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# Deployments, Combat Exposure, and Crime

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## Abstract

During the period 2001–9, four combat brigades and the Third Armored Cavalry Regiment were based at Fort Carson, Colorado. These units were repeatedly deployed during the Iraq War, which allows us to measure the effect of arguably exogenous changes in troop levels on violent crime in El Paso County, where Fort Carson is located. We find that never-deployed units contributed to community violence in the form of assaults, murders, rapes, and robberies. In contrast, estimates of the relationship between previously deployed units and violent crime are generally small and statistically insignificant at conventional levels. We interpret this pattern of results as evidence that never-deployed units represent a greater threat to public safety than units recently returned from combat.

I'm happier. I know I'm alive, and I'm home. There's no reason to be mad. (Spc. Michael Gillis, US Army National Guard [*Washington Post* 2006])

I get mad a lot. . . . I feel like fighting. Even if someone looks like he could beat me up, I don't care. (Cpl. Jose Rosales, US Marine Corps [*Washington Post* 2006])

## 1. Introduction

Although flagged for symptoms of mental illness by the US Army, Spc. Robert H. Marko was deployed in February 2007 to Iraq, where he served with the Second Brigade of the Second Infantry Division (2BCT-2ID). He returned to Fort Carson, Colorado, almost a year later convinced that he was transforming into “a true Black Raptor” able to kill “without mercy or reason.” On October 13, 2008,

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he admitted to raping and murdering Judilianna Lawrence, a local 19-year-old woman whom he had met online.<sup>1</sup>

The tragic killing of Lawrence was not an isolated incident. In the space of 4 years (2005–8), 10 soldiers from Fort Carson were charged by civilian authorities in connection with nine murders, and an 11th soldier from Fort Carson committed suicide after killing his wife (Henley and Roeder 2005; Olinger 2008).<sup>2</sup> The majority of these soldiers had been exposed to intense conflict while serving in Iraq, which led the media and prominent policy makers such as Senator Kenneth Salazar to question whether the units deployed from Fort Carson had been pushed too far (Mitchell 2008b; Luning 2009; Alvarez and Frosch 2009b).<sup>3</sup>

In theory, combat exposure could have either a positive or a negative effect on postdeployment violence. Exposure to combat is often described by mental health experts as triggering, or indirectly leading to, acts of violence committed on returning home (Killgore et al. 2008; Songtag and Alvarez 2008; Sreenivasan et al. 2013), but studies have found that exposure to adversity, including combat, can result in posttraumatic growth. Several features of posttraumatic growth (for example, increased compassion, self-discipline, resilience, and spirituality) could reduce the propensity to engage in violent behavior.<sup>4</sup>

A substantial proportion of American soldiers who saw combat in Iraq developed posttraumatic stress disorder (PTSD) and/or exhibited the symptoms of depression on returning home (Smith et al. 2008; Scioli, Otis, and Keane 2010). Although PTSD and depression are associated with domestic violence (Chaffin, Kelleher, and Hollenberg 1996; Galovskia and Lyons 2004), anger issues (Fava 1998; Jakupcak et al. 2007), substance use (Swendsen and Merikangas 2000; Mills et al. 2006), and arrest (Fazel and Danesh 2002; Elbogen et al. 2012), they can lead to withdrawal from social activities (Schnurr et al. 2009; Sharpley and Bitsika

<sup>1</sup> Our description of Marko's history and the murder of Lawrence is based on Benzel (2008), Frosch and Alvarez (2008), and Mitchell (2008a).

<sup>2</sup> A 12th Fort Carson soldier, Pvt. Timothy Parker, was convicted of involuntary manslaughter by a military court for beating Spc. Piotr Szczypka to death on November 11, 2005 (Huspeni 2006; Riley and Roeder 2009). Parker belonged to the Third Brigade of the Fourth Infantry Division (3BCT-4ID), based at Fort Carson.

<sup>3</sup> While the Fort Carson murders received more attention from the media and policy makers, soldiers from Forts Bragg, Campbell, Drum, and Riley were also charged in connection with high-profile violent crimes after returning from Iraq and Afghanistan (Main 2005; Milburn 2005; Collins 2009; Lowary 2010; Tang 2010; Kristof 2012).

<sup>4</sup> Studies that document posttraumatic growth include Elder and Clipp (1989), Fontana and Rosenheck (1998), Koenig, Pargament, and Nielsen (1998), McMillen and Cook (2003), Dohrenwend et al. (2004), Maguen et al. (2006), and Forstmeier et al. (2009). Park, Cohen, and Murch (1996), Tedeschi and Calhoun (1996), and Linley and Joseph (2004) review the concept of posttraumatic growth (also known as stress-related growth). According to Linley and Joseph (2004, p. 11): "Positive changes following adversity have long been recognized in philosophy, literature, and religion. . . . They have been reported empirically following chronic illness, heart attacks, breast cancer, bone marrow transplants, HIV and AIDS, rape and sexual assault, military combat, maritime disasters, plane crashes, tornadoes, shootings, bereavement, injury, recovery from substance addiction, and in the parents of children with disabilities. . . . It is through this process of struggling with adversity that changes may arise that propel the individual to a higher level of functioning than that which existed prior to the event. These positive changes have been labeled posttraumatic growth, stress-related growth . . . and positive adaptation."

2010), which potentially limits the opportunities to engage in violent behavior. In addition, PTSD has been linked to emotional numbing (Mason et al. 2001; Galovskia and Lyons 2004), while depression can cause fatigue and lower energy levels (Nestler et al. 2002; Nutt et al. 2007). Criminologists have argued that individuals suffering from depression may lack the requisite drive to engage in violent behavior (Agnew 1992; Mazerolle and Piquero 1997; Broidy 2001).

Economists have typically relied on draft lotteries to examine military service and criminal acts committed years or even decades after discharge (Rohlf 2010; Galiani, Rossi, and Schargrodsky 2011; Lindo and Stoecker 2014). In contrast, our interest is in the immediate impact of combat exposure on postdeployment violence. Exploiting a unique natural experiment, we draw on incident-level crime reports provided by Colorado Front Range police agencies for the period 2001–9. During this period, well over 100 US soldiers, many stationed at Fort Carson, were charged with murder after returning from Iraq or Afghanistan (Songtag and Alvarez 2008; Riley and Roeder 2009). Our empirical strategy is based on the premise that troop movements into and out of Fort Carson were exogenous, driven by events in Iraq and the recommendations of the 2005 Base Realignment and Closure (BRAC) Commission.

We find strong evidence that never-deployed combat units represent a threat to public safety. Increases in the number of never-deployed combat brigades at Fort Carson are associated with more reports of assault, murder, rape, and robbery in El Paso County, where Fort Carson is located. They are also associated with more arrests of 18–29-year-old males for violent crimes. In contrast, estimates of the relationship between previously deployed combat brigades and violent crime are generally small and statistically insignificant; the hypothesis that previously deployed brigades had the same effect on violent crime as never-deployed brigades is typically rejected at conventional levels. Although mental health experts often describe combat exposure as a trigger for postdeployment violence, these results suggest that never-deployed brigades at Fort Carson were a greater threat to public safety than brigades recently returned from combat.

## 2. Background

Fort Carson is located just a few miles south of Colorado Springs, a medium-sized city in El Paso County, Colorado, that was experiencing rapid population growth during the 2000s.<sup>5</sup> When the spate of murders involving Fort Carson soldiers occurred, residents of Colorado Springs were described as “shaken” and “outraged” (Frosch 2008; Smith 2009). Salazar asked for a review of the soldiers’ records (Mitchell 2008b), and the army responded by conducting a 3-month-long investigation focused on the 2BCT-2ID. Nine of the Fort Carson soldiers connected to the murders belonged to the 2BCT-2ID, which experienced heavy casualties during its two deployments to Iraq.

<sup>5</sup> Colorado Springs had a population of 360,890 according to the 2000 US census; its population had reached 416,427 by 2010. El Paso County had a population of 519,463 according to the 2000 US census; its population had reached 627,159 by 2010.

This investigation, the results of which were released in July 2009, found an association between combat exposure and violence. Noting that such an association was “consistent with recent research on combat exposure,” the investigation concluded that the “combination of multiple pre-existing personal risk factors in given individuals, combat intensity/exposure, and other unmeasured unit factors may have increased the risk of violent behavior” (US Army Center for Health Promotion and Preventive Medicine 2009, p. ES-3).<sup>6</sup>

A few months after these results were released, the armywide Comprehensive Soldier Fitness program (CSF) was launched (Hames 2009; Millerodgers 2010; Horgan 2011). The goal of the CFS is to help soldiers cope with the stresses involved with military service by fostering resilience and “providing Soldiers skills needed to take care of themselves, their families, and their peers” (Lester et al. 2011, p. 24). Fort Carson responded to the murders and subsequent investigation by developing the Embedded Behavioral Health (EBH) program (Fisher 2009; Carabajal 2011).<sup>7</sup> Under this program, EBH teams composed of one psychiatrist (or psychiatric nurse practitioner), psychologists, and social workers were tasked with providing counseling to troops deployed overseas and evaluating the mental health of returning soldiers (Carabajal 2011; Collins 2012; Sheehy 2012; Cho-Stutler 2013). Since their debut at Fort Carson in 2009, EBH teams have been established at Forts Bliss, Campbell, Drum, Hood, and Knox (Ingram 2009b; Carabajal 2011; Rose 2012; Block 2013; Grey 2013; KVEU.com 2013). The army is requiring that all combat brigades incorporate EBH teams by 2016 (Collins 2012; Holley 2013).

At the outset of the Iraq War, Fort Carson was home to the Third Armored Cavalry Regiment (3ACR) and the Third Brigade of the Fourth Infantry Division (3BCT-4ID).<sup>8</sup> These were among the first army units to be deployed to Iraq, and

<sup>6</sup> The US Army Center for Health Promotion and Preventive Medicine (2009, pp. 11–12) reached this conclusion by comparing the personnel records of soldiers from the Second Brigade of the Second Infantry Division (2BCT-4ID) with those of soldiers from the 3BCT-4ID, also based at Fort Carson. Soldiers from the 2BCT-4ID were more likely to have been diagnosed with an anxiety disorder such as posttraumatic stress disorder (PTSD) and were more likely to have tested positive for an illegal drug than were soldiers from the 3BCT-4ID. Citing previous research (Elbogen and Johnson 2009), the US Army Center for Health Promotion and Preventive Medicine (2009, pp. 11–12) went on to note that both substance use and anxiety disorders are risk factors for aggressive behavior.

<sup>7</sup> Fort Carson also established the Courtesy Patrol program, under which military officers patrol the streets of downtown Colorado Springs on Friday and Saturday nights, encouraging off-duty soldiers to act responsibly (Cantrell 2011; Ingram 2012). Civilian authorities responded to the series of murders involving Fort Carson soldiers by establishing the El Paso County Veteran Trauma Court, a jail-diversion program for veterans with trauma-related disorders or substance abuse problems (Warner 2010; Benzel 2011; Werthmann 2012).

<sup>8</sup> In addition to the Third Armored Cavalry Regiment (3ACR) and the 3BCT-4ID, the 10th Special Forces Group (Airborne), composed of approximately 1,000 soldiers, was stationed at Fort Carson when the Iraq War began. Its repeated deployments to Iraq and Afghanistan were kept secret (Roeder 2004b). The Third Battalion of the 10th Special Forces Group (Airborne), composed of approximately 400 soldiers, was activated at Fort Carson on August 19, 2010. Noncombat units stationed at Fort Carson at the outset of the Iraq War included the Fourth Engineer Battalion, the 43d Area Support Group, the 10th Combat Support Hospital, the 759th Military Police Battalion, the 13th Air Support Operations Squadron, and the Headquarters Company of the Seventh Infantry Division. The 71st Ordnance Group was activated at Fort Carson on October 16, 2005. Approxi-

both conducted combat operations through the remainder of 2003 and into 2004 (Ricks 2006; US Department of Defense 2007; Roeder 2013).

The 3ACR was deployed to Iraq once more before being permanently relocated to Fort Hood on the basis of the recommendations of the 2005 BRAC Commission.<sup>9</sup> When the 3ACR was relocated to Fort Hood, its aviation element stayed at Fort Carson, reflagged as the First Squadron, Sixth Cavalry (1-6 CAV).<sup>10</sup> The 3BCT-4ID was deployed two more times during the period under study. Its third deployment was unexpectedly extended to 15 months after President George W. Bush announced the so-called surge in US troops (Vanden Brook and Michaels 2007; Tyson and White 2007).

On the basis of the recommendations of the 2005 BRAC Commission, three additional combat brigades were reassigned to Fort Carson during the period under study (Robson 2004; Slevin 2005; Lorge 2007).<sup>11</sup> The 2BCT-2ID arrived in July 2005 after spending 1 year in Iraq, the Second Brigade of the Fourth Infantry Division (2BCT-4ID) arrived from Fort Hood in June 2007, and the First Brigade of the Fourth Infantry Division (1BCT-4ID) arrived from Fort Hood in July 2009. The 2BCT-2ID was deployed to Iraq in October 2006, reflagged as the Fourth Brigade of the Fourth Infantry Division in April 2008, and deployed to Afghanistan in May 2009. The 2BCT-4ID was deployed to Iraq in August 2008.

### 3. Previous Studies

No previous study has examined whether troop movements such as those described above are related to the number of crimes reported to local law enforcement authorities. Medical researchers have documented an association between being exposed to combat in Iraq or Afghanistan and postdeployment violence (MacManus et al. 2012, 2013). However, they measured combat exposure using military occupation (for example, whether a soldier was assigned to an infantry or logistics unit), which is likely to be correlated with factors such as personal-

mately 300 Colorado National Guard soldiers belonging to the Second Battalion of the 135th Aviation Regiment, headquartered at Buckley Air Force Base, were deployed to Iraq from August 2006 through August 2007. In addition, support personnel and approximately 30 pilots belonging to the 120th Fighter Squadron of the Colorado Air National Guard at Buckley Air Force Base were repeatedly deployed to Iraq during the period under study. Buckley Air Force Base is located in Aurora, Colorado. Excluding crime reports from the Aurora Police Department has very little impact on the estimates discussed here.

<sup>9</sup> The 2005 Base Realignment and Closure Commission recommended closing 22 major US military bases and realigning 33 other military bases (Gonzales 2009). The commission's recommendations went into effect on November 9, 2005, after Congress failed to pass a joint resolution of disapproval (Miles 2005).

<sup>10</sup> Composed of approximately 380 soldiers, the First Squadron, Sixth Cavalry (1-6 CAV) was deployed to Iraq in August 2007. It was permanently relocated from Fort Carson to Fort Riley in June 2009, replaced by the First Battalion, Second Aviation Regiment, Second Infantry Division (1-2 AVN). The 1-2 AVN arrived at Fort Carson from Camp Eagle, South Korea, in April 2009.

<sup>11</sup> Anderson and Rees (2013, app. B) provides more information about the combat units stationed at Fort Carson during the period 2001–9, including deployment dates. Deployment dates were gathered from a wide variety of sources including the following: *Army News*, the *Colorado Springs Gazette*, the *Denver Post*, the *Fort Carson Mountaineer*, the *Killeen Daily Herald*, and the *Laredo Morning Times*.

ity and test scores (Zeidner, Scholarios, and Johnson 2001; Ball and Peake 2006; MacLean and Parsons 2010).<sup>12</sup>

Economists have adopted more credible identification strategies based on draft lottery outcomes (Rohlf's 2010; Galiani, Rossi, and Schargrodsky 2011; Albæk et al. 2013; Siminski, Ville, and Paull 2013; Lindo and Stoecker 2014). Their focus, however, is on the relationship between military service and crimes committed after discharge.<sup>13</sup> Moreover, their results are mixed. For instance, Galiani, Rossi, and Schargrodsky (2011) find that service in the Argentine military increased the likelihood of being prosecuted for or convicted of committing a property crime but had no impact on the likelihood of being prosecuted for or convicted of committing a violent crime; Lindo and Stoecker (2014) find that service in the US military during the Vietnam War decreased the likelihood of incarceration for nonviolent crime but increased the likelihood of incarceration for violent crime.<sup>14</sup>

In addition to exploiting a unique natural experiment, the current study differs from the previous work by economists on military service and crime in at least three important respects. First, we are able to assess the immediate impact of troops returning home from combat. Instead of relying on arrest or incarceration records from years or even decades after service, we observe monthly crime and arrest data before, during, and after overseas deployments.

Second, previous studies by economists have typically estimated the effects of military service *per se*, but the number of people who serve in the military greatly exceeds the number who see combat (Siminski, Ville, and Paull 2013). In contrast, our focus is on combat units that saw action in Iraq during the period under study. Using unit-specific information on fatalities suffered in Iraq, we are able to explore the relationship between combat intensity and postdeployment violence. To our knowledge, no previous study has used unit-specific information on fatalities to examine the effect of combat intensity on crime.

Last, our results are likely to be more relevant to current policy formation than results based on data pertaining to Vietnam War veterans. Perhaps the most obvious difference between soldiers who served in Iraq and those who served in Vietnam is that the former were volunteers whereas a substantial portion of the latter were draftees. While tour lengths for the US Army were roughly equal during the Iraq War and the Vietnam War, the vast majority of troops in Vietnam served

<sup>12</sup> Other studies in the medical literature that document a positive, but potentially spurious, association between combat exposure and violent behavior include Elbogen et al. (2012, 2013).

<sup>13</sup> Economists have also used the Vietnam-era draft lottery to study the effects of military service on earnings (Angrist 1990; Angrist and Chen 2007), disability status (Angrist and Chen 2007), health and mortality (Angrist and Chen 2007; Dobkin and Shabani 2009; Conley and Heerwig 2012), and household stability (Conley and Heerwig 2011).

<sup>14</sup> Using draft lottery outcomes as an instrument, Siminski, Ville, and Paull (2013) examine a sample of Australian men between 41 and 65 years of age. They find no evidence that military service was related to violent crime. Using a similar empirical approach, Albæk et al. (2013) find that peacetime service in the Danish military had no impact on the likelihood of being arrested for a violent crime. Rohlf's (2010) analyzes data from the National Vietnam Veterans Readjustment Study. He finds evidence that self-reported exposure to combat in Vietnam was associated with more violent crime among blacks. Among whites, estimates of the relationship between combat exposure and violent crime were positive but not statistically significant.



single, yearlong deployments. Repeated deployments were much more common among American troops during the Iraq War, and many soldiers spent 3–4 cumulative years at war (Zoroya 2010). In addition, US soldiers faced radically different threats and combat environments during the two wars.<sup>15</sup>

#### 4. Troop Levels and Crime

We obtained information on crimes reported to Colorado Front Range police agencies from incident-level files for 2001–9 compiled by the National Incident-Based Reporting System (NIBRS), administered by the Federal Bureau of Investigation and made available by the Inter-university Consortium for Political and Social Research (ICPSR).<sup>16</sup> These data include information on the type of offense and where and when the crime took place. One advantage to using the incident-level files is that they include information on all offenses reported as opposed to only those that ended in arrests. Because we are interested in relatively rare events such as murder and rape, the distinction between reported crimes and arrests is potentially important.

Twenty-one Colorado Front Range police agencies provided data to the NIBRS during the period 2001–9.<sup>17</sup> Several of these agencies (including the Arapahoe County Sheriff's Office, the Aurora Police Department, the Colorado Springs Police Department, the El Paso County Sheriff's Office, and the Jefferson County Sheriff's Office) had jurisdiction over communities with more than 100,000 residents. Unfortunately, the Denver Police Department did not provide data to the NIBRS during the period under study.

The Colorado Springs Police Department and the El Paso County Sheriff's Office routinely interact with, and arrest, soldiers from Fort Carson (Huspeni and Roeder 2007; Knight Ridder 2007; Olinger 2008; Philipps 2009; Warner 2010). The other 19 Colorado Front Range police agencies that provided data to the NIBRS during the period under study are located outside of El Paso County and

<sup>15</sup> In Vietnam, US forces faced a well-defined threat in the Vietcong and North Vietnamese Army, while US forces in Iraq faced an unorganized, "mixed-bag" insurgency (Akers 2011, p. 2). Carpenter (2007, p. 21) describes the conflict in Iraq as resembling a "Hobbesian struggle of all against all rather than the kind of conventional insurgency the United States encountered in Vietnam." While the loss of life was greater in Vietnam, the enemy in Iraq is described as crueler, with a penchant for execution instead of taking prisoners (Komarow 2005).

<sup>16</sup> National Archive of Criminal Justice Data, National Incident-Based Reporting System Resource Guide (<http://www.icpsr.umich.edu/icpsrweb/NACJD/NIBRS>).

<sup>17</sup> The Colorado Front Range extends north from Pueblo to Fort Collins along Interstate Highway 25 and includes the Denver-Aurora-Lakewood metropolitan statistical area (MSA) and the Colorado Springs MSA. The 21 police agencies that contributed data to the analysis are the Adams County Sheriff's Office, the Arapahoe County Sheriff's Office, the Aurora Police Department, the Berthoud Police Department, the Broomfield Police Department, the Centennial Police Department, the Colorado Springs Police Department, the Commerce City Police Department, the Eaton Police Department, the El Paso County Sheriff's Office, the Erie Police Department, the Glendale Police Department, the Golden Police Department, the Greenwood Village Police Department, the Jefferson County Sheriff's Office, the Lakewood Police Department, the Larimer County Sheriff's Office, the Northglenn Police Department, the Parker Police Department, the Sheridan Police Department, and the Wheat Ridge Police Department.



are considered untreated. That is, we assume that troop movements into and out of Fort Carson had no effect on crime in the communities over which these 19 agencies had jurisdiction.<sup>18</sup>

Figure 1 shows the number of combat brigades at Fort Carson over the period 2001–9. The largest changes in troop levels correspond to the 13-month deployments of the 3ACR and the 3BCT-4ID when the Iraq War began. The 3BCT-4ID was composed of approximately 3,500 soldiers, the standard size of a US Army combat brigade (Slevin 2005; Foster 2006; Benzel 2010). Because the 3ACR was composed of approximately 5,200 soldiers (Finley 2005; Roeder 2013), its 2003 deployment corresponds to a 1.5-brigade decrease, and its return to Fort Carson in April 2004 corresponds to a 1.5-brigade increase.

After April 2004, the number of combat brigades at Fort Carson did not fall below one. Nevertheless, there was still considerable variation in troop levels resulting from overseas deployments and the restationing of brigades according to the recommendations of the 2005 BRAC Commission. This variation can be thought of as exogenous. As noted by previous researchers, operational needs and world events determine where US Army units are stationed and when they are deployed (Lyle 2006; Engel, Gallagher, and Lyle 2010; Cesur, Sabia, and Tekin 2013).

Figure 2 plots the natural log of violent crimes reported in month  $t$  to the El Paso County Sheriff's Office against the number of combat brigades stationed at Fort Carson but not deployed overseas. The solid line is from an ordinary least squares regression of violent crimes on troop levels. An additional combat brigade at Fort Carson is associated with a 6.3 percent increase in violent crimes reported to the El Paso County Sheriff's Office ( $e^{.0613} - 1 = .063$ ).

Figure 3 plots violent crimes reported to the Colorado Springs Police Department against the number of combat brigades stationed at Fort Carson but not deployed overseas. Again, the solid line is from a simple bivariate regression. An additional combat brigade at Fort Carson is associated with a 2.5 percent increase in violent crimes reported to the Colorado Springs Police Department.

Figures 2 and 3 provide descriptive evidence consistent with the hypothesis that Fort Carson soldiers directly contributed to community violence, but there

<sup>18</sup> The portion of Fort Carson located within El Paso County forms a census-designated place with a 2010 population of 13,339. Covering an area of more than 500 square miles, Fort Carson extends into unincorporated Pueblo County and unincorporated Fremont County. The population living on base is not under the jurisdiction of the Colorado Springs Police Department or the El Paso County Sheriff's Office. The resort town of Manitou Springs, located in El Paso County, is only 13 miles from Fort Carson. Grouping crime reports from the Manitou Springs Police Department with those from the Colorado Springs Police Department and the El Paso County Sheriff's Office did not have an appreciable impact on the estimates discussed here. Although Fountain, Colorado, is located in El Paso County, we do not use crime reports from the Fountain Police Department in the analysis because they were available for only a limited number of years. The nearest untreated Front Range community for which we have data is Parker, located approximately 50 miles from Fort Carson. Archived issues of the *Parker Chronicle*, the local newspaper, contain no accounts of Fort Carson soldiers committing violent crimes in or around Parker. There are newspaper accounts of Fort Carson soldiers committing violent crimes in Pueblo County (Rappold 2005; Riley and Roeder 2009), but the Pueblo County Sheriff's Office did not provide data to the National Incident-Based Reporting System (NIBRS) during the period under study, and the Pueblo Police Department provided data for only 2009.

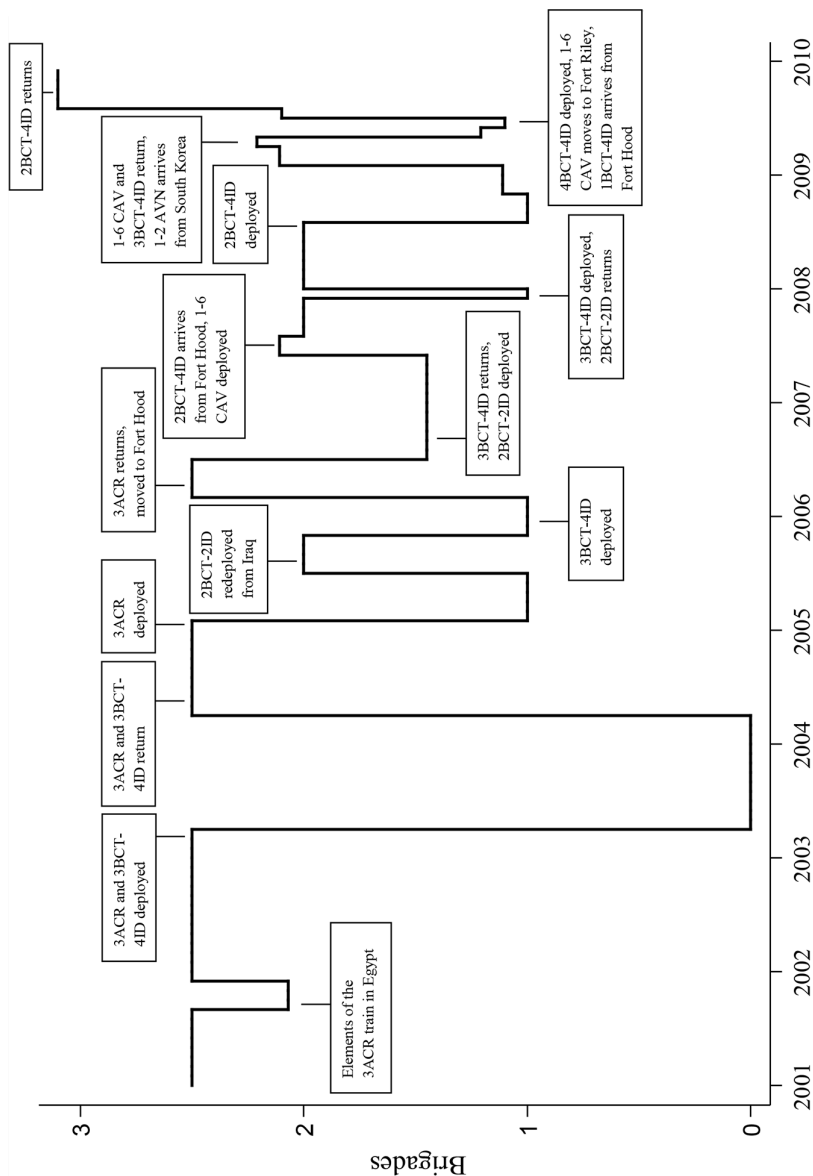
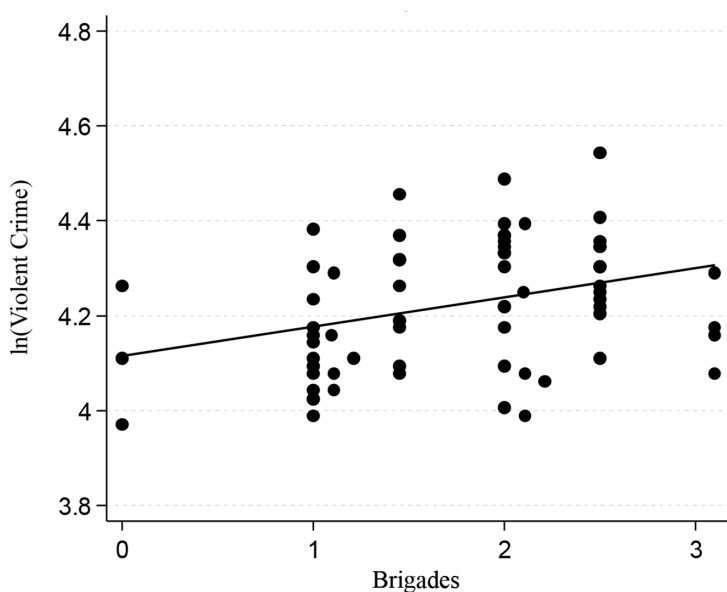


Figure 1. Number of combat brigades at Fort Carson, 2001–9



are at least two alternative explanations that merit exploration. First, it is possible that economic activity mediates the relationship between troop levels and violent crime. Soldiers clearly contribute to local economic activity (Hooker and Knetter 2001; Poppert and Herzog 2003), and their extended overseas deployments could have forced civilian residents of El Paso County to turn to illicit sources of income (for example, theft or robbery). Second, it is possible that the number of combat brigades stationed at Fort Carson tracked secular crime trends. We can rule out these alternative explanations by estimating a Poisson regression in which crime is related to troop movements into and out of Fort Carson by the following equation:

$$\ln \lambda_{jt} = \alpha_0 + \alpha_1 \text{Brigades}_{jt} + \mathbf{X}_{jt} \boldsymbol{\beta} + \nu_j, \quad (1)$$

where  $\lambda_{jt}$  represents the expected number of offenses in agency  $j$  and month  $t$ .<sup>19</sup> The independent variable of interest is  $\text{Brigades}_{jt}$ , which is equal to zero for the 19 untreated police agencies. For the treated agencies (the Colorado Springs Police Department and the El Paso County Sheriff's Office),  $\text{Brigades}_{jt}$  is equal to the number of combat brigades based at Fort Carson but not deployed overseas in month  $t$ . The vector of controls  $\mathbf{X}_{jt}$  includes 8-year indicators, 11-month indicators, the county unemployment rate, and the natural log of the population over which agency  $j$  had jurisdiction;<sup>20</sup> the inclusion of agency fixed effects  $\nu_j$  ensures that our estimates of  $\alpha_1$  are identified using within-agency variation. Equation (1) can be augmented with agency-specific linear time trends to account for smoothly evolving crime trends at the community level.

Table 1 presents estimates of equation (1). Standard errors are corrected for clustering at the county-year level.<sup>21</sup> Although not shown, controls for the county unemployment rate and agency population are included.

The baseline specification suggests that a one-brigade increase in troop levels at Fort Carson is associated with a 2.4 percent increase in violent crime. Adding agency-specific linear time trends does not have an appreciable impact on this estimate, although it does become more precise. There is no evidence of a

<sup>19</sup> See Cameron and Trivedi (1986) and Grootendorst (2002) for descriptions of the Poisson regression model. As noted by Card and Dahl (2011), an advantage of the Poisson regression model is that including fixed effects does not lead to an incidental parameters problem. Table A1 provides descriptive statistics for the variables used in the analysis.

<sup>20</sup> There is evidence that economic conditions and time of year are important predictors of crime (Raphael and Winter-Ebmer 2001; Gould, Weinberg, and Mustard 2002; Jacob, Lefgren, and Moretti 2007; McDowall, Loftin, and Pate 2012).

<sup>21</sup> Correcting for clustering at the agency level produces results similar to those reported. We also experimented with clustering the standard errors at the county level. Because one regressor (unemployment) varied at the county level, and nine Colorado Front Range counties contributed data to the analysis, we used critical values from a  $t_{G-K-1}$  distribution, where  $G$  is 9 and  $K$  is 1 (Cohen and Dupas 2010). The results were similar to those reported below. We can test the assumption that troop movements into and out of Fort Carson had no effect on crime in the communities over which the 19 control agencies had jurisdiction by estimating  $\ln \lambda_{jt} = \beta_0 + \beta_1 N_t + \beta_2 N_{jt} T_j + \mathbf{X}_{jt} \boldsymbol{\beta}_3 + \nu_j$ , where  $N_t$  is equal to the number of combat brigades at Fort Carson in month  $t$  and the treatment indicator  $T_j$  is equal to one for the treated agencies (the Colorado Springs Police Department and the El Paso County Sheriff's Office) and zero for the control agencies. Consistent with the assumption that troop levels at Fort Carson had no effect on violent crime outside of El Paso County, estimates of  $\beta_1$  were small and statistically insignificant. Estimates of  $\beta_2$  were similar to those reported in Table 1.

Table 1  
Troop Levels at Fort Carson and Crime

	Violent Crime by Type									
	Violent Crime	Violent Crime	Property Crime	Property Crime	Property Crime	Murder	Robbery	Rape	Aggravated Assault	Simple Assault
Brigades	.0242+ (.0140)	.0245* (.0119)	.0014 (.0142)	.0076 (.0059)		-.0007 (.0349)	.0488* (.0202)	.0356 (.0298)	.0361* (.0167)	.0128 (.0113)
All agencies	62.72	62.72	361.3	361.3		.1492	6.256	4.143	14.29	37.80
Colorado Springs Police Department	322.5	322.5	2,006	2,006		.6667	40.01	23.82	81.68	175.6
El Paso County Sheriff's Office	68.40	68.40	323.3	323.3		.2222	2.194	5.222	56.31	4.444
Agency-specific linear time trends	No	Yes	No	Yes		Yes	Yes	Yes	Yes	Yes

Note. The estimated relationship between combat brigades at Fort Carson and murders is from an ordinary least squares regression. All other estimated coefficients are from Poisson regressions. Data on crime reports at the agency-month level are from the National Incident-Based Reporting System and cover the period 2001–9. Property crimes include arson, burglary, larceny, motor vehicle theft, stolen property, and vandalism. Controls include 8-year indicators, 11-month indicators, 20 agency indicators, the natural log of the agency population, and the county unemployment rate. Standard errors (in parentheses) are corrected for clustering at the county-year level.  $N = 2,192$ .

+ Statistically significant at the 10% level.

\* Statistically significant at the 5% level.

relationship between the number of combat brigades at Fort Carson and property crimes reported to the Colorado Springs Police Department and the El Paso County Sheriff's Office.

When violent crimes are decomposed, we find that an additional combat brigade is associated with a 5 percent increase in robberies and a 3.7 percent increase in aggravated assaults.<sup>22</sup> These estimates suggest that the typical Fort Carson soldier was more prone to violence than the residents of communities over which the El Paso County Sheriff's Office and the Colorado Springs Police Department have jurisdiction. As noted above, a standard US Army combat brigade consists of approximately 3,500 soldiers, or slightly more than .5 percent of the combined population of the treated agencies, while a one-brigade increase in troop levels is associated with a 2.4 percent increase in the total number of violent crimes and even larger increases in robberies and aggravated assaults.<sup>23</sup>

As a test of whether troop movements into and out of Fort Carson can be thought of as exogenous, we experimented with adding leads of  $\text{Brigades}_{jt}$  to the right-hand side of equation (1). The results of this exercise are reported in Table 2. Adding leads of 1 to 12 months has very little impact on the estimated relationship between troop levels and violent crime. Moreover, these leads are never significant at conventional levels.<sup>24</sup>

## 5. Exposure to Combat and Crime

Our primary interest is in the relationship between combat exposure and violent crime. To explore this relationship, we estimate the following equation:

$$\begin{aligned} \ln \lambda_{jt} = & \alpha_0 + \alpha_1 (\text{Never-Deployed Brigades}_{jt}) \\ & + \alpha_2 (\text{Brigades Returned} > 6 \text{ Months}_{jt}) \\ & + \alpha_3 (\text{Brigades Returned} \leq 6 \text{ Months}_{jt}) + \mathbf{X}_{jt} \beta + \nu_j + \Theta_j t, \end{aligned} \quad (2)$$

<sup>22</sup> The estimated relationship between  $\text{Brigades}_{jt}$  and reported rapes, although positive, is not statistically significant at conventional levels. Similarly, the estimated relationship between  $\text{Brigades}_{jt}$  and simple assaults (defined as a weaponless assault in which the victim does not suffer severe bodily harm) is positive but not statistically significant. The estimated relationship between murder and  $\text{Brigades}_{jt}$  is from an ordinary least squares (OLS) regression. An additional brigade is associated with a .0007 reduction in the probability that a murder occurs. However, this estimate is not statistically significant at conventional levels.

<sup>23</sup> Because population estimates at the agency level from the NIBRS are not broken down by age or gender, and because information on the age distribution of Fort Carson personnel is unavailable, we cannot gauge whether soldiers at Fort Carson were more prone to violence than males of similar ages living in the communities over which the El Paso County Sheriff's Office and the Colorado Springs Police Department have jurisdiction.

<sup>24</sup> Other robustness checks included estimating equation (1) using OLS and as a negative binomial regression model. The estimated relationships between  $\text{Brigades}_{jt}$  and violent crime obtained using these approaches were similar to the baseline estimates presented in Table 1. Excluding observations from the El Paso County Sheriff's Office from the analysis resulted in a smaller estimate of  $\alpha_1$ : a one-brigade increase in troop levels at Fort Carson was associated with a statistically significant 2.1 percent increase in violent crime. When the Colorado Springs Police Department observations were excluded, an additional brigade was associated with a statistically significant 6.2 percent increase in violent crime. Estimates of  $\alpha_1$  were also robust to replacing the year and month fixed effects with month-year fixed effects and restricting the analysis to agencies with a population over 50,000.

Table 2  
Violent Crime before Deployments and Redeployments

	(1)	(2)	(3)	(4)	(5)	(6)
Brigades, 12-month lead						-.0094 (.0161)
Brigades, 9-month lead					-.0071 (.0165)	-.0037 (.0116)
Brigades, 6-month lead				.0071 (.0095)	.0102 (.0082)	.0100 (.0080)
Brigades, 3-month lead			.0194 (.0142)	.0156 (.0137)	.0153 (.0134)	.0168 (.0137)
Brigades, 2-month lead		.0045 (.0129)	-.0118 (.0174)	-.0108 (.0162)	-.0110 (.0162)	-.0112 (.0165)
Brigades, 1-month lead	-.0065 (.0091)	-.0104 (.0118)	-.0097 (.0122)	-.0098 (.0121)	-.0090 (.0120)	-.0107 (.0113)
Brigades	.0296* (.0135)	.0301* (.0132)	.0317* (.0125)	.0317** (.0119)	.0303* (.0119)	.0279* (.0118)

**Note.** Estimated coefficients are from Poisson regressions. Data on crime reports at the agency-month level are from the National Incident-Based Reporting System and cover the period 2001–9. Controls include 8-year indicators, 11-month indicators, 20 agency indicators, agency-specific linear time trends, the natural log of the agency population, and the county unemployment rate. Standard errors (in parentheses) are corrected for clustering at the county-year level.  $N = 2,192$ .

\* Statistically significant at the 5% level.  
\*\* Statistically significant at the 1% level.

where, for the treated agencies,  $\text{Never-Deployed Brigades}_{it}$  is equal to the number of combat brigades at Fort Carson that had not been deployed to Iraq prior to month  $t$ ,  $\text{Brigades Returned} > 6 \text{ Months}_{it}$  is equal to the number of previously deployed combat brigades at Fort Carson that had not returned from overseas in the past 6 months, and  $\text{Brigades Returned} \leq 6 \text{ Months}_{it}$  is equal to the number of previously deployed combat brigades at Fort Carson that had returned from overseas in the past 6 months.<sup>25</sup> For the 19 untreated police agencies,  $\text{Never-Deployed Brigades}_{it}$ ,  $\text{Brigades Returned} > 6 \text{ Months}_{it}$ , and  $\text{Brigades Returned} \leq 6 \text{ Months}_{it}$  are always equal to zero. Agency-specific linear time trends are represented by  $\Theta_{jt}$ . If combat exposure leads to postdeployment violence, then estimates of  $\alpha_2$  and  $\alpha_3$  should be larger than estimates of  $\alpha_1$ .

Table 3 reports estimates of equation (2). The estimates suggest that the association between troop levels and violent crime documented in Table 1 is almost entirely driven by never-deployed combat units. An additional never-deployed brigade at Fort Carson is associated with a .103 increase in the probability that a murder occurs, a 13.9 percent increase in robberies, an 8.6 percent increase in rapes, and an 8.4 percent increase in aggravated assaults. In contrast, regardless of when they returned from Iraq, previously deployed brigades do not appear to have contributed to community violence. Estimates of  $\alpha_2$  and  $\alpha_3$  are considerably smaller than the corresponding estimates of  $\alpha_1$  and are (with one exception) statistically insignificant;<sup>26</sup> the hypothesis that previously deployed brigades

<sup>25</sup> Figures A1–A3 show the variation over time in  $\text{Never-Deployed Brigades}_{it}$ ,  $\text{Brigades Returned} > 6 \text{ Months}_{it}$ , and  $\text{Brigades Returned} \leq 6 \text{ Months}_{it}$ .

<sup>26</sup> In general, we cannot reject the hypothesis that  $\alpha_2 = \alpha_3 = 0$ ; it is rejected only in the case of rape.



had the same effect on violent crime as never-deployed brigades ( $\alpha_1 = \alpha_2$  or  $\alpha_1 = \alpha_3$ ) is rejected at conventional levels except when the outcome is rape or simple assault.<sup>27</sup> Increases in Brigades Returned > 6 Months<sub>*jt*</sub> are associated with fewer murders, which raises the possibility that experienced soldiers function as positive role models, instilling discipline and discouraging aggressive or violent behavior among never-deployed soldiers.<sup>28</sup>

## 6. Combat Intensity

To investigate the effects of combat intensity on postdeployment violence, we use data from the Iraq Coalition Casualty Count on the number of fatalities experienced by Fort Carson units while deployed. These data include information on the fallen soldier's military branch, unit, and date of death. Construction of the fatality counts required matching fatality reports with Fort Carson combat units (that is, the 3ACR, the 1BCT-4ID, the 2BCT-2ID, the 2BCT-4ID, and the 3BCT-4ID).<sup>29</sup> During the period under study, six deployments of Fort Carson combat units resulted in 17 or more fatalities.<sup>30</sup> Using 17 fatalities as a benchmark, we estimate the following equation:

$$\ln \lambda_{jt} = \alpha_0 + \alpha_1(\text{Never-Deployed Brigades}_{jt}) + \alpha_2(\text{Brigades 0-16 Fatalities}_{jt}) + \alpha_3(\text{Brigades} \geq 17 \text{ Fatalities}_{jt}) + \mathbf{X}_{jt}\beta + \nu_j + \Theta_j t, \quad (3)$$

where, for the treated agencies, Brigades 0–16 Fatalities<sub>*jt*</sub> is equal to the number of brigades at Fort Carson in month *t* that had experienced between 0 and 16 fatalities when they were last deployed, and Brigades ≥ 17 Fatalities<sub>*jt*</sub> is equal to the number of brigades at Fort Carson in month *t* that had experienced 17 or more

<sup>27</sup> In the case of rape, we fail to reject the hypothesis that  $\alpha_1 = \alpha_3$  (*p*-value = .101). We also estimated a modified version of equation (2) that distinguished between previously deployed brigades on the basis of whether they had returned from Iraq in the past 3, as opposed to 6, months. Army policies in effect during the Iraq War ensured that unit composition was stable for 3 months after a deployment. So-called stop-loss rules forced soldiers whose terms of service had expired to remain on active duty for 90 days after returning to the United States (Hess 2004; Squitieri 2004; Tice 2009). Stop-move rules prevented reassignments for 90 days after a unit returned (Squitieri 2004; Tice 2009). The results were similar to those presented in Table 3. Because soldiers were eligible for 30 days of leave on completing a 1-year deployment, and because mental health issues such as depression and PTSD often emerge several months after returning home (Bliese et al. 2007), we did not examine the relationship between the number of combat brigades that had been deployed in the previous 2 months and violent crime in El Paso County.

<sup>28</sup> In other words, the presence of previously deployed units could help socialize less experienced soldiers into what Katz (1990, p. 460) describes as the “organizational ethos” of the US Army. According to Katz (1990 p. 460), this ethos requires soldiers “to act in a highly disciplined, rigidly specified, and coordinated manner and to strictly control any individual behavior that is aggressive, angry or violent.”

<sup>29</sup> For example, Sgt. Denis Gallardo, who died on November 22, 2005, was assigned to Troop E, Second Squadron. Troop E, Second Squadron belonged to the 3ACR. To take another example, Cpl. Jason Pautsch, who died on April 10, 2009, was assigned to Company A, First Battalion, 67th Armor Regiment. Company A belonged to the 2BCT-4ID. These data are from iCasualties.org, Operation Iraqi Freedom (<http://icasualties.org/Iraq/Index.aspx>).

<sup>30</sup> The Fort Carson brigade combat teams deployed a total of 11 times during the period 2001–9. The 3ACR deployed twice before being permanently relocated to Fort Hood.

Table 3  
 Combat Exposure and Crime: Brigades Returned from a Deployment in the Past 6 Months

	Violent Crime	Property Crime	Violent Crime by Type			
			Murder	Robbery	Rape	Aggravated Assault
Never-Deployed Brigades	.0506** (.0123)	-.0033 (.0099)	.1031** (.0330)	.1298** (.0353)	.0825* (.0386)	.0806** (.0180)
Brigades Returned > 6 Months	.0022 (.0115)	.0208 (.0137)	-.0604* (.0302)	-.0120 (.0350)	-.0426 (.0340)	.0133 (.0195)
Brigades Returned ≤ 6 Months	.0026 (.0157)	.0148 (.0101)	-.0612 (.0443)	-.0267 (.0412)	.0264 (.0250)	.0059 (.0245)

Note. N = 2,192.

\* Statistically significant at the 5% level.

\*\* Statistically significant at the 1% level.

fatalities when they were last deployed. For the 19 untreated police agencies, the variables  $\text{Brigades } 0\text{--}16 \text{ Fatalities}_{jt}$  and  $\text{Brigades } \geq 17 \text{ Fatalities}_{jt}$  are always equal to zero. Again, if combat exposure leads to postdeployment violence, then estimates of  $\alpha_2$  and  $\alpha_3$  should be larger than estimates of  $\alpha_1$ .

Table 4 reports estimates of equation (3). The estimates provide little evidence that exposure to combat, even intense combat, leads to postdeployment violence: estimates of  $\alpha_2$  and  $\alpha_3$  are, with only one exception, considerably smaller than the corresponding estimates of  $\alpha_1$ ,<sup>31</sup> an additional brigade that experienced 0–16 fatalities when last deployed is associated with a 7.0 percent reduction in robberies.

## 7. Cumulative Exposure

Equation (2) can be modified to examine the effects of cumulative, as opposed to recent, exposure to combat. During the Iraq War, recruits typically committed to 4 years of active duty on joining the army (Moniz 2005). Reenlistment rates were between 35 and 50 percent after the first term of service (Hosek and Martorell 2009, p. 11), but Fort Carson units regularly exceeded their retention goals (Roeder 2004a; Egbert 2008; Ingram 2009a).<sup>32</sup> By the end of the war, a nontrivial proportion of soldiers at Fort Carson had deployed to Iraq with the same unit two or even three times (Emery and Olinger 2008; Alvarez and Frosch 2009a).

Given the relatively low turnover among soldiers serving with Fort Carson combat units, a natural modification of equation (2) is

$$\ln \lambda_{jt} = \alpha_0 + \alpha_1 (\text{Never-Deployed Brigades}_{jt}) + \alpha_2 (\text{Once-Deployed Brigades}_{jt}) + \alpha_3 (\text{Twice-Deployed Brigades}_{jt}) + \mathbf{X}_{jt} \beta + \nu_j + \Theta_j t, \quad (4)$$

where, for the treated agencies,  $\text{Once-Deployed Brigades}_{jt}$  is equal to the number of brigades at Fort Carson that had been deployed to Iraq once prior to month  $t$  and  $\text{Twice-Deployed Brigades}_{jt}$  is equal to the number of brigades at Fort Carson that had been deployed to Iraq two or more times.

Fort Carson soldiers who returned from Iraq and chose not to reenlist when their term of service expired were replaced by recruits who, on average, were of lower quality than prewar recruits.<sup>33</sup> Ninety percent of US Army recruits were

<sup>31</sup> The hypothesis that  $\alpha_2 = \alpha_1$  cannot be rejected in the case of simple assault. The hypothesis that  $\alpha_2 = \alpha_3 = 0$  is rejected when the outcome is either robbery or simple assault.

<sup>32</sup> In the fall of 2004, the army implemented a unit manning system, under which new recruits served for 3 years with the same brigade (Naylor 2004; Towell 2004). Reenlistment rates were between 60 and 80 percent after the second term of service (Hosek and Martorell 2009, p. 11). The annual retention rate of active soldiers in the US Army was between 82 and 87 percent (Congressional Budget Office 2006, p. 12).

<sup>33</sup> In addition to replacing soldiers whose 4-year term of service expired, brigades returning from Iraq had to replace soldiers killed in action and seriously injured soldiers, a process that could take up to 2 years (Philipps 2013). From 2001 to 2009, 7,626 soldiers were discharged from the US Army after being diagnosed with a personality disorder (Ader et al. 2012, p. 8). Although there is anecdotal evidence that many of these soldiers were suffering from PTSD or traumatic brain injury (Kors 2007), only 15 percent of military personnel discharged for personality disorders had been deployed to Afghanistan or Iraq (US House 2010). Eighty-five percent of personality-disorder discharges occurred in the first 2 years of service (US House 2010). From 2002 to 2007, a total of 3,372 service

Table 4  
Fatalities Suffered during Last Deployment and Crime

	Violent Crime	Property Crime	Violent Crime by Type				
			Murder	Robbery	Rape	Aggravated Assault	Simple Assault
Never-Deployed Brigades	.0513** (.0132)	-.0027 (.0101)	.1056** (.0273)	.1439** (.0386)	.0817+ (.0421)	.0845** (.0190)	.0177 (.0140)
Brigades 0–16 Fatalities	-.0004 (.0105)	.0137 (.0117)	-.0717 (.0470)	-.0727* (.0342)	.0042 (.0223)	-.0104 (.0180)	.0274* (.0122)
Brigades ≥ 17 Fatalities	.0054 (.0201)	.0200 (.0123)	-.0478 (.0443)	.0364 (.0488)	.0013 (.0316)	.0271 (.0288)	-.0222 (.0170)

Note.  $N = 2,192$ .

+ Statistically significant at the 10% level.

\* Statistically significant at the 5% level.

\*\* Statistically significant at the 1% level.

high school graduates at the outset of the Iraq War (Congressional Budget Office 2006, p. 6). By 2006, this figure had fallen to 82 percent, and one in five recruits entered the army under some type of waiver (Congressional Budget Office 2006, p. 6; Baldor 2012). Waivers were given for low aptitude scores, medical problems, past substance abuse, and criminal convictions including robbery and manslaughter (Baldor 2012).

Table 5 presents estimates of equation (4). Again, there is strong evidence that never-deployed units contributed to community violence. Estimates of  $\alpha_1$  are positive and (with two exceptions) statistically significant. Despite the relaxation of army recruitment standards over the course of the war, estimates of the relationship between once-deployed combat units at Fort Carson ( $\alpha_2$ ) and violent crime are significantly smaller than estimates of  $\alpha_1$  except in the case of simple assault. Estimates of  $\alpha_1$  and  $\alpha_3$  are statistically indistinguishable except in the case of murder, which leaves open the possibility that repeated (that is, two or more) deployments led to more violent crime in El Paso County.<sup>34</sup>

## 8. Evidence from Arrest Records

A disadvantage of examining crime reports is that they often do not contain information about the perpetrator, especially when the crime is unsolved. In this section we take advantage of the fact that all 21 of the Colorado Front Range police agencies that contributed data to the analysis of crime reports also provided data to the NIBRS with regard to arrests. The arrest data include information on the arresting agency, the date the arrest was made, the type of crime that was committed, and the age and gender of the offender. These data are available from the ICPSR for the period 2001–7.

Table 6 presents estimates of the relationship between troop levels at Fort Carson and arrests of males 18 years of age and older for violent crimes.<sup>35</sup> An ad-

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members were discharged from the US military for personality disorders after returning from a deployment in support of Operation Iraqi Freedom or Operation Enduring Freedom (US House 2010). This figure represents only .2 percent of the total number of personnel who served in Afghanistan or Iraq during the period 2002–7 (Hosek and Martorell 2009, p. 1).

<sup>34</sup> In general, we cannot reject the hypothesis that  $\alpha_2 = \alpha_3 = 0$ ; it is rejected only when the outcome is robbery. An additional twice-deployed brigade at Fort Carson is associated with a 7.4 percent increase in robberies. In comparison, an additional never-deployed brigade is associated with a 9.1 percent increase in robberies. An additional twice-deployed brigade is associated with a 6.2 percent increase in rapes, but this estimate is not statistically significant at convention levels. We also estimated the impact of cumulative fatalities suffered in Iraq during the period 2001–9 on violent crime. The results were broadly consistent with those reported in Table 4. That is, we found little evidence that intensity of combat was related to postdeployment violence.

<sup>35</sup> Our focus is on this age group because most 17-year-olds, although permitted to enlist with the written permission of their parents, were effectively barred from service because of the army's strong preference for high school graduates. Seventeen-year-old recruits would have spent at least 3 months in basic training before being assigned to Fort Carson (Schwartz and Mael 1990; Cavallaro 2007). According to Child Soldiers International (2004, 2008), less than 1 percent of recruits into the US armed forces were under the age of 18 after completing basic training. Until 2012, women were barred from serving in combat units such as the 3ACR, the 1-6 CAV, and the brigade combat teams (Lopez and Henning 2013). By 2016, all occupational specialties in these units will be open to women (Lopez and Henning 2013).

Table 5  
The Effect of Cumulative Deployments on Crime

	Violent Crime	Property Crime	Violent Crime by Type				
			Murder	Robbery	Rape	Aggravated Assault	Simple Assault
Never-Deployed Brigades	.0471** (.0125)	.0002 (.0134)	.1177** (.0292)	.0872** (.0259)	.0539 (.0394)	.0744** (.0191)	.0310+ (.0178)
Once-Deployed Brigades	.0004 (.0144)	.0187* (.0077)	-.0524 (.0318)	-.0492+ (.0269)	-.0152 (.0203)	.0044 (.0237)	.0064 (.0146)
Twice-Deployed Brigades	.0106 (.0177)	.0085 (.0277)	-.0905 (.0664)	.0718+ (.0429)	.0606 (.0375)	.0220 (.0241)	-.0178 (.0276)

Note.  $N = 2,192$ .

+ Statistically significant at the 10% level.

\* Statistically significant at the 5% level.

\*\* Statistically significant at the 1% level.

Table 6  
Combat Exposure and Arrests of Males for Violent Crime, by Age

	18–29	30–39	40+
Never-Deployed Brigades	.0526** (.0180)	.0278 (.0261)	–.0091 (.0189)
Deployed Brigades	.0067 (.0176)	.0275 (.0195)	–.0053 (.0215)
N	1,669	1,635	1,627

\*\* Statistically significant at the 1% level.

ditional never-deployed brigade at Fort Carson is associated with a 5.4 percent increase in arrests of 18–29-year-old males for violent crimes, but an additional previously deployed brigade is associated with a (statistically insignificant) .7 percent increase in such arrests.<sup>36</sup> Our principal interest is in the difference between these two estimates. Importantly, we can reject the hypothesis that this difference is 0 at conventional levels.<sup>37</sup>

## 9. Conclusion

During the period 2005–8, 10 soldiers from Fort Carson were charged by civilian authorities in connection with high-profile murders. Under pressure from the public and policy makers, the US Army responded by conducting a 3-month investigation focused on the 2BCT-2ID, which had experienced heavy casualties in Iraq. The investigation concluded that soldiers from this unit were especially prone to violent behavior as a result of having been exposed to intense combat in Iraq.

Authorities at Fort Carson responded to the murders and subsequent investigation by developing EBH teams composed of psychiatrists, psychologists, and social workers. These teams were tasked with providing counseling to soldiers in the field and evaluating their mental health upon returning. The army is committed to assigning EBH teams to all of its combat brigades by 2016.

The current study relies on troop movements into and out of Fort Carson during the period 2001–9 to estimate the relationship between combat exposure and postdeployment violence. Because operational needs and world events de-

<sup>36</sup> The variable  $\text{Deployed Brigades}_t$  is equal to the number of brigades at Fort Carson that had been deployed to Iraq at least once prior to month  $t$ . Although the results are not shown in Table 6, we also regressed arrests of women 18 years of age and older on troop levels at Fort Carson. This regression, which can be thought of as a falsification test, produced no evidence that troop movements into and out of Fort Carson were related to arrests of women for violent crimes.

<sup>37</sup> The advantage of examining arrests as opposed to crime reports is that we know the age and sex of the arrestee. Moreover, we can infer that the police viewed the arrestee as culpable. The disadvantage is that arrests are, at least in part, a function of policing effort. As a test of whether policing effort can explain our results, we regressed the number of sworn officers employed by agency  $j$  on troop levels at Fort Carson. Annual data on sworn police officers are from the Uniform Crime Reporting Program; see Federal Bureau of Investigation, UCR Publications (<http://www.fbi.gov/about-us/cjis/ucr/ucr-publications#Crime>) for the period 2001–9. Estimates of the relationship between troop levels and sworn police officers were generally small and statistically insignificant.



termine where US Army units are stationed and when they are deployed, these troop movements are arguably exogenous.

Using data from Colorado Front Range police agencies, we find a positive association between the number of never-deployed combat brigades at Fort Carson and reports of violent crime in El Paso County. For instance, an additional never-deployed combat brigade based at Fort Carson is associated with an 8.4 percent increase in aggravated assaults, an 8.6 percent increase in rapes, and a 13.9 percent increase in robberies. In contrast, estimates of the relationship between previously deployed combat brigades and violent crime in El Paso County are generally small and statistically insignificant at conventional levels. In fact, there is some evidence of a negative association between the number of previously deployed units at Fort Carson and violent crime. This negative association raises the possibility that experienced soldiers serve as role models, instilling discipline and discouraging aggressive behavior.

The disadvantage of examining crime reports is that they often do not contain information about the perpetrator. To address this shortcoming, we turn to arrest records and find that an additional never-deployed brigade at Fort Carson is associated with a 5.4 percent increase in arrests of 18–29-year-old males for violent crimes. In contrast, there is no evidence of a relationship between the number of previously deployed brigades at Fort Carson and arrests for violent crime. The hypothesis that previously deployed units had the same effect on arrests of 18–29-year-old males for violent crimes as never-deployed units is rejected at conventional levels.

The EBH program was built on the premise that combat exposure contributes to postdeployment violence. Providing psychological counseling to soldiers in the field through EBH teams may ultimately yield benefits. However, our results suggest that never-deployed units represent a greater threat to public safety than do units recently returned from combat.

# Appendix

## Supplementary Information

Table A1  
Descriptive Statistics for Independent Variables

Variable	Mean	Description
Brigades	.1468 (.5429)	Number of combat brigades at Fort Carson in month $t$
Never-Deployed Brigades	.0361 (.2741)	Number of combat brigades at Fort Carson that had not been deployed prior to month $t$
Brigades Returned > 6 Months	.0607 (.2848)	Number of previously deployed combat brigades at Fort Carson that had not returned from overseas in the past 6 months
Brigades Returned ≤ 6 Months	.0500 (.2752)	Number of previously deployed combat brigades at Fort Carson that had returned from overseas in the past 6 months
Brigades 0–16 Fatalities	.0509 (.2788)	Number of brigades at Fort Carson that had experienced up to 16 fatalities when last deployed
Brigades ≥ 17 Fatalities	.0598 (.2854)	Number of brigades at Fort Carson that had experienced 17 or more fatalities when last deployed
Once-Deployed Brigades	.0465 (.2912)	Number of brigades at Fort Carson that had been deployed once prior to month $t$
Twice-Deployed Brigades	.0642 (.3259)	Number of brigades at Fort Carson that had been deployed two or more times prior to month $t$
Population	10.50 (1.396)	Natural logarithm of agency population
Unemployment	5.257 (1.457)	County unemployment rate

**Sources.** Sources used to construct Brigades are given in Anderson and Rees (2013, app. B). Agency-level population data are provided by the National Incident-Based Reporting System. Unemployment data are from Bureau of Labor Statistics, Local Area Unemployment Statistics (<http://www.bls.gov/lau/>).  
**Note.** Standard deviations are in parentheses.

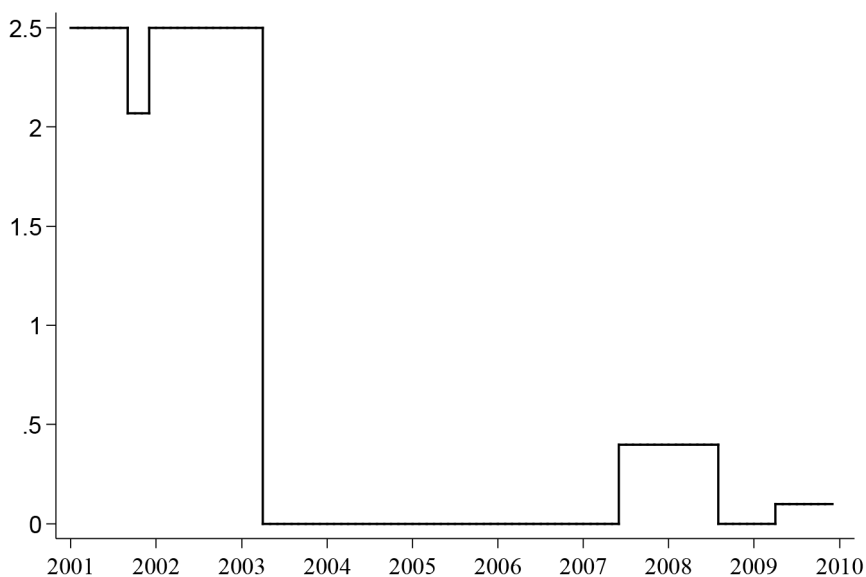


Figure A1. Variation in never-deployed brigades, 2001-9

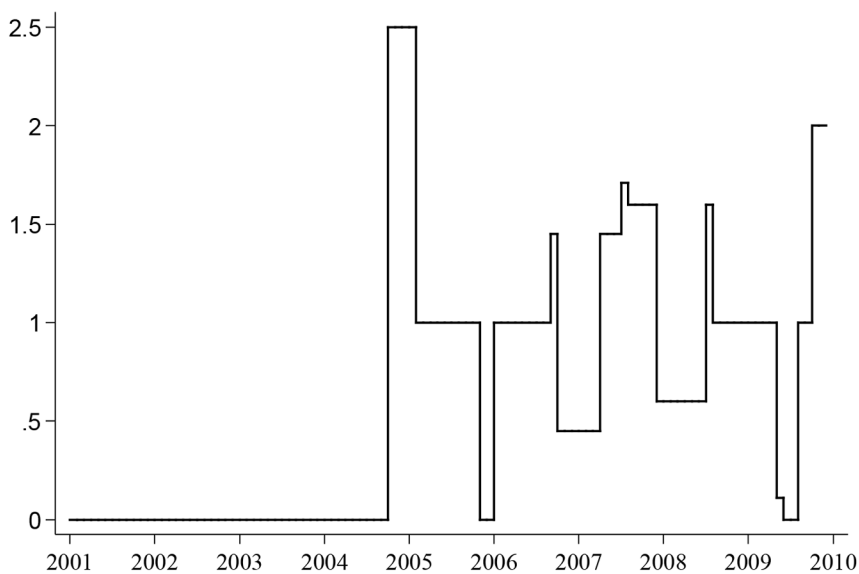


Figure A2. Variation in brigades returned > 6 months, 2001-9

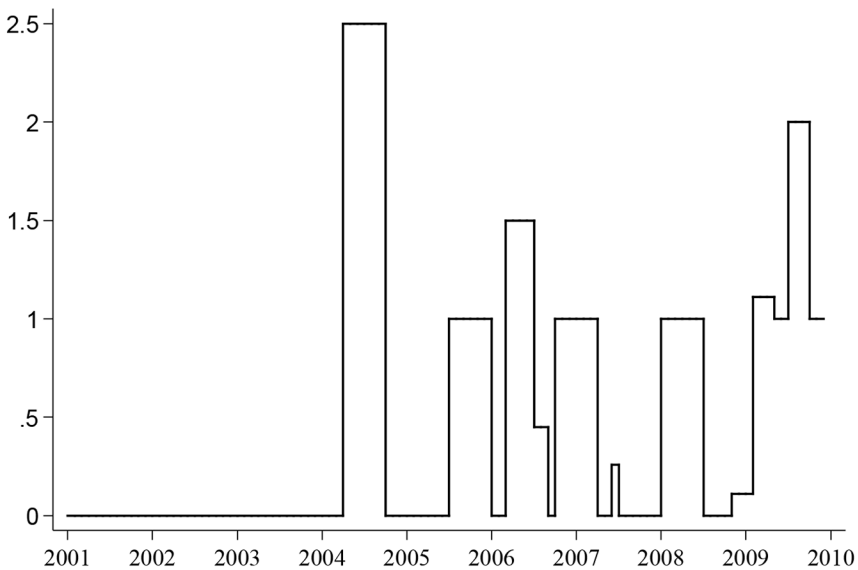


Figure A3. Variation in brigades returned  $\leq 6$  months, 2001–9

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