Journal of Global Security Studies, 8(1), 2023, 1–8
https://doi.org/10.1093/jogss/ogac046
Research Innovation

Rage and the Machines? Force Mechanization and Violence against Civilians

Marius Mehrl

University of Leeds, UK

Abstract

There is an ongoing discussion regarding the role of mechanized forces in counterinsurgency warfare. Proponents note that they boost counterinsurgents' ability to fight while critics point out that they diminish their ability to gather information. This note adds to this discussion by focusing on violence against civilians, an outcome that theory suggests should be affected by mechanization via both of these channels. Results from quantitative analyses employing new data on mechanization and covering the period 1989–2016 indicate that mechanization is unrelated to the number of civilians killed by government forces but positively associated with that killed by rebels. These results are in line with the idea that mechanization increases counterinsurgents' fighting but decreases their information-gathering abilities. By offering quantitative evidence that mechanized forces have a place in modern counterinsurgency, these results contribute to both academics' and practitioners' understanding of armed intrastate conflict.

Resumen

¿Cóll existe actuellement un débat quant au rôle des forces mécanisées dans la lutte contre l'insurrection. Les partisans de ces forces soutiennent qu'elles renforcent les moyens de lutte tandis que leurs détracteurs font remarquer qu'elles limitent les possibilités de collecte d'informations. La présente note vient enrichir ce débat en se concentrant sur les violences contre les civils, une issue sur laquelle la mécanisation, selon la théorie, devrait influer par l'intermédiaire de ces deux canaux. Les résultats d'analyses quantitatives ayant recours à de nouvelles données sur la mécanisation et couvrant la période 1989–2016 indiquent que la mécanisation n'a pas de lien avec le nombre de civils tués par les forces du gouvernement, mais qu'une relation positive existe avec le nombre de civils tués par les rebelles. Ces résultats confirment l'idée que la mécanisation renforce la lutte contre l'insurrection, mais diminue les possibilités de collecte d'informations. En présentant des preuves quantitatives du rôle que les forces mécanisées peuvent jouer dans la lutte moderne contre l'insurrection, ces résultats permettent aux chercheurs et aux professionnels de mieux comprendre les conflits armés intraétatiques.

Résumé

Actualmente se debate el papel de las fuerzas mecanizadas en la guerra de contrainsurgencia. Sus defensores señalan que aumentan la capacidad de lucha de los contrainsurgentes, mientras que sus detractores señalan que disminuyen su capacidad de recopilar información. Esta nota se suma a este debate centrándose en la violencia contra los civiles, un resultado que, según sugiere la teoría, debería verse afectado por la mecanización a través de estos dos canales. Los resultados de los análisis cuantitativos en los que se emplean nuevos datos sobre mecanización y que abarcan el periodo 1989–2016

Mehrl, Marius (2023) Rage and the Machines? Force Mechanization and Violence against Civilians. *Journal of Global Security Studies*, https://doi.org/10.1093/jogss/ogac046

indican que la mecanización no está relacionada con el número de civiles asesinados por las fuerzas gubernamentales, pero sí con el de los asesinados por los rebeldes. Estos resultados son coherentes con la idea de que la mecanización aumenta la capacidad de lucha de los contrainsurgentes, pero disminuye su capacidad de recopilación de información. Al ofrecer pruebas cuantitativas de que las fuerzas mecanizadas tienen cabida en la contrainsurgencia moderna, estos resultados contribuyen tanto a la comprensión de los conflictos armados intraestatales por parte de los académicos como por parte de los propios profesionales.

Keywords: violence against civilians, mechanization, counterinsurgency, civil wars
Mots clés: violence contre les civils, mécanisation, lutte contre l'insurrection, guerres civiles
Palabras clave: violencia contra la población civil, mecanización, contrainsurgencia, guerras civiles

Introduction

Tanks and other armored fighting vehicles are staples of modern counterinsurgencies. At the same time, their role within these campaigns remains contested. Practitioners consider armored fighting vehicles, and force mechanization on the whole, as decisive for counterinsurgency operations due to the fighting capabilities, in the form of protection, mobility, and firepower, they offer (see Van Wie and Walden 2022). However, academics caution that force mechanization may instead harm counterinsurgents because it reduces their contact with and access to civilians, resulting in longer and less successful campaigns (Lyall and Wilson 2009; Caverley and Sechser 2017). Ultimately, the debate on the relationship between mechanization and intrastate conflict dynamics remains unresolved. Against this background, I focus on an outcome that should be affected through both of the theoretical mechanisms attributed to mechanization, that is, reduced information and increased military power, is of core importance to (counter-)insurgency success (see Valentino 2014), and thus lies on the causal pathway from mechanization to the outcomes studied by previous research (Lyall and Wilson 2009; Caverley and Sechser 2017): one-sided violence against civilians, that is, violence that is intentional,[1] direct, and thus does not include fatalities due to unintentional actions, such as civilians killed by stray bullets destined for combatants, or indirect causes, for example, starvation (see Eck and Hultman 2007, 235).

Specifically, I investigate how governmental forces' mechanization affects the number of civilians killed by these forces as well as by rebels. I first clarify the two theoretical mechanisms, information and military power, through which these effects may occur. As these mechanisms work in opposite directions, no clear expectation regarding the link between governmental forces' mechanization and their violence against civilians emerges. But because rebels are only affected by the military power mechanism, I expect that governmental forces' mechanization, by increasing their fighting ability, leads rebels to increasingly target civilians. Empirical results using new data on governmental forces' mechanization indicate no clear effect on their own but a positive relationship with rebels' use of violence against civilians. These findings add to our understanding of the relative benefits of deploying mechanized units in internal armed conflicts.

Theoretical Background

Existing research offers two mechanisms through which governmental force mechanization may influence counterinsurgents' and rebels' one-sided violence against civilians. The first one focuses on mechanized forces' access to local information while the second one emphasizes their military power. I discuss each in turn and then derive expectations regarding the overall effects of governmental force mechanization.

On one hand, as argued prominently by Lyall and Wilson (2009), mechanization decreases armed forces' ability to gather information from the civilian population (see also Caverley and Sechser 2017). Mechanized forces require specialized supplies and thus rely on external supply lines for these rather than local sources. Their armor and transportation not only protect them from harm but also isolate them from civilians. And given their need for space, they tend to be based in geographically isolated bases that, again, they only leave within their vehicles. As a result, mechanized forces have little

1 There is an argument to be made that government forces' mechanization also affects their *unintentional* killing of civilians. I take up this possibility at the end of the empirics section.

contact with or access to local civilians, remaining outside of their information networks (Lyall and Wilson 2009; Caverley and Sechser 2017). The resulting lack of information reduces their ability to correctly identify insurgent informers and combatants, tell them apart from the civilians they may be hiding among, and selectively target violence toward them. It instead necessitates the use of more indiscriminate violence aimed not at individuals but at whole groups of people suspected of supporting insurgents (Kalyvas 2006; Lyall 2010). As Caverley and Sechser (2017, 706) put it, "mechanized armies [. . .] must [. . .] choose between using violence indiscriminately (and losing the support of the local population) or allowing enemy combatants to operate with relative impunity." Unless mechanized forces thus simply remain in their bases, leaving the field to their opponent, their lack of information presents a key obstacle to targeting rebels in a selective manner and without also erroneously hitting noncombatants. Instead of taking out individually known targets, counterinsurgents will then have to resort to the more indiscriminate use of one-sided violence, for example, sweeps directed against whole villages or the victimization of entire ethnic groups due to their suspected support for the enemy. As compared to targeted violence, this broader, nontargeted victimization of civilians may still be effective by hitting some actual insurgents and, at least in the short term, deterring civilian collaboration with them (see Lyall 2009), but comes at the cost of affecting more civilians. From the perspective of information, increasing force mechanization should thus be associated with more one-sided violence against civilians by government forces.

In contrast, the mechanization of *government forces* should not affect rebels in a similar manner as they do not face the same kind of information problem vis-à-vis their enemy. Government forces are generally uniformed, easy to identify, do not hide from their opponent, and instead seek to show their presence. And while rebels do require information from civilians on, for example, the political affiliation of other individuals in their community, it is not clear that governmental mechanization meaningfully increases their ability to obtain it. Insurgents will often already have stronger links to local civilians, and thus easier access to information, than government forces due to pre-conflict networks, ethnic links, and a shared language (Habyarimana et al. 2007; Lyall, Shiraito, and Imai 2015). And although mechanization reduces government forces' ability to gather information from civilians themselves, it should not impede their ability to interfere with insurgents' intelligence collection in the same way. Instead, the increased mobility offered by mechanization arguably allows for increased patrolling, and thus more of a regular presence in more settlements (Lyall and Wilson 2009), hindering insurgents' access to the civilians living there. At least through this mechanism, rebels' violence against civilians should thus not be affected by governmental force mechanization.[2]

On the other hand, there is a reason that governments employ mechanized forces to defeat insurgents. These forces, outfitted with major conventional weapons that can simultaneously withstand substantial enemy firepower and respond with their heavy on-board armaments, can inflict severe costs on an opponent while minimizing their own losses (see, e.g., Choulis et al. 2023). And their mobility also allows them to rapidly deploy to areas attacked by rebels. While not good at collecting information, mechanized forces are thus a plus on the battlefield, allow the government to boost its military effectiveness, that is, "destroying hostile forces while preserving one's own" (Biddle and Long 2004, 528), and therefore bring it closer to military victory. Along these lines, there is evidence that imports of such major conventional weapons enable governments to inflict more fatalities upon rebels (Mehrl and Thurner 2020; Fritz et al. 2022), who in turn become more likely to bow out of the conflict (Mehltretter and Thurner 2021). Government forces' mechanization thus implies a shift in the distribution of military power that affects rebels negatively and counterinsurgents, in turn, positively. Numerous studies show that such a shift affects civilians' incentives and behavior toward the belligerents, which in turn results in both sides adapting to what extent they target civilians (Hultman 2007; Wood 2010, 2014; Wood, Kathman, and Gent 2012). Ceteris paribus, civilians tend to support the belligerent they view as best able to protect them, provide services, and, ultimately, win the war (see, e.g., Mason 1996; Wood, Kathman, and Gent 2012). This means that they pay attention to power shifts and, accordingly, move their allegiance to the belligerent that is increasing its power.

By shifting military power in favor of government forces, mechanization thus also shifts civilian allegiances in their favor. As a result, government forces can benefit from more voluntary civilian cooperation and, in turn, have a reduced need to violently coerce civilians into assisting them. What is more, there is also a reduced need

2 Indirectly, the information mechanism may affect rebels' violence against civilians because it increases government forces' use of one-sided violence that, in turn, rebels have to match (Raleigh and Choi 2017). See the online appendix for a robustness check on this.

to violently deter civilians from cooperating with the insurgents as civilians will increasingly abstain from it in any case. The beneficial power shift induced by mechanization means that civilians will increasingly side with government forces, thus reducing the need to violently coerce and deter them, as they voluntarily act in line with government forces' preferences. Enjoying more uncoerced collaboration by civilians, government forces can reduce their violence against and instead focus on consolidating support among them. Doing so is beneficial for them as, in the long run, civilian victimization is counterproductive. Specifically, while effective at coercing involuntary, short-term cooperation, civilian victimization reduces civilians' levels of genuine, voluntary support and cooperation (Lyall, Blair, and Imai 2013; Condra and Wright 2019; Shaver and Shapiro 2021). In the long term, this is a problem as genuine civilian support is widely held to be crucial for the success of the counterinsurgency (see Mason 1996; Kalyvas 2006). If government forces thus use violence against civilians instrumentally, that is, to coerce civilians into assistance and to deter them from collaborating with insurgents, then mechanization, by increasing government forces' military power, should reduce the need for, and hence usage of, such violence.[3]

In contrast, increasing government forces' mechanization means that rebels face not only a more powerful adversary but also reduced civilian support. To match their enemy, they now require more resources while their main source of them, civilian communities, will be less willing to provide them. And what is more, the threat of civilian cooperation with the government has now also increased. As a result of adverse shifts in military power, rebels are thus less able to rely on civilians' voluntary assistance and noncooperation with the enemy (Mason 1996). And under these circumstances, they also have neither the resources to offer civilians additional compensation for their collaboration nor the favorable military outlook to credibly promise future rewards for it. For instance, rebels may offer social services or conduct elections to garner support (Flynn and Stewart 2018; Arves, Cunningham, and McCulloch 2019), but doing so requires an extent of resources and territorial control that becomes less and less available as they are militarily more challenged. Instead, rebels increasingly have to resort to coercion and violent means to extract resources from civilian communities and deter them from assisting government forces (Wood, Kathman, and Gent 2012; Wood 2014). This will especially be the case as rebels, suddenly facing a stronger adversary, a reduced resource base, and the increased threat of enemy collaboration, must shift their attention from long-term goals to ensuring their short-term survival even if, in the long run, their coercive means of doing so are counterproductive. From this perspective, the weakening of rebels' military position, induced by increasing government forces' mechanization, should thus push them toward engaging in civilian victimization. In a nutshell, this suggests that more mechanized government forces, because they are increasingly successful on the battlefield, will target less civilians while rebels, facing a more powerful opponent than before, will target them more.

Taken together, the "information" and the "military power" mechanism result in no straightforward expectation regarding the association between government forces' mechanization and governmental violence against civilians but a clear one regarding its relationship with rebels' victimization of civilians. Starting with the former, the two mechanisms push in different directions. A positive relationship between force mechanization and government one-sided violence against civilians would indicate that the information mechanism dominates while a negative one would suggest that the military power mechanism is at play. It is also possible that they precisely cancel each other out, resulting in a null effect. Ultimately, it appears most likely that their relative strength, and hence the effect of mechanization, depends on circumstantial factors. These may include government forces' overall knowledge about the insurgency (Kalyvas 2006), force specialization (Lyall 2010; Pilster, Böhmelt, and Tago 2016), and employment (Van Wie and Walden 2022) as well as rebels' relative strength (Mehrl and Thurner 2020) and own links to the population (Lyall, Shiraito, and Imai 2015). This leads me to empirically investigate the association between force mechanization and governmental violence against civilians without formulating a clear expectation regarding its direction. However, the information mechanism does not affect the rebel side, meaning that governmental force mechanization should only affect rebels' actions toward civilians via the military power mechanism. I thus expect a positive relationship between force mechanization and rebel one-sided violence against civilians.

3 In extension, this means that if government forces do not, or not only, use violence against civilians in this instrumental fashion, then the military power mechanism will not apply or at least to a reduced extent. This may, for instance, be the case if a government has an agenda of ethnic cleansing toward the population of a secessionist region. However, even in these cases, government forces' increased military power may result in reduced civilian victimization if civilians, now caught between weak insurgents and strong counterinsurgents that will continue targeting them, decide to flee instead of staying in place.

Research Design

For the empirical tests, I combine data on one-sided violence against civilians from the Uppsala Conflict Data Program (UCDP; Eck and Hultman 2007; Pettersson et al. 2021) with global data on state forces' extent of mechanization (Sechser and Saunders 2010; Choulis et al. 2023). I use the conflict dyad-year as unit of observation. The two dependent variables, governmental and rebel violence against civilians, are count variables describing the number of civilian fatalities deliberately inflicted by each actor in a given year. They are collected from the UCDP Georeferenced Event Dataset, meaning that they do not use the threshold of twenty-five deaths from one-sided violence (Eck and Hultman 2007) but instead encompass observations of all actors active in armed conflicts in the period 1989–2016.[4] Following Sechser and Saunders (2010), mechanization is measured by the number of armored fighting vehicles per one hundred ground soldiers. I obtain these data from Choulis et al. (2023), who extend Sechser and Saunders' original data collection beyond 2001. Observations of this variable are available in odd-numbered years only due to mechanization levels changing slowly; I follow existing studies by linearly interpolating this variable and log-transforming it[5] (see Sechser and Saunders 2010; Caverley and Sechser 2017; Choulis et al. 2023).

Given that the two dependent variables, governmental and rebel one-sided violence against civilians, are count variables, I use Poisson models with conflict dyad- and year-fixed effects to investigate how government forces' mechanization affects them. Conflict dyad-fixed effects capture the influence of time-invariant or slow-moving confounders such as terrain, military norms and culture, governmental agendas on the targeting of civilians, or rebels' organizational features. Year-fixed effects account for global shocks in mechanization levels that may have occurred due to the sudden availability of used arms following the breakup of the USSR or changes in what is considered good counterinsurgency practice due to western countries' experiences in Afghanistan and Iraq. I cluster standard errors on the conflict dyad; this captures the nonindependence of different yearly observations of the same conflict and corrects the otherwise too small standard errors reported by Poisson models with unit-fixed effects (Wooldridge 1999).

Finally, I control for additional confounders that are not captured by the fixed effects. This requires care as I do not want to control for posttreatment variables, that is, variables causally preceded by mechanization, because doing so would bias effect estimates (Dworschak 2021). Because mechanization is so slow-moving, potential posttreatment bias acquires additional importance, leading me to (1) present main specifications with and without controls and (2) include only covariates that are credibly unaffected by mechanization. I thus control for conflict country's (logged) population number, its GDP per capita, regime type, and the share of the population belonging to politically excluded ethnic groups. The first three variables not only are known drivers of mechanization (Gartzke 2001; Sechser and Saunders 2010) but also affect rebels' and government forces' costs and benefits of targeting civilians (Valentino, Huth, and Balch-Lindsay 2004; Hultman 2012). Large politically excluded ethnic groups, in turn, may be perceived by governments as a risk to their rule, resulting in arming and thus increased mechanization levels, while also affecting both rebels' and government forces' civilian victimization (e.g., Weidmann 2011; Fjelde and Hultman 2014). Population and GDP data come from the World Bank (2021),[6] regime type is coded based on the Polity index (Marshall, Gurr, and Jaggers 2016), and data on excluded ethnic group sizes are taken from Vogt et al. (2015). In the online appendix, I also control for additional, potentially posttreatment covariates, including conflict duration, conflict intensity, and military spending, to ensure that my findings do not depend on their omission.

Results

The results of four models, testing the relationship between government forces' mechanization and, respectively, governmental and rebel violence against civilians with and without control variables, are presented in figure 1. A full-result table can be found in the online appendix; its main takeaway is that the coefficient of mechanization is negative but statistically indistinguishable from zero in the models on governmental one-sided violence while it is positive and statistically significant on the 99 percent level in the models on rebel one-sided violence. Figure 1 shows what this means in substantive terms.

Its left panel shows that as logged mechanization is moved from 0 to 1.75 (~90th percentile), the number of civilians killed by the government is estimated to drop by approximately eighty fatalities. This effect may be considered substantively important, but its confidence

4 Observations from the genocidal one-sided violence in Rwanda in 1994 are dropped as they present an outlier in both the number and drivers of killings.

5 Unity is added before the log transformation.

6 Penn World Table data (Feenstra et al. 2015) were used if World Bank values were missing.

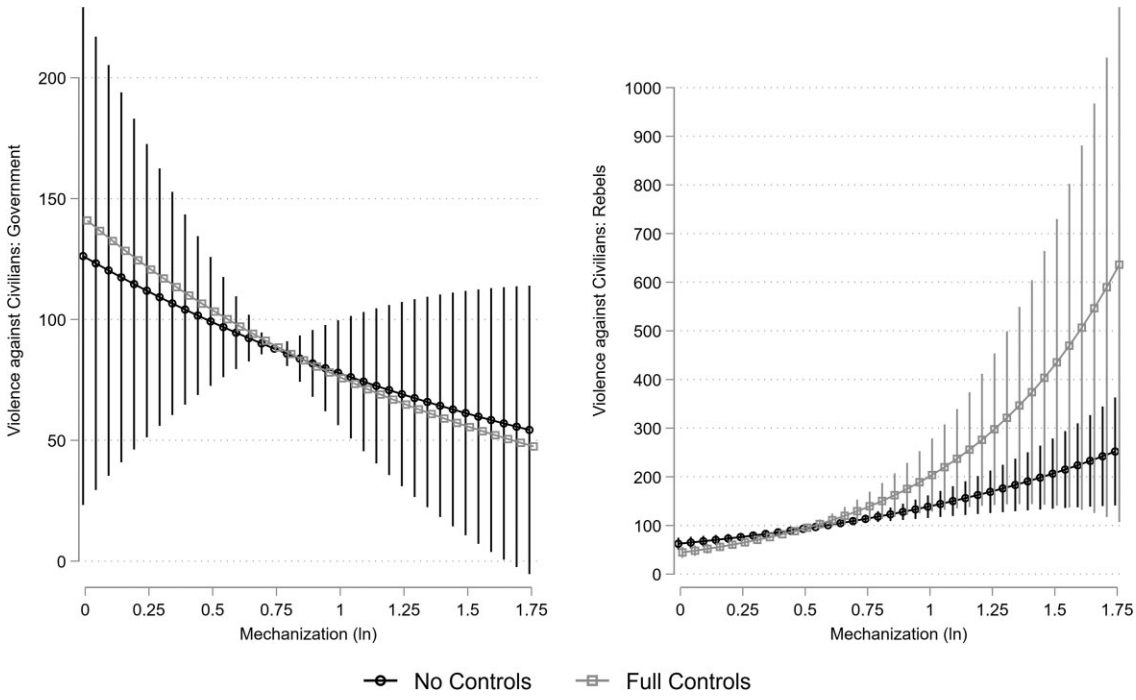

Figure 1. Government force mechanization and violence against civilians.
Note: Main effects from Poisson panel models. Dependent variable in the left panel is governmental violence against civilians and in the right panel rebel violence against civilians. Circles and squares indicate point prediction from the respective model and whiskers 95 percent confidence intervals. All models include conflict dyad- and year-fixed effects. Standard errors are clustered on the conflict dyad.

intervals are very large and always overlap. The right panel of figure 1 shows how rebel one-sided violence against civilians is predicted to change as governmental force mechanization increases. The model without control variables estimates that a shift in mechanization from 0 to 1.75 is associated with 190 more civilians being killed by rebels while the model accounting for potential confounders suggests a much higher number, 590. While these two models thus ultimately disagree on the size of the effect of government forces' mechanization, both indicate that this effect is substantively sizeable.

Taken together, these results thus indicate that there is no clear effect of governmental forces' mechanization on their targeting of civilians but that it instead increases rebels' use of this type of violence. Both of these findings support the view that force mechanization influences belligerents' behavior toward noncombatants via an information and a military power mechanism. Rebels are only affected by the latter and as their opponents' ability to fight is boosted by additional mechanization, they increasingly target civilians. Government forces, in contrast, gain military power but lose information-gathering capabilities when mechanizing. The relative importance of each mechanism will depend on its specific situation, resulting in an imprecisely estimated and likely heterogeneous effect of mechanization on its intentional use of violence against noncombatants.

In a series of additional analyses in the online appendix, I show that these substantive results remain unchanged when using random instead of fixed effect models, controlling for previous levels of one-sided violence, dropping outliers or the year-fixed effects, and adding additional covariates. There, I also address the possibility that government forces' mechanization, while not affecting their use of *intentional* violence against civilians, may increase their *unintentional* killing of noncombatants. This is a real possibility as mechanized forces may produce more lethal stray bullets and shells than pure infantry forces and their actions may more likely be coded as combat events, even if a tank projectile fired into an apartment building hits several civilians in addition to the rebel outpost suspected to be located there. It is also important as ultimately, civilians' voluntary cooperation with counterinsurgents will depend on their both intentional *and* unintentional killings of noncombatants. However, results indicate that government mechanization affects neither the total number of civilians

killed during combat nor a (somewhat crude) measure of government forces' fighting precision, the ratio of civilians to rebels killed in combat. There is thus no evidence that governmental forces' intentional, unintentional, or, taking them together, overall violence toward civilians is affected by their extent of mechanization. In contrast, the results presented here offer support for the expectation that as government forces become more mechanized, rebels engage in more intentional civilian victimization.

Conclusion

Do tanks and armored fighting vehicles have a role in counterinsurgencies? Prominent work answers this question with a resounding no (Lyall and Wilson 2009), while following research qualifies this claim (Caverley and Sechser 2017; Van Wie and Walden 2022) or rejects it outright (Smith and Toronto 2010). I add to this debate by studying an outcome that, theoretically, should be affected by both of the effects attributed to mechanization, reduced information, and increased fighting ability, and is a core factor in counterinsurgency campaigns: belligerents' violence against civilians. I show that government forces' mechanization has no clear effect on their own intentional targeting of civilians, indicating that at least on the whole, the reduced access to information due to force mechanization is balanced out by the gains in military capability that it induces. In contrast, governmental force mechanization is associated with the increased targeting of civilians by rebels, suggesting that, as a result of an adverse power shift, insurgents' entrenched position with civilians weakens and they have to turn to violence in order to control them. Taken together, these findings suggest that armored fighting vehicles can play a bigger role in combating insurgencies than argued by earlier research.

However, this role appears to depend on situational factors. Both the theory and the empirical results presented here indicate that force mechanization, in some contexts, can decrease governmental violence against civilians, thus boosting prospects for counterinsurgency success, but can increase it in others, hence harming them. Future research should follow Van Wie and Walden's (2022) early lead and further consider what situational factors this variation hinges upon. In addition, future research should also further consider to what extent drivers of *intentional* violence against civilians, such as force mechanization, lead to the *unintentional* victimization of noncombatants. The latter kind of violence remains much poorer understood but will be similarly crucial for counterinsurgency outcomes.

Supplementary Information

Supplementary information is available at the *Journal of Global Security Studies* data archive.

Acknowledgements

I would like to thank two anonymous reviewers and the editors for their helpful comments on earlier versions of this research note.

References

Arves, S., K.G. Cunningham, and C. McCulloch. 2019. "Rebel Tactics and External Public Opinion." *Research & Politics* 6 (3): 1–7.

Biddle, S., and S. Long. 2004. "Democracy and Military Effectiveness: A Deeper Look." *Journal of Conflict Resolution* 48 (4): 525–46.

Caverley, J.D., and T.S. Sechser. 2017. "Military Technology and the Duration of Civil Conflict." *International Studies Quarterly* 61 (3): 704–20.

Choulis, I., M. Mehrl, A. Escribà-Folch, and T. Böhmelt. 2023. "How Mechanization Shapes Coups." *Comparative Political Studies* 56 (2): 267–96.

Condra, L.N., and A.L. Wright. 2019. "Civilians, Control, and Collaboration during Civil Conflict." *International Studies Quarterly* 63 (4): 897–907.

Dworschak, C. 2021. "Bias Mitigation in Empirical Peace and Conflict Studies: A Short Primer on Posttreatment Variables." Accessed October 26, 2021. https://www.chrisdworschak.com/uploads/1/2/0/0/120000777/20211008_draft_posttreatment_dworschak.pdf

Eck, K., and L. Hultman. 2007. "One-Sided Violence against Civilians in War: Insights from New Fatality Data." *Journal of Peace Research* 44 (2): 233–46.

Feenstra, R.C., R. Inklaar, and M.P. Timmer. 2015. "The Next Generation of the Penn World Table." *American Economic Review* 105 (10): 3150–82.

Fjelde, H., and L. Hultman. 2014. "Weakening the Enemy: A Disaggregated Study of Violence against Civilians in Africa." *Journal of Conflict Resolution* 58 (7): 1230–57.

Flynn, D.J., and M.A. Stewart. 2018. "Secessionist Social Services Reduce the Public Costs of Civilian Killings: Experimental Evidence from the United States and the United Kingdom." *Research & Politics* 5 (4): 205316801881007.

Fritz, C., M. Mehrl, P.W. Thurner, and G. Kauermann. 2022. "The Role of Governmental Weapons Procurements in Forecasting Monthly Fatalities in Intrastate Conflicts: A Semiparametric Hierarchical Hurdle Model." *International Interactions* 48 (4): 778–99.

Gartzke, E. 2001. "Democracy and the Preparation for War: Does Regime Type Affect States' Anticipation of Casualties?" *International Studies Quarterly* 45 (3): 467–84.

Habyarimana, J., M. Humphreys, D.N. Posner, and J.M. Weinstein. 2007. "Why Does Ethnic Diversity Undermine Public Goods Provision?" *American Political Science Review* 101 (4): 709–25.

Hultman, L. 2007. "Battle Losses and Rebel Violence: Raising the Costs for Fighting." *Terrorism and Political Violence* 19 (2): 205–22.

———. 2012. "Attacks on Civilians in Civil War: Targeting the Achilles Heel of Democratic Governments." *International Interactions* 38 (2): 164–81.

Kalyvas, S.N. 2006. *The Logic of Violence in Civil War*. Cambridge: Cambridge University Press.

Lyall, J. 2009. "Does Indiscriminate Violence Incite Insurgent Attacks? Evidence from Chechnya." *Journal of Conflict Resolution* 53 (3): 331–62.

———. 2010. "Are Coethnics More Effective Counterinsurgents? Evidence from the Second Chechen War." *American Political Science Review* 104 (1): 1–20.

Lyall, J., G. Blair, and K. Imai. 2013. "Explaining Support for Combatants during Wartime: A Survey Experiment in Afghanistan." *American Political Science Review* 107 (4): 679–705.

Lyall, J., Y. Shiraito, and K. Imai. 2015. "Coethnic Bias and Wartime Informing." *Journal of Politics* 77 (3): 833–48.

Lyall, J., and I. Wilson. 2009. "Rage against the Machines: Explaining Outcomes in Counterinsurgency Wars." *International Organization* 63 (1): 67–106.

Marshall, M.G., T.R. Gurr, and K. Jaggers. 2016. *Polity IV Project: Political Regime Characteristics and Transitions, 1800–2015: Dataset Users' Manual*. Vienna, VA: Center for Systemic Peace.

Mason, T.D. 1996. "Insurgency, Counterinsurgency, and the Rational Peasant." *Public Choice* 86 (1–2): 63–83.

Mehltretter, A., and P. Thurner. 2021. "Duration of Intrastate Wars of Attrition: The Causal Impact of Military Build-Ups." September 22. SocArXiv. DOI: 10.31235/osf.io/5tgew.

Mehrl, M., and P.W. Thurner. 2020. "Military Technology and Human Loss in Intrastate Conflict: The Conditional Impact of Arms Imports." *Journal of Conflict Resolution* 64 (6): 1172–96.

Pettersson, T., S. Davies, A. Deniz, G. Engström, N. Hawach, S. Högbladh, and M.S.M. Öberg. 2021. "Organized Violence 1989–2020, with a Special Emphasis on Syria." *Journal of Peace Research* 58 (4): 809–25.

Pilster, U., T. Böhmelt, and A. Tago. 2016. "The Differentiation of Security Forces and the Onset of Genocidal Violence." *Armed Forces & Society* 42 (1): 26–50.

Raleigh, C., and H.J. Choi. 2017. "Conflict Dynamics and Feedback: Explaining Change in Violence against Civilians within Conflicts." *International Interactions* 43 (5): 848–78.

Sechser, T.S., and E.N. Saunders. 2010. "The Army You Have: The Determinants of Military Mechanization, 1979–2001." *International Studies Quarterly* 54 (2): 481–511.

Shaver, A., and J.N. Shapiro. 2021. "The Effect of Civilian Casualties on Wartime Informing: Evidence from the Iraq War." *Journal of Conflict Resolution* 65 (7–8): 1337–77.

Smith, N.A., and N.W. Toronto. 2010. "It's All the Rage: Why Mechanization Doesn't Explain COIN Outcomes." *Small Wars & Insurgencies* 21 (3): 519–28.

Valentino, B.A. 2014. "Why We Kill: The Political Science of Political Violence against Civilians." *Annual Review of Political Science* 17 (1): 89–103.

Valentino, B.A., P. Huth, and D. Balch-Lindsay. 2004. "'Draining the Sea': Mass Killing and Guerrilla Warfare." *International Organization* 58 (2): 375–407.

Van Wie, R.C., and J.A. Walden. 2022. "Troops or Tanks? Rethinking COIN Mechanization and Force Employment." *Small Wars & Insurgencies* 33 (6): 1032–58.

Vogt, M., N.C. Bormann, S. Rüegger, L.E. Cederman, P. Hunziker, and L. Girardin. 2015. "Integrating Data on Ethnicity, Geography, and Conflict: The Ethnic Power Relations Data Set Family." *Journal of Conflict Resolution* 59 (7): 1327–42.

Weidmann, N.B. 2011. "Violence 'from above' or 'from below'? The Role of Ethnicity in Bosnia's Civil War." *Journal of Politics* 73 (4): 1178–90.

Wood, R.M. 2010. "Rebel Capability and Strategic Violence against Civilians." *Journal of Peace Research* 47 (5): 601–14.

———. 2014. "From Loss to Looting? Battlefield Costs and Rebel Incentives for Violence." *International Organization* 68 (4): 979–99.

Wood, R.M., J.D. Kathman, and S.E. Gent. 2012. "Armed Intervention and Civilian Victimization in Intrastate Conflicts." *Journal of Peace Research* 49 (5): 647–60.

Wooldridge, J.M. 1999. "Distribution-Free Estimation of Some Nonlinear Panel Data Models." *Journal of Econometrics* 90 (1): 77–97.

World Bank. 2021. "World Bank Open Data." Accessed May 3, 2021. https://data.worldbank.org/.