaths, we also included non-White total homicides and non-White accidental deaths,¹⁰ respectively, as covariates. Non-White homicides and accidental deaths should be influenced by many of the same local variables as White homicides and accidental deaths, with the exception of regional differences in honor ideology, for reasons we have already noted. Thus, if the gun access gap among Whites predicts White homicides and accidental deaths above and beyond those of non-Whites, this finding would give us even greater confidence that a cultural influence associated with regional differences in honor ideology is at work in the gun access gap. We attempted to do the same for argument-related homicide rates; however, the counts were too low in many states to reliably estimate the argument-related homicide rates for young, male, non-Whites. Thus, we were forced to analyze White argument-related homicide rates without being able to include non-White rates as a covariate. See Table 2 for correlations and descriptive statistics for the variables used in Study 2.

Results

Gun Access Gap: The gun access gap for Whites was fairly normally distributed (skewness = -0.31 , $p > .05$) with a range of -0.88 to 0.74 . The correlation between the firearm suicide ratio and the self-reported gun ownership rate was $r = .93$ among Whites, consistent with the high correlation between these two variables found by Azrael et al. (2004). We also calculated the gun access gap for non-Whites in the same manner as for Whites. This gap was somewhat more negatively skewed (skewness = -0.65 , $p = .02$); however, the skew was not driven by any single data point, and it was not severe. The gun access gap among non-Whites ranged from -2.41 to 1.53 , a much wider range than we observed among Whites. The correlation between the non-White firearm suicide ratio and the non-White gun ownership rate was $.50$, which was much smaller than the correlation among Whites.

In Study 1, we showed that CH was not predictive of non-Whites' firearm suicide rates. To complement this result, we regressed the non-White gun access gap on statewide CH status. There was virtually no association between these two variables, $\beta = -.001$, $t(48) = -0.01$, $p = .99$. However, when we regressed the non-White gap on the White gap and statewide CH status, the White gun access gap was a significant predictor of the non-White gap, $\beta = .63$, $t(47) = 4.68$, $p < .001$, and CH status was now significantly and *negatively* associated with the non-White gun access gap, $\beta = -.28$, $t(47) = -2.11$, $p = .04$. In contrast, CH status was positively and significantly associated with the White gun access gap, $\beta = .45$, $t(47) = 4.18$, $p < .001$.

Total homicide rates. A simple analysis of the zero-order association between total homicide rates and the gun access gap among Whites revealed that the gun access gap was, as expected, positively associated with the total homicide rate, $\beta = .47$, $t(48) = 3.65$, $p = .001$. After controlling for economic deprivation, HPSA, annual mean temperature, rurality, and non-White homicide rates in each state, the White gun access gap remained positively associated with total homicide rates among Whites, $\beta = .32$, $t(43) = 3.45$, $p = .001$, and significant covariates included economic deprivation, $\beta = .41$, $t(43) = 3.26$, $p = .002$ and mean state temperature, $\beta = .22$, $t(43) = 2.06$, $p = .05$ (see Table 3).

Argument-related homicides. Consistent with past research on honor cultures, Whites' gun access gap was significantly and positively

associated with argument-related homicide rates, $\beta = .58$, $t(48) = 4.90$, $p < .001$. This association was somewhat larger than it was for total homicide rates and remained significant after controlling for the same covariates used in the total homicide analysis (except for non-White homicide rates), $\beta = .39$, $t(44) = 3.15$, $p = .003$. Significant covariates included economic deprivation, $\beta = .62$, $t(44) = 3.74$, $p = .001$, and rurality, $\beta = -.27$, $t(44) = -2.37$, $p = .02$ (Table 3).

Accidental deaths. Whites' gun access gap was not significantly associated with accidental death rates, $\beta = .23$, $t(48) = 1.61$, $p = .12$, despite being in the predicted direction. However, after controlling for economic deprivation, HPSA, annual mean temperature, rurality, and the non-White accidental death rate, the association became stronger, $\beta = .27$, $t(43) = 2.89$, $p = .01$. Mean state temperature, $\beta = .24$, $t(43) = 2.20$, $p = .03$, rurality, $\beta = .28$, $t(43) = 3.00$, $p = .004$, and the non-White accidental death rate were also significant covariates, $\beta = .35$, $t(43) = 3.51$, $p = .001$ (see Table 3).

Additional analyses. Earlier, we suggested that the gun access gap might only be driven *in part* by honor-culture motives, which would mean that a potentially meaningful portion of this gap might reflect a systematic, non-random set of influences that enhance attraction to guns, but for reasons that have little to do with honor-related values. If this is the case, then even the non-White gun access gap might be a meaningful index of a general predilection for guns, independent of the influence of honor-related norms, making it a potential predictor of homicides even among non-Whites. We tested this possibility in a final set of analyses on the non-White gun access gap. Although, as we noted previously, the gun access gap among non-Whites proved problematic in several states with very small non-White populations, the non-White gap was still significantly associated with non-White homicide rates, $\beta = .51$, $t(48) = 4.10$, $p < .001$. This association remained significant when we controlled for the statewide covariates used in our analyses among Whites (including the White total homicide rate), $\beta = .60$, $t(43) = 4.34$, $p < .001$ (none of the covariates was a significant factor in this model). The notion that part of the gun access gap reflects a general predilection for guns that is independent of honor-related motives does not suggest that there should be a similar association between the gun access gap and accidental death rates. Thus, we did not expect a positive association

to occur between the gun access gap and accidental death rates among non-Whites, as this link should only occur for honor-related reasons among Whites (at least at a regional level of analysis). To our surprise, however, we actually found a significant *negative* association between the gun access gap and accidental death rates among non-Whites, $\beta = -.52$, $t(48) = -4.24$, $p < .001$. When we included the statewide covariates, including the White accidental death rate, this negative association remained significant, $\beta = -.43$, $t(43) = -3.78$, $p < .001$. Only HPSA, $\beta = .33$, $t(43) = 2.38$, $p = .02$, and the White accidental death rate, $\beta = .37$, $t(43) = 2.30$, $p = .03$, were significant covariates in this analysis.

Discussion

Consistent with our hypothesis, the discrepancy between the firearm suicide ratio and the self-reported firearm ownership rate served as a powerful signal of the influence of honor norms across states, and this discrepancy—the gun access gap—was a reliable predictor of homicide rates (especially argument-related homicide rates) and accidental death rates among Whites, outcomes that have been shown in prior research to be linked to honor-related dynamics. It is worth noting that the gun access gap was a sensitive enough index to predict these behaviors despite the fact that the gun ownership rate was computed just across the years 2001-2002 (the only years for which gun ownership rates were available), and the two components of the gap were highly correlated. When two variables are highly correlated with one another, subtracting one from another tends to produce an unreliable difference—effectively, statistical noise. However, a high degree of reliability *within* each component has the opposite effect on difference scores, and in the present case, each component of the gun access gap was a highly reliable estimate. Thus, the difference between the components was *not* mere noise, but rather was a sensitive signal of a predilection for guns in the commission of suicides that appears to be linked to regional differences in honor norms among Whites. That this signal was capable of predicting regional differences in both homicides and accidental deaths, and that this signal was sensitive even to homicide type, consistent with previous research on honor and violence, was especially remarkable.

In addition, the gun access gap also appeared to reflect an aspect of gun culture that goes beyond regional differences in honor-related norms. Specifically, the gun access gap was

associated with homicide rates among non-Whites, not just Whites, a finding that does not fit well within a culture-of-honor framework. As noted already, US regional differences in honor-related behaviors and attitudes have been consistently documented among Whites, consistent with historical patterns of immigration and migration. But such regional differences rarely occur among non-White groups in the US. Although regional differences in honor status were not associated with the gun access gap among non-Whites, this gap still predicted non-White homicide rates. We believe this finding supports the view that the gun access gap is partly a reflection of honor-based values and motives, but that it is also partly about a more general predilection for guns that transcends honor ideology (a conclusion that also comports with the finding that the White and non-White gun access gaps were correlated with each other, even though only the former was associated with regional differences in honor status). This conclusion is merely speculative on our part, but it also suggests an interesting avenue for future research. In addition, future research should attempt to explain two other anomalous findings in this study: (1) that the gun access gap among non-Whites was negatively (and robustly) associated with non-White accidental death rates, and (2) that the simple correlation between the firearm suicide ratio and the self-reported gun ownership rate was substantially lower among non-Whites than it was among Whites.

General Discussion

The results of these two studies suggest that using the firearm suicide ratio as a proxy for gun accessibility might be problematic, as it appears to overestimate firearm accessibility in honor regions of the United States. Study 1 showed that residents of honor states exhibit a preference for committing suicide with firearms even after controlling for the gun ownership rate. In addition, and consistent with past studies, this association was observed only among Whites. This finding supports the argument that the firearm suicide *ratio*, which depends on the firearm suicide *rate* for its calculation, might be contaminated by the cultural influence of honor norms, rather than being a pure reflection of gun availability. Study 2 showed that the gap between the firearm suicide ratio and self-reported gun ownership rates could be used to replicate effects previously documented using Cohen's (1998) dichotomous culture-of-honor designation. In other

words, the gun access gap seems to be a useful statistical signal reflecting the regional influence of honor ideology. These findings reinforce our contention that the firearm suicide ratio is inflated in certain regions of the US by this cultural variable.

A potential critique of our interpretation of the gun access gap could be that this gap is driven by a distortion in self-reported gun ownership rates rather than by an inflation of the firearm suicide ratio. In other words, it could be that residents of honor regions are more likely to *under-report gun ownership*, rather than to *over-use guns* in the commission of suicides. This interpretation of our data is certainly possible, but it seems unlikely for two reasons. First, Study 1 showed that residents of honor states are particularly attracted to the firearm suicide method, which appears to be true with or without controlling for the self-reported gun ownership rate. Second, we found evidence of a heightened attraction to the firearm suicide method in honor states to be limited to the White population. If the under-reporting of gun ownership rates alone were responsible for the gun access gap, why would non-Whites fail to exhibit the same levels of under-reporting as Whites? Indeed, it strikes us as more plausible that non-Whites might be *especially* prone to under-report owning firearms as a way of undercutting social stereotypes concerning violent proclivities among racial minorities in the US. This possibility might help to explain why the simple correlation between the firearm suicide ratio and the self-reported gun ownership rate was smaller among non-Whites than it was among Whites in Study 2.

Third, previous research demonstrates that cultures of honor not only exhibit higher rates of retaliatory violence, but also display marked endorsement—or even, in some situations, a tacit social *requirement*—of such aggression in the service of reputational or physical defense. For example, people in honor states report more positive attitudes toward retaliatory violence (Hayes & Lee, 2005), and legislation regarding the rights of an individual to enact defensive violence is more permissive in honor states (Cohen, 1996). Because of this cultural approval, it seems unlikely that honor-oriented survey respondents would feel especially compelled to hide the fact that they own firearms. They might even relish the opportunity to make known the existence of firearms in their homes or even over-report gun ownership, as part of the reputation-management script that lies at the

heart of honor cultures. A person with a gun is a person to take seriously, and there is little that a person who embraces honor norms wants more than to be taken seriously. For all of these reasons, we think it more plausible that the gun access gap (at least among Whites) is driven primarily by an inflation of the firearm suicide ratio, rather than a deflation of the self-reported gun ownership level.

The findings presented here suggest that researchers should use caution when implementing the firearm suicide ratio as a proxy for gun availability. As has already been discussed at length, the culture of honor has been associated with a variety of violence-related outcomes that might also be theoretically linked with the accessibility of guns. Studies that use the firearm suicide ratio to investigate the extent to which gun availability per se influences a particular outcome might consider accounting for the influence of the culture of honor before attempting to draw any firm conclusions.

Study 2 also suggests the possibility that a peculiar predilection for guns in the commission of suicide might be used by researchers to predict interpersonal violence and excessive risk-taking (leading to increased risk of accidental death). Although we found, as predicted, that honor states only exhibited a higher gun access gap among Whites, and not among non-Whites, the White gun access gap was significantly associated with the non-White gap. Furthermore, the non-White gap significantly predicted non-White homicide rates above and beyond our other statewide covariates, including economic deprivation, temperature, and rurality, such that in states with a larger gun access gap, non-White homicide rates were also higher. In contrast, the non-White gun access gap was negatively associated with the non-White accidental death rate. We expected to see *no association* between these two variables rather than a negative one, so this surprising result requires further examination. In any case, the fact that the gun access gap proved to be a meaningful social signal among both Whites and non-Whites remains an important finding worthy of exploration by social scientists.

Conclusion

In addition to the note of caution sounded by these studies about the use of the firearm suicide ratio as a proxy for gun availability, the present results also point to a subtle cultural manifestation that has heretofore gone unnoticed. In a gap that

might otherwise be viewed as little more than statistical noise, we have found a meaningful social signal, one that we believe originates partly in the cultural dynamics of honor-related beliefs and values. This research thus complements other recent studies that have demonstrated some of the subtle ways that honor culture can manifest itself, beyond the classic demonstrations of interpersonal belligerence. For instance, Brown, Carvallo, and Imura (in press) have documented that parents in honor states in the US are more likely to name their male babies after fathers or grandfathers, and that this enhanced use of patronyms (but not matronyms) was especially pronounced following the terrorist attacks of 9/11. As in the present studies on the gun access gap, the enhanced use of patronyms was also statistically associated with other manifestations of honor culture, including state execution levels.

Studies of phenomena such as baby naming practices or the methods people use to commit suicide show how deep and how broad the influence of honor cultures can be. This depth and breadth, in turn, demonstrates that the extent to which societies make defense of honor a central organizing theme is itself a major dimension of cultural variation worthy of the kind of attention that theorists and researchers have long paid to other dimensions, such as individualism/collectivism. We hope that the current studies encourage more such attention to the social dynamics of honor culture, from the mundane to the extraordinary.

References

- Azrael, D., Cook, P. J., Miller, M. (2004). State and local prevalence of firearms ownership measurement, structure, and trends. *Journal of Quantitative Criminology*, 20, 43-62.
- Barnes, C. D., Brown, R. P., & Tamborski, M. (2012). Living dangerously: Culture of honor, risk-taking, and the nonrandomness of "accidental" deaths. *Social Psychology and Personality Science*, 3, 100-107.
- Baumeister, R. F. (1990). Suicide as escape from self. *Psychological Review*, 97, 90-113.
- Brown, R. P., Carvallo, M., & Imura, M. (in press). Naming patterns reveal cultural values: Patronyms, matronyms, and the US culture of honor. *Personality and Social Psychology Bulletin*.

- Brown, R. P., & Osterman, L. L. (2012). Culture of honor, violence, and homicide. In T. K. Shackelford & V. A. Weekes-Shackelford (Eds.), *The Oxford handbook of evolutionary perspectives on violence, homicide, and war* (pp. 218-232). New York, NY: Oxford University Press.
- Brown, R. P., Osterman, L. L., & Barnes, C. D. (2009). School violence and the culture of honor. *Psychological Science, 20*, 1400-1405.
- Bushman, B. J., Wang, M. C., & Anderson, C. A. (2005). Is the curve relating temperature to aggression linear or curvilinear? Assaults and temperature in Minneapolis reexamined. *Journal of Personality and Social Psychology, 89*, 62-66.
- Center for Disease Control and Prevention. (2008a). *BRFSS annual survey data: 2001 BRFSS Data*. Retrieved from http://www.cdc.gov/brfss/technical_infodata/surveydata/2001.htm#data
- Center for Disease Control and Prevention. (2008b). *BRFSS annual survey data: 2002 BRFSS Data*. Retrieved from http://www.cdc.gov/brfss/technical_infodata/surveydata/2002.htm#data
- Center for Disease Control and Prevention. (2013). *Compressed mortality file: Mortality for 1999-2008 with ICD 10 codes*. Retrieved from <http://wonder.cdc.gov/>
- Chatard, A., & Selimbegović, L. (2011). When self-destructive thoughts flash through the mind: Failure to meet standards affects the accessibility of suicide-related thoughts. *Journal of Personality and Social Psychology, 100*, 587-605.
- Cohen, D. (1996). Law, social policy, and violence: The impact of regional cultures. *Journal of Personality and Social Psychology, 70*, 961-978.
- Cohen, D. (1998). Culture, social organization, and patterns of violence. *Journal of Personality and Social Psychology, 75*, 408-419.
- Cohen, D., Nisbett, R. E., Bowdle, B. F., & Schwarz, N. (1996). Insult, aggression, and the southern culture of honor: An 'experimental ethnography'. *Journal of Personality and Social Psychology, 70*, 945-960.
- Cook, P. J. (1979). The effect of gun availability on robbery and robbery murder: A cross-section study of fifty cities. In R. H. Haveman, & B. B. Zellner, (Eds.), *Policy Studies Review Annual, Vol. 3* (pp. 743-781). Beverly Hills, CA: Sage.
- Denning, D. G., Convell, Y., King, D., & Cox, C. (2000). Method choice, intent, and gender in completed suicide. *Suicide and Life-Threatening Behavior, 30*, 282-288.
- Duggan, M. (2001). More guns, more crime. *Journal of Political Economy, 109*, 1086-1114.
- Fox, J. A. (2005). Uniform crime reports [United States]: Supplementary homicide reports, 1976-2002. Ann Arbor: Inter-university Consortium for Political and Social Research.
- Garland, A. F., & Zigler, E. (1993). Adolescent suicide prevention: Current research and social policy implications. *American Psychologist, 48*, 169-182.
- Hayes, T. C., & Lee, M. R. (2005). The Southern culture of honor and violent attitudes. *Sociological Spectrum, 25*, 593-617.
- Health Resources and Services Administration. (2005). *Selected statistics on health professional shortage areas, 2000-2004*. Rockville, MD: Bureau of Health Professions, Health Resources and Services Administration.
- IJzerman, H., & Cohen, D. (2011). Grounding cultural syndromes: Body comportment and values in honor and dignity cultures. *European Journal of Social Psychology, 41*, 456-467
- Joiner, T. E. (2005). *Why people die by suicide*. Cambridge, MA: Harvard University Press.
- Joiner, T. E., Pettit, J. W., Walker, R. L., Voelz, Z. R., Cruz, J., Rudd, M. D., & Lester, D. (2002). Perceived burdensomeness and suicidality: Two studies on the suicide notes of those attempting and those completing suicide. *Journal of Social and Clinical Psychology, 21*, 531-545.
- Kaplan, M. S., Huguet, N., McFarland, B. H., & Newsom, J. T. (2007). Suicide among male veterans: A prospective population-based study. *Journal of Epidemiology and Community Health, 61*, 619-624.
- Leung, A. K.-Y. & Cohen, D. (2011). Within- and between-culture variation: Individual differences and the cultural logics of honor, face, and dignity cultures. *Journal of Personality and Social Psychology, 100*, 507-526.

- Ludwig, J., Cook, P. J., & Smith, T. W. (1998). The gender gap in reporting household gun ownership. *American Journal of Public Health, 88*, 1715-1718.
- Miller, M., Azrael, D., & Hemenway, D. (2002). Rates of household firearm ownership and homicide across US regions and States, 1988-1997. *American journal of Public Health, 92*, 1988-1993.
- National Oceanic and Atmospheric Administration. (2000). *Average mean temperature index by month: 1971–2000*. Retrieved October 16, 2008, from <http://www.cdc.noaa.gov/USclimate/tmp.state.19712000.climo>
- Nisbett, R. E. (1993). Violence and U.S. regional culture. *American Psychologist, 48*, 441–449.
- Nisbett, R. E., & Cohen, D. (1996). *Culture of honor: The psychology of violence in the South*. Boulder, CO: Westview.
- Nitobe, I. (2002). *Bushido: The soul of Japan*. NY, NY: Kodansha USA. (Original work published 1899)
- Osterman, L. L., & Brown, R. P. (2011). Culture of honor and violence against the self. *Personality and Social Psychology Bulletin, 37*, 1611-1623.
- Peristiany, J. G. (1966). *Honour and shame: The value of Mediterranean society*. Chicago, IL: University of Chicago Press.
- Tang, J., Wu, S., & Miao, D. (2013). Experimental test of escape theory: Accessibility to implicit suicidal mind. *Suicide and Life-Threatening Behavior, 43*, 347-355.
- US Bureau of Labor Statistics. (2005). *Unemployment rates for states, annual average rankings, year: 2000*. Retrieved October 16, 2008, from <http://www.bls.gov/lau/lastrk00.htm>
- US Census Bureau. (2001a). *Table 25: Poverty status by state in 2000*. Retrieved October 16, 2008, from http://pubdb3.census.gov/macro/032001/po v/new25_001.htm
- US Census Bureau. (2001b). *Census 2000 Summary File 3 (SF 3)—Sample data. Table P37: Sex by educational attainment for the population 25 years and over [35]*. Retrieved from <http://www.census.gov/prod/cen2000/doc/sf3.pdf>
- US Census Bureau. (2008). *Table H-8: Median household income by state: 1984 to 2007*. Retrieved October 16, 2008, from <http://www.census.gov/hhes/www/income/histinc/h08.html>
- Vandello, J. A. & Cohen, D. (2003). Male honor and female fidelity: Implicit cultural scripts that perpetuate domestic violence. *Journal of Personality and Social Psychology, 84*, 997-1010.
- Vandello, J. A., Cohen, D., Grandon, R., & Franiuk, R. (2009). Stand by your man: Indirect prescriptions for honorable violence and feminine loyalty in Canada, Chile, and the United States. *Journal of Cross-Cultural Psychology, 40*, 81-104.
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The interpersonal theory of suicide. *Psychological Review, 117*, 575-600.

Footnotes

¹ As noted by Nitobe (1899/2002) the ancient Japanese ritual of *seppuku* involved a Samurai stabbing himself in the stomach (which was believed to be the seat of the soul) prior to being beheaded. By not showing his pain to the audience, the Samurai could demonstrate the purity of his soul and thus restore his stained honor.

² Some past studies on culture of honor have included White Hispanics with White Anglos, whereas others have not. We did not include Hispanics in the present study, in part because this demographic group is so unequally distributed across the US that we did not wish to confound this variable with our categorization of honor and non-honor states. However, we should note that analyses that included Hispanics with White Anglos did not differ appreciably from those reported here.

³ The question regarding firearm ownership was not asked in California in 2002. Thus, we used only responses from the 2001 survey for California.

⁴ All data obtained from CDC were calculated per 100,000 persons and adjusted for age based on the US standard population in the year 2000.

⁵ When non-White firearm suicide rates for Alaska, New Hampshire and Vermont are treated simply as missing data, the interaction is still significant despite the reduction in power, $F(1, 41) = 27.22, p < .001$.

⁶ With New Hampshire, Vermont, and Alaska's data points missing, states' CH status was still not a significant predictor of the non-White firearm suicide rate, $\beta = .001$, $t(41) = .01$, $p = .99$. Also, the firearm suicide rate for non-Whites was still skewed after winsorizing Alaska because of a few other outliers. We log-transformed the rate, which eliminated the positive skew, and used this new rate as the outcome variable in a separate regression analysis. The result was nearly identical to the one we report in the text with the merely winsorized rate; CH status was not a significant predictor of the non-White firearm suicide rate ($\beta = .05$, $p = .63$), but the non-White gun ownership rate was, $\beta = .80$, $t(44) = 7.34$, $p < .001$.

⁷ Following Cohen (1998), argument-related homicide cases included lovers' triangles, brawls under alcohol, brawls under drugs, arguments over money, and other arguments.

Although Cohen (1998) specified an age range of 15 to 39 for his analyses, we were unable to obtain population estimates that perfectly matched this age range. We thus substituted the available age range of 15 to 34 for both the offender data and the population estimates.

⁸ Analyzing argument-related homicide rates with the gun access gap that excludes Hispanic Whites did not change any of our conclusions.

⁹ Before the log transformation, the argument-related homicide rates were skewed at 1.41. After the transformation, skew was more acceptable at 1.07.

¹⁰ Because the non-White accidental death rate was quite skewed at 1.78, we performed a natural log transformation on this covariate prior to analysis. The resulting skew was a more acceptable 0.60.

Table 1

Multiple Regression Analyses of Firearm Suicide Rates in Study 1

Predictor	Whites		Non-Whites	
	β	t	β	t
CH	.45**	5.17	.00	0.003
Gun Ownership	.68**	6.28	.73**	6.34
Economic Deprivation	.08	0.76	.08	0.62
HPSA	-.12	-1.04	.00	0.001
Temperature	-.06	-0.67	-.26*	-2.13

Note. CH = culture-of-honor status (0 = *non-honor state*, 1 = *honor state*); Economic Deprivation = economic deprivation composite index; HPSA = proportion of population living in a health professional shortage area; Temperature = winsorized mean annual temperature.

R^2 Whites = .81; R^2 non-Whites = .69

* $p \leq .05$. ** $p \leq .01$.

Table 2

Intercorrelations and Descriptive Statistics for Variables in Study 2

	1	2	3	4	5	6	7	8	9	10	11	12
1. Gap (Whites)	—											
2. Gap (Non-Whites)	.50**	—										
3. Gap (Whites including Hispanics)	.97**	.47**	—									
4. Homicides (Whites)	.47**	.20	.52**	—								
5. Homicides (Non-Whites)	.17	.51**	.15	.43**	—							
6. Homicides (whites)	.38**	.001	.52**	.65**	.03	—						
7. Accidents (Whites)	.23	-.03	.26	.85**	.31*	.43**	—					
8. Accidents (Non-Whites)	-.37**	-.60**	-.34*	.17	.03	.004	.42**	—				
9. Economic Deprivation	.21	.10	.26	.78**	.34*	.56**	.72**	.28**	—			
10. HPSA	-.21	-.15	-.18	.49**	.25	.14	.64**	.54**	.65**	—		
11. Temperature	.45**	.49**	.50**	.62**	.30*	.45**	.40**	-.20**	.52**	.15	—	
12. Rurality	-.16	-.13	-.22	.19	.08	-.14	.47**	-.39**	.29*	.42**	-.21	—
<i>M</i>	0.00	0.03	.00	2.73	13.13	4.22	40.85	38.67	0.00	0.18	52.24	0.28
<i>SD</i>	0.37	0.99	.40	1.18	6.35	2.64	8.76	19.74	0.81	0.09	8.15	0.15

Note. All variables are untransformed.

Gap (Whites/non-Whites/Whites including Hispanics) = gun access gap for Whites/non-Whites/Whites including Hispanics; Homicide (Whites/non-Whites) = age-adjusted homicide rates per 100,000 for Whites/non-Whites; Accidents (Whites/non-Whites) = age-adjusted deaths associated with unintended, external causes per 100,000 for Whites/non-Whites; Economic Deprivation = economic deprivation composite index; HPSA = proportion of population living in a health professional shortage area; Temperature = winsorized mean annual temperature; Rurality = proportion of population living in rural areas.

* $p \leq .05$. ** $p \leq .01$.

Table 3

Multiple Regression Analyses of Homicide Rates and Accidental Death Rates Using Gun Access Gaps

Predictors	Whites						Non-Whites			
	Total Homicides		Argument Homicides		Accidents		Total Homicides		Accidents	
	β	t	β	t	β	t	β	t	β	t
Gap	.32**	3.45	.39**	3.15	.27**	2.89	.60**	4.34	-.43**	-3.78
Economic Deprivation	.41**	3.26	.62**	3.74	.20	1.57	.01	0.03	-.07	-0.42
HPSA	.20	1.72	-.04	-0.30	.20	1.60	.21	1.27	.33*	2.38
Temperature	.22*	2.06	-.08	-0.57	.24*	2.20	-.29	-1.56	-.04	-0.23
Rurality	.07	0.79	-.27*	-2.37	.28**	3.00	-.07	-0.53	.05	0.36
White/Non-White Homicides/Accidents	.12	1.43	—	—	.35**	3.51	.40	1.97	.37*	2.30

Note. When the outcome is White total homicides, or accidents, the gun access gap for Whites is used, and when the outcome variable is non-White homicides or accidents, the gun access gap for non-Whites is used. When the outcome is White argument homicides, the gun access gap for Whites that includes those of Hispanic origins is used. HPSA = proportion of population living in a health professional shortage areas; Temperature = winsorized mean annual temperature; Rurality = proportion of population living in rural areas. For White total homicides and accidents, non-White homicides and accidents were used as covariates, respectively. For non-White homicides and accidents, White homicides and accidents were used as covariates, respectively.

Whites: R^2 Homicides = .76; R^2 Accidents = .75; R^2 Argument homicides = .59.

Non-Whites: R^2 Homicides = .44; R^2 Accidents = .63.

* $p \leq .05$. ** $p \leq .01$.

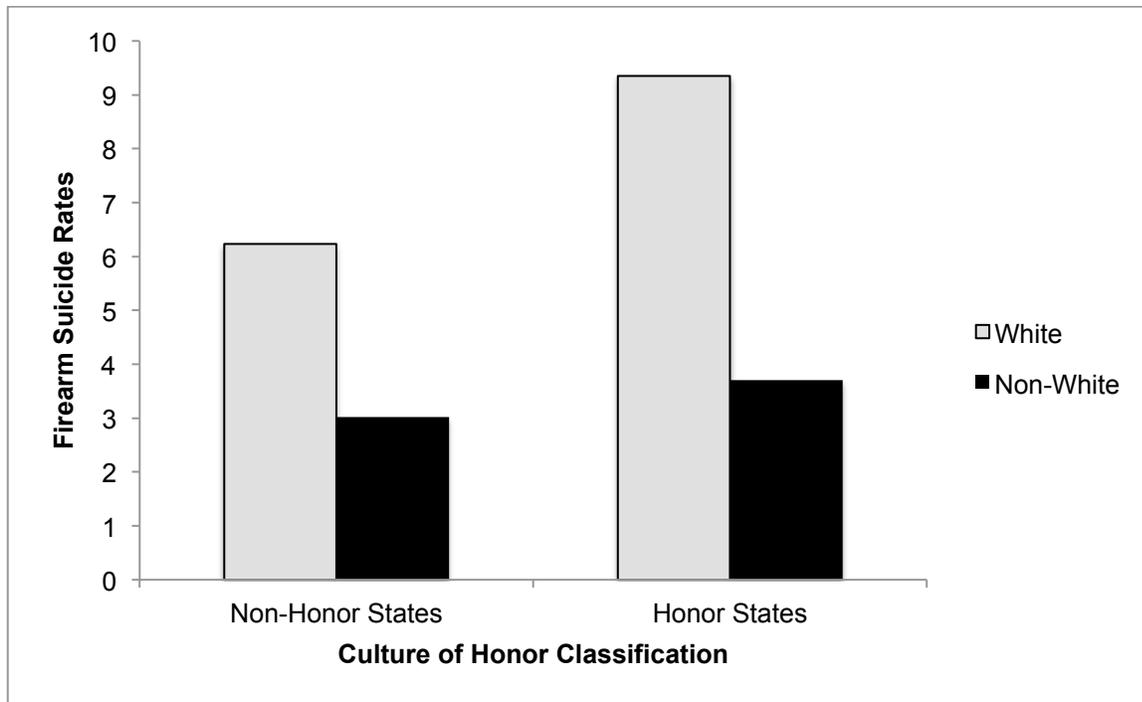


Figure 1. Firearm suicide rates (per 100,000) among White and non-White residents as a function of the states' culture of honor status.