NATION BUILDING THROUGH FOREIGN INTERVENTION: EVIDENCE FROM DISCONTINUITIES IN MILITARY STRATEGIES[*]

MELISSA DELL AND PABLO QUERUBIN

This study uses discontinuities in U.S. strategies employed during the Vietnam War to estimate their causal impacts. It identifies the effects of bombing by exploiting rounding thresholds in an algorithm used to target air strikes. Bombing increased the military and political activities of the communist insurgency, weakened local governance, and reduced noncommunist civic engagement. The study also exploits a spatial discontinuity across neighboring military regions that pursued different counterinsurgency strategies. A strategy emphasizing overwhelming firepower plausibly increased insurgent attacks and worsened attitudes toward the U.S. and South Vietnamese government, relative to a more hearts-and-minds-oriented approach. *JEL Codes*: F35, F51, F52

> Never before did the people of Vietnam, from top to bottom, unite as they did during the years that the U.S. was bombing us. Never before had Chairman Ho Chi Minh's appeal—that there is nothing more precious than freedom and independence—gone straight to the hearts and minds of the Vietnamese people.
> —Tran Quang Co

> The solution in Vietnam is more bombs, more shells, more napalm.
> —General William DePuy

I. INTRODUCTION

Military interventions in weakly institutionalized societies were a central feature of the Cold War and continue through the present. These interventions consume significant resources and

may have important national security consequences for all countries involved. A variety of strategies have aimed to defeat insurgents and build states capable of monopolizing violence, ranging from the deployment of overwhelming firepower to initiatives to win hearts and minds through development aid. This study identifies the causal effects of key interventions employed during the Vietnam War by exploiting two distinct policy discontinuities: one varies the intensity of an overwhelming firepower approach—air strikes—and the other compares an overwhelming firepower approach to a more hearts-and-minds-oriented approach.

The overwhelming firepower approach can be summed up by the Vietnam-era adage: "get the people by the balls and their hearts and minds will follow" (Kodosky 2007, p. 175). Military strategy emphasized that overwhelming firepower could reduce insurgent forces, disrupt operations, and crush morale. According to General William DePuy: "The solution in Vietnam is more bombs, more shells, more napalm" (Sheehan 1988, p. 619). Civilian strategists advocated that coercion could also incentivize citizen compliance, with National Security Adviser Walt Rostow arguing that countering communism required "a ruthless projection to the peasantry that the central government intends to be the wave of the future" (Milne 2008, p. 88). In contrast, skeptics highlighted that insurgents were difficult to locate and that overwhelming firepower could backfire if civilians were hit instead. It could create grievances that inspired citizens to join the insurgency and could widen the political legitimacy gap between the insurgents and the South Vietnamese government. As James Scott (1985, 2009) argues, a coercion-oriented approach will be ill-suited to gaining cooperation if citizens have many ways to undermine a state they do not genuinely support.

Air strikes were a key component of overwhelming firepower, with the U.S. Air Force receiving over half of wartime appropriations and twice as many tons of explosives dropped as during World War II, about 500 pounds of ordnance per resident of South Vietnam (Thayer 1975). This study empirically estimates the impacts of bombing near civilian populations, a common occurrence: in our sample 21% of hamlet-month observations had ordnance dropped within 5 kilometers of the hamlet centroid. Outcome data on security, governance, civic engagement, and economics are drawn from armed forces administrative records, data compiled by a military-civilian pacification agency, and public opinion surveys.

This is a challenging question to examine because military forces may target places where insurgency is already on the rise, confounding simple correlations. Moreover, an unconditional random allocation, beyond being unfeasible and unethical, would likewise be uninformative, since military resources in practice are targeted to where they are believed to be most effective. The most informative estimation approach would be to exploit a source of plausibly random variation that influenced the allocation of military force at the margin, between places that had been deemed potential targets. We can closely approximate this empirical setup by exploiting a newly discovered algorithm component of bombing strategy that includes plausibly exogenous discontinuities. Declassified Air Force histories document that one of the factors used in allocating weekly preplanned bombing missions was hamlet security (Project CHECO 1969).[1] A Bayesian algorithm combined data from 169 questions on security, political, and economic characteristics into a single hamlet security rating. The output ranged continuously from 1 to 5 but was rounded to the nearest whole number before being printed from the mainframe computer.

The study estimates the causal impacts of overwhelming firepower by comparing places just below and above the rounding thresholds, with being below the threshold used as an instrument for bombing. Following score assignment, places that fall just below the cutoffs are significantly more likely to be bombed. There is no evidence that the hamlet-level score was used systematically for other resource allocations, including ground and naval troops, and hence it allows us to isolate the impacts of air strikes. Hamlets near the thresholds are similar prior to score assignment, indicating that places just above the thresholds are a good control group for those just below. Placebo checks document that there were no effects during a 1969 pilot, when the score was computed but not disseminated.

The estimates document that bombing near population centers undermined U.S. military objectives, leading more Vietnamese to participate in Viet Cong (VC) insurgent military and political activities. The initial deterioration in security entered the next quarter's security score, increasing the probability of future bombing. Moving from no strikes during the sample period to the sample average increased the probability that there was

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1. Other factors included goals in the military region, security of friendly forces, location of combat maneuver battalions, and enemy movements.

a village VC guerrilla squad—which consists of local fighters—by 27 percentage points, relative to a sample mean of 0.38. It also increased the probability that the VC infrastructure—the VC's political branch—was active by 25 percentage points and increased the probability of a VC-initiated attack on local security forces, government officials, or civilians by 9 percentage points. Public opinion surveys and armed forces administrative data show similar patterns, alleviating concerns that effects could be due to measurement error in a given data set. Qualitative evidence suggests that insurgents were difficult to identify and that hitting civilians instead generated grievances that increased insurgent support.

Impacts on places that were hit will not necessarily aggregate up to the overall impacts if bombing affects places beyond those directly hit. We find limited evidence that targeting one village affected security in nearby areas or within the same VC administrative district and to the extent spillovers exist they tend to go in the same direction as the direct effects. Moreover, the presence of impacts on local outcomes—such as the local guerrilla squad and the local VC infrastructure—indicates that the effects we estimate do not just reflect a reallocation of insurgent troops.

The broader U.S. objective in Vietnam was to create a state that would provide a bulwark against communism after U.S. withdrawal. The hope was that by signaling to the population that the government—and not communist rebels—were the main game in town, over time individuals would become more engaged with the state and noncommunist civil society. Some strategists also argued that bombing the countryside would lead to mass migration to cities, where citizens could be more easily controlled. In contrast, we show that bombing weakened local government and noncommunist civic society, while generating at most limited out migration. Moving from zero to sample mean bombing during the conflict reduced the probability that the local government collected taxes by 25 percentage points. Bombing also decreased access to primary school by 16 percentage points and reduced participation in noncommunist civil society organizations by 13 percentage points. Qualitative evidence suggests that it widened the political legitimacy gap between the government and insurgents, potentially leading citizens to undermine the state in a variety of ways.

We also shed light on how the overwhelming firepower approach compares to a more hearts-and-minds-oriented strategy by exploiting a spatial regression discontinuity between Military

Corps Region I—commanded by the U.S. Marine Corps (USMC)—and Military Corps Region II—commanded by the U.S. Army. The marines emphasized providing security by embedding soldiers in communities and winning support through development programs (USMC 2009). Their approach was motivated by the view that "in small wars the goal is to gain decisive results with the least application of force . . . the end aim is the social, economic, and political development of the people" (USMC 1940). In contrast, the army relied on overwhelming firepower deployed through search-and-destroy raids (Krepinevich 1986; Long 2016). Although a number of factors could differ between the army and USMC, most differences appear to be relatively modest during the Vietnam War era, whereas counterinsurgency strategies are markedly different.

Comparisons of nearby hamlets on either side of the corps boundary paint a picture that is consistent with the bombing results. Specifically, regression discontinuity estimates document that public goods provision was higher on the USMC side of the boundary for targeted public goods. Moreover, hamlets just to the USMC side of the boundary were attacked less by the VC and were less likely to have a VC presence. Finally, public opinion data document that citizens in the USMC region reported more positive attitudes toward the United States and all levels of South Vietnamese government. While we cannot rule out that other differences between the army and marines contribute to these estimates—or isolate the contributions of different features of the USMC counterinsurgency strategy—it is difficult to tell a story where differences in counterinsurgency strategies are not important. Pre period VC attacks, other pre characteristics, geography, urbanization, and soldier characteristics (including Armed Forces Qualifying Test scores) are all relatively balanced.

Understanding whether overwhelming firepower strategies are likely to achieve their desired objectives remains policy relevant. While targeting has improved significantly, it remains imperfect. Insurgents have responded by embedding more tightly among civilians, and it is widely accepted that heavy reliance on air power will lead to collateral damage.[2] Recently, human rights organizations have provided detailed evidence that Russian

2. For example, a data set from the Bureau of Investigative Journalism suggests that since 2004, civilians have represented 25% of the deaths in U.S. drone strikes of Pakistan.

bombing in Syria and bombing by the Syrian regime have killed numerous civilians, in part by using munitions such as cluster bombs that were widely employed in Vietnam.[3] In addition, politicians continue to advocate an overwhelming firepower approach, deployed from the air because sending ground troops is unpopular.[4] Our estimates highlight ways this could pose challenges to achieving desired objectives when insurgents are embedded among civilians. They do not reveal whether a more hearts-and-minds-oriented approach is more effective than refraining from intervention, a question beyond the scope of this article.

This study contributes compelling identification to issues difficult to elucidate through correlations, informing the literature on military force in civil conflicts. Kocher, Pepinsky, and Kalyvas (2011) also examine bombing in Vietnam, testing how bombing in September 1969 affected an index of VC insurgent activity in subsequent months.[5] Miguel and Roland (2011) use distance to the 17th Parallel to instrument for district-level bombing and do not find persistent effects on poverty today. Condra et al. (2010), Dube and Naidu (2015), Dell (2015), and Acemoglu et al. (2016) find evidence that military force can backfire in reducing violence.[6] In contrast, Lyall (2009) uses a difference-in-differences strategy across Chechnyan villages to show that

3. See Graham-Harrison (2016), Smith-Spark, Karadsheh, and McKirdy (2016), Human Rights Watch (2015), Amnesty International (2015).

4. Donald Trump argued: "I would bomb the [expletive] out of them [ISIS in Iraq]. I would just bomb those suckers... I would blow up every single inch" (Trump in Fort Dodge 2016). Ted Cruz similarly stated: "We'll carpet bomb [ISIS] into oblivion. I don't know if sand can glow in the dark, but we're going to find out" (Cruz in Cedar Rapids 2015).

5. The study instruments bombing using the VC index for July–August 1969 and finds positive impacts on the VC index for September-November of 1969. We employ an identification strategy in which the instrument is orthogonal to initial insurgent activity and other pre characteristics—an essential identifying assumption that is unlikely to hold when the lagged dependent variable is used as the instrument—and examine a longer period and much broader set of outcomes.

6. Condra et al. (2010) show that counterinsurgency-generated civilian casualties in Afghanistan, but not Iraq, are associated with increases in insurgent violence over a period of six weeks to six months. Dell (2015) documents that a military force approach to combating the drug trade backfired in Mexico, generating significant increases in violence; Dube and Naidu (2015) find that U.S. military bases in Colombia increase paramilitary attacks; and Acemoglu et al. (2016) show that incentives that encourage military force in Colombia led to a deterioration in security and a weakening of the local state.

shelled villages experienced a substantial reduction in insurgent attacks.[7]

Consistent with this study's results exploiting the army-USMC natural experiment, Berman, Shapiro, and Felter (2011), Beath, Christia, and Enikolopov (2012), and Blattman and Annan (2015) find evidence that hearts and minds initiatives can reduce conflict.[8] In contrast, Crost, Felter, and Johnston (2014) offer a cautionary note, documenting that insurgents may sabotage development programs if they expect them to weaken their support.[9]

The study is organized as follows. Section II provides an overview of the conflict, the use of overwhelming firepower, and the rules of engagement with regard to targeting civilians. It then discusses the potential effects of different military strategies, drawing on evidence from the academic literature, policy makers, and accounts given by Vietnamese on the ground. Section III examines the impacts of bombing population centers, first discussing how air strikes were targeted, then outlining the empirical approach and data sources, and finally presenting the results. Next, Section IV compares the overwhelming firepower and hearts-and-minds approaches by examining the discontinuity between the army and USMC corps regions. Finally, Section V concludes.

II. The Context

II.A. An Overview of the Vietnam War

Following Vietnamese independence from France, the Geneva Accords of 1954 temporarily divided Vietnam at the 17th Parallel, until nationwide elections could be held in 1956. Elections were not held, in part because the United States concluded that the communist revolutionary hero Ho Chi Minh would be elected by

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7. The study argues that exposure to shelling is as if random since artillery fire was often conducted by inebriated soldiers following a policy of random firing intervals.

8. Berman, Shapiro, and Felter (2011) document that improved public service provision reduced insurgent violence in Iraq. Using a randomized experiment, Beath, Christia, and Enikolopov (2012) show that participating in the largest development program in Afghanistan improves perceptions of well-being, attitudes toward the government, and levels of security, but only in relatively secure regions; and Blattman and Annan (2015) find that a combination of capital inputs, agricultural training, and counseling reduced participation in conflict in Liberia.

9. Similarly, Nunn and Qian (2014) find that U.S. food aid increases conflict.

a landslide. Ho Chi Minh proceeded to establish a Soviet-backed communist state in the north, and the U.S.-backed dictator Ngo Dinh Diem declared leadership of a noncommunist state in the south.

A communist insurgency began in South Vietnam, led by the VC. In 1965, Lyndon Johnson deployed around 200,000 troops to South Vietnam. U.S. troop levels peaked at over half a million in 1969, and the United States withdrew in January 1973. The costs of the conflict in Vietnamese lives were staggering. The Vietnamese government (1995) estimated more than 3 million total deaths between 1954 and 1975, including over 2 million civilian deaths. A 2008 *British Medical Journal* study estimated a death toll of 3.8 million (Obermeyer, Murray, and Gakidou 2008). All sides—the North Vietnamese, South Vietnamese, VC, and U.S. troops—contributed significantly, though breakdowns of casualties by responsible party vary widely. The financial costs of the war to the United States were also substantial, with the Department of Defense estimating that it cost U.S. taxpayers over $1 trillion. Spending on Vietnam during the Lyndon Johnson administration exceeded spending on the War on Poverty by a factor of 17 (Appy 2015).

The ultimate U.S. objective in Vietnam was the creation of a stable noncommunist state that could stand as a bulwark against communism without massive U.S. intervention. This required achieving the so-called crossover point, where VC deaths and defections exceeded new recruits, in a way that could be sustained as the United States scaled back military intervention. The United States considered two broad counterinsurgency strategies—overwhelming firepower and hearts and minds—and in practice the overwhelming firepower approach dominated.

II.B. Overwhelming Firepower

1. Background. More firepower was unleashed during the Vietnam War than during any other conflict in human history. The United States had a vast arsenal that no country—let alone a third-world insurgency—could match.[10] More than twice as many tons of explosives were dropped as during World War II and

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10. The United States also had a nuclear arsenal, but deploying this would have risked total war with the Soviets or Chinese and hence was avoided. This study does not speak to what would have happened had firepower on this scale been unleashed.

four times more tons were dropped on South Vietnam than on North Vietnam, about 500 pounds of ordnance per inhabitant. The munitions unleashed equaled the power of 640 Hiroshima-sized atomic bombs, and the amount of ammunition fired per soldier was 26 times greater than in World War II (Turse 2013, p. 79).

Bombing played a particularly central role in a conflict where sending ground troops was unpopular. Between 1965 and 1972, U.S. aircraft flew 3.4 million combat sorties in Southeast Asia, with a plurality of these conducted in South Vietnam. The largest bomber was the B-52, and the United States flew around 125,000 B-52 sorties. Many air strikes were conducted by smaller aircraft, such as the F-4 Phantoms, which typically dropped napalm and cluster bombs. Napalm, an incendiary engineered to stick to clothes and skin, had been modified to burn hotter and longer than in World War II, and around 400,000 tons of it were dropped during the conflict, killing or disfiguring anyone in its path. Another incendiary sometimes used in bombs (and frequently in grenades) was white phosphorous, which became embedded in flesh and slowly burned the body. In 1969 alone, the U.S. military purchased 379 million white phosphorus grenades (SIPRA 1978, p. 52–53). Cluster bombs contained steel pellets with razor-sharp edges. The pineapple cluster bomb contained 250 steel pellets, and the "guava" cluster bomb contained 650 separate bomblets, each of which contained 300 steel pellets, for a total of 200,000 steel fragments per bomb. During the war, the U.S. military purchased approximately 37 million pineapple bombs and 285 million guava bomblets (Prokosch 1995, p. 97, 100). Munitions expenditures were also unparalleled. Over the course of the war, U.S. troops expended 15 billion pounds of artillery shells, much in the form of harassment and interdiction (H&I) fire (Turse 2013, p. 91). H&I involved firing at regular intervals without a specific target and was intended to keep the enemy in a state of unease.

2. The Rules of Engagement and Civilian Casualties. Directly targeting civilians violated the laws of war, but in practice the rules of engagement (ROE) allowed for many scenarios where civilians could be hit by overwhelming firepower, a tragedy exacerbated by the difficulties of distinguishing civilians from insurgents. If any type of fire came from the vicinity of a village, the ROE permitted attacking it without warning. If civilians were thought to be supporting the VC, say, by providing food or intelligence, the village could also be targeted, but a South Vietnamese

official, called a backseat, was supposed to give approval "whenever possible" (Reisman and Antoniou 1994, p. 111–113). Nick Turse (2013, p. 54–55), a historian who has conducted the most thorough investigation of civilian casualties in Vietnam to date, cites evidence from journalists and U.S. correspondence that in practice the backseat often gave the United States blanket authorization to conduct airstrikes in his region, and in cases where more detailed instructions were given, they were sometimes ignored. A warning was also supposed to be provided to the village first. This could come in a variety of forms, including a blanket leaflet drop on the area. Because such warnings were general and frequent, it could be difficult for villagers to distinguish whether they were on a target list or receiving a generic warning (Appy 2015, p. 167).

In addition, the United States designated some regions as free-fire zones, where anyone could be fired on without violating the laws of war. Civilians were supposed to be warned by South Vietnamese officials to leave, but in practice, a U.S. internal investigation found that "doubt exists" that the program to warn civilians was "either effective or thorough" (Walton 1970). Even if warned, many faced severe credit constraints in leaving their ancestral villages.

Online Appendix Figures A-1 and A-2 show leaflets that illustrate U.S. willingness to target civilian villages. Leaflets, dropped from high altitudes, could blow many kilometers before hitting the ground, and hence they could be targeted to districts but not specific villages. Leaflet 244-055-68 shows a picture of a village leveled by bombing and informs citizens: "if you support the Viet Cong, your village will look like this." It warns: "The Viet Cong hide among the innocent women and children in your villages to fire upon troops and aircraft. If the Viet Cong in this area use you or your village for this purpose, you can expect death from the sky. Do not let the Viet Cong be the reason for the death of your loved ones." Leaflet HQ-18-67 warns: "It is regrettable that the Government of Vietnam has to use bombs and artillery to drive the Viet Cong from places where they're hiding. In order to liberate your area, sometimes there is no other means." The leaflet instructs citizens to protect their lives by asking VC to leave the village. Leaflet 244-068-68, titled "Your village has been bombed," explains the village has been bombed because it helped the VC in some way.

This begs the question of how unarmed civilians could eject armed insurgents. Vietnamese accounts indicate that many found the ROE profoundly unjust, in a conflict where civilians on U.S. soil were never in danger. As Viet Thanh Nguyen wrote in his Pulitzer Prize–winning novel: "We are all guilty until proven innocent, as even the Americans have shown. Why else do they believe everyone is really Viet Cong? Why else do they shoot first and ask questions later?" (Nguyen 2015, loc. 2902). Turse (2013, p. 55) argues:

> At every turn, the onus was put on Vietnamese civilians to actively demonstrate that they were indeed noncombatants... by staying out of off-limits areas (the borders of which they might not know)... by not running or not walking in a certain way, or not standing still and thus looking unnatural; by somehow forcing armed guerrillas from their villages but also not carrying weapons, which would automatically brand a Vietnamese as VC.

Moreover, the rules were not always followed. In a survey of generals who commanded troops in Vietnam, only 19% said that the ROE were "carefully adhered to throughout the chain of command" before the My Lai massacre became public knowledge (November 1969), while 15% responded that that ROE weren't even "particularly considered in the day to day conduct of the war" (Kinnard 1991, p. 54–55). The remainder responded that the rules were "fairly well adhered to." The United States kept a count of enemy dead, which was an important metric of success within certain sectors of the armed force (Turse 2013, p. 43). Many have written about how this created perverse incentives for civilian casualties, and a study of similar incentives by Acemoglu et al. (2016) in Colombia indeed finds this to be the case. In 1970, an internal report by the U.S. Army's general counsel examined whether the body count encouraged troops "to inflate the count by violating established ROE," concluding that there was "a certain inescapable logic" to accusations that emphasizing the body count led to violations of the ROE (Turse 2013, p. 47).

3. Overwhelming Firepower for Achieving Military Objectives. U.S. leaders emphasized a variety of reasons overwhelming firepower would be effective in defeating the VC. "Long range artillery, naval gunfire, fighter bombers, strategic bombers and land and amphibious raids will hamper his operations, reduce his forces, destroy his morale and materially detract from his

ability to prosecute the war effectively" (U.S. Army Chief of Staff William Westmoreland, quoted Hunt 2010, p. 90). Policy makers also argued that insurgents were fundamentally rational and would be deterred once they realized the costs of facing an enemy who would not hesitate to unleash his arsenal. McGeorge Bundy, National Security Adviser and a Harvard political scientist, advocated bombing, telling Johnson: "a reprisal policy—to the extent that it demonstrates U.S. willingness to employ this new norm in counter-insurgency—will set a higher price for the future upon all adventures of guerrilla warfare, and it should therefore increase our ability to deter such adventures" (Hunt 2010, p. 68). "The national security adviser's objective was to break the will of the insurgency in ways consistent with the expectations of game theory" (Goldstein 2008, p. 155–156). By setting a harsh punishment for villages that aided the VC, this behavior could be deterred. Overwhelming firepower projected U.S. strength, signaling that it was not a "paper tiger" who would sit by idly as communism spread. "What we can say is that even if it fails, the policy [bombing] will be worth it," Bundy told Johnson. "At a minimum, it will damp down the charge that we did not do all that we could have done" (Goldstein 2008, p. 220).

When overwhelming firepower did not end the war as quickly as expected, the military establishment argued that it was effective but not enough had been deployed, given the propensity of the Vietnamese to fight. According to Westmoreland: "the Oriental doesn't put the same high price on life as does the Westerner. Life is plentiful, life is cheap in the Orient. As the philosophy of the Orient expresses it, life is not important" (Davis 1974).

Vietnamese and skeptical Americans, in contrast, suggested a number of reasons overwhelming firepower could backfire in achieving U.S. military objectives. In principle, the United States had enough firepower to destroy the VC many times over, but they first had to locate them. Even targeting VC leadership proved difficult—for example, the Soviets closely monitored if U.S. bombers were heading toward VC headquarters and relayed this information to them (Tang and Chanoff 1985, p. 162).

These difficulties were multiplied in targeting rank-and-file VC, many of whom were part-time guerrilla fighters operating in the immediate vicinity of their villages who could not be distinguished from civilians without close local cooperation. Even when they could be identified, the VC had sympathizers in almost every branch of the South Vietnamese Army (ARVN), and they knew

the terrain much better than U.S. ground troops or external ARVN forces (Hunt 2010, p. 64–65). It would pose less risk to U.S. lives to target VC from the air, but the common F-105 bomber had a circular error probability of 447 feet, meaning that half the bombs dropped fell within this radius of the target. This was sufficient to hit a village or in the vicinity of a VC base, but imprecise enough that civilians could easily be hit instead of insurgents.

When civilians were hit, some might decide to join the cause because of grievances, or grievances might reduce their propensity to share information with the South Vietnamese government and increase their propensity to aid the VC. According to one soldier: "During one of the air strikes in Haiphong my fiancé was killed by an American bomb. Immediately afterwards I decided that I had to go South to fight. . . I desperately wanted to go and kill a couple of Americans to relieve the bitterness I felt" (Hunt 2010, p. 137). In addition, economic destruction could reduce the opportunity cost of joining the insurgency.

If seeing a neighbor targeted led nearby villages to believe that they could avoid getting hit by opposing the insurgents, it could decrease VC support. On the other hand, if they felt there was little that they could do to avoid meeting the same fate, because they couldn't evict armed insurgents, or if they felt moral outrage at the situation, they too might decide to join the insurgent cause. As one Vietnamese citizen wrote: "Don't be pessimistic when you read this letter. Instead you should intensify your hatred . . . fight harder and avenge the people of South Vietnam" (Hunt 2010, p. 140).

The VC, aware of their acute firepower disadvantage, made efforts to win the sympathy of the population. According to a VC nurse: "I was told that our first mission was to win the people's sympathy. If we helped them as much as we could we would win them over. After we won them over, they would help us" (Hunt 2010, p. 142). The VC could also be brutal, but even so we might expect Vietnamese citizens to respond more negatively to civilian casualties caused by a foreign power—seen by many as the successor to imperialist France—as compared to casualties caused by a local insurgency.[11]

11. Lyall, Blair, and Imai (2013) provide evidence from Afghanistan that in response to harm by U.S.-backed government forces, citizens increase support for the Taliban and decrease support for the government, but they do not respond symmetrically to Taliban-induced harm.

The best quantitative information on VC motivations, while imperfect, comes from interviews that RAND conducted with 2,400 VC defectors and POWs between 1964 and 1968. A RAND study compares VC volunteers to forced draftees (Denton 1968). Volunteers were significantly more likely than forced draftees to report grievances against the government and to face economic hardship, suggesting that overwhelming firepower could lead individuals to volunteer for a range of reasons.[12] These results are in line with Elisabeth Wood's (2003) study of El Salvadorian rebels, who she finds are motivated by having experienced violence and injustice at the hands of the government.

These hypotheses have specific testable predictions. If Westmoreland and Bundy were right, VC activity should decline following the deployment of overwhelming firepower, immediately and in the longer run. In contrast, if overwhelming firepower backfired, we would expect it to increase VC activity. To disentangle potential spillovers, we can observe both the activity of the local guerrilla squad—which consisted entirely of part-time insurgents from the village—and of main force squads (regular forces that moved across locations) in places that were hit and in places nearby.

4. Overwhelming Firepower for Nation Building. Policy makers argued that beyond crippling the VC militarily, bombing would also help the state better control the civilian population, allowing it to monopolize violence even after U.S. withdrawal. First, bombing the countryside would drive citizens from rural areas, where they were difficult to control, to urban areas and government refugee camps, where the state had a more developed presence. According to Westmoreland: "in order to thwart the communist's designs," the United States had to eliminate the fish [the VC] or "dry up the water [civilian supporters] so that the fish cannot survive" (Elliott 2003, p. 336).[13] Sam Huntington (1968) made this argument even more forcefully, calling the approach of bombing the countryside "on such a massive scale as

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12. Common grievances included being falsely accused by the government and the killing or rape of a family member by government forces.

13. Another U.S. senior officer put it even more bluntly in an interview with reporter R. W. Apple: "You've got to dry up the sea the guerrillas swim in—that's the peasants—and the best way to do that is to blast the hell out of their villages so they'll come into our refugee camps" (Apple 1971, p. 449).

to produce a massive migration from countryside to city" forced draft urbanization.

> The war in Vietnam is a war for the control of population. . . . The effective response lies neither in the quest for conventional military victory nor in the esoteric doctrines and gimmicks of counterinsurgency warfare [hearts and minds initiatives]. It is instead forced-draft urbanization and modernization which rapidly brings the country in question out of the phase in which a rural revolutionary movement can hope to generate sufficient strength to come to power.

Little attention was given to the massive suffering such an approach could cause. National Security Adviser and MIT economist Walt Rostow likewise saw communist insurgencies as a threat at a primitive stage of economic development, which could be countered by providing "a ruthless projection to the peasantry that the central government intends to be the wave of the future" (Milne 2008, p. 88).

The qualitative evidence suggests that in practice, movement to urban areas and refugee camps happened to a lesser extent than expected by advocates of forced draft urbanization. As one peasant who moved to Saigon after his hamlet had been destroyed reported about those who remained: "Most of them are poor farmers. A few of them had left the village for [Saigon]-controlled areas but they had to come back since they were not able to make a living over there. Those who stayed didn't have a choice" (Tirman 2011, p. 162).

It is also unclear that a "ruthless projection" of power would do much to convince citizens to obey a central state that they did not find legitimate initially. The VC had an inherent political advantage, given its close ties with the anticolonial struggle and the fact that the United States and aligned South Vietnamese government were seen by many as the successor to imperialist France. Overwhelming firepower may have rallied Vietnamese around what many saw as an imperialist enemy, galvanizing citizens into action. Communist leader Tran Quang Co argued: "Never before did the people of Vietnam, from top to bottom, unite as they did during the years that the U.S. was bombing us. Never before had Chairman Ho Chi Minh's appeal—that there is nothing more precious than freedom and independence—gone straight to the hearts and minds of the Vietnamese people" (Goldstein 2008, p. 122). According to the memoir of Truong Nhu Tang, a senior VC

leader, "our true strength and the enemy's true weakness was on the political front. The advantage in political leadership was not something that the Americans could easily build up or provide" (Tang and Chanoff 1985, p. 59). Senator William Fulbright (1965) argued that the United States had failed "to understand social revolution and the injustices that give it rise . . . instead of supporting the great majority of people," and thus sided with "corrupt and reactionary military oligarchies."

Overwhelming firepower could have plausibly widened the legitimacy gap between the VC and South Vietnamese government. James Scott (1985, 2009) has argued that a coercion-oriented approach is ill-suited to nation building, as citizens have many ways to undermine a state they do not support, even short of joining an insurgency. Much as bombing inspired some to join the insurgency, for many others it may have simply reduced their support for the government, leading them to evade tax collection, not participate in state-endorsed organizations, and so on. Bombing might also directly reduce public goods provision, further eroding support. Truong Nhu Tang writes about how a series of school closures in 1971 provided a boost to VC recruitment (Tang and Chanoff 1985, p. 202).

These alternative views have specific testable predictions. If Westmoreland and Huntington were right, we would expect population to decline substantially following the use of overwhelming firepower and VC activity to ultimately decline as rural insurgents were deprived of civilian supporters. If Rostow was correct, we would expect VC activity to decline in bombed areas—or places nearby that observed the ruthless projection of power— and over time engagement with the South Vietnamese government and noncommunist organizations should increase. If instead Tran Quang Co, Truong Nhu Tang, and James Scott were right, we should see an increase in VC activity, a decline in noncommunist civic engagement, and a decline in the functioning of the South Vietnamese government following the deployment of overwhelming firepower. To the extent that population did not change dramatically, losses in the countryside would be unlikely to be offset by movement to cities or refugee camps.

II.C. Overwhelming Firepower versus Hearts and Minds

This study primarily focuses on the overwhelming firepower approach—the central U.S. strategy pursued in Vietnam—but

some voices within the armed forces advocated a strategy more focused on winning hearts and minds and working with locals to neutralize specific threats. In particular, a qualitative literature highlights major differences in how the U.S. Army and USMC approached counterinsurgency (Krepinevich 1986; Long 2016). The army has traditionally emphasized overwhelming firepower and large-scale operations, a by-product of its formative years during the U.S. Civil War. In contrast, following the Spanish-American War, the USMC developed as a de facto imperial police force with operations in the Caribbean. USMC units worked closely with local police to maintain order, developing an organizational culture that prioritized small units, limited firepower, and close collaboration with locals and civilians.[14] This study exploits a natural experiment comparing the army to marines to shed light on whether their very distinct counterinsurgency (COIN) strategies plausibly led to different outcomes.

Specifically, U.S. Army leadership emphasized overwhelming firepower, deployed through search-and-destroy raids that aimed to neutralize the VC. Hearts and minds initiatives had little place in armed conflict, which was about control. As expressed in an official army publication: "Units in Vietnam emphasized pacification by stressing civic action [development aid] efforts. In our opinion, this was a mistake ... we always stressed the military ... The only way to overcome VC control is by brute force ... one has to lower the boom occasionally and battalion commanders have authority to use heavy firepower in populated areas" (Ewell and Hunt 1974, p. 160). Westmoreland described his COIN strategy in one word: "firepower" (Krepinevich 1986, p. 197). Development aid could be undertaken by USAID later (Daddis 2011). This approach was reflected in the army's preferred metrics: the enemy body count, battalion (large-scale) days of operation, ammunition expended, and the ratio of U.S. to enemy deaths (Krepvinevich 1986, p. 196–205; Sheehan 1988, p. 287–288).[15]

In contrast, the marines designated Civic Action (development aid) and Combined Action (small units embedded in

14. The USMC also had an amphibious subculture that operated as an advanced landing team for the navy, but technological advancements following World War II made this function largely obsolete.

15. The favored metrics of the air force, sorties flown and bomb tonnage dropped, were similar.

communities that worked closely with local security forces) as pillars of their counterinsurgency mission.[16] The 1962 USMC Manual argues that firepower alone would not work because "a positive program of civil assistance must be conducted to eliminate the original cause of the resistance movement" (USMC 1962, p. 72). "Marine units built schools, roads, marketplaces, and hospitals... provided regular medical care... and provided training and equipment to local and regional militias" (USMC 2009). Combined Action units eschewed heavy firepower, as it was likely to harm populations they were protecting (Long 2016). Moreover, "one of the most important duties to be performed by the commander... is to gain the cooperation and assistance of local police" (USMC 1962, p. 16). Recall that it was difficult to find the VC, but locals—if willing to cooperate—often had substantial information.[17] The USMC's favored metrics focused on measuring the above inputs to pacification (USMC 1970, p. 15–17).[18]

These different approaches have testable implications. We use a spatial discontinuity design to compare hamlets commanded by the U.S. Army to nearby hamlets commanded by the USMC, examining whether hearts-and-minds initiatives, security, and attitudes toward Americans and the South Vietnamese government differed.

III. Overwhelming Firepower

III.A. McNamara and the Whiz Kids

The United States used an unprecedented number of quantitative metrics during the Vietnam War, spurred by the systems analysis perspective that Secretary Robert McNamara brought to the Department of Defense (DoD). McNamara pioneered the use of operations research in the private sector during his tenure in the 1950s as President of Ford Motor Company. Upon be-

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16. The nascent U.S. Army Special Forces pursued an approach that resembled that of the USMC.

17. Working closely with local authorities to provide security and basic public goods may have convinced some citizens "that they will be well rewarded and well protected when they serve as local agents in the regime's political network," which Roger Myerson (2011) argues is fundamental to counterinsurgency.

18. When the CIA developed the original, subjective Hamlet Evaluation System in 1967, they used the USMC Matrix metric as a template.

ing named Secretary of Defense by John F. Kennedy in 1961, McNamara surrounded himself with "whiz kid" analysts from the Rand Corporation, aiming to bring economics, operations research, game theory, and computing into DoD operations. This produced policies and data that offer unique opportunities for estimating causal impacts.

As Defense Secretary (1961–1968), McNamara launched a variety of data systems to monitor the progress of the Vietnam War. Field data were key-punched into mainframe computers in Saigon and Washington and used to determine resource allocation. The resulting electronic data would have likely been destroyed, but data tapes produced by the two IBM 360 mainframe computers in Saigon and Washington were subpoenaed during an IBM lawsuit. Much of this study's outcome data are drawn from these tapes.

The study uses discontinuities in quantitative ratings of hamlet security to identify the causal effects of overwhelming firepower. In 1967, the United States and South Vietnam began the Hamlet Evaluation System (HES). Initially, U.S. district advisers assigned hamlets A–E letter grades based on their subjective perceptions, but two 1968 studies showed that subjective ratings did not always correlate well with actual conditions. In response, the United States hired a defense consulting firm to develop an objective metric of hamlet security. In the Revised HES, 169 monthly and quarterly questions about security, politics, and economics were collected by U.S. advisory personnel affiliated with Civil Operations and Revolutionary Development Support (CORDS), a joint civilian-military agency. Data were collected between July 1969 and 1973 by U.S. district advisers and their subordinates, in conjunction with South Vietnamese district heads and province heads, who obtained information by visiting hamlets and interviewing locals. District advisers were part of a personnel structure that advised the South Vietnamese government. Information was not collected for hamlets controlled by the VC, which are around 3% of hamlet-month observations.

The majority of the questions were classified into 19 submodels, and Bayes's rule was used to aggregate responses within each submodel into a continuous score ranging from 1 to 5. The submodel scores were rounded to the nearest whole number, creating discontinuities, and combinatorial logic aggregated the rounded scores into an overall security score.

Specifically, the algorithm starts with a flat prior that each hamlet belongs to one of five security classes, ranging from A (very

secure) to E (very insecure). Then:

    i. It updates using Bayes's rule, the question responses, and conditional probability matrixes, which give the probabilities that each question would take on different response values if the hamlet was very secure (A), somewhat secure (B), and so forth. Online Appendix Figure A-3 shows some example conditional probability matrixes, where the first column gives response probabilities if the hamlet is an A, and so forth. The successive application of Bayes's rule yields a posterior probability that a hamlet belongs to each of the five latent security classes for that submodel.

    ii. An A is assigned 5 points, a B 4 points, a C 3 points, a D 2 points, and an E 1 point. Then the expected value of the posterior distribution is computed, using the points assigned to each latent class.

    iii. This expected value is rounded to the nearest whole number to produce a score for that submodel. For example, a hamlet with a numerical score of 4.4999 is rounded down to a 4/B (somewhat secure), whereas a hamlet with a numerical score of 4.5001 is rounded up to a 5/A (very secure).

    iv. Combinatorial logic is used to aggregate the rounded submodel scores, two or three at a time, into an overall security score, which was disseminated to military planners.

Figure I illustrates the logic for combining scores two at a time. It is symmetric, taking an average of the two submodel scores and rounding down. Online Appendix Figure A-4 shows the three-way logic, which combines three scores asymmetrically. Figure II illustrates how the 19 submodel scores are combined, using the two- and three-way logic, to produce a single hamlet security score.[19] Intermediate scores were also created during this process, covering military, political, and economic topics. Although national and provincial trends in these intermediate scores were disseminated, the coding manuals for creating reports document that only the overall score was reported at the hamlet level, and hence we focus on it.

19. The way that submodel scores were combined changed somewhat between 1970 and 1971 to deemphasize economic submodels, but the conditional probabilities remained the same.
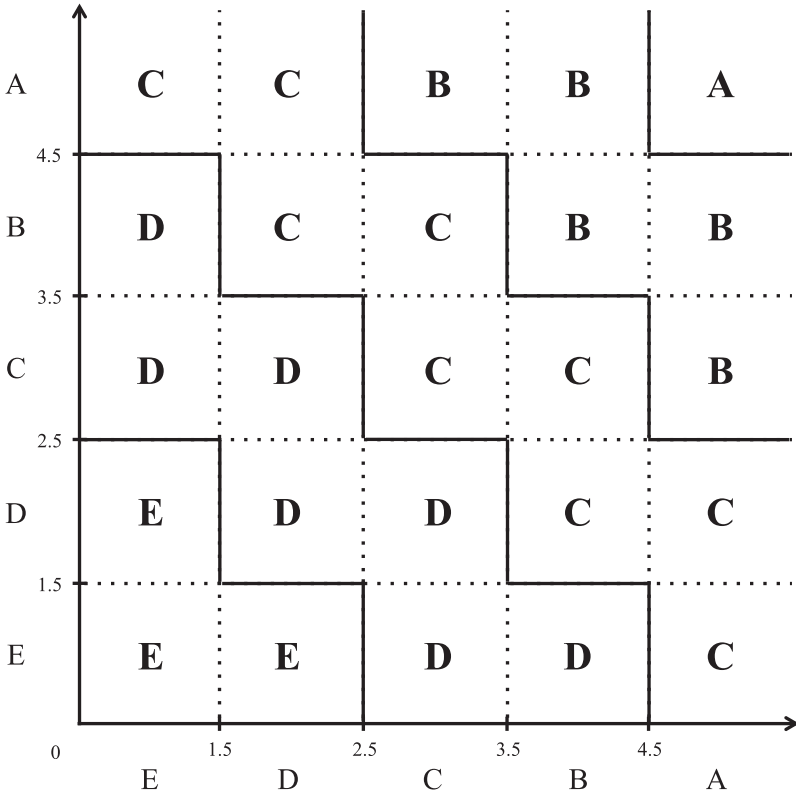
FIGURE I

Decision Logic (Two-Way)

This figure shows the aggregation logic for combining two submodel scores at a time.

Consider the following simplified example of how the algorithm provides identification. Suppose the security score combined two submodels, whose continuous scores are shown on the *x*- and *y*-axes of Figure I. The thick lines show the thresholds between different output scores, and their location is determined by the rounding of the input scores and the decision logic used to combine the rounded submodel scores. The thresholds create discontinuities, and identification can be achieved by comparing nearby hamlets on either side. For example, a hamlet with continuous submodel scores of 4.7 (rounded to 5/A) and 4.49 (rounded
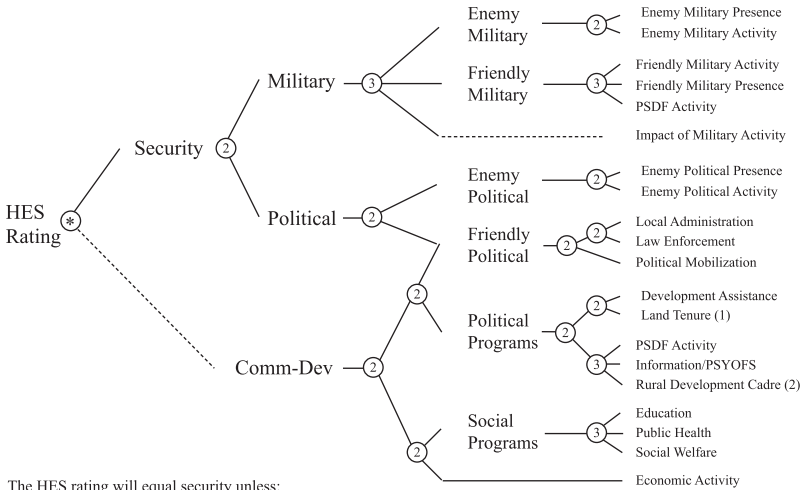
The HES rating will equal security unless:

    1. HMBO1 = 1 or 2 when the HES Rating will be set to 'V'

    2. Community Development (Comm-Dev) is three letter grades higher or lower than security whereupon it will be raised or lowered by one letter grade as applicable. If security is Not-evaluated (N) , the HES Rating will = 'N'

(1) If Land Tenure = 'N', use Development Assistance only.

(2) If RD Cadre = 'N', use a two way decision table rather than the three way table.

FIGURE II

Model Aggregation

This figure illustrates how the 19 submodel scores are combined two or three at a time to create a single hamlet security score. "N" indicates a missing value and "V" indicates Viet Cong controlled.

to 4/B—which would produce a 4/B output score—could be compared to a hamlet with input scores 4.7 (rounded to 5/A) and 4.5 (rounded to 5/A)—whose output score would be a 5/A.

The security score combines 19 submodels, creating a 19 dimensional equivalent of Figure I. The study computes the location of the A-B, B-C, C-D, and D-E thresholds and calculates the distance (using a Euclidean metric in continuous score space) from each observation to the nearest threshold. To compute the continuous scores, which were never printed or saved from the mainframe's memory, we located the conditional probability matrices in uncataloged documents at Fort McNair. We obtained the question responses from tapes now held at the U.S. National Archives.[20] The tapes also contain the rounded scores, and we can

20. HES is in Record Group (RG) 472. There is a version online from RG 330, but it is missing most months.

reproduce all rounded scores using the algorithm and question responses. Online Appendix Figure A-5 plots average HES scores across the sample period.[21]

Substantial variations in the score are strongly correlated with changes in the security situation. However, meeting memos held in an uncataloged collection at Fort McNair emphasize the arbitrariness of the algorithm's details. Military field officers were sent a survey stating "you have been selected to participate in the design of a Bayesian processor," which elicited the conditional probabilities for one of the submodels. When the surveys were returned, the probabilities had a high variance. Conditional probabilities more than two standard deviations from the mean were dropped, and the remaining responses were averaged to create a conditional probability matrix for each question. When the same question enters multiple submodels, the conditional probabilities can be different.

This study documents that the discontinuities have a strong influence on the targeting of air strikes. Public information about targeting is thin—as it was a highly classified process and much information remains classified today—but we can piece together some understanding from declassified materials. Ten percent of sorties supported ground operations, and most of the remainder targeted Viet Cong supply lines and insurgents (Thayer 1975). Declassified studies by the Defense Office for Systems Analysis (Thayer 1975) reveal that over half of air attacks in South Vietnam did not respond to real-time intelligence. Moreover, most were preplanned by the corps commander, according to a preallocated quota. Prior to 1968, planners had to provide answers to a detailed set of questions before allocating a sortie, but as the air war accelerated, this process was streamlined significantly to make allocating a large number of sorties feasible. Overall hamlet security, as summarized by the HES score, was a relevant consideration (Project CHECO 1969). Other factors taken into consideration included goals in the military region, security of friendly (U.S. and SVN) forces, location of combat maneuver battalions, and enemy movements.

21. Online Appendix Figures A-6 through A-10 show a histogram plot of distance to the nearest threshold (the running variable), as well as histogram plots of each of the 19 continuous submodel scores. Each bin is a discrete value of the score, and the *y*-axis shows the percentage of observations in that bin.

III.B. *Empirical Strategy*

Estimating the impacts of overwhelming firepower is challenging, as planners may target places where insurgency is on the rise, confounding OLS analysis. An unconditional random allocation, beyond being unfeasible and unethical, would likewise be uninformative, since military resources in practice are targeted to where they are believed to be most effective. The most informative estimation approach would be to exploit a source of plausibly random variation that influenced the allocation of military force at the margin, between places that had been deemed potential targets, and our specification approximates this.

The endogenous variables are immediate bombing in quarter $t + 1$ and cumulative bombing averaged across quarters $t + 1$ through U.S. withdrawal, both instrumented by whether the hamlet was below the security score threshold when the score was computed at the end of quarter t.[22] Quarters are used because the score was calculated primarily from quarterly data, with just a few inputs updated monthly. The first stage takes the following form, and the second-stage regressions are analogous:

$$y_{h,t+n} = \gamma_1 \; below_{ht} + \sum_{d=1}^{4} \delta_d D_{htd} + \sum_{d=1}^{4} \upsilon_d D_{htd} f_d(dist_{ht})$$

$$(1) \qquad + \sum_{d=1}^{4} \psi_d D_{htd} f_d(dist_{ht}) \; below_{ht} + \alpha_t + \beta X_{ht} + \epsilon_{ht},$$

where $y_{h,\,t+n}$ is bombing in hamlet h, in quarter(s) $t + n$, and $below_{ht}$ is an indicator equal to 1 if the hamlet is below the threshold in quarter t. $f_d(dist_{ht})$ is an RD polynomial in distance to the nearest score threshold, estimated separately on either side of each threshold (A-B, B-C, C-D, D-E). D_{htd} is a set of indicators equal to 1 if threshold d is the nearest threshold, X_{ht} includes indicators for all question responses that enter the quarter t security score, and α_t is a quarter-year fixed effect.

Baseline estimates use the Imbens and Kalyanaraman (2011) bandwidth and local linear regression (the Calonico, Cattaneo, and Titiunik 2014 bandwidth is nearly identical). Each hamlet appears in the sample once, with period t denoting the first time

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22. Other papers have also exploited rounding discontinuities for identification, notably the Luca (2011) study of Yelp ratings.

that the hamlet is near the threshold. This is more compelling than exploiting all times near the threshold, because whether a hamlet is near in $t + 1$ could be endogenous to whether it is below in t.[23] Standard errors are clustered by village and would be nearly identical if clustered by district.

Identification requires (i) all factors besides security score assignment change smoothly at the rounding thresholds, (ii) the security score is strongly correlated with bombing, and (iii) the score only impacts outcomes through the allocation of air power. These assumptions are examined in Section III.D. There is a strong first-stage relationship between cumulative bombing and the quarter t security score because bombing in $t + 1$ worsens security, reducing the $t + 1$ score and making bombing more likely at $t + 2$, and so forth.

The IV specification estimates a local average treatment effect of the impact of bombing on places that were targeted because they were below the threshold. Places for which planners had detailed intelligence on high-value targets would have been bombed in any case, and hence will not influence the estimates. The estimates inform contexts where air strikes are conducted with relatively limited intelligence, a situation most likely to obtain when the air war is accelerated but intelligence is not scaled proportionately.

III.C. Data

1. Bombing Data. This study uses data from the U.S. National Archives. Our preferred data on bombing are from the HES, a joint data collection effort between the United States and South Vietnam described earlier. HES records whether air or artillery fire struck near a populated area of the village during the previous month, and we use this to compute the share of months during the quarter with a strike. Since we do not find impacts of the security score on ground troop activity—using HES as well as detailed administrative data—we expect any impacts to be driven primarily by air strikes. However, even if results are driven by both air and artillery fire, the study's broader arguments about the impacts of overwhelming firepower would remain unchanged.

23. Results are robust to using share of times near the threshold that the hamlet is below it as the instrument for cumulative bombing. If we focus only on places near the threshold the first quarter that the score was used, estimates are qualitatively similar but the first stage is weaker since the sample is much smaller.

We also examine air force data providing the coordinates of ordnance dropped over South Vietnam.[24] Unfortunately, the system was migrated during our sample period, leading to fragmentary information.[25] It is also difficult to infer whether the ordnance struck a populated area, as the data record the approximate coordinate where the ordnance was dropped, not what it hit, and we only know the coordinate of the hamlet centroid.[26]

2. Outcome Data. We combine three diverse sources of outcome data to elucidate robust insights about impacts: HES, armed forces administrative data, and public opinion surveys. One can raise concerns with any single data source, but together they help paint a consistent picture.

HES contains answers to questions about monthly and quarterly security, as well as economic, governance, and civic society outcomes, and has been described above. The main concern in the context of outcome data is that it exhibits differential measurement error by whether the hamlet was bombed. For example, CORDS advisers may have reported less VC activity to show that bombing was working, or more VC activity to justify that bombing was needed. While there have been critiques of HES, overall the evidence points to the source as being reasonable, if potentially noisy, and to our knowledge there are no critiques suggesting differential measurement error by bombing or incentives for this type of misreporting. A well-known critique of HES comes from a memoir by David Donovan (1985), who observed its collection during his tour of duty in Vietnam. He argued that U.S. District Advisers delegated collection to subordinates or collected information hastily since they were overworked. He also claims that advisers feigned progress by inflating responses over time. While it was plausibly common to rely on subordinates, and to be hasty, it is not obvious that Donovan's experiences generalize. For example, scores tend to deteriorate across our sample period. An

24. These are "Combat Air Activities" (RG 218, 529) and "Sorties Flown in Southeast Asia" (RG 218).

25. Some months appear in both systems but record different incidents. Some months are marked as incomplete in both systems.

26. These data also contain information on the type of target, which in theory could provide additional information not available from HES but in practice is typically missing: for 71% of strikes in our sample the target is missing, 9% list it as "confirmed enemy," 3.9% list it as "bunkers," 3% list it as "any [enemy] personnel," and 2.8% list it as "structures."

academic critique of Vietnam-era data by Gregory Daddis (2011, p. 40) argues that the main failing, particularly in the case of HES, stemmed "not from a lack of effort" by those collecting the data but from an overreliance on summary statistics without a careful interpretation of what the data implied about policy effectiveness.[27]

Second, we examine administrative data from the U.S. and South Vietnamese armed forces on operations, attacks, and casualties. Specifically, data on ground troops are from the "Situation Report Army" (RG 218). Data on enemy-initiated attacks from 1964–1969 come from the "Vietnam Database" (RG 330), and data on naval incidents are from the "Naval Surveillance Activities File" (RG 218). Finally, data on South Vietnamese territorial defense units are from the "Territorial Forces Evaluation System" (RG 472) and the "Territorial Forces Activity Reporting System" (RG 330). The collection of these data was independent of HES. VC casualties (the so-called body count) should be taken with a grain of salt because they conflated civilians with insurgents and were exaggerated, but attacks, U.S. operations, and U.S. casualties are well measured.

Finally, public opinion data on citizen attitudes toward local government, national government, and the war are available for a sample of hamlets through the Pacification Attitudes and Analysis Survey (PAAS, RG 472), a U.S.–South Vietnamese effort that was compiled by Vietnamese enumerators. PAAS was launched in March 1970 and was conducted monthly until December 1972, overlapping closely with the period in which the security score was used to target bombing, though unfortunately not all months have been preserved.[28] Each month, surveys were conducted in six randomly selected hamlets per province. Fifteen respondents were randomly selected per hamlet, with stratification on demographic characteristics. The number of months in which a given question was included in the questionnaire (and whether the question was asked in all or only a subset of hamlets) varies. Sample sizes for some interesting questions, such as those about

27. In a description of HES, CORDS director Robert Komer (1970) similarly concludes: "Vietnam has been the most extensively commented on but least solidly analyzed conflict in living memory . . . [HES's] full exploitation may have to be left to the academic community."

28. Tapes containing information for May 1970 through February 1971 and for August and September 1971 were not preserved.

anti-Americanism, are sufficiently small that few observations are left when we limit to hamlets near the security score discontinuities.

III.D. Results

1. First Stage. We begin by examining graphically the relationship between being below the security score threshold and the share of months in the quarter with air or artillery strikes near inhabited areas. Discontinuity fixed effects are partialed out, so barely A's are compared to barely B's and so forth, but other controls are excluded to transparently display the raw data. As discussed above, since we find little immediate impact of the security score on ground troop activity, we expect impacts to be driven primarily by air strikes. However, even if the discontinuity is driven by both air and artillery fire, the study's arguments about the impacts of overwhelming firepower would remain unchanged.

Figure III, Panel A uses a local linear polynomial to plot strikes in quarter $t + 1$ against the distance to the nearest threshold in quarter t. Dashed lines show 95% confidence intervals. A negative distance signifies that the hamlet is below the threshold. Strikes fall discontinuously at the threshold, indicating that the score was an important determinant. When the controls from equation (1) are included, estimates become more precise but do not change in magnitude. Panel B repeats this exercise for the cumulative specification, plotting the distance to the threshold in quarter t against average strikes in quarters $t + 1$ through U.S. withdrawal. Again, strikes change discontinuously at the threshold. As we will show, the cumulative first stage is strong because bombing reduces security, which lowers the score and makes future bombing more likely.

Online Appendix Figure A-11 documents that these estimates are highly robust to the choice of bandwidth and are also robust to the choice of RD polynomial, as are the study's other main outcomes.[29] Estimates tend to become noisier when a quadratic RD polynomial is used and sometimes are no longer statistically significant, but the point estimates are typically similar in magnitude and statistically indistinguishable.

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29. The quadratic RD polynomial specification becomes extremely noisy when the polynomial is estimated separately on each side of the four score discontinuities. Hence, for the quadratic specification, we estimate a single RD polynomial, separately above and below the thresholds.

(A) Immediate First Stage

(B) Cumulative First Stage

(C) Impacts by Quarter

(D) McCrary Test

(E) 1969 $(t+1)$

(F) 1969 (Cum)

FIGURE III

First Stage

In Panels A, B, D, E, and F, each point plots an average value within a bin. Discontinuity fixed effects have been partialed out. The solid line plots a local linear regression and dashed lines show 95% confidence intervals. In Panel C, each point plots a coefficient from a separate regression and lines show 95% confidence intervals.

Panel C examines how the score relates to bombing in the quarters before and after it was computed, by plotting quarter-by-quarter RD estimates from equation (1). There is no preperiod impact of being below the threshold, and the effect persists

following the score's dissemination.[30] Panel D shows the McCrary
plot, which tests for selective sorting around the threshold. Given
that the continuous scores were never viewed and required the
world's most powerful computer to calculate, it would have been
difficult to manipulate around the threshold, and indeed there is
no discontinuity in the density of observations.[31] During 1969 the
system was in pilot, and the security score was computed but not
disseminated. Panels E and F document that there are no impacts
of security scores in 1969 on bombing in the following quarter or
cumulatively until U.S. withdrawal.

   Next we examine whether hamlets barely above the thresh-
old are a valid control group for those barely below. Since the
data used to compute the score were not received until the
close of the quarter, there should be no contemporaneous im-
pact. Figure IV, Panel A documents that contemporaneous strikes
change smoothly at the threshold. Strikes during quarter $t-1$
(Panel B) and on average during the preperiod (Panel C) also
change smoothly.

   Table I examines preperiod balance for the study's outcomes,
using the preperiod characteristics as the dependent variables
in equation (1). Columns (1) and (2) consider quarter $t-1$, and
columns (3) and (4) the entire preperiod. The coefficients on *below*
are typically small and statistically insignificant, with the few sta-
tistically significant differences plausibly arising due to sampling
error.

   To further check for balance, we predict strikes in $t+1$ using
the variables that enter the period t security score but not the score
itself. Figure IV, Panel D documents that predicted strikes change
continuously, as expected given that the characteristics that enter
the score change smoothly. Panel E documents a similar pattern
for predicted cumulative strikes. Information about VC attacks
on troops is available for an extended preperiod. Panel F plots
the quarterly relationship from equation (1) between being below
the threshold and VC attacks for 1964–1969, documenting that
attacks are balanced throughout the period.

   Finally, we conduct the following randomization exercise. For
each of the study's outcomes, we randomly reassign distance to

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30. The sample can be extended further back, but sample size declines sub-
stantially.
31. Moreover, the conditional probabilities were classified and were not known
by those in the field who collected the data (Komer 1970).

(A) Contemporaneous Bombing

(B) $t-1$ Bombing

(C) All Prior Quarters Bombing

(D) Predicted Bombing $(t+1)$

(E) Predicted Bombing (Cum)

(F) 1964-1969 VC-Initiated Attacks

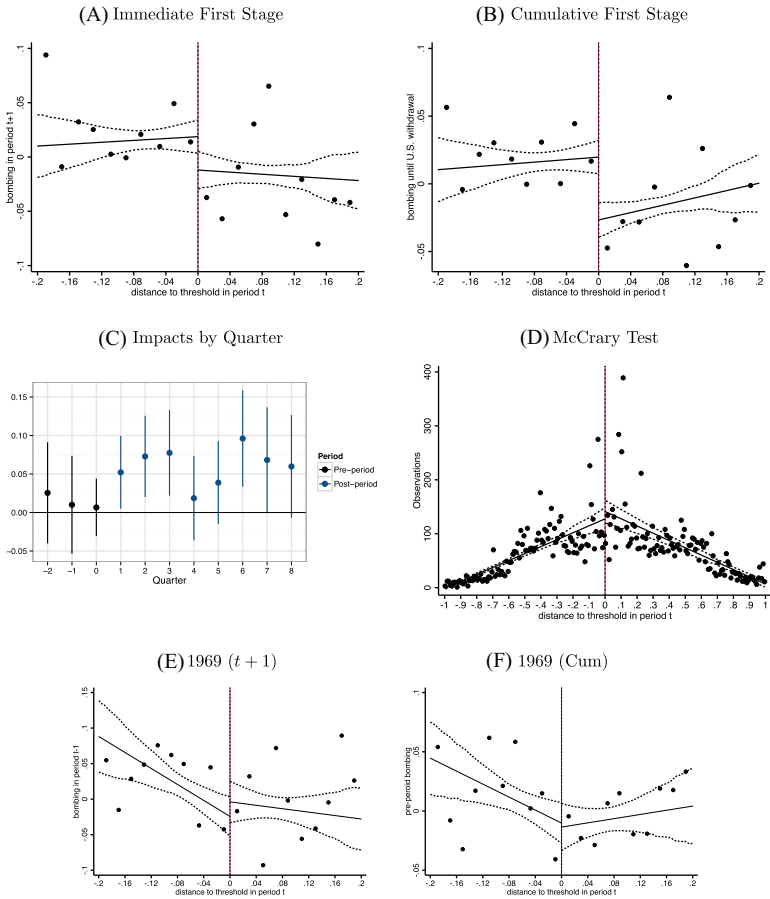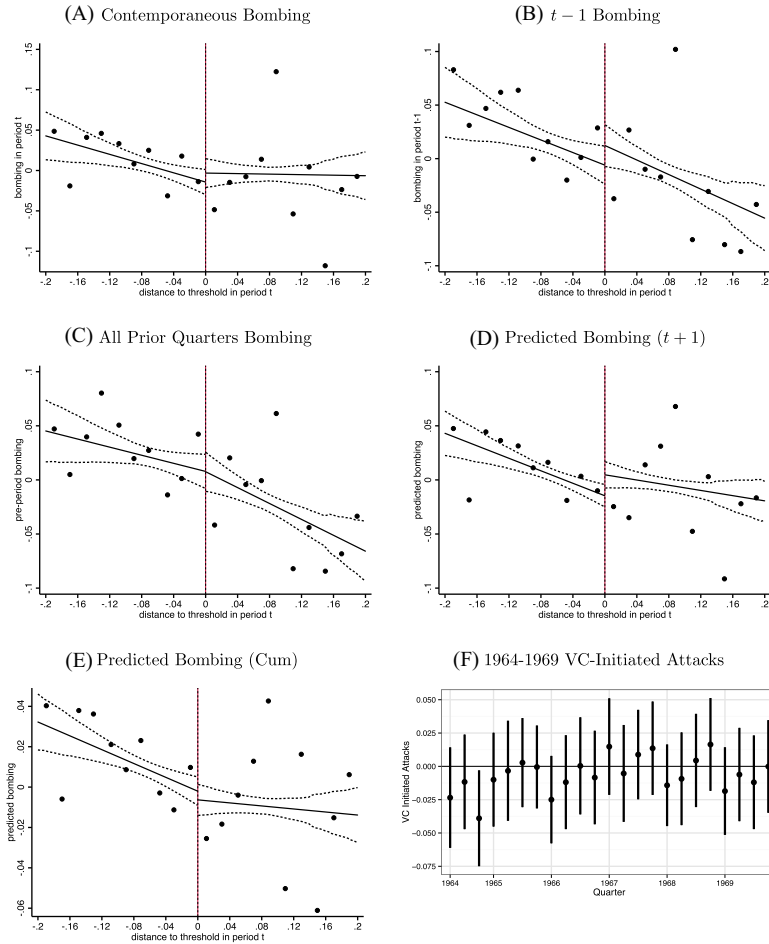FIGURE IV

Placebos

In Panels A–E, each point plots an average value within a bin. Discontinuity fixed effects have been partialed out. The solid line plots a local linear regression and dashed lines show 95% confidence intervals. In Panel F, each point plots a coefficient from a separate regression and lines show 95% confidence intervals.

the threshold. We regress the outcome of interest on the reassigned indicator for whether the hamlet is below the threshold, and then repeat this exercise 1,000 times. Online Appendix Figures A-12 through A-24 plot the distribution of placebo

TABLE I

BALANCE CHECKS

	$t-1$		Full preperiod	
	RD coeff. (1)	Std. err. (2)	RD coeff. (3)	Std. err. (4)
Bombing	−0.001	(0.018)	0.020	(0.016)
Security				
Security LCA	−0.002	(0.015)	0.002	(0.015)
Enemy forces present	−0.017	(0.018)	−0.008	(0.014)
Village guerrilla squad	0.026	(0.021)	0.015	(0.019)
VC main force squad	−0.019	(0.022)	−0.021	(0.019)
VC base nearby	0.022	(0.018)	0.012	(0.017)
VC attack	0.007	(0.015)	0.005	(0.012)
Active VC infrastructure	−0.013	(0.018)	−0.022	(0.017)
% households participate VC	−0.003	(0.005)	−0.005	(0.006)
VC propaganda	−0.019	(0.014)	−0.018	(0.014)
VC taxation	−0.024	(0.020)	−0.019	(0.019)
Troops				
Friendly forces nearby	−0.02	(0.024)	−0.004	(0.019)
U.S. operations	0.006	(0.005)	0.005	(0.003)
U.S. initiated attacks	0.007	(0.006)	0.009	(0.005)
U.S. deaths	0.036	(0.060)	0.036	(0.094)
SVN deaths	0.326	(0.191)	0.141	(0.057)
VC deaths	2.000	(1.950)	0.320	(2.027)
Economic				
Economic LCA	−0.031	(0.016)	−0.024	(0.016)
Nonrice food available	−0.055	(0.019)	−0.038	(0.019)
Manufactures available	−0.036	(0.016)	−0.018	(0.016)
Surplus goods produced	−0.023	(0.020)	−0.011	(0.020)
Fields fallow due to insecurity	0.029	(0.019)	0.017	(0.019)
HH with motorized vehicle	−0.005	(0.005)	−0.004	(0.006)
HH require assistance to subsist	0.003	(0.007)	0.007	(0.007)
Hamlet population growth	0.003	(0.012)	0.006	(0.010)
Urban	−0.015	(0.012)	−0.018	(0.012)
Governance				
Administration LCA	0.005	(0.008)	0.012	(0.009)
Local government taxes	−0.007	(0.021)	0.016	(0.021)
Village committee filled	−0.001	(0.020)	0.026	(0.019)
Local chief visits hamlet	0.01	(0.012)	0.012	(0.012)
Education LCA	0.007	(0.015)	0.000	(0.015)
Primary school access	0.004	(0.012)	0.013	(0.012)
Secondary school access	−0.005	(0.019)	0.004	(0.018)
Health LCA	0.01	(0.015)	0.013	(0.015)
Public works under construction	0.005	(0.027)	0.040	(0.022)
Civic society				
Civic society LCA	0.009	(0.018)	0.020	(0.018)
HH participation in civic orgs	−0.008	(0.011)	0.006	(0.010)
HH participation in PSDF	0.005	(0.012)	0.002	(0.011)

TABLE I

(Continued)

	$t-1$		Full preperiod	
	RD coeff. (1)	Std. err. (2)	RD coeff. (3)	Std. err. (4)
HH participation in econ training	−0.017	(0.009)	0.003	(0.007)
HH participation in devo projects	−0.012	(0.013)	−0.004	(0.010)
Self devo projects under way	−0.021	(0.024)	−0.030	(0.019)
Youth organization exists	0.014	(0.022)	0.014	(0.021)
Council meets regularly with citizens	−0.008	(0.023)	−0.018	(0.023)

Notes. Columns (1) and (3) report the coefficients on *below* in RD regressions. Columns (2) and (4) report robust standard errors clustered by village.

TABLE II

First Stage

	$t+1$ 70–72 (1)	t 70–72 (2)	$t-1$ 70–72 (3)	$t+1$ 69 (4)	Post 70–72 (5)	Pre 70–72 (6)	Post 69 (7)
Below	0.054	0.011	−0.001	−0.016	0.044	0.020	−0.002
	(0.014)	(0.011)	(0.018)	(0.019)	(0.013)	(0.016)	(0.017)
Obs.	12,188	12,259	11,382	4,510	12,206	11,427	4,527
Clusters	2,261	2,277	2,196	1,435	2,265	2,201	1,439
Mean	0.28	0.31	0.33	0.39	0.26	0.36	0.30

Notes. The dependent variable is the share of months that friendly air or artillery fire struck in or near a populated area. *Below* is an indicator equal to 1 if the security score is below the threshold in quarter t. The regression also includes a linear RD polynomial—estimated separately on either side of the threshold for each discontinuity—as well as discontinuity fixed effects, quarter-year fixed effects, and controls for the characteristics that enter the period t security score. Robust standard errors clustered by village are in parentheses.

coefficients for each of the study's outcome variables, showing the actual coefficient on below the threshold with a vertical red line. For both the immediate and cumulative first stage, the actual coefficient is far in the right tail of the placebo distribution, indicating that these effects are very unlikely to arise by chance. Table A-1 reports the share of the 1,000 absolute placebo coefficients that are larger in magnitude than the absolute actual coefficient on the below threshold dummy.[32] The *p*-values computed using the randomization exercise provide a similar picture to those computed using conventional inference.

Table II reports the first-stage estimates using the RD specification from equation (1). Being below the score threshold in

32. We use absolute coefficients to conduct a two-sided test.

quarter t increases the share of months in quarter $t + 1$ with bombing or artillery fire that hit near inhabited areas by 5.4 percentage points, relative to a sample average probability of 28% (column (1)). The F-statistic, equal to 14.9, indicates a strong first-stage relationship. Columns (2) and (3) document that there is no discontinuity using period t and $t − 1$ bombing, respectively, and column (4) shows that there are no significant impacts using scores from 1969, when the score was not disseminated.

Column (5) reports the first stage for the cumulative specification. Being below the threshold in quarter t increases the share of months with bombing or artillery fire that hit inhabited areas in quarters $t + 1$ through U.S. withdrawal by 4.4 percentage points, relative to a sample average probability of 26%. The first-stage F-statistic is 11.5. Column (6) shows that cumulative preperiod bombing is balanced, and column (7) documents that there is no impact of being below the threshold in 1969 on cumulative bombing afterward.

These patterns can be validated with the air force ordnance data, which while incomplete for our period, provide corroborating information. RD estimates document that being below the threshold increases the tons of ordnance dropped within 5 kilometers of the hamlet by 22 percentage points, though the effect is noisily estimated and would not provide a strong first stage. Twenty-one percent of hamlet-months have ordnance dropped within 5 kilometers.

While the circular error probability of bombers was in principle low enough to target a given village, in practice neighbors could be hit instead. This would weaken our first stage, and the strength of the first stage suggests targeting was reasonable. Online Appendix Table A-2 does not find a statistically significant impact of own score on neighbors' bombing, where neighbors are other villages within a 10-kilometer radius (estimates are robust to other radii).

We focus on bombing because we do not find evidence that the score directly affected other military allocations. However, even if it did the interpretation of the results as informing our understanding of the overwhelming firepower strategy would remain unchanged. To examine whether there are direct effects on other allocations, we focus on whether they change in quarter $t + 1$: military planners use recent information to locate insurgents, and thus it is unlikely that the score would have no immediate effects but would directly influence allocations later. To the extent that

long-run but not short-run allocations changed, this would suggest indirect effects (i.e., troops responding to a deterioration in security caused by bombing). Since this could also happen immediately, positive short-run impacts of the score on other allocations would not necessarily imply direct effects, but null correlations would suggest that direct effects are unlikely.

Table III, column (1) documents that there is no discontinuity in whether friendly (U.S. or SVN) ground troops operated near populated areas in quarter $t + 1$. These data are drawn from the same questionnaire as the data on air/artillery strikes and are used to maximize comparability. Columns (2) and (3) use armed forces administrative data to document that the score likewise does not immediately affect U.S. battalion operations or U.S.-initiated attacks, and columns (4) and (5) show that there are no effects on South Vietnamese battalion operations or South Vietnamese–initiated attacks.[33] The coefficients are small and precisely estimated. Moreover, there is no discontinuity in U.S.-initiated naval attacks (column (6)), in the presence of South Vietnamese Regional or Popular Forces, which were regional self-defense forces (columns (7) and (8)), or in the presence or share of households participating in the People's Self-Defense Forces, which were local self-defense units (columns (9) and (10)).[34] Finally, there is no effect on the presence of South Vietnamese development aid teams (the Rural Development Cadre, column (11)). In an extensive qualitative search, the only other allocation we could find that used the hamlet-level HES score directly was the Accelerated Pacification Campaign, which aimed to drive VC out of D and E hamlets following the Tet Offensive. It began in 1968 and had concluded before the start of our sample period.

2. Impacts on Military Objectives. We now turn to an investigation of how overwhelming firepower impacted U.S. military objectives, using the hypotheses discussed in Section II.B.3 as a guide. Data are drawn from HES, armed forces administrative records, and public opinion surveys.

33. Battalion operations exclude small-scale operations. Data on small operation movements are unavailable, but U.S.-(SVN)-initiated attacks include all attacks made by the United States (SVN), regardless of the size of the attacking unit.

34. Data on U.S.-initiated attacks are available through the first quarter of 1972. Data on the allocation of naval personnel are only available at the district level.

TABLE III

OTHER RESOURCE ALLOCATIONS

| | | | | | Dependent variable | | | | | | |
| | | | | | Immediate ($t + 1$) | | | | | | |
	Friendly forces (1)	U.S. ops (2)	U.S. attacks (3)	SVN ops (4)	SVN attacks (5)	Naval attacks (6)	Regional forces (7)	Popular forces (8)	PSDF present (9)	% HH PSDF (10)	RD cadre present (11)
Below	0.016	0.004	0.005	−0.018	−0.014	−0.000	0.026	0.012	0.013	0.004	0.012
	(0.018)	(0.005)	(0.005)	(0.018)	(0.018)	(0.006)	(0.021)	(0.013)	(0.011)	(0.010)	(0.019)
Obs.	12,188	12,181	12,181	12,181	12,181	11,535	10,432	10,432	11,796	11,839	11,610
Clusters	2,261	2,261	2,261	2,261	2,261	2,221	2,162	2,162	2,180	2,196	2,179
Mean	0.53	0.02	0.02	0.02	0.02	0.01	0.35	0.10	0.86	0.46	0.53

Notes. *Below* is an indicator equal to 1 if the score is below the threshold in quarter *t*. The regression includes a linear RD polynomial (estimated separately on either side of the threshold for each discontinuity) as well as discontinuity fixed effects, quarter-year fixed effects, and controls for the characteristics that enter the period *t* security score. Robust standard errors clustered by village are in parentheses.

HES contains multiple questions on security, some with categorical responses. We code these into binary indicators that preserve as much variation as possible (see the Online Data Appendix for more details). For example, a coding of no VC attacks as 0 and sporadic/frequent VC attacks as 1 preserves significantly more information than a coding of no/sporadic VC attacks as 0 and frequent attacks as 1, since frequent attacks are rare.[35] To address multiple hypothesis testing concerns and show that effects are not driven by the coding of categorical questions into binary outcomes, we compute a summary measure created using latent class analysis (LCA) that combines information from all available security questions.[36] Based on the observed question responses, LCA uses a mixture model to estimate the posterior probability that each hamlet belongs to one of two latent groups associated with "high" and "low" security. LCA is described in detail in the Online Data Appendix.[37]

Table IV, column (1) reports the immediate effect of bombing on the security LCA, using whether the hamlet was below the threshold as the instrument. Moving from no strikes to the sample mean of 0.28 strikes per month decreases the posterior probability of being in the high security class by 19 percentage points (-0.67×0.28), relative to an overall sample mean of 0.65, and the effect is statistically significant at the 1% level.[38] Column (2) considers cumulative effects until U.S. withdrawal. The point estimate of -0.64 (std. err. 0.25) suggests that moving from no cumulative strikes (which is rare) to the sample average of 0.26

35. An alternative would be to estimate a multinomial logit, but this does not converge well because there is often little variation in some of the categories.

36. We include questions that are available for the entire sample period. Results are similar if we include questions that were only asked during part of the sample period.

37. An alternative method sometimes used to address multiple comparisons is a Bonferroni adjustment, which divides the *p*-value required to reject the null by the number of hypotheses under consideration. The Bonferroni correction targets Type 1 error but at the same time can severely exacerbate Type 2 error because it substantially reduces power. Hence, we prefer the much higher-powered LCA approach.

38. The main text reports IV estimates, and Online Appendix Table A-4 documents that OLS estimates are similar. This could be the case because on average biases in the OLS cancel each other out—that is, an upward omitted variables bias cancels a downward attenuation bias—or the OLS could be a biased estimate of an average treatment effect that is different from the local average treatment effect estimated by the IV.

TABLE IV

SECURITY

| | Security Posterior Prob | | Armed VC present | Vilg guer squad | VC main squad | VC base nearby | VC attack hamlet | Reg VC infra activity | % HH part VC infr. | VC prop. drive | VC extorts pop. |
| | t + 1 (1) | cum. (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
						Dependent variable					
Bombing (t + 1)	−0.673										
	(0.246)										
Bombing (cum.)		−0.642	0.571	1.030	0.640	1.139	0.328	0.978	0.159	0.278	0.893
		(0.246)	(0.222)	(0.435)	(0.387)	(0.429)	(0.183)	(0.384)	(0.095)	(0.179)	(0.417)
Obs.	12,188	12,206	12,189	11,923	11,924	11,925	12,149	11,921	11,914	12,139	11,904
Clusters	2,261	2,265	2,263	2,204	2,204	2,205	2,262	2,198	2,200	2,260	2,195
F stat.	14.43	12.12	11.89	10.03	10.18	10.04	11.45	10.41	11.76	11.44	10.43
Mean	0.65	0.68	0.19	0.38	0.39	0.22	0.16	0.25	0.03	0.09	0.27

Notes. Bombing measures the share of months that friendly air or artillery fire was directed in or near a populated area. It is instrumented by whether the hamlet was below the security score threshold. The regression also includes a linear RD polynomial (estimated separately on either side of the threshold for each discontinuity) as well as discontinuity fixed effects, quarter-year fixed effects, and controls for the characteristics that enter the security score. Robust standard errors clustered by village are in parentheses.

strikes per month decreases the posterior probability of being in the high security class by 17 percentage points. Online Appendix Figures A-25 and A-26 plot the reduced-form RD relationships. Placebo checks, reported in Online Appendix Table A-3 for this and the other main outcomes, document that bombing does not impact the security posterior probability in $t-1$, nor does cumulative bombing affect the average preperiod posterior probability.

The remaining columns examine cumulative effects until U.S. withdrawal for outcomes that enter the LCA.[39] Estimates using the immediate specification tend to be qualitatively similar but noisier. Moving from no bombing to the sample mean increases the average probability of an armed VC presence in a hamlet-month by 15 percentage points, relative to a sample mean probability of 0.19, and the estimate is statistically significant at the 5% level (column (3)). Figure V, Panel A plots the reduced-form relationship between distance to the threshold and VC armed presence in the raw data, revealing a clear discontinuity. Column (4) documents that moving from no bombing to the sample mean increases the average probability that there is an active VC village guerrilla squad during a given quarter by 27 percentage points. The village guerrilla squad consists of locals, and hence this is an important outcome indicating an increase (and not just a reallocation) of VC activity. Bombing also increases the probability that a VC main or full-time local squad, which may operate throughout the region, is active (column (5)) and increases the probability that there is a VC base nearby (column (6)). Finally, bombing increases attacks on local security forces, government officials, and civilians by 9 percentage points, relative to a sample mean of 16 percent of hamlet-months witnessing an attack (column (7)). Together these outcomes illustrate that rather than reducing insurgent forces and draining insurgent morale, overwhelming firepower near civilian populations increased VC activity and local participation in the VC.

In addition to its military branch, the VC maintained a political branch (the VC infrastructure) tasked with propaganda, recruitment, and extortion (taxation). Column (8) documents that

39. Online Appendix Table A-5 reports estimates for the other outcomes that enter the security LCA. The effects are qualitatively similar, but the outcomes reported in Table A-5 tend to have significantly less variation than the outcomes in the main text. Hence more power is required to detect effects, and impacts tend not to be statistically significant.

(A) *VC Presence (Cumulative)*

(B) *Active VC Infrastructure (Cumulative)*

(C) *U.S. Initiated Attacks (Cumulative)*

(D) *Village Committee Filled (Cumulative)*

(E) *Access to a Primary School (Cumulative)*

(F) *Participation in Civic Orgs (Cumulative)*
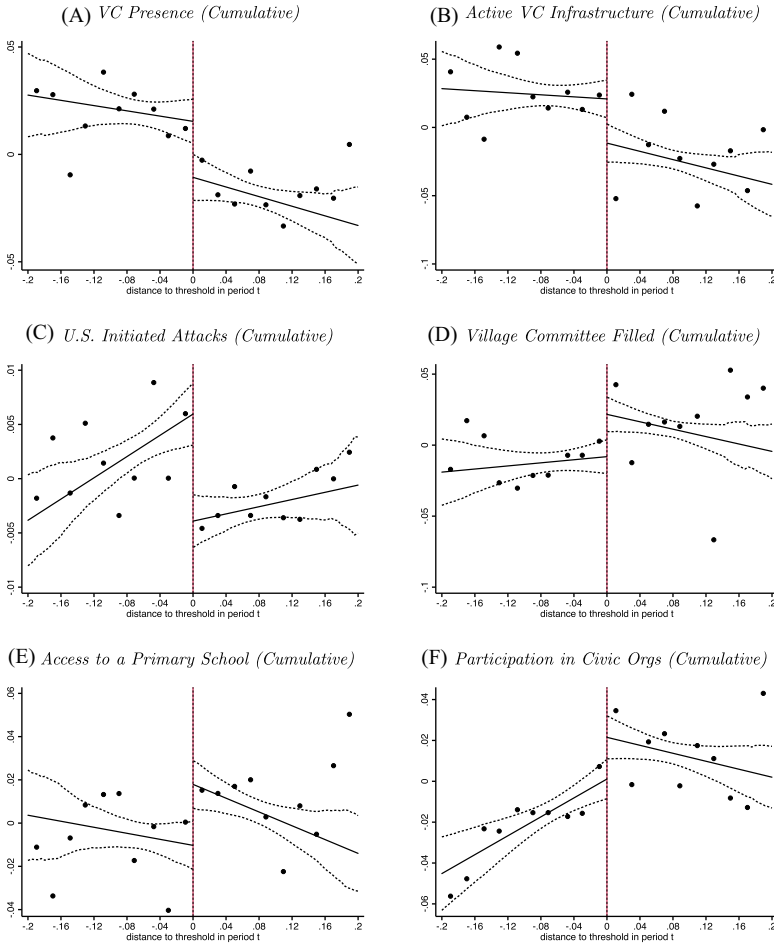
FIGURE V

Reduced Forms

Each point plots an average value within a bin. Discontinuity fixed effects have been partialed out. The solid line plots a local linear regression and dashed lines show 95% confidence intervals.

moving from no bombing to sample mean bombing increases the probability that there is an active VC infrastructure by 25 percentage points, and this effect is statistically significant at the 5% level. Figure V, Panel B plots the reduced-form relationship between distance to the threshold and VC infrastructure presence in

the raw data. Bombing also increases the share of households estimated to have engaged in VC infrastructure activities by around 4 percentage points (column (9)). These outcomes again illustrate an increase in local engagement with the VC. There is not a statistically significant effect on whether a VC propaganda drive was held, although the coefficient is large and positive (column (10)). Finally, bombing increases the probability that the VC extorted residents by 23 percentage points, relative to a sample mean of 0.27 (column (11)).

We explore a variety of robustness checks. Online Appendix Figure A-11 documents that the estimated impacts on the security LCA are robust to the choice of bandwidth and RD polynomial.[40] Moreover, Online Appendix Figure A-27 (A-28) plots quarter × quarter reduced-form (IV) estimates. There is no impact of being below the threshold (bombing) before score assignment, whereas being below the threshold (bombing) reduces the security LCA after score assignment. The impacts after score assignment are all negative, as expected, though some are noisily estimated. Similar figures are shown for the study's other main outcomes.

Our specification pools four separate thresholds, and one interesting question is whether effects obtain across all thresholds or are concentrated around particular ones. Thirty-five percent of observations are near the A-B threshold, 46% near the B-C threshold, 16% near the C-D threshold, and 3% near the D-E threshold. Hence, we are most powered to detect effects around A-B and B-C, and very underpowered to detect effects around the lower thresholds. Online Appendix Figure A-29 plots bombing against distance to the threshold, separately for all four thresholds. It documents discontinuities at the A-B, B-C, and D-E thresholds. Around the A-B threshold, low A's have only around a 5% chance of being hit in a given month, whereas high B's have a 10% chance of being hit. Air force planners were combining various pieces of information to target the VC, and having a higher score led them to give the area the benefit of the doubt more often. Low B's have around a 25% chance of being hit, whereas high C's have a 30% chance. Around the C-D threshold, both low C's and high D's have around a 50% chance of being hit. Finally, around the D-E threshold, low D's have around a 55% chance of being hit, whereas high E's have nearly a 75% chance of being hit. Online Appendix Figure A-30

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40. The other outcomes in Table IV are similarly robust but are not shown to avoid displaying a very large number of coefficients.

shows that the discontinuities in the security posterior proba-
bility closely match this pattern. There is not enough power to
run IV estimates by threshold, but Online Appendix Figure A-31
shows coefficient plots for the reduced form for the outcomes in Ta-
ble IV. Impacts of the score on security outcomes are concentrated
around the A-B, B-C, and D-E thresholds, though some estimates
are noisy. Similar patterns obtain for the study's outcomes more
generally.

Thus far we have focused on direct impacts, but bomb-
ing could also affect other locations. As discussed in Section II,
nearby places might be less likely to support the VC if see-
ing a neighbor get bombed leads residents to update their be-
liefs about the costs of supporting the insurgents. In addition,
VC recruiters might go to the bombed areas instead of target-
ing nearby places. On the other hand, if nearby bombing creates
grievances or disillusionment—or impacts the opportunity cost of
insurgency—it could increase VC support. We examine spillovers
using two measures of neighbors: contiguous areas and places
in the same VC administrative district.[41] Spillovers would likely
occur in nearby places, since media markets were nearly nonexis-
tent (radio and television were state-owned), and VC recruitment
networks were highly local. Moreover, spillovers might be more
likely to occur in denser areas, and hence we consider spillover
estimates both for the full sample and only in the subsample
with above median hamlet density. Online Appendix Tables A-6
through A-25 report four spillovers specifications—nearby, same
VC district, nearby dense only, and same VC district dense only—
for all the study's outcomes, where the average outcome in the
nearby areas is used as the dependent variable. There is limited
evidence of spillovers, and to the extent they exist, they tend to
go in the same direction as the direct effects. This is true both for
the full sample and for the more densely populated areas. These
results suggest that in a context where so many explosives were
dropped that the odds of having explosives hit near your own
hamlet were high, seeing neighbors hit either had little effect, or
the intimidation effects on average approximately canceled out
grievance or opportunity cost-type effects.

A potential concern with the foregoing results using HES
data is that CORDS advisers may have reported less VC

41. The Online Appendix uses a radius of 10 kilometers. Results are similar
when other radii are used.

activity to show that bombing was working, or more VC activity to justify that bombing was needed.[42] Administrative data on U.S. troop movements and casualties provide an alternative, very well-measured source of information on security, that is informative because over time troops would plausibly respond to a deterioration of security. The data are also interesting in their own right, as overwhelming firepower unleashed by ground troops could contribute to the effects of bombing. Table V, columns (1) through (6) consider immediate effects, and columns (7) through (12) examine cumulative impacts. Consistent with ground troops not directly using the score to allocate resources, there are no contemporaneous effects. In contrast, column (7) documents, using data from HES, that moving from no bombing to sample mean bombing over the course of the war increases the monthly probability that friendly troops operated nearby by 17 percentage points. Moreover armed forces administrative data show that U.S. battalion operations are more likely over the course of the war near more bombed areas (column (8)), as are U.S.-initiated attacks (column (9)). Figure V, Panel C plots the RD relationship between distance to the threshold and U.S.-initiated attacks.

There is no impact on the number of U.S. deaths (column (10)), which with a mean of 0.06 are relatively rare within a 5 kilometer radius of any given hamlet, whereas bombing increases South Vietnamese and VC troop deaths (columns (11) and (12)). There is a large literature arguing that VC deaths (the so-called body count) were largely fabricated and conflate civilians with insurgents, and thus it is unfortunately difficult to conclude from these data how many VC insurgents were killed. Regardless, the various security measures in Table IV suggest that on net VC activity increased following bombing.

These estimates are complemented by Online Appendix Figure A-44, which examines citizens' perceptions of security. The data are drawn from public opinion surveys collected by South Vietnamese enumerators and provide an alternative source to corroborate the effects documented above. The surveys were

42. HES continued to be collected by the South Vietnamese for a year following U.S. withdrawal. The study cannot reject that the impacts of cumulative bombing on the average LCA posteriors prior to U.S. withdrawal are the same as those on the average LCA posteriors in the year following U.S. withdrawal. This suggests that effects are unlikely to be driven purely by reporting incentives of the U.S. district advisers.

TABLE V

ARMED FORCES ADMINISTRATIVE DATA

						Dependent variable					
	Immediate						Cumulative				
	Friendly forces	U.S. ops	U.S. attacks	U.S.	SVN troop deaths	VC	Friendly forces	U.S. ops	U.S. attacks	U.S.	SVN troop deaths	VC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Bombing ($t+1$)	0.294	0.068	0.088	−0.204	−1.263	−4.742						
	(0.326)	(0.094)	(0.096)	(0.806)	(2.976)	(18.764)						
Bombing (cum.)							0.635	0.110	0.113	−0.048	24.547	171.569
							(0.312)	(0.063)	(0.063)	(0.209)	(12.863)	(78.879)
Obs.	12,188	12,181	12,181	12,181	12,181	12,181	12,206	12,199	12,199	12,199	12,199	12,199
Clusters	2,261	2,261	2,261	2,261	2,261	2,261	2,265	2,265	2,265	2,265	2,265	2,265
F stat.	14.43	14.47	14.47	14.47	14.47	14.47	12.12	12.05	12.05	12.05	12.05	12.05
Mean	0.52	0.02	0.02	0.14	1.84	4.80	0.43	0.01	0.02	0.06	2.41	8.74

Notes. Bombing measures the share of months that friendly air or artillery fire was directed in or near a populated area. *Bombing* is instrumented by whether the hamlet was below the security score threshold. The regression also includes a linear RD polynomial (estimated separately on either side of the threshold for each discontinuity) as well as discontinuity fixed effects, quarter-year fixed effects, and controls for the characteristics that enter the security score. Robust standard errors clustered by village are in parentheses.

conducted in six randomly selected hamlets in each province ×
month and not all months have been preserved. Hence, these data
are available for a much smaller sample, and due to lower power
the first stage is weaker, though the coefficients do not differ sig-
nificantly. To avoid a weak first stage, Online Appendix Figure A-
44 instead plots the reduced form. Perceived VC terrorism in the
hamlet is higher below the threshold (Panel A); the probability of
citizens reporting VC recruitment is higher, though the effect is
noisy (Panel B); citizens' assessment of the effectiveness of local
officials at ensuring security is worse (Panel C); and citizens rate
the police as less effective in preventing VC activity (Panel D).

The evidence in Section II.B suggests grievances and changes
in the economic opportunity cost of joining the insurgency as
potential reasons that bombing near civilian population centers
could backfire militarily. South Vietnam was a subsistence agri-
cultural economy with little capital to destroy. The economic ef-
fects, reported in Table VI, appear weaker and more delayed than
the security effects, suggesting that grievances may be more cen-
tral, but it would be unwarranted to dismiss opportunity costs
given the noisy nature of the available economic data.

Specifically, column (1) reports the immediate effect of bomb-
ing on the probability of being in the high economic latent class—
constructed using the same methodology as the security LCA—
and the estimate is small and statistically insignificant. Column
(2) considers the cumulative specification. The point estimate is
negative and fairly large but not quite statistically distinct from
0. Columns (3)–(8) report cumulative estimates for all outcomes
used in the LCA. Bombing decreases the availability of manufac-
tures (column (4)), reduces the likelihood that there is a surplus of
goods (column (5)), and reduces the share of households with ac-
cess to a vehicle (column (7)). The point estimate for the availabil-
ity of nonrice foodstuffs (column (3)) is negative but statistically
insignificant, and the impacts on whether plots are left fallow
due to security concerns (column (6)) and the share of households
requiring assistance to subsist (column (8)) are positive but in-
significant.

3. Nation-Building Objectives. Those who believed over-
whelming firepower could be used as a tool for nation building
argued that it would drive citizens to urban areas (where they
were easier to control) and would signal that the central state
intended to be the wave of the future. The hope was that by

TABLE VI
ECONOMIC OUTCOMES

	Economic Posterior Prob		Nonrice food avail.	Manuf. goods avail.	Surplus goods prod.	No farm security bad	% HH own vehicle	% HH require assist.	Ham. pop. growth
	t+1 (1)	cum. (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bombing (t+1)	0.029								
	(0.148)								
Bombing (cum.)		−0.452	−0.336	−0.839	−0.775	0.636	−0.302	0.074	−0.063
		(0.287)	(0.379)	(0.460)	(0.487)	(0.418)	(0.154)	(0.158)	(0.212)
Obs.	12,188	12,206	11,882	11,882	11,894	10,976	11,935	11,848	11,966
Clusters	2,261	2,265	2,187	2,187	2,190	2,072	2,204	2,197	2,209
F stat.	14.43	12.12	9.66	9.66	9.90	10.18	11.84	11.74	10.38
Mean	0.67	0.68	0.71	0.61	0.43	0.28	0.26	0.07	−0.02

Notes. Bombing measures the share of months that friendly air or artillery fire was directed in or near a populated area. *Bombing* is instrumented by whether the hamlet was below the security score threshold. The regression also includes a linear RD polynomial—estimated separately on either side of the threshold for each discontinuity—as well as discontinuity fixed effects, quarter-year fixed effects, and controls for the characteristics that enter the security score. Robust standard errors clustered by village are in parentheses.

signaling to the population that the government, not communist rebels, would be the main game in town, over time individuals would become more engaged with the state and noncommunist civic society. This would lead to better local administration, public goods provision, and civic engagement. In contrast, skeptics argued that overwhelming firepower would widen the political legitimacy gap between the VC and the South Vietnamese government, already seen by many as an imperialist puppet of the United States.

Table VI, column (9) examines quarterly population growth. Hamlet population was declining in this period, though the secondary literature notes that Vietnamese often remained even when their towns were destroyed (Appy 2015, p. 167). The coefficient on bombing is negative but statistically insignificant. Bombing also reduced population through deaths, and hence it appears unlikely that it led to movements to urban areas on the massive scale envisioned by advocates of forced draft urbanization (as confirmed by urban population).

Next, we consider impacts on local government administration. Table VII, column (1) examines the contemporaneous effect of bombing on a local government administration LCA, which incorporates the government's ability to tax, staff its positions, and interface with citizens. The point estimate is small and statistically insignificant, which is not surprising because this may change slowly. Column (2) documents that an increase in cumulative bombing until U.S. withdrawal from 0 to the sample mean decreases the posterior probability of being in the high administration latent class by 8 percentage points.

Columns (3)–(5) examine outcomes that enter the administration LCA.[43] Moving from no bombing to sample mean cumulative bombing decreases the probability that all village committee positions are filled by 21 percentage points, relative to a sample average of 0.84 (column (3)). The village committee administered public goods provision, and Figure V, Panel D plots the reduced-form relationship for this outcome. Moreover, bombing reduces the probability that the local government systematically collects taxes by 25 percentage points, relative to a sample mean of 0.70 (column (4)). Finally, the village chief is less likely to visit all neighborhoods

43. Additional outcomes entering the LCA are presented in Online Appendix Table A-26. The other outcomes do not have as much variation, and thus we are less powered to detect effects.

TABLE VII

GOVERNANCE

	Administration Posterior Prob.		Vilg. comm. filled	Vilg. gov. taxes	Chief visits hamlet	Education Posterior Prob.		Primary school access	Sec. school access	Health Posterior Prob.		Pub works cons.
	$t+1$ (1)	cum. (2)	(3)	(4)	(5)	$t+1$ (6)	cum. (7)	(8)	(9)	$t+1$ (10)	cum. (11)	(12)
Bombing ($t+1$)	−0.091					−0.090				0.277		
	(0.110)					(0.183)				(0.175)		
Bombing (cum.)		−0.305	−0.798	−0.944	−0.560		−0.447	−0.623	−0.752		0.417	−0.523
		(0.144)	(0.380)	(0.443)	(0.241)		(0.283)	(0.307)	(0.455)		(0.286)	(0.492)
Obs.	12,188	12,206	11,815	11,878	11,928	12,188	12,206	11,928	11,906	12,188	12,206	11,904
Clusters	2,261	2,265	2,188	2,189	2,202	2,261	2,265	2,204	2,192	2,261	2,265	2,191
F stat.	14.43	12.12	10.33	10.62	11.44	14.43	12.12	11.61	9.76	14.43	12.12	10.34
Mean	0.97	0.96	0.84	0.70	0.93	0.59	0.66	0.88	0.37	0.72	0.76	0.51

Notes. Bombing measures the share of months that friendly air or artillery fire was directed in or near a populated area. *Bombing* is instrumented by whether the hamlet was below the security score threshold. The regression also includes a linear RD polynomial—estimated separately on either side of the threshold for each discontinuity—as well as discontinuity fixed effects, quarter-year fixed effects, and controls for the characteristics that enter the security score. Robust standard errors clustered by village are in parentheses.

in the village at least once a month in more bombed areas (column (5)). Bombing could directly affect the functioning of local government, and by widening the political legitimacy gap it could lead citizens to undermine it in many small ways, even short of joining an insurgency (Scott 1985).

Both education and health care were provided primarily by local governments. Column (6) documents that there is not an immediate effect of bombing on the posterior probability of being in the high education provision latent class, which incorporates questions about the accessibility of primary and secondary education and challenges faced by schools. In contrast, moving from no bombing to sample mean bombing over the course of the war reduces the probability of being in the high latent class by 12 percentage points, relative to a sample mean of 0.66 (column (7)). Columns (8) and (9) document that cumulative bombing reduces access to primary and secondary school, respectively. See also Figure V, Panel E. Decreases in the government's ability to provide public goods may have further widened the legitimacy gap, and the VC argued that a lack of access to schools provided a recruitment boost (Tang and Chanoff 1985, p. 202). Next, columns (10) and (11) consider the impact of immediate and cumulative bombing on the health care provision LCA. If anything, the impact is positive, but it is not statistically significant. Bombing could increase health care demand. Column (12) examines whether public works were under construction during the quarter. The estimate is negative and large but not statistically significant.

Increasing noncommunist civic engagement was another aim of nation building in South Vietnam, but the study shows that bombing had the opposite effect. Table VIII, column (1) documents that there is an immediate negative impact of bombing on civil society, which is significant at the 10% level. Column (2) estimates that moving from no bombing to sample mean cumulative bombing reduces the probability of being in the high civil society latent class by 14 percentage points, relative to a sample mean of 0.69, and this effect is significant at the 5% level. Columns (3)–(9) report cumulative estimates for all outcomes used in the LCA. Moving from no bombing to sample average bombing reduces the share of individuals participating in civic organizations by 13 percentage points, relative to a sample mean of 0.29 (column (3)). Figure V, Panel F plots this reduced-form relationship. The impacts on participation in the People's Self-Defense Force and economic training programs are negative but not statistically

TABLE VIII

NONINSURGENT CIVIC SOCIETY

	Civic society Posterior Prob.		% HH with a member active in				Self-dev. proj. under way	Youth org exists	Council meets regularly
	$t+1$ (1)	cum. (2)	Civic org. (3)	PSDF units (4)	Econ. train. (5)	Dev. proj. (6)	(7)	(8)	(9)
Bombing ($t+1$)	−0.331 (0.186)								
Bombing (cum.)		−0.523 (0.248)	−0.504 (0.266)	−0.260 (0.238)	−0.225 (0.230)	−0.563 (0.357)	−0.471 (0.245)	0.166 (0.359)	−0.128 (0.421)
Obs.	12,188	12,206	11,927	11,914	11,967	11,298	11,863	11,855	11,761
Clusters	2,261	2,265	2,202	2,201	2,209	2,168	2,186	2,189	2,143
F stat.	14.43	12.12	11.28	11.61	10.35	8.53	11.03	11.25	11.16
Mean	0.61	0.69	0.29	0.52	0.20	0.37	0.89	0.76	0.58

Notes. Bombing measures the share of months that friendly air or artillery fire was directed in or near a populated area. *Bombing* is instrumented by whether the hamlet was below the security score threshold. The regression also includes a linear RD polynomial—estimated separately on either side of the threshold for each discontinuity—as well as discontinuity fixed effects, quarter-year fixed effects, and controls for the characteristics that enter the security score. Robust standard errors clustered by village are in parentheses.

significant (columns (4) and (5)). Locally organized self-development projects are less likely to be under way in more bombed hamlets (column (7)). There is not a statistically significant impact on the presence of youth organizations (column (8)) or whether the local council meets frequently with citizens (column (9)). In summary, bombing made citizens more likely to engage in the insurgency and less likely to participate in noncommunist civil society, plausibly by reducing the legitimacy of the noncommunist state in the eyes of its citizens.

IV. OVERWHELMING FIREPOWER VERSUS HEARTS AND MINDS

IV.A. Overview

This section examines a second natural experiment, which compares the overwhelming firepower strategy pursued by the U.S. Army to a more hearts-and-minds-oriented COIN approach pursued by the USMC.

Military historian Austin Long examines a 1967 natural experiment in which the army replaced the Third Marine Division, which was diverted to deal with urgent threats along the DMZ. Long documents that the USMC emphasized small-unit operations in conjunction with locals, whereas the army emphasized overwhelming firepower. For example, the army expended significantly more rounds of ammunition than the USMC after assuming control of the districts, even on days with no enemy contact. The latter occurred because of H&I which did not have a specific target but fired at a general area that could contain the enemy and civilians. Eighty-eight percent of army rounds were used for H&I in the districts Long examines. Moreover, refugees were produced five times faster after the army arrived than when the USMC controlled the districts.

This study exploits another natural experiment comparing the army and marines to shed light on whether their distinct COIN strategies plausibly led to different outcomes. The USMC commanded Corps I, the northernmost of the four military regions in South Vietnam, whereas the army commanded neighboring Corps II. Lyndon Johnson deployed the marines (who serve as international first responders) to Vietnam in 1965 to protect a key airbase in Da Nang, located in Corps I. Later that year the USMC expanded into the rest of northern South Vietnam. The marines were given command of Corps I on arrival and retained it until
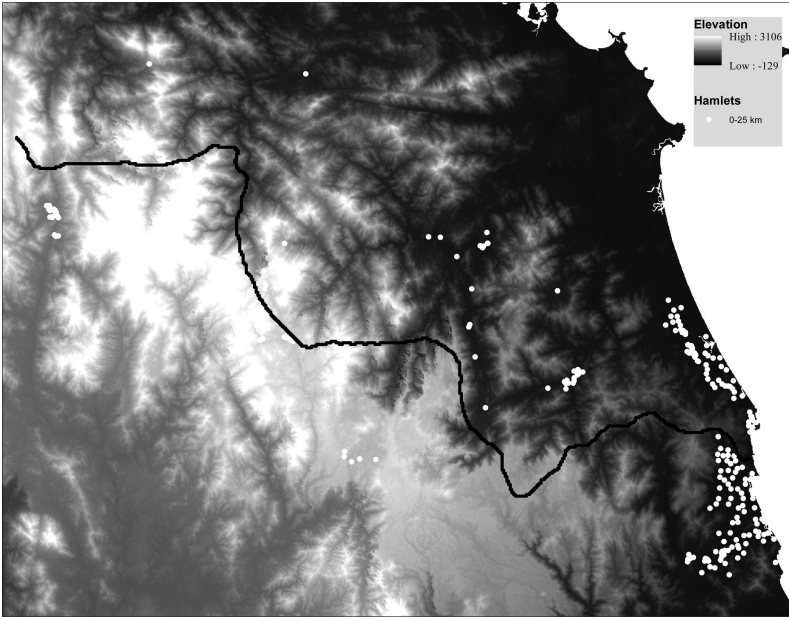
FIGURE VI

Corps Region Boundary

This map plots hamlets near the Corps I–II boundary. See the legend for more details.

March 1970, when the army assumed command, and the USMC withdrew from Vietnam in April 1971. The corps boundaries followed preexisting province boundaries. Army soldiers operated in Corps I, under USMC command, and administrative data document that the marines were concentrated almost exclusively in Corps I.[44] The Third Division was stationed along the DMZ and engaged primarily in conventional warfare, whereas the First Division conducted counterinsurgency in the remainder of Corps I.

We use an RD to compare across the corps boundary (Figure VI). If other factors change smoothly, the RD will isolate the causal impact of the USMC relative to the army, though there could be other mechanisms beyond COIN strategies that led to

44. Of armed incidents involving the USMC, 99.7% occurred in Corps I; 99.8% of attacks on U.S. Marines were in Corps I; and 99.8% of deaths of U.S. Marines were in Corps I. Online Appendix Figures A-45 to A-47 plot USMC-initiated attacks, enemy attacks on the USMC, and USMC casualties, respectively.

different outcomes. Qualitative evidence points to the differences in COIN strategies discussed in Section II.C as particularly central, painting a picture that is consistent with the bombing results.

Differences in personnel recruitment, training, and rotation are the most plausible alternative channels that differentiate the army and marines, but these differences appear relatively modest. Notably, average army and marines scores on the Armed Forces Qualifying Test (AFQT)—which was taken by all soldiers—were not different, nor were the shares of soldiers drawn from the lowest AFQT score groups (Dawson 1995). High school completion rates for army soldiers were slightly higher. The army also had a higher share of soldiers from the Selective Service, but rates varied from year to year, and the USMC relied extensively on the draft from 1968 until withdrawal. Online Appendix Table A-27 compares a wide range of demographic characteristics of army and USMC casualties.[45] USMC casualties were modestly more likely to be from the Northeast, whereas U.S. Army casualties were modestly more likely to be from the South, but there are no differences in racial composition.

Initially, USMC boot camp was 4 weeks longer than army boot camp, but due to manpower shortages it was shortened from 12 to 8 weeks (the same length as army boot camp) starting in 1967. Both the USMC and army pursued an individual rotation policy, in which enlisted men were rotated in and out of combat units on a 12-(Army) or 13-(USMC) month schedule. During a tour of duty, army officers spent six months each in combat and staff positions, whereas USMC officers could be assigned for the entire year to combat, which may have boosted morale or provided more relevant experience (Gabriel and Savage 1979).[46] It is possible that differences in officer rotation or other officer characteristics could contribute to differences across the boundary, though impacts are statistically identical across quarters and thus unlikely to be driven entirely by officers in months 7 through 12 of their rotation or by particular individuals stationed near the boundary.

IV.B. Empirical Design

To compare the impacts of the USMC to those of the army, the study uses a spatial regression discontinuity across the Corps

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45. This information cannot be released for individuals who are still living.

46. Due to rotation policies, however, officers would not spend the entire time with the same soldiers, and often not in command of the same unit.

Region I–II boundary:

$$(2) \quad y_{hs} = \alpha_0 + \alpha_1 USMC_{hs} + f(lat_{hs}, lon_{hs}) + \beta G_{hs} + \alpha_s + \epsilon_{hs},$$

where $USMC_{hs}$ is a dummy equal to 1 if hamlet h, along segment s, is in Corps I and $f(lat_{hs}, lon_{hs})$ is an RD polynomial in latitude and longitude. G_{hs} is a vector of geographic controls, and α_s is a boundary segment fixed effect that splits the boundary into two segments. Standard errors are clustered by village. The baseline uses a local linear specification and a bandwidth of 25 kilometers. Results are robust to alternative specifications.[47]

The identifying assumptions for a spatial RD are the same as those for the RD in security score space, and Table IX examines whether precharacteristics change smoothly at the corps region boundary, which followed the preexisting provincial boundary. Column (1) considers VC attacks, averaged from 1964 through when the marines established operations in southern Corps I in May 1965. VC attacks are balanced during the preperiod. The dependent variable in Column (2) is a dummy for whether the hamlet is urban. The estimate is small and statistically insignificant, suggesting no difference in urbanization across the boundary. Columns (3) and (4) consider elevation and slope, respectively, documenting that there are no statistically significant differences.

Next, geo-referenced 1929 maps are used to compute whether there are various landmarks located near the hamlet: factories (column (5)), markets (column (6)), military posts (column (7)), telegraphs (column (8)), and train or tram stations (column (9)). While the landmarks tend to be rare, the limited data from the French colonial period are highly aggregated, and these maps provide a unique source of hamlet level information. Overall, colonial landmarks are balanced, though military posts are higher on the marines' side of the boundary, and the difference is significant at the 10% level. Columns (10) and (11) examine the density of all roads and paved colonial-built roads near the hamlet, taken from the 1929 maps. Total roads are higher on the marines side, but paved roads are not. Data on outcomes like schooling or health care are not available, and these were not widely accessible.

47. Online Appendix Table A-28 examines robustness to using a quadratic RD polynomial, and Table A-29 examines a wider 50 kilometer bandwidth. Results are broadly similar. While the education LCA is still positive and fairly large in magnitude, it is no longer statistically significant.

TABLE IX
ARMY AND MARINES: BALANCE CHECKS

	VC attack (1)	Urban (2)	Elev. (3)	Slope (4)	Factory (5)	Market (6)	Military post (7)	Telegraph (8)	Tram or train (9)	Total roads (km) (10)	Colonial roads (km) (11)
						Dependent variable					
Marines	0.020	0.031	−78.042	−1.552	0.003	−0.032	0.300	−0.017	0.038	2.253	−0.109
	(0.047)	(0.037)	(107.561)	(1.497)	(0.010)	(0.040)	(0.160)	(0.037)	(0.047)	(0.816)	(0.710)
Obs.	302	289	302	302	302	302	302	302	302	302	302
Clusters	64	63	64	64	64	64	64	64	64	64	64
Mean	0.35	0.04	302.24	3.32	0.01	0.03	0.05	0.02	0.05	1.63	0.64

Notes. Marines is an indicator equal to 1 if the observation is in Corps Region I. Regressions also include a linear RD polynomial in latitude and longitude and a boundary segment fixed effect. Robust standard errors clustered by village are in parentheses.

IV.C. Results

We compare outcomes across the Army-USMC boundary, using the spatial RD described by equation (2) and data drawn from HES, military administrative records, and public opinion surveys. Outcomes are averaged for the period prior to USMC withdrawal in April 1971.

We first examine whether public goods targeted by the Marines (education and health care) were higher on their side of the boundary, using data from HES. CORDS, the agency that collected these data, was not directly affiliated with the USMC or Army. Table X, columns (1) and (2) document that the posterior probability of being in the high education latent class is 24 percentage points higher on the USMC side of the boundary and the probability of being in the high health care provision latent class is 56 percentage points higher.[48]

Columns (3)–(9) examine differences across the boundary in security. The posterior probability of being in the high security latent class is 10 percentage points higher on the marines' side of the boundary, relative to a sample mean of 0.35, but the estimate is not statistically significant (column (3)). Security impacts are concentrated in VC military but not political activity. The village is less likely to have an armed VC presence (column (4)), and VC-initiated attacks on hamlets are lower (column (5)). However, there is not a statistically significant difference in the presence of the VC infrastructure (column (6)).

Columns (7)–(9) consider military administrative data. VC attacks on troops are significantly lower on the USMC side. This could reflect lower VC presence but may also result from the fact that search and destroy—pejoratively known as "dangling the bait"—often found the amorphous Viet Cong by sending troops into areas where they would attack and then responded with overwhelming firepower. The impacts on friendly (U.S. and South Vietnamese) and enemy troop deaths are negative but not statistically significant (columns (8) and (9)). Online Appendix Figure A-48 shows RD figures for key outcomes. The *x*- and *y*-axes plot latitude and longitude, whereas shading is used to denote the outcomes. Predicted values are shown in the background and the

48. Results for specific outcomes, available on request, document that primary school completion is 39 percentage points higher, medical services are 19 percentage points more likely to be available, and public works are 28 percentage points more likely to be under construction on the USMC side.

TABLE X

ARMY AND MARINES: PUBLIC GOODS AND SECURITY

| | Educ. | Health | Secur. | Armed VC present | VC init. attack | Active VC infr. | VC attacks troops | Friendly troop deaths | VC deaths | Admin | Civic soc. | Econ. |
	posterior probability									posterior probability		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Marines	0.243	0.562	0.095	−0.560	−0.482	−0.018	−0.191	−0.628	−1.935	0.147	0.130	−0.242
	(0.096)	(0.198)	(0.110)	(0.075)	(0.061)	(0.036)	(0.071)	(0.405)	(2.807)	(0.138)	(0.153)	(0.270)
Obs.	302	302	302	300	300	286	302	302	302	302	302	302
Clusters	64	64	64	63	64	63	64	64	64	64	64	64
Mean	0.25	0.36	0.35	0.32	0.33	0.87	0.18	0.68	4.06	0.87	0.35	0.39

Notes. Marines is an indicator equal to 1 if the observation is in Corps Region I. Regressions also include a linear RD polynomial in latitude and longitude, as well as geographic controls and a boundary segment fixed effect. Robust standard errors clustered by village are in parentheses.

raw data values are displayed using points in the foreground. Discontinuities in outcomes at the corps boundary are clearly visible.

Columns (10)–(12) consider the administration, civic society, and economic posterior probabilities and do not find statistically significant impacts. We have also examined whether bombing differs across the boundary. As expected given that security enters the algorithm targeting air strikes, bombing was 11 percentage points lower on the USMC side of the boundary, but the difference is not statistically significant (std. err. = 0.10).[49] Nonetheless, bombing could be a channel magnifying initial security differences. Effects are similar when we limit the sample to 1969, before the security score was used to target bombing.[50]

It could be that spillovers from Corps I impact nearby Corps II hamlets, leading the boundary region to be atypical. Online Appendix Table A-30 shows that results are broadly similar when we compare only hamlets 10–25 kilometers from the boundary, suggesting that areas very near the boundary are not atypical.[51]

A potential interpretation of the results thus far is that while less aggression reduced violence, instead of winning hearts and minds it may have simply led the Vietnamese to perceive noncommunists as weak. Public opinion surveys, while potentially subject to experimenter demand effects, can help shed light on whether hearts and minds were influenced. Table XI examines attitudes toward Americans and the South Vietnamese government. Since there are only 13 sampled hamlets within 25 kilometers of the corps boundary, we use OLS to compare places within 100 kilometers.

Respondents in Corps I were 16 percentage points more likely to state that they liked Americans and significantly less likely

49. CAP-targeted public goods also enter the security score algorithm, but are among the less influential questions and alone cannot explain much of the potential difference in air strikes.

50. It is also possible that the USMC strategy could have reduced or magnified the impacts of bombing. We do not estimate the impacts of bombing separately for Corps I because the significantly smaller sample in this region weakens the first stage, but the reduced-form impacts are broadly similar for Corps I and II.

51. As an additional check, we conduct the same randomization exercise as we did for bombing, where we randomly reassign distance to the threshold, and results are reported in Online Appendix Figures A-49 through A-54 and Online Appendix Table A-32. The *p*-values computed using the randomization exercise provide a very similar picture to those computed using conventional clustered inference, suggesting that the results are unlikely to arise by chance.

TABLE XI

ARMY AND MARINES: ATTITUDE TOWARDS AMERICANS AND SOUTH VIETNAM

	Dependent variable											
	Respondent			American			Effective			Police effective		Local officials effective
	Americans		No hostility Am.	Vietnam harmony	Presence beneficial	Fully conf. in GVN	ARVN	PF	RF	VC	Order	
	Likes	Hates										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Marines	0.158	−0.086	0.392	0.111	0.383	0.139	0.110	0.288	0.287	0.179	0.175	0.190
	(0.082)	(0.023)	(0.110)	(0.058)	(0.079)	(0.041)	(0.060)	(0.066)	(0.158)	(0.051)	(0.039)	(0.055)
Obs.	117	117	115	116	117	250	181	179	85	408	344	288
Clusters	66	66	65	66	66	112	102	109	54	178	156	145
Mean	0.24	0.04	0.48	0.18	0.51	0.43	0.79	0.35	0.55	0.77	0.28	0.56

Notes. Marines is an indicator equal to 1 if the observation is in Corps Region I. Regressions also include geographic controls. Robust standard errors clustered by village are in parentheses.

to respond that they hated Americans (columns (1) and (2)).[52] Moreover, respondents were 39 percentage points more likely to state that there was no hostility toward the United States in their community, 11 percentage points more likely to state that there is harmony between Americans and Vietnamese, and 38 percentage points more likely to state that the U.S. presence was beneficial (columns (3)–(5)).

Citizens in Corps I were also more likely to respond that they were fully confident in the effectiveness of the South Vietnamese government (column (6)). They were more likely to rate the ARVN as effective (column (7)), to rate the popular and regional forces (PF and RF) (regional security forces) as effective (columns (8) and (9)), and to rate the police as effective in countering the VC and maintaining order (columns (10) and (11)). Finally, they also rated local officials as more effective in ensuring security (column (12)).[53] These results are consistent with the hypothesis that hearts and minds were won—or lost less—relative to a more exclusive focus on overwhelming force.

V. Conclusion

Military interventions in weakly institutionalized societies were a central feature of the Cold War and continue through the present. This study identifies the causal impacts of bombing South Vietnamese population centers by exploiting discontinuities in an algorithm used to target air strikes. Bombing increased VC military and political activity, weakened local government administration, and lowered noncommunist civic engagement. Consistent with this, evidence suggests that the army's reliance on overwhelming firepower led to worse outcomes than the USMC's more hearts-and-minds-oriented approach.

We do not have systematic data on the perspectives of those who bore the brunt of overwhelming firepower, but qualitative evidence points to grievances and a widening of the political legitimacy gap between the South Vietnamese government and VC as central mechanisms. Although we can only speculate about what would have happened in scenarios off the equilibrium path,

52. The omitted category, and modal response, is "neither likes nor hates Americans."

53. Table A-31 show that results are broadly similar when the sample is limited to hamlets further than 25 kilometers from the boundary.

the empirical results and qualitative evidence push us toward agreement with President John F. Kennedy's 1954 assertion: "I am frankly of the belief that no amount of American military assistance in Indochina can conquer an enemy which is everywhere and at the same time nowhere . . . and which has the sympathy and covert support of the people."

Social scientists played an outsized role in convincing Kennedy's successor, Lyndon Johnson, that the war could indeed be won through the deployment of America's arsenal. None were more influential than Johnson's national security advisers: McGeorge Bundy—a political scientist who in the 1950s had been the youngest dean in Harvard's history—and MIT economist Walt Rostow, who was called "America's Rasputin" for the influence he held over Johnson. "Rostow was the prophet of American victory in the Vietnam War. He felt that he intuitively understood the nature of communist insurgency—as the disease of the 'transition to capitalism'—and was confident that he knew how to win the war" (Milne 2008, p. 148). Rostow and Bundy used their models of universal economic development and game theoretic conflict to make forceful arguments for what they believed ought to happen, but gave little consideration to what might happen due to forces outside their models. They had little appreciation for the role that anticolonial sentiments and other factors central to Vietnam's history played in shaping citizens' motivations.[54]

Bundy and Rostow contrast with another influential Vietnam War architect, Defense Secretary Robert McNamara, who began his career as the youngest professor in Harvard Business School history and has been described as the father of evidence-based policy making. McNamara initially advocated involvement in Vietnam but began encouraging Johnson to craft an exit strategy as early as 1966, when unfavorable evidence started to mount. McNamara ultimately argued: "this [expletive] bombing campaign, it's been worth nothing, it's done nothing, they've dropped more bombs than in all of Europe in all of World War II and it hasn't done a [expletive] thing" (Milne 2008, p. 5). McNamara did not make these critiques public, and within the

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54. Rostow, confident of the universality of the forces argued in his magnum opus *Stages of Economic Growth*, took little interest in the Vietnamese context. As his MIT colleague East Asian specialist Lucian Pye told his class in 1961 in reference to Rostow: "You know, you don't quite sleep so well any more when you know some of the people going to Washington" (Milne 2008, p. 72).

administration he was marginalized for his lack of creative ideas on how to win the war: "Robert McNamara was a brilliant manager of facts and data but no innovator. He took his ideas from others, subjected them to a quantitative critique, and if the numbers worked, his decisions were made" (Milne 2008, p. 148). Social scientists are not likely to soon regain the zenith of influence that they enjoyed in the 1960s—and lost in no small part because of their role along with military leaders such as Westmoreland in orchestrating the United States' greatest military defeat. Yet the need for insightful policy ideas, carefully informed by the motivations of those on the ground and worth little unless subjected to rigorous empirical critique, remains imperative.

HARVARD UNIVERSITY AND NATIONAL BUREAU OF ECONOMIC RESEARCH
NEW YORK UNIVERSITY

SUPPLEMENTARY MATERIAL

An Online Appendix for this article can be found at *The Quarterly Journal of Economics* online. Data and code replicating tables and figures in this article can be found in Dell and Querubin (2017), in the Harvard Dataverse, doi:10.7910/DVN/F4WUD6.

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