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Firearm Ownership and Capability for Suicide in Post-Deployment National Guard Service Members

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Objective: National Guard service members demonstrate increased suicide risk relative to the civilian population. One potential mechanism for this increased risk may be familiarity with and access to firearms following deployment. This study examined the association between firearm ownership, reasons for ownership, and firearm familiarity with a widely studied suicide risk factor—capability for suicide—among National Guard service members.

Method: Data were drawn from a cross-sectional survey of National Guard service members conducted immediately post-deployment in 2010. Service members (n = 2,292) completed measures of firearm ownership, firearm familiarity, and capability for suicide.

Results: Firearm ownership and increased firearm familiarity were associated with capability for suicide (d = 0.47 and r = .25, for firearm ownership and familiarity, respectively). When examined separately based on reason for ownership, owning a firearm for self-protection (d = 0.33) or owning a military weapon (d = 0.27) remained significantly associated with capability for suicide. In contrast, owning a firearm for hobby purposes did not (d = −0.07).

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Conclusion: Our findings support theories emphasizing practical aspects of suicide (e.g., three-step theory) and suggest that owning firearms, in particular for self-protection, along with familiarity using firearms may be associated with greater capability for suicide.

There has been an alarming increase in suicide among members of the United States (U.S.) military beginning in the mid-2000s. The military suicide rate rose from 10.3 per 100,000 person years in 2005 to 20.2 in 2015 (DoDSER, 2016; LeardMann et al., 2013; McIntosh, 2011). Suicide rates increased in the general population within this time frame as well (11.0 to 13.8 per 100,000 per years, for 2005 and 2015, respectively; Drapeau & McIntosh, 2018). However, comparisons between civilian and military samples indicate that although military suicide rates began below the U.S. general population in 2002, military suicide rates exceeded the general population by 2009 (Reger et al., 2018). Across all branches of the military, members of the National Guard showed the highest rates of death by suicide in 2015 at 27.1/100,000 (Department of Defense Suicide Event Report, 2016).

Theoretical models of suicidal behavior have been developed to determine modifiable factors to aid suicide prevention efforts. Although various contemporary psychological models of suicidal behavior exist (Barzilay & Apter, 2014), the Interpersonal Theory of Suicide (ITS) has received substantial investigation (Chu et al., 2017; Joiner, 2005; Van Orden et al., 2010). This theory makes a distinction between factors that influence the development of suicidal thoughts and those that lead to suicidal behavior once suicidal thoughts are present. The ITS model proposes that the *capability for suicide* must be elevated and combined with the desire to die, in order for an individual to enact a lethal or near-lethal suicide attempt. Capability for suicide is a multidimensional construct that includes fearlessness of death and elevated pain tolerance and is proposed to develop through repeated exposure to painful and provocative events (Van Orden, Witte, Gordon, Bender, & Joiner, 2008). A recent meta-analysis testing empirically the central tenants of ITS supports the relationship between elevated capability and past suicide attempts (Chu et al., 2017). Capability and past suicide attempts have also been positively linked in a sample of predominantly National Guard service members (Anestis, Khazem, Mohn, & Green, 2015). As hypothesized by the ITS, past suicide attempts were predicted by suicidal desire only at high levels of capability for suicide in this study.

Newer models of suicidal behavior continue to include factors such as capability for suicide that facilitate the enactment of suicidal behavior when thoughts of suicide are present. The three-step theory of suicide (3ST; Klonsky & May, 2015) extends the ITS and proposes that the capability for suicide has practical components, along with the dispositional and acquired components embedded in the construct within ITS. These practical components are factors that simply make a suicide attempt easier, such as having access to means for suicide and being familiar with how to use these means. In the initial test of the 3ST, adult participants with a history of suicide attempt(s) and suicidal ideation scored higher on a self-report measure of practical capacity for suicide compared to those with a history of suicidal ideation but no suicide attempt (Klonsky & May, 2015). Taken together, contemporary psychological models of suicidal behavior such as ITS and 3ST make clear hypotheses regarding the capability to enact lethal self-harm and how aspects of firearms ownership relate to this capability. As 62% of suicides in the military

population are by firearms (Department of Defense Suicide Event Report, 2016), the study of capability for suicide, aspects of firearms ownership, and suicide is an important line of work to preventing military service member suicide.

Prior work has begun establishing a link between firearm ownership and increased suicide risk. Data suggest that firearm ownership is related to overall and firearm-specific death by suicide (Anestis & Houtsma, 2018; Miller, Warren, Hemenway, & Azrael, 2015) but unrelated to thoughts of suicide (Khazem et al., 2015). Additionally, those who own a firearm and experience suicidal ideation are more likely to develop a plan for suicide that involves a firearm than are those who experience suicidal ideation but do not own a firearm (Betz, Barber, & Miller, 2011). Greater historical firearm use is related to increased levels of capability for suicide, specifically pain tolerance, ability to persist through painful experiences, and fearlessness about death (Anestis & Capron, 2018). Taken together, these data suggest that ownership of firearms and experience firing them, as could be predicted given contemporary psychological models of suicidal behavior, does not cause the development of suicidal thoughts but rather increases the capability to enact lethal self-harm if suicidal thoughts are present.

Although previous work has linked suicide risk to other aspects of practical capacity (e.g., safe vs. unsafe firearm storage; Anestis, Khazem, & Anestis, 2017), no work has investigated how self-assessed competency or skill using firearms relates to suicide risk, specifically the capability for suicide. Additionally, no work has investigated if motivations for owning a firearm relate to the capability to enact lethal self-harm, although previous work has shown that owning firearms primarily for self-protection is common in the veteran population (Simonetti, Azrael, & Miller, 2018). Finally, the relationship between capability for suicide and firearm ownership has not been studied in a sample of National Guard service members.

The current study investigated the relationship between aspects of firearms ownership and capability for suicide in a large, post-deployment sample of National Guard service members. Specifically, we investigate how firearm ownership, motivations for ownership, and familiarity and training with firearms are associated with capability for suicide. In line with findings in other populations (Anestis & Capron, 2018; Anestis & Houtsema, 2018), it was hypothesized that National Guard service members who endorsed owning a firearm would demonstrate higher levels of capability for suicide. Based on the practical capability constructs emphasized in the 3ST (Klonsky & May, 2015), we hypothesized that familiarity and training with firearms would also be related to increased capability for suicide. As no research has explicitly tested the relationship between specific motivations for firearms ownership and capability for suicide, no hypotheses were made for this aspect of firearms ownership. Finally, as research has demonstrated that men are more likely to own firearms and die by self-inflicted firearm violence than women (Centers for Disease Control and Prevention, 2015; Parker, Horowitz, Igielnik, Oliphant, & Brown, 2017), gender was explored as a moderator of all proposed relationships.

METHOD

Participants and Procedure

This study involved secondary data analysis of survey data collected from a sample of Army National Guard service members at Volk Field, WI. The original study was designed to evaluate a cognitive/interpersonal model of suicide among pre- and post-deployment National Guard service members and involved assessment at three time points: before deployment (pre-deployment), immediately after return from deployment (post-deployment), and 6–9 months after deployment (follow-up). Post-deployment data collection occurred in 2010. The current study

examines data from post-deployment only due to the large sample size available at this time point (n = 2,292) capable of detecting potentially small effects, due to particular theoretical importance of the post-deployment period based on increased suicide risk for military service members after separation from the military (Reger et al., 2015), and due to variations in measures across all three time points that precluded longitudinal analyses. Participants were invited to participate in the study during a mandatory post-mobilization session in early 2010. Session activities primarily involved physical and mental health screenings along with educational sessions designed to promote re-integration into civilian life (e.g., financial planning, employment workshop). Potential participants were provided with a verbal description of the study and information regarding confidentiality and the right to withdraw from the study at any time without penalty. No compensation was provided for survey completion. Due to the sensitive nature of the survey content and likely reluctance on the part of National Guard service members to accurately disclose information regarding mental health variables that could be linked to them, the paper survey questionnaires were administered anonymously and in the survey itself, participants were not asked to provide identifying information beyond basic demographic data. Due to the anonymous survey distribution and collection procedures, response rates for survey completion were not available.

Measures

Demographic Questionnaire. A brief demographic questionnaire was used to assess participants' gender, age, and race/ethnicity.

Firearm Ownership. Two items assessed firearm ownership characteristics. An initial item assessed firearm ownership ("Do you own a gun?") with a follow-up item assessing the purpose of ownership. Listed purposes for ownership included: "self-protection," "hobby," "military weapons," and "other" (which allowed a text response). Participants could indicate multiple reasons for ownership (e.g., self-protection and hobby). Separate models examined each reason for ownership independently (i.e., an individual could give more than one reason). In addition, text responses for "other" were reviewed to determine whether they overlapped with the three specific purposes. When overlap was obvious, items were recoded (e.g., "hunting" was coded as
hobby).

Firearm Familiarity. Two items developed in our laboratory assessed firearm training and skill. These included "to what extent have you been trained to use a gun?" and "to what extent are you familiar/skilled with a gun?" Items were rated on a seven-point Likert-type scale ranging from not at all (1) to extensively (7). Based on the theoretical overlap and high correlation between these two items (r = .68, p < .001), a single-item composite of firearm familiarity was computed by taking the average of both items.

Acquired Capability for Suicide (Van Orden et al., 2008). The full 20-item acquired capability for suicide (ACSS) was completed. Based on Joiner's (2005) ITS, this measure is intended to assess whether an individual exhibits elevated levels of the capability for suicide. Based on recent factor analytic work supporting the use of the ACSS total score (Rimkeviciene, Hawgood, O'Gorman, & De Leo, 2017), a total score was computed as the sum of all items with a higher score indicating greater capability for suicide. Individual item responses range from 0 ("not at all like me") to 4 ("very much like me") with potential total scores ranging from 0 to 80. Internal consistency reliability was in the acceptable range (α = .82).

Statistical Methods

Associations between gender, firearm ownership variables, firearm familiarity, and

capability for suicide were examined using chi-square tests, independent samples *t*-tests, and both linear (for continuous outcomes) and logistic (for dichotomous outcomes) regression models. Potential interactions between gender and firearm ownership, reasons for ownership, and firearm familiarity as predictors of capability for suicide were examined in linear regression models. Standardized effect sizes (e.g., Pearson's *r*, Cohen's *d*, odds ratios) were computed as appropriate for the distribution of the relevant study variables (i.e., continuous versus [vs.] dichotomous). Specific reasons for firearm ownership (e.g., hobby, self-protection) were coded dichotomously (i.e., yes/no) and were examined separately. Analyses were also conducted for male and female participants separately. Although analyses within female participants were underpowered to detect small effects, they are presented nonetheless as very little is known about firearm ownership and suicide risk in female National Guard members.

Potential bias introduced due to non-random missing data was also assessed. A total of $n = 2{,}351$ participants completed at least some demographic data with $n = 2{,}240$ (95.28%) providing a complete set of demographic data and responses for other study variables. Missingness of firearm- and suicide-related variables was small (i.e., <5%; Roth, 1994). Previous work suggests that when missingness is less than 5% and data are missing in random patterns, any missing data technique (including pairwise deletion) does not introduce bias into parameter estimates or significance tests (see Roth, 1994 for a discussion). In order to assess the presence of non-random patterns of missingness, we conducted analyses comparing participants with missing versus complete data on the firearm- and suicide-related variables (Bennett, 2001). Older age and non-White race/ethnicity were associated with greater likelihood of responding (rs = −.07 and −.05, for age and White race/ethnicity, respectively, ps < .050). Age and race/ethnicity were also associated with capability for suicide (rs = −.15 and .07, for age and White race/ethnicity, respectively, ps < .050). Gender, firearm ownership, firearm familiarity, and capability for suicide were not associated with missing firearm- and suicide-related variables (rs = .00 to .02, $p \geq .279$). Given the association between age and race/ethnicity with both patterns of missingness and our outcome (capability for suicide), the primary models presented below (i.e., examining the relationship between firearm ownership, reasons for ownership, and capability for suicide) were also conducted with adjustments for age and race/ethnicity. However, the very small magnitude of associations between demographics and key study variables (i.e., firearm- and suicide-related variables) with missingness was taken as warrant to consider bias introduced due to missingness to be low. Analyses were subsequently conducted using all available data (i.e., pairwise deletion).

RESULTS

Sample Descriptive Statistics

Firearm ownership data were available from $n = 2{,}292$ National Guard service members. Descriptive statistics are reported in Table 1. The sample was on average 27.30 years of age ($SD = 7.13$, range = 18 to 58) and predominantly male gender (89.40%). The majority identified as non-Hispanic White (89.46%), 3.77% identified as Hispanic, 3.10% identified as non-Hispanic Black, 2.13% identified as Asian or Pacific Islander, and 1.56% identified as American Indian or Alaskan Native. Due to the small proportion of non-White respondents, race/ethnicity was coded as White versus non-White for all analyses.

The majority of the sample reported owning a firearm ($n = 1{,}568$, 68.41%). Among firearm owners who provided at least one specific reason for firearm ownership ($n = 1{,}529$), the most common

TABLE 1
Sample Demographic, Firearm Ownership, and Suicide Risk Factor Descriptive Statistics

Variable	*N*	Full sample *n* (%)/Mean (*SD*)	Male *n* (%)/Mean (*SD*)	Female *n* (%)/Mean (*SD*)	Comparison by Gender			
					χ^2/t	*df*	*p*	*OR*/*d*
Male gender	2,282	2,040 (89.40)						
White	2,257	2,019 (89.46)	1,855 (89.92)	212 (88.33)	0.38	1	.468	*OR* = 1.17
Age	2,201	27.30 (7.13)	27.46 (7.18)	26.00 (6.56)	2.98	1	.003	*d* = 0.20
Firearm owner	2,292	1,568 (68.41)	1,471 (72.11)	91 (37.60)	117.67	1	<.001	*OR* = 4.29
Reasons for ownership								
Self-protection	1,529	700 (45.78)	675 (47.07)	21 (23.33)	18.34	1	<.001	*OR* = 2.93
Hobby	1,529	1,372 (89.73)	1,290 (89.96)	77 (85.56)	1.33	1	.186	*OR* = 1.51
Military weapon	1,529	246 (16.09)	237 (16.53)	8 (8.89)	3.13	1	.060	*OR* = 2.03
Other	1,529	471 (30.80)	443 (30.89)	27 (30.00)	0.004	1	.856	*OR* = 1.04
Firearm familiarity	2,289	6.18 (1.02)	6.24 (0.99)	5.60 (1.03)	9.42	2,277	<.001	*d* = 0.64
Capability for suicide	2,284	54.11 (11.93)	55.21 (11.40)	44.82 (12.21)	13.28	2,272	<.001	*d* = 0.90

Percentages computed as the proportion of the sample with non-missing responses for each item. Specific firearm ownership reasons computed only on sample of firearm owners. Female used as reference group for gender comparisons. *N* = *t*otal non-missing *n* for given variable; *OR* = odds ratio; *d* = *C*ohen's *d* (i.e., standardized mean difference; computed as male mean minus female mean, divided by pooled standard deviation); Capability for suicide = Acquired Capability for Suicide Scale (Van Orden et al., 2008) total score (potential range = 0–80, with higher scores indicating greater capability for suicide); Firearm familiarity potential range = 1–7, with higher scores indicating greater firearm familiarity and training.

TABLE 2
Firearm Ownership Variables Predicting Capability for Suicide

Predictor	Full sample						Male	Female	Interaction	
	Owner (*M* [*SD*])	Non-owner (*M* [*SD*])	χ^2/t	*df*	*p*	*d*/*r*	*d*/*r*	*d*/*r*	*B*	*p*
Firearm ownership	55.83 (11.41)	50.37 (12.17)	10.41	2,282	<.001	*d* = 0.47	*d* = 0.37***	*d* = 0.31*	−0.52	0.749
Reasons for ownership										
Self-protection	57.86 (11.02)	54.19 (11.49)	6.33	1,523	<.001	*d* = 0.33	*d* = 0.30***	*d* = −0.06	−4.1	0.147
Hobby	55.78 (11.31)	56.55 (12.35)	−0.80	1,523	.422	*d* = −0.07	*d* = −0.12	*d* = 0.25	4.72	0.177
Military weapon	58.48 (11.70)	55.36 (11.30)	3.93	1,523	<.001	*d* = 0.27	*d* = 0.24***	*d* = 0.29	0.42	0.921
Firearm familiarity			12.08	2,280	<.001	*r* = .25	*r* = .23***	*r* = .01	−2.51	<.001

Capability for suicide = Acquired Capability for Suicide Scale (ACSS; Van Orden et al., 2008) total score; *M* [*SD*] = means and standard deviations of ACSS scores for participants owning or not owning firearms; *d* = Cohen's *d* (i.e., standardized mean difference, computed for dichotomous firearm ownership predictors; computed as owner mean minus non-owner mean, divided by pooled standard deviation); *r* = Pearson's *r* correlation coefficient (for associations between firearm familiarity and capability for suicide).
***$p < .001$, *$p < .05$.

reasons for owning a firearm were for hobby purposes (89.73%), followed by self-protection (45.78%), other (30.80%), and owning a military weapon (16.09%). Using logistic regression, gender was associated with several firearm ownership variables, with male participants showing higher likelihood of owning a firearm (72.11% vs. 37.60%, odd ratio [*OR*] = 4.29), higher likelihood of owning a firearm for self-protection (47.07% vs. 23.33%, *OR* = 2.93), and higher firearm familiarity (*Means* [*M*s] = 6.24 vs. 5.60, Cohen's *d* = 0.64, all *p*s < .001). Male participants were no more likely to own a firearm for hobby purposes (89.96% vs. 85.56%, *OR* = 1.51, *p* = .250), own a military weapon (6.53% vs. 8.89%, *OR* = 2.03, *p* = .077), or own a firearm for an "other" reason (30.89% vs. 30.00%, *OR* = 1.04, *p* = .949). Using linear regression, gender was also associated with capability for suicide, with male participants reporting higher capability for suicide (*M*s = 55.21 vs. 44.82, *d* = 0.90, *p* < .001).

Associations Between Firearm Ownership, Firearm Familiarity, and Capability for Suicide

Associations between firearm ownership, firearm familiarity, and capability for suicide were examined first in the full sample using independent samples *t*-tests and linear regression with capability for suicide entered as the outcome variable (Table 2). Firearm owners reported higher capability for suicide (*M*s = 55.83 vs. 50.37, *d* = 0.47, *p*s < .001). Firearm familiarity was also positively associated with capability for suicide (*r* = .25, *p*s < .001).

Among firearm owners, associations were examined between the three specific purposes for owning a firearm and capability for suicide. Owning a firearm for self-protection and owning a military weapon were both associated with increased capability for suicide (*d*s = 0.33 and 0.27, for owning for self-protection and military weapons, respectively, *p*s < .001). Owning a firearm for hobby

purposes was not associated with capability for suicide ($d = -0.07, p = .422$).[1,2]

Given gender was associated with both firearm ownership and capability for suicide, associations were examined separately for male and female participants. Among male participants, firearm ownership and familiarity remained a significant predictor of capability for suicide (Table 2). Among female participants, firearm ownership also remained associated with capability for suicide, although firearm familiarity was not associated with capability for suicide.

Among male firearm owners, owning a firearm for self-protection or owning a military weapon remained significant predictors of capability for suicide while owning a firearm for hobby purposes was not a significant predictor of capability. Among female firearm owners, none of the specific reasons for firearm ownership were associated with capability for suicide.

[1]The unusually high rate of endorsement of ownership for hobby purposes (89.7%) likely indicates that this category is heterogeneous, including dissimilar reasons for ownership (e.g., firearm collecting vs. hunting). In an attempt to further examine the link between hunting specifically and capability for suicide, we conducted an exploratory analysis using text responses from the "other" reasons for ownership category that specified hunting as an indicator of ownership for hunting purposes ($n = 344$). No relationship was found between owning for hunting purposes and capability for suicide in these models (rs = .02 and −.05, ps = .254 and .075, in the full sample and when restricting to those who did not indicate hobby as a reason for ownership, respectively). Of course, we are unable to assess whether individuals who voluntarily specified hunting are representative of all individuals owning firearms for hunting purposes. Thus, these results should be interpreted cautiously and explored in a future study.

[2]All results reported in this section remained unchanged when controlling for demographic variables (age, race/ethnicity) associated with patterns of missingness. Namely, firearm ownership and greater firearm familiarity remained positively associated with capability for suicide (ps < .001). Similarly, owning firearms for self-protection and owning military weapons remained positively associated with capability for suicide (ps < .001) while owning a firearm for hobby purposes was not associated with capability for suicide ($p = .420$).

Gender was also examined as a moderator of the link between firearm ownership and familiarity variables and capability for suicide in linear regression models (see Table 2). Specifically, the interaction between gender and firearm-related variables (e.g., firearm ownership) was entered as predictors of capability for suicide. In the full sample, gender significantly moderated the link between firearm familiarity and capability, with male participants showing a stronger association than females (rs = .23 vs. .01).

DISCUSSION

Within the context of high rates of suicide for military service members and veterans, the current study sought to assess suicide-related correlates of a modifiable risk factor—firearm ownership—in a large sample ($n = 2,292$) of post-deployment National Guard service members. Self-reported firearm ownership and reasons for ownership, firearm familiarity and skill, and key suicide risk factor—capability for suicide—were assessed.

As previously reported in military veteran samples (Cleveland, Azrael, Simonetti, & Miller, 2017), firearm ownership was highly prevalent in the current sample of National Guard service members, with 68.41% owning firearms. Rate of ownership among males was almost twice the rate among female participants (72.11% vs. 37.60%), in line with previous findings (Cleveland et al., 2017). Service members were most likely to report owning a firearm for hobby purposes (89.73% of firearm owners), with approximately half owning a firearm for self-protection (45.78%). Gender differences emerged in reasons for ownership, with male participants reporting higher rates of owning a firearm for self-protection compared to female participants (47.07% vs. 23.33%).

In general, robust evidence was found linking firearm ownership and familiarity with capability for suicide in a post-deployment National Guard sample. Service members who owned a firearm reported higher

mean levels of capability for suicide (d = 0.47) as did those more familiar with firearms (r = .25). When reasons for owning a firearm were examined separately, owning for self-protection was most strongly associated with capability (d = 0.33), while owning for hobby purposes was not (d = −0.07).

Overall, effects were larger for male compared to female service members (e.g., ds = 0.30 vs. −0.06, for owning a firearm for self-protection and capability for suicide for males and females, respectively). However, gender only functioned as a statistically significant moderator when examining the link between firearm familiarity and capability for suicide. Nonetheless, the numerically larger effects in male service members may underscore the importance of assessing firearm ownership and storage practices for male National Guard service members (Khazem et al., 2015), particularly given the well-established heightened rate of death by firearm for males vs. females in the general U.S. population (Canetto & Sakinofsky, 1998).

Taken together, findings from the current study lend support to the three-step theory of suicide (3ST; Klonsky & May, 2015) that emphasizes consideration of practical aspects of suicide. Our results suggest that the ownership of firearms, in particular for self-protection, along with familiarity using firearms, is associated with increased capability for suicide within a post-deployment National Guard sample. That is to say, aspects increasing one's capability for suicide, including fearlessness about death and pain tolerance, are higher for service members who own and are more familiar with firearms. Future research will need to assess whether firearm ownership-related variables confer an increased risk for attempts and death by suicide in National Guard service members and other military and veteran populations.

In some ways, links between reasons for firearm ownership and firearm familiarity with capability for suicide are unsurprising. Owning a firearm for self-protection instead of for sport may involve imagining using the firearm to harm another human being, a process that could habituate an individual to the painful and provocative nature of using the firearm to die by suicide. This finding should also be interpreted in light of other recent work also with military veterans that highlights variation in firearm storage practices depending on the motivation for ownership (Simonetti, Azrael, Rowhani-Rahbar, & Miller, 2018). Owning a firearm primarily for protection from other people has been linked to other behaviors that may increase practical risk factors for suicide (e.g., storing firearms loaded and unlocked).

Despite showing a robust relationship between firearm ownership and familiarity with capability for suicide, the current study does not provide evidence for a causal relationship between these variables. While it is possible that firearm ownership increases suicide risk, it is also plausible that the causal direction is reversed. For example, individuals who have increased capability for suicide (e.g., greater fearlessness about death; Ribeiro et al., 2014) may simply be more comfortable owning firearms. It is also possible that both firearm ownership and capability for suicide are driven by a third unmeasured variable. Within the current military sample, it may be that aspects of service members' military training and deployment experiences (e.g., engaging in combat) may have increased both their familiarity with firearms (and perhaps likelihood of owning a firearm) and their capability for suicide through elevating pain tolerance and fearlessness about death. And, as research also indicates that capability for suicide is elevated in service members pre-deployment and may remain high and unchanged following deployment (Bryan, Sinclair, & Heron, 2016), it could be that capability and characteristics of firearms ownership are linked by experiences that occurred prior to deployment. Further, various correlates of psychological distress, such as anger, paranoia, or hypervigilance, may lead individuals to both purchase firearms (especially for self-protection) and to develop increased capability for suicide (Hawkins et al., 2014; Silva, Ribeiro, & Joiner, 2015). However, a considerable body of research suggests that firearm ownership is associated with death by suicide even when accounting for a host of potential third variables (e.g., mental

illness; Anglemyer, Horvath, & Rutherford, 2014) and the existence of a plausibly potent third variable to yield the observed relationship between firearm ownership and suicide is highly unlikely (Miller, Swanson, & Azrael, 2016).

The current study implies several directions for improving clinical practices around firearms and suicide risk for post-deployment military service members. This study adds to the growing body of literature emphasizing the importance of assessing firearm ownership and storage practices, and the possibility of decreasing deaths by suicide through means safety initiatives (Britton, Bryan, & Valenstein, 2016). Findings from the current study suggest suicide risk assessment may be improved by asking the purposes for owning a firearm, as additional risk was associated with firearms owned for self-protection.

Several limitations are worth considering. Although the study included a large sample of National Guard service members, it is limited by its cross-sectional nature, which restricts assessment of causal pathways. The study was also conducted immediately post-deployment, leaving open the question whether the observed pattern of findings persists years after deployment. In addition, the current study was collected in a largely rural, Midwestern state, where hunting is very common. It is possible that the current sample showed idiosyncratic ownership patterns due to the broader regional context (e.g., higher rates of firearm ownership for hobby purposes compared with nationally representative surveys of veterans or civilians; Cleveland et al., 2017; Pew Research Center, 2017). It certainly should also be recognized that the assessment of reasons for firearms ownership was not ideal, specifically regarding the categorization of ownership for hobby purposes. Although we attempted to further disentangle this category by analyzing data from those who wrote in hunting-related motivations for ownership (see footnote above), it is uncertain whether those writing in hunting are representative of those owning firearms for hunting purposes. Future work would benefit from a more nuanced assessment of motivation for owning firearms. The unknown survey response rate for the post-deployment survey reported here is another limitation. It is possible that those completing the survey differed systematically from those who did not complete the survey, thereby introducing bias and raising additional questions regarding generalizability. However, it is worth noting that if potential participants were hesitant to consent due to concerns about reporting socially undesirable information (e.g., suicide risk), this theoretically would have led to a restricted range in these variables and would therefore have attenuated (rather than inflated) the observed relationships (Cohen, Cohen, West, & Aiken, 2003).

These limitations aside, the current study is the first to demonstrate a link between capability for suicide and firearm ownership, familiarity with firearms, and motivation for firearm ownership within a National Guard sample. Findings can inform future research, clinical practice, and policy to decrease potentially fatal suicide attempts within military samples. This research also provides continued support for the study of capability for suicide to include practical components, such as access and familiarity with means of suicide (Klonsky & May, 2015). Lastly, this research indicates that motivation for firearms ownership may be an additional construct relevant to suicide risk and worthy of further investigation and replication in both military and civilian populations.

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