State Capacity and Gender Inequality: Experimental evidence from Papua New Guinea*

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Abstract

How does expanding state capacity change power inequalities between men and women? I design a field experiment in a remote area of post-conflict Papua New Guinea that randomly assigns permanent police officer presence to 17 villages and not to 22 others. After the police have been working in treatment villages for over eight months, I measure outcomes in interviews with 1,383 respondents, and broaden the findings through analysis of over 30,000 historical case records. Whereas many expect the state to supplant non-state institutions, I find the opposite can occur. As police enforce a more equal rule of law, and empower women, men seek to preserve their advantage by increasing their reliance on local chiefs. Previous accounts overlook such strategic complementarities because they assume use of alternative resolution mechanisms is zero-sum. The findings show how forum-shopping can limit the ability of the state to reduce power inequalities between men and women.

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> It doesn't matter that she shouldn't, that she never would. What matters is that she could, if she wanted. The power to hurt is a kind of wealth.
>
> Naomi Alderman (2017)

Citizens frequently need the help of a more powerful authority to resolve interpersonal disputes. A primary purpose of the state is to provide such authority.[1] In contexts where police and courts are inaccessible or have low capacity, however, many people settle conflict with the help of non-state authorities, such as chiefs, religious leaders, and clan heads.[2] Non-state authorities thus play an important role in regulating social conflict where few alternatives exist.[3] However, much evidence suggests their judgments reflect and sustain pre-existing power inequalities: between men and women, autochthons and migrants, landed and landless, and so on.[4]

Central governments, often with foreign assistance, have sought to enforce more equitable rule

[1] While scholars from different traditions have emphasized that some degree of social cooperation without the state is possible (e.g., Posner and Landes, 1975; Axelrod and Hamilton, 1981; Fearon and Laitin, 1996; Henrich et al., 2006), the historical evolution of interpersonal violence speaks in favor of Hobbes' Leviathan as a supremely effective solution to the problem of social order (Hobbes, 2004). Authors such as Gurr (1981) and Eisner (2003), for example, have illustrated that the rise of central states in Europe and the United States throughout the 800-year period spanning the thirteenth to twenty-first centuries precipitated a massive reduction in the rate of serious inter-personal violence, on the order of 10:1 to 50:1. By contrast, crime rates in the developing world today are estimated to be over eight times higher than in Western Europe and the United States (see Table 8 of appendix for data source).

[2] As Baker (2008, 157) puts it "in rural areas of Africa the great majority of disputes are processed in customary courts. The cases are normally brought to the court by the disputants, although arrests may be made by native authority police. Hence customary leaders have a very great influence on local policing [in addition to adjudication]." Note that "dispute resolution" refers here and in the rest of this paper to both the policing services that take place prior to adjudication—i.e., arrest, protection, investigation—and to the adjudication itself. In practice, the same actor or group of actors will perform both policing and adjudication roles during dispute resolution. See Isser (2011) for a review of non-state justice.

[3] In a field experiment in Liberia, for example, Blattman, Hartman, and Blair (2014) find that strengthening non-state dispute resolution mechanisms reduced violence.

[4] Begler (1978) and Harris (1993), for example, have argued that even in the most egalitarian traditional societies, dispute resolution practices are biased toward men. More recently, Sandefur and Siddiqi (2013) show in Liberia that women plaintiffs are more likely to take complaints to the formal sector over customary fora because they expect to face bias under the custom. Gender is not the only salient cleavage that determines partiality. Baldwin, Muyengwa, and Mvukiyehe (2018) illustrate that village heads in Zimbabwe are frequently accused of making dispute resolution decisions in favor of co-partisans in either the ruling ZANU-PF or opposition parties. In her study of customary governance and state-building in Afghanistan, Murtazashvili (2016, 77) quotes a Pashtun nomad who believes that her family receives biased decisions from customary authorities because her people do not use the local mosque: "The village mullah is not from our side. He is from another group and usually makes decisions that favor them." Along similar lines, a report by the Danish Institute for Human Rights (2010) describes how poor members of society in Bangladesh are typically disadvantaged when disputes with richer members of society are adjudicated by the informal *shalish* court, because poor members cannot afford the services of "middlemen" who can pre-arrange the outcome of disputes.

of law by locating security forces in remote areas where state services are lacking.[5] As the state expands its capacity to address interpersonal disputes, the increasing availability of police and courts is expected to gradually supplant non-state institutions, which are perceived to be less equitable.[6] Often, however, these outcomes fail to materialize. Deep social inequality, violence, and reliance on non-state authorities can persist even after the installation of state security forces.[7]

In this paper, I explain one reason for which power inequalities may persist even in the face of expanding state capacity. I assess the observable implications of the theory using a novel opportunity to study the causal impact of state-building in remote parts of post-conflict Papua New Guinea.

Expanding police presence into remote areas, I argue, may not necessarily diminish the role of customary authorities. As the state empowers those disadvantaged by the custom, they begin to report to police disputes with high-status individuals about which they might otherwise have kept silent. High-status individuals can protect their interests against police involvement by appealing to customary leaders who are likely to take their side in the dispute resolution process. Thus, even in a best-case scenario in which the police tend to side with vulnerable members of society, expanding state capacity to intervene in interpersonal disputes might actually *increase* reliance on chiefs—at least among segments of the population privileged by the custom. The ability to draw on alternative authorities can blunt any deterrent effects of policing.

Consider the following example taken from case records kept by police who are stationed in remote parts of Papua New Guinea. On December 27, 2008, a woman in a coastal village in the region of Bougainville complained to a nearby female police officer that a man had attempted to

[5] For example, in an attempt to decentralize state security services to war-torn communities in Afghanistan in 2010 to 2013, the U.S., the U.K., and Afghan governments spent billions of dollars to locate 30,000 Afghan Local Police throughout remote villages. See also Fukuyama et al. (2004), Paris (2004), Autesserre (2014), and Girod (2015).

[6] According to O'Donnell (2004, 37-8), rule of law is equitable when it "extends homogeneously across the space delimited by the state—there must be no places where the law's writ does not run [...] the legal system must treat like cases alike irrespective of the class, gender, ethnicity, or other attributes of the respective actors."

[7] Oomen (2000) describes how, as state courts became more accessible to townships in post-apartheid South Africa, for example, some chiefs violently resisted plaintiffs' attempts to have cases heard in civil statutory courts, insisting they instead be decided back in the traditional village court. Autesserre (2014) describes the persistence of violent conflict and ongoing reliance on local customs despite the "successful" installation of UN security forces in the Congo. A report on the judicial system in Somaliland describes how, even after the state courts had become available, women were forced to use traditional courts that would be less favorable to them: "Someone guilty of homicide may be brought before court for trial under state law, but if settlement is reached outside the court in accordance with customary authorities, he or she may be set free without punishment. Women can be particularly vulnerable to the substitution of customary law for state law. Elders routinely exert pressure on women to settle out of court through traditional channels and thus forfeit their legal rights" (ADP, 2002, 5).

rape her. With the aid of community vehicles, the police took the suspect to the nearest jail, located at a distance of several hours' travel over rough terrain. The suspect implored his family members to summon the village chief, who eventually negotiated the man's release through assurances that he would be tried according to customary procedure. Back in the village, the chief ordered the suspect to pay the woman roughly 30 USD—police records suggest he never did so.

I formalize such processes in order to think through the counterfactual outcomes of cases like this. If the female complainant did not have an officer she could turn to, it is very likely she would have anticipated the unfavorable outcome provided by the chief and not have reported the incident at all. Given that neither the chief nor the police would have been called upon if the police were absent from the village, the causal effect of state expansion in this scenario is to increase reliance on both kinds of dispute resolution simultaneously. While the outcome of the dispute ultimately upheld the male defendant's privileged position, the complainant was nevertheless able to attain some temporary measure of security by going to the police. Thus, the presence of state police might have reduced power inequality somewhat, but ultimately the state's ability to deter violence is limited by high-status individuals' ability to forum shop.

Eight months of fieldwork in Bougainville, Papua New Guinea, helped to form the descriptive inferences underlying these claims. To test them, I pursue two main empirical strategies that generate and compare counterfactual situations like those previously described.

First, I designed a field experiment in partnership with the New Zealand and Papua New Guinea police forces that randomizes permanent police officer presence to seventeen remote villages and not to twenty-two others. Eight months after the police have been working in the treatment villages, I conducted one of the first ever surveys on crime and political attitudes in this part of Papua New Guinea, working with nine enumerators to interview 1,383 adult men and women in experimental villages.

Consistent with the idea that the police cater to the interests of women in disputes with men, in pre-registered analyses I find that men and women experience state expansion in fundamentally different ways.[8] Men become more likely and women less likely to report negative experiences with police when the police are present in their village—especially when the officer is a woman. In this

[8]Pre-analysis plan available at EGAP (http://egap.org/registration/2042) and AEA (https://www.socialscienceregistry.org/trials/1505).

part of Papua New Guinea, just over one-third of interpersonal crime involves men assaulting or robbing women.[9] Thus it is very possible that these differential experiences arise from first- or secondhand observation of how police presence changes dispute resolution behavior. As a result of the treatment, police *and* chiefs are more likely to be involved in the resolution of disputes women have with men. When community police are located in their village, men become substantially more likely to agree with the notion that "The police should never be able to tell the chief how to resolve issues in the community; The chief always knows what's best," whereas women on average remain of the opinion that "Sometimes the chief should let the police step in and handle issues, even if not everyone agrees." Consistent with the theory, I find no evidence that the apparent shifts in behavior and attitudes around dispute resolution reduce underlying victimization rates: the study is powered to reject with 95% confidence any constant negative effect on the per-capita crime rate greater than one-tenth of a standard deviation. The findings suggest that any reduction in violence is faint.

Building off the strong internal validity of the experimental design, my second empirical strategy seeks to expand the temporal and spatial scope of the findings by analyzing over 30,000 case records generated by police over a five year period from January 2005 to December 2009.[10] This inquiry focuses on a slightly different estimand: rather than the presence or absence of the police in a village, the historical analysis asks whether dispute resolution behavior is different in villages that have male versus female police officers. To address concerns about underlying differences in the types of villages that do or do not have a female police officer, I focus only on villages in which a female police officer was present at some point, and leverage plausibly exogenous timing in when women officers start and finish in a given village for identification. I further show that the results are robust to a generalized difference-in-differences strategy.

The historical results corroborate the experimental results. Relative to village-months in which only male officers were present, the presence of at least one female community police officer greatly increases the relative probability that incidents of violence against women are reported and resolved

[9] In the endline survey conducted for this paper, for example, I collected data on 2,385 criminal incidents. Of those, 842 (35%) were man on woman crime. The police records analyzed as part of this study contain information on 16,701 disputes in which the gender of both parties could be identified. Of these, 5,376 (32%) were between men and women.

[10] Data provided by the Bougainville Police and New Zealand Police services subsequent to written approval from police and Columbia University IRB approval under protocol AAAQ2006.

jointly by the police and chief. Bougainville features both matrilocal village networks—in which newlyweds move to the village of the wife—and patrilocal village networks—in which newlyweds move to the village of the husband. The effect of female police officer presence on dispute resolution dynamics is much stronger in matrilocal versus patrilocal communities. One interpretation is that female police officers are best able to support women in disputes with men when they can draw on a coalition of family and clan members, suggesting the success of state-building is shaped by variation in non-state institutions that influence power relationships between men and women.[11]

Taken together the theory and results yield two principal insights. First, expanding the state's capacity to intervene in interpersonal disputes does not necessarily crowd-out non-state authorities, but can instead increase reliance on them. The strategic complementarity between reporting to police and reporting to the chief captured by my model is not anticipated in comparatively more complex models of forum shopping, because they structure the decision to involve either the state or the custom in a given dispute as inherently zero-sum.[12]

Rather than supplanting customary dispute resolution, the expansion of state capacity may simultaneously increase reliance on customary authorities *and* state authorities. By locating police in remote areas, the state lowers the costs of accessing formal dispute resolution services. This incentivizes low-status individuals to report disputes with high-status individuals to police, which in turn incentivizes high-status individuals to draw upon customary authorities to protect their interests. In principle then, state expansion can foster the emergence of hybrid institutional environments,[13] as individuals fall into disputes and simultaneously draw upon the authorities that will best advance their interests during the resolution process.

This claim engages a longstanding debate in comparative politics about the conditions under

[11] See also Lowes (2017), who finds that women in matrilineal societies may be better-positioned in the household to implement their preferences, for example, and Brulé and Gaikwad (2018), who find men hold greater political and economic influence than women in patrilineal communities.

[12] As discussed in more detail below, disputants in Aldashev et al. (2012), Sandefur and Siddiqi (2013) and D'Aoust and Sterck (2016) must choose between either the customary authority or the state authority as an adjudicative forum (in Aldashev et al. this is a sequential choice). The two kinds of resolution agents cannot be simultaneously involved in a single dispute.

[13] The vast literature on legal pluralism (See Merry, 2017, for a review) illustrates that "hybrid" or "plural" institutional environments remain common throughout the world. Demand for dispute resolution by non-state actors remains high even in contexts where growing state capacity has drastically reduced the cost of accessing state services (Baker, 2008; Isser, 2011; Sandefur and Siddiqi, 2013; Holzinger, Kern, and Kromrey, 2016; Zenker and Hoehne, 2018).

which state and non-state institutions constitute substitutes or complements.[14] Based on the view that non-state authorities such as chiefs are "competitors to the centralized state and are viewed as such by leaders" of government, scholars such as Herbst (1990, 172), Ensminger (1996) and Boone (2003) have depicted the territorial broadcasting of state power as a zero-sum game, in which increasing demand for state services among the population decreases the demand for and legitimacy of non-state service providers.[15] However, if state-builders strategically broadcast power to areas in which non-state authorities are *already* weak, associations of this kind can appear without any causal effect of state expansion on institutional demand.[16] By generating exogenous variation in the areas in which the state permanently installs uniformed police officers, this study is able to address this inferential concern. Whereas zero-sum accounts of state expansion struggle to account for the persistence of non-state authorities in the face of growing state capacity, my theory provides a simple logic through which demand for multiple institutions persists.[17] As I point out in the discussion, this logic is not limited to the case of Papua New Guinea, gender inequality or even weak state societies.

The second principal insight is that, while the mere presence of agents of the state may be sufficient to influence intimate power dynamics between men and women, forum-shopping sets a limit on the state's capacity to deter violence against vulnerable members of society. In principle, I here study a most-likely case for state-building to generate large positive changes. The community police at the frontlines of state-building efforts in Bougainville are well-trained, engage in very low levels of corruption, work hard, and appear highly publicly motivated (Cooper, 2018). Moreover, despite apparently high levels of community support, they do not appear subject to capture by elites or relational contracting by villagers, instead maintaining a degree of independence in the work that

[14] Aspects of this debate are summarized in Helmke and Levitsky (2004). While authors such as Tilly (1975) and Herbst (1990) have painted the broadcasting of state power as a process that inevitably undermines competing authorities provided the state is sufficiently capable, others such as Migdal (1988), Mamdani (1996) and more recently Logan (2009, 2013) have argued the expansion of the state's "infrastructural power" (Mann, 1993; Soifer, 2008; Acemoglu, Garcia-Jimeno, and Robinson, 2015) through the decentralization of centrally-controlled functionaries can actually bolster the power of local elites.

[15] Ensminger (1996), for example, contends that the expansion of state policing under Kenyan decentralization in the late 1980s undermined elders' ability to enforce customary laws around grazing and family quarrels, as disputants increasingly relied on the more effective state institutions.

[16] Boone (2003), for example, elaborates four different strategies of expansion pursued by state-builders in West Africa, all of which condition on spatial variation non-state authorities' local capacity.

[17] See also Baldwin (2015) for an electoral theory of customary authorities' persistence in Sub-Saharan Africa.

they do. Finally, the difference between the treatment and control communities is sometimes large. Without the community police presence, many villagers would have to trek through dense jungle and travel hours over open ocean or rugged mountains in order to access state police.

And indeed, these large differences in state presence do produce large differences in disputant behavior. Even so, we do not see the large shifts in outcomes that many policymakers hope for: while many villagers perceive that there is less violence against women in their communities, there is no evidence of a reduction in violence in the victimization data. Failure here, however, does not appear attributable to poor implementation, a misunderstanding of local realities (Autesserre, 2014) or misguided foreign intervention strategy (Girod, 2015). Rather, the ability of the state to provide more equitable outcomes is limited by the strategic response of those with a vested interest in incumbent institutions, who shun the state and turn towards customary authorities.

The remainder of the paper proceeds in five sections. In the next section, I describe my theory and apply it to the case of state and non-state authority in Bougainville. Section two presents the research design, while section three presents the results. The results are grouped thematically, so that experimental findings on forum-shopping behavior, for example, are presented alongside the observational findings on forum-shopping behavior. I address alternative mechanisms in section four. Section five discusses the scope conditions and broader implications of the findings and concludes.

1 Theory

Prior to the state's arrival—or following its collapse—remote areas are often governed by local elites referred to in this paper as "customary authorities:" chiefs, headmen, traditional leaders, religious authorities, prominent landowners, and so on (Baldwin, 2015; Murtazashvili, 2016; Zenker and Hoehne, 2018). Those customary authorities perform functions that can overlap with fundamental services provided by the state: from taxation and investment in agricultural productivity (Boone, 2003), to management of property rights (Oomen, 2000; Herbst, 1990), provision of social welfare (Cammett and MacLean, 2014), and the maintenance of social order through dispute resolution and punishment (Malinowski, 1926; Blattman, Hartman, and Blair, 2014). We are here interested in the latter.

How does the behavior of potential disputants change as the government expands its capacity to address interpersonal conflict into new areas? Is the mere presence of police officers sufficient to

transform the power dynamics of traditional societies?

Speculating about these processes informally is difficult because there are many moving parts. Continuing the story from the introduction, for example, conjectures about how the woman would have behaved if she did not have the option of reporting to police requires specifying both her and the man's beliefs about how each other and the chief would react to the different actions she could take. I thus formalize a number of simplifying assumptions and use game theory to think through the implications of one important source of strategic complexity: namely, dispute resolution often implicates not just one but a range of different authorities.[18]

The model shares features in common with other theories of forum-shopping presented in Aldashev et al. (2012), Sandefur and Siddiqi (2013) and D'Aoust and Sterck (2016). By allowing both the chief and the police officer to be involved or not involved in the resolution of a single dispute, however, I arrive at quite different conclusions. In Sandefur and Siddiqi (2013) and D'Aoust and Sterck (2016), once the customary authority has been selected as dispute arbiter, the state no longer plays any role and vice versa. In Aldashev et al. (2012), the customary authority can never be by-passed by disputants in favor of the state, who serves only as a court of appeal. These models thus rule out common situations in which multiple state and non-state actors simultaneously influence the outcome of a single dispute: they implicitly structure the interaction between authorities as a zero-sum game.

The theory is premised on two main claims inspired by anthropological literature and fieldwork in Papua New Guinea. First, the resolution practices of police and chiefs are partial to different groups in society. Second, such authorities only become involved in disputes when called upon.

Regarding the first claim, I assume that resolutions to disputes enforced by customary authorities exhibit more partiality than those produced by state authorities, even in contexts where certain groups face systemic disadvantage. As Baker (2008, 157-8) puts it, in most African countries "the

[18] Baker (2008, 30) gives this summary of an incident reported in (Salamone, 1998), for example:

> In another situation, a Hausa young man who stole money from a market woman in the Yoruba city of Ibadan, Nigeria, was chased by a crowd bent on violence, but was arrested by a policeman after a struggle. Both the policeman and the market woman believed that both justice and their own interests would best be served if they took the accused to the local Hausa community's court, presided over by Hausa elders and the local Emir's deputy. After both had given testimony, the informal court found the young man guilty, fined him a large sum of money, lent him this money to pay the fine to the woman and policeman, and warned him that any further trouble and he would be exiled to his home town in the North and confined there.

customary courts overall have a conciliatory character, aiming to restore peace between members and social order."[19] However, Afrobarometer data suggests that in almost every region of Africa, both men and women see traditional leaders as significantly more biased against women than police and courts (see Figure 9 in the discussion section).

To the difference of state courts and police, the decisions of customary leaders are not based on written legal code and formal sentencing guidelines; are almost never subject to appeal or review by a higher authority; and are presided over exclusively by a very small group of people who often hold the political power in a given community. In the remainder of the paper, I focus on the effects of patriarchal bias because gender is perhaps the primary cleavage structuring interpersonal conflict in the Bougainvillean context (Nash, 1978, 1981). More generally, however, the literature documents diverse sources of group bias in customary dispute resolution, including favoring rich over poor citizens, autochthonous citizens over migrants, ethnic majorities over minorities, ruling party partisans over opposition sympathizers, and so on.[20] Finally, it should be noted that diverse instances of ethnic and other in-group bias have also been documented in formal courts and in the behavior of police officers.[21] However, formal rules tend to limit the scope of such partiality relative to the customary sector.

Regarding the second assumption, in many weak state societies, local actors who have the power to address interpersonal conflicts cannot do so because citizens are reluctant to come forward about their problems.[22] Sometimes this reluctance relates to a concern about paying transfers to

[19] "However," he clarifies, "chiefs do not always follow conciliatory procedures. They may authorise posses to go after cattle thieves and kill the presumed culprits; they may send organised urban vigilantes out to 'catch criminals' with little concern if they are shot or beaten to the point of near death."

[20] See footnotes 4 and 11 above for examples of bias in the customary sector. Various explanations exist to account for gender bias. For example, favoritism of men's interests may be linked to the reproduction of agnatic lineage through patrilineal property institutions (Friedl, 1975; Hudson, Bowen, and Nielsen, 2015). Most societies structured into lineage-based groups transfer property through the patriline, which subordinates women's economic interests particularly in disagreements over property (Agarwal, 1994).

[21] See, for example, Gazal-Ayal and Sulitzeanu-Kenan (2010) for a study of ethnic bias in judicial decision-making. As Hudson et al. (2009, 15) point out, the formulation of state law has also often featured strong patriarchal bias: "Those with physical power also dominate political power, so that when law developed in human societies, men created legal systems that, generally speaking, favored male reproductive success and interests—with adultery as a crime for women but not for men; with female infanticide, male-on-female domestic violence, and marital rape not recognized as crimes; with polygamy legal but polyandry proscribed; with divorce easy for men and almost impossible for women."

[22] Green, Wilke, and Cooper (2018), for example, document widespread unwillingness to come forward about allegations of intimate partner violence in Uganda, resulting in an inability of local village elders with jurisdiction over such cases to address abuse.

authorities, such as bribes.[23] But often, it is costly to report simply because it takes time and effort.

Despite their potential partiality, one of the key advantages that customary authorities present to all disputants over the state is their availability. Chiefs, headmen, and religious authorities often constitute a port of first call in disputes because they are immediately geographically accessible to disputants (Ensminger, 1990; Murtazashvili, 2016). By contrast, the nearest state police officer or magistrate can be located hours of travel away from many citizens in rural parts of developing countries (Acemoglu, Garcia-Jimeno, and Robinson, 2015). I thus formalize state expansion as a reduction in the travel cost imposed on disputants who choose to report to the police. I focus comparative statics on variation in this cost.

Similar to other models of forum-shopping (Sandefur and Siddiqi, 2013), I do not model chief and police strategy in this theory. This abstraction helps to derive intuitions about how potential disputants will behave holding dispute resolution norms constant while varying the cost of access to police. Yet, if chiefs derive legitimacy or even material benefits from dispute resolution, it seems plausible that they would adjust the way in which they adjudicate disputes in order to capture more disputant demand.[24] However, it is not clear that chiefs have a strong incentive to expand or even retain their role as the primary dispute resolution forum in contexts like the one I study. Anthropologists, such as Clastres (1974), have noted that in societies where power is attained through gift-giving, customary authorities exist in something of a gilded cage.[25] As I describe in greater detail below, chiefs are expected to play a range of social functions for which they are not necessarily remunerated. In the Bougainvillean context, many chiefs see the increasing availability of the police as something that frees them from a tiresome and not particularly pleasant burden.

[23] Ubink and Quan (2008), for example, describe how "drink money" must be paid to customary authorities during land disputes in Ghana, while Baker (2008) describes a number of contexts in which help from state police is seen as conditional on bribes

[24] Aldashev et al. (2012), for example, endogenize the customary norm and make predictions about the strategic response of customary authorities to state reforms and forum shopping by disputants. Indeed, much evidence suggests that norms of practices of customary dispute resolution evolve. However, typically this process takes decades (Tombot, 2003). If anything, one is struck by the remarkable *persistence* of norms and tendencies in customary dispute resolution that remain invariant in the face of large structural changes. Given the processes under analysis in this study span a maximum of five years, it seems reasonable to assume that customary dispute resolution norms will not change greatly (i.e., become less biased toward women) in response to state expansion.

[25] Clastres (1974, 30-1) cites Francis Huxley's description of headmen in the Urubu as follows: "It is the business of chief to be generous and to give what is asked of him. In some tribes you can always tell the chief because he has fewest possessions and wears the shabbiest ornaments. He has to give away everything else."

1.1 Formal Framework

The model features two citizens who each belong to two different social groups, A and B. For example, one might think of A as women and of B men, or of A as an ethnic minority group and B as the majority. The game is finite and contains two consecutive stages.

In the first stage, the citizens play a prisoner's dilemma against one another. In the second, they both decide whether to report to state and non-state authorities—the police and the chief.

The payoffs in the first stage are structured to capture the idea of defection as property crime, but can also be interpreted as assault that generates as much benefit to the offender as it does cost to the victim. When actors bilaterally cooperate the status quo is maintained—they keep their property (obtaining 0). Defectors obtain s from defection against cooperators, who obtain $-s$ (theft). And under mutual defection, both actors suffer $-s$—through fighting one another or destroying each other's property. The value of theft is assumed to be strictly positive, $0 < s \in \mathbb{R}^+$. Information is perfect and complete, and actors share the same beliefs about the values of the parameters.

If both actors cooperate, the game ends. If either actor defects, they reach a second stage in which each actor makes a simultaneous institutional choice. They can choose to appeal to the chief (C) for assistance in dispute resolution, appeal to the state police (P), or simply refrain from reporting the incident at all ($\emptyset$).

Authorities resolve disputes by forcing redistributive transfers between A and B. The baseline for such transfers involves subtracting s from the payoff of defectors and adding s to the payoff of cooperators. But transfers also include various kinds of additive bias that systematically favor some disputants over others.

First, both the police and the state may share a general social bias against A. The previously mentioned Afrobarometer data, for example, illustrates that people in many communities see both traditional leaders *and* police as biased against women. I denote this norm $n \in \mathbb{R}^+$ and suppose that it is subtracted off actor A's payoff in any instance where authorities are involved.

Relative to n, authorities are assumed to exhibit additional bias for or against actor B, denoted β_j. In line with the motivation above, I assume that the customary authority is *relatively* B-biased and the state authority is *relatively* A-biased, such that $\beta_C < 0 < \beta_P$. Thus, for example, if actor

B defects and A cooperates, and actor A reports to the chief, the transfer A will receive will equal $s - \beta_C - n$, while authorities will mete out punishment $-s + \beta_C$ for actor B. For sufficiently high n, A never defects or reports. Thus, to home in on the relevant comparative statics and to simplify exposition, I set $n = 0$.

Any disputant who decides to involve one of the authorities incurs a transaction cost t. I assume that the cost is small.[26] Citizens also pay a travel cost $\theta(1 - Z)$ in order to report disputes to the police, where $Z \in \{0, 1\}$. I assume that travel costs are higher than the sum of all other relevant considerations: $\theta > s + t + \sum_j |\beta_j|$.

Thus, Z is an indicator for state expansion: when $Z = 0$ travel costs are so high as to render appealing to the police a strictly dominated strategy, whereas when $Z = 1$ the police are as cheap to access as the chief. The parameter Z captures state expansion. It is therefore the primary variable upon which I focus comparative statics. It is also the parameter that the field experiment in this study manipulates.

In section D of the Appendix, I solve the model when $Z = 0$ and $Z = 1$, and analyze differences in equilibrium outcomes at both stages of the game.

When the state is absent, the chief's bias in favor of B makes it unlikely that A reports when defected against, and makes it very likely that B reports when defected against. As such, B defects against a cooperating A, who does not report at all unless bias is very low. This equilibrium resembles the situation in Papua New Guinea, and one that is common in other parts of the world, in which women who are victimized by men must report to patriarchally-biased chiefs if they do report, and so in practice stay silent for the most part (Begler, 1978; Harris, 1993).

Appealing to the police and appealing to the customary authority are strategic complements when police are available. If A reports to the police, B is strictly better off when paying the transaction cost to report to the chief, thereby mitigating the impact of the state's punishment.

Before the state expands women are likely to stay silent about their victimization—neither authority is in demand. When the state expands its capacity to address disputes by locating a police officer in the village, women are more likely to come forward. Accused men protect their interests by involving the chief. Like the man described in the case records in the introduction,

[26] Specifically, in relationship to the bias parameter I assume $t < \min_j |\beta_j|$.

actor B knows he will be better off if he can involve customary authorities who will protect his interests. The expansion of the state increases reliance on both kinds of authority.

What can we say about the effect of state expansion on the probability that disputes arise at all? Supposing that potential disputants do in fact anticipate the subsequent institutional choices of their counterpart, the model predicts that bias will play a large role in determining the probability that disputes arise. Bias plays this role because it determines the net transfer between disputants, and in this sense reflects the relative strength of the state and customary authorities.

Suppose that chiefs and police officers have roughly equal strength so that their respective bias terms effectively nullify one another: i.e., $|\beta_C + \beta_P| < t$. In this case, disputes do not arise because neither actor expects to be better off if they instigate a dispute resolution process. Crime is deterred.

In practice, however, customary authorities are often able to undermine and even reverse the sanctions imposed by the state, nullifying their deterrent effect. Consider the example in the introduction: the man received a relatively steep sanction in the form of jail time. However, the chief was able to negotiate his release and presided over a reconciliation whose terms the man never met. Formally, I represent such situations as ones in which the relative bias that the chief is able to impose is more than t larger than the relative bias imposed by the police: $t < \beta_C + \beta_P$. In this case, the equilibrium outcome is for A to cooperate and B to defect—even though the unique equilibrium outcome in the second stage is the strategy pair in which A reports to the police and B reports to the chief. In other words, while the availability of the chief does not stop a woman from reporting, it blunts and even nullifies any deterrent effect that this reporting might otherwise have had on the man's behavior.[27]

To summarize, there are three main predictions that arise from a comparison of the equilibrium outcomes when the state does and does not have the capacity to cheaply intervene in disputes. First, reporting to *either* actor is likely to increase when police become more accessible, as women refrain from reporting when only biased chiefs are available (unless the bias is not too strong). Second, the increasing availability of the police encourages reporting not just to police, but also to chiefs, because men seek to preserve their advantage in disputes that women decide to report. Third, in a

[27] Suppose, for example, that the chief was removed from the game entirely. In this case the players would face a classic prisoners dilemma and simply defect against one another whenever $Z = 0$. As soon as the police becomes accessible ($Z = 1$), however, this would deter defection by the man.

Figure 1: Bougainville and Papua New Guinea.

context where the chief is able to undermine the state's sanctions to produce outcomes that are still somewhat favorable to men, the increasing availability of police will not deter defection by men. Women still have an incentive to report such cases, however, insofar as doing so enables them to obtain some form of compensation or temporary protection. In the following subsections, I present features of the case study that support the assumptions underlying these predictions.

1.2 State Capacity and Violence Against Women in Bougainville

This study is set in the islands that comprise the Autonomous Region of Bougainville (AROB), in Eastern Papua New Guinea (PNG). Geologically, the islands form part of the Solomon Archipelago, situated in the Pacific Ocean to the northeast of Australia. Bougainville has roughly the same land mass as Jamaica or Cyprus and was home to about 250,000 people in 2016. I describe here the features of this context relevant to the theoretical predictions made above. Specifically, I describe the weakness of state capacity there, in particular with respect to security forces. I describe the nature of customary authority and provide examples of how dispute resolution often disadvantages women. Finally, I provide background on the community policing project that comprises the "treatment" in the field experimental component of this study.

Prior to its independence in 1975, Bougainville fell under German then Australian colonial rule.[28] By and large, colonial territorial strategy in Bougainville resembled what Boone (2003)

[28]German colonial presence in Bougainville began in 1905 with the establishment of an administrative post at the port of Kieta (Oliver, 1991). Australia inherited control over Bougainville following WWI.

describes as non-incorporation: the lack of strong potential for taxation or resource extraction there meant colonialists largely neglected Bougainville, with the exception of occasional coconut and cocoa plantations (Thurnwald, 1934).[29] Communities that did fall under colonial administration operated through the *kiap* (captain) system. The *kiap*—a white Australian officer—would serve in principle as the ultimate arbiter of disputes in an area. In each village under his administration was appointed a *luluai* or *hatman*—a government-appointed chief who was given an official hat and constabulary duties.[30]

The advent of WWII marked the first of two serious state retrenchments in Bougainville, as missionaries and colonial administrators withdrew what small presence they had established under the looming threat of Japanese occupation. Discovery of major copper ore deposits sparked the onset of serious mineral exploitation by Rio Tinto in 1964. This resulted in some infrastructural development, largely confined to the area surrounding the mine.[31] Until its closure, the copper mine was the largest open cut mine in the world, and responsible for almost half of PNG's total export revenue. Its severe negative impact on the Nasioi people in the surrounding mountains[32] led to tensions, and in late 1988 landowners from those communities sabotaged its operations. Secessionist groups took advantage of outcry sparked by the PNG government, who sent in police to violently reopen the mine (Regan, 2010). Growing support for armed revolution eventually resulted in a full-scale civil conflict. The following decade brought severe inter-clan strife and repression by the PNG military, deployed to Bougainville in 1989. By the time a ceasefire was signed in 1998, the war had wrought vast damage: 12,000-20,000 people had been killed; over 15,000 had fled Bougainville; around 67,000 were internally displaced, and; the homes of roughly a third of the population had been razed (Tierney et al., 2016).

Throughout long stretches of the conflict, what minimal state services had been brought to the towns of Bougainville (courts, police, tax offices, etc.) were withdrawn, once again leaving the

[29] Bougainvilleans living near natural ports, particularly on the Eastern coasts, had some contact with outsiders, such as missionaries, planters, and administrators. However, penetration of state institutions into Bougainville's hinterland was uneven at best, with many communities living as they had during pre-colonial times (Ogan, 1991).

[30] As Oliver (1991) describes, the actual authority exercised by the *luluai* varied greatly as a function of the degree of overlap with pre-existing traditional authorities.

[31] By 1980, approximately 2,000 Bougainvilleans were employed in the Bougainville Copper Mine in Panguna (Regan, 1998).

[32] Including loss of land, social tensions due to inequitable compensation and environmental degradation (Regan, 1998, 276).

region stateless. Into the power vacuum stepped gangs of young men, who pillaged communities and settled long-standing clan grievances. Reestablishing order in the wake of the Bougainville crisis has been a fraught exercise, and crime rates remain extremely high. Some 87% of households in this study report experiencing at least one incident of theft or assault over the preceding year. Women experienced especially severe violence, possibly aggravated by the fact that they are the primary property owners in the mostly matrilineal Bougainville. Following a study in which 60% (502/846) of Bougainvillean men self-reported having "forced a woman [...] to have sex," the UN labeled Bougainville one of the worst places in the world to be a woman (Jewkes et al., 2013). Of the 2,385 incidents of assault or property crime reported by respondents in this study, 35% constitute man-on-woman crime.[33]

Victims of crime in Bougainville rarely rely on the central police force. In part, this may be due to distrust.[34] However, geography undoubtedly plays a large role. The Bougainville Police Service (BPS), or the "regulars" (to contrast them with the community police officers who are the object of this study) live in the urbanized towns in housing provided by the government. By contrast, most Bougainvilleans live in small villages that are extremely difficult to access. Four communities in this study, for example, are over three hours' boat ride away over open ocean from the central police station. Other communities are located high in the mountains, and lack means of communicating with the central police other than by physically visiting them, usually requiring up to four hours' trek and several hours of transport in four-wheel drive vehicles.

The Community Auxiliary Police (CAP) model in Bougainville was conceived as a way of providing security to remote communities. On the tail end of the Bougainville civil war in early 1998 the nascent Bougainvillean government requested the help of New Zealand and Australia to train and recruit a force of community-based police that would work under the authority of the BPS (Dinnen and Peake, 2013, 575). In 2005, the New Zealand Police—in Bougainville with advisory,

[33]Defined as an incident of assault or theft whose victim was a woman and whose perpetrator was a man, alone or in a group. By contrast, only 3% of incidents feature male victims and female suspects.

[34]The Bougainville Police Service are part of the Royal Papua New Guinea Constabulary, widely maligned for its repressive role in the Bougainville crisis. Although many BPS are now from Bougainville, for a long time the "regulars" were recruited from areas outside of Bougainville upon completing their training. As a result of this outside recruitment, many Bougainvilleans did not draw a distinction between the BPS and the Royal Papua New Guinea Constabulary (RPNGC). The stark phenotypical differences between West Papuans and those to the east in Bougainville and parts of the Solomon islands archipelago only reinforced such perceptions (Friedlaender, 2005). The BPS were widely distrusted and seen as an outside force.

non-operational powers under the auspices of New Zealand's aid programme—officially took charge of recruiting, training and assisting in the management of the CAP. Community police officers are present today in about 350 of Bougainville's roughly 2000 villages. For the most part, Bougainvilleans thus live without immediate access to state dispute resolution services. Instead, they rely on customary authorities.

1.3 Customary Authority and Dispute Resolution in Bougainville

Among all criminal victimization incidents recorded during the endline survey for this study, fewer than one-quarter were reported at all. When they are reported, however, the vast majority of incidents are reported to customary authorities.[35]

Customary authority in Melanesia is usually exercised at a much smaller scale than in other parts of the world, such as nearby Polynesia, or farther afield in West Africa. Non-state political units in Melanesia seldom govern more than seventy to three hundred persons.[36]

With some degree of inaccuracy, customary governance in Melanesia is often associated with the "big-man" style of attained authority, in contrast to the inheritance-based authority style of the Polynesian "chief" (Sahlins, 1963). Melanesia's association with the "big-man" style of governance, in fact, stems primarily from Bougainville, namely Oliver's 1955 study of the Siwai. In pre-WWII Siwai culture, the *mumi* was the man in the village who had the most renown, which he attained by generating surpluses of material goods, usually pigs, and holding large feasts.[37]

[35] 70% of incidents that were reported at all were reported to the chief, which is roughly the same as the proportion of respondents who cited the village or clan chief as "the first point of contact in case of law and order problems that involve family members" in a similar survey by Curran et al. (2017).

[36] Environmental features make large population concentration and wide-ranging communication impracticable in most Melanesian settings (Hogbin and Wedgwood, 1953): the islands often feature a towering backbone of tall mountains (such as the Crown Prince range in Bougainville), and large tracts of land are required for farming because the main crops (taro, sweet potato, sago) cannot be stored and are grown in a system of shifting cultivation. A typical "tribe" in Bougainville does not extend beyond one or two villages, which fall roughly into one of two models: nucleated villages containing fifty or so dwellings, typically located in coastal areas; and scattered clusters of hamlets, often inland, with one to ten dwellings per cluster (Oliver, 1991, 95).

The minute scale of traditional authority is also reinforced by kinship patterns that have produced a high degree of cultural heterogeneity. While village-level exogamy is practiced throughout Melanesia and especially in Bougainville, kinship groupings between villages are typically organized into area-specific moieties that share the same language and are for the most part endogamous (Hage, 2004). Bougainville exemplifies the cultural diversity that results from such highly fragmented patterns of interaction: it contains twenty-six distinct language groups distributed among a population of roughly 250,000, giving a linguistic fractionalization index of .88 (Herfindahl - calculated based on census data).

[37] The model of status attainment through competitive gift-giving is found in Western Papua New Guinea as well, most famously in the *Moka* exchange in Mount Hagen (Strathern, 1971) or the *Kula* exchange in the Trobriand islands (Malinowski, 1922). However, Oliver (1991, 106) himself points out that the degree to which headmen inherit

In Bougainville, successful ascension to the position of headman—referred to in contemporary *Tok Pisin* interchangeably as *bikman* ("big man") or "chief"—brings both benefits and duties. One of the core services chiefs provide is the maintenance of social order through dispute arbitration.[38] Disputes are principally resolved through a reconciliation process referred to as the *wanbel kot*—literally "one-belly court," or "agreement/reconciliation court."

The following account of the *wanbel kot* system is given by a chief from Bougainville in Tombot (2003, 256):

> The chief asked the disputing people to meet and to come to an agreement. When they did, the chief prepared a betel nut with lime and mustard on his thumb and asked them to take their share and chew it. While they chewed, the chief dug a hole and then told the chewing people to spit into the hole. Then he covered the hole. He told them to have courage and shake hands. The anger and hate was now in the covered hole.

Often disputes are resolved simply through talking: "Property dispute between two men. Both parties to look after the coconut plantation as being decided by the Wan Bel Court" (police case records, May 2005). In addition to such symbolic reconciliations, chiefs often require disputants to give material goods as compensation for wrongdoing. Cash, shell money (cowrie shells), betel nut, and pigs are all exchanged as part of such ceremonies.[39] While the *wanbel kot* system has the

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versus attain status is a matter of degree and depends to some extent on the size and lineage structure of their clan:

> At one extreme were those tribal neighbourhoods dominated numerically, or in terms of land-holdings, by one particular matrilineage. In such cases the members of the principal matrilineage constituted an aristocracy, and their senior member a hereditary chief, to be succeeded in time by the eldest son of his eldest sister (not by his own son, who would of course have been a member of a different matrilineage). [...] At the other extreme were those tribes whose leaders earned their positions of authority solely by exercising military or political skill. Usually, actual fighting prowess was less important than the ability to gain and inspire followers, which was exemplified by forcefulness of personality and by shrewd distribution of favours and hospitality.

[38] Others include managing land use, interfacing with outsiders, and mobilizing the community for collective contributions to public goods (i.e., building structures, clearing paths through the bush).

The four principal benefits chiefs enjoy are personal prestige (public deference and praise from one's peers), material goods (regular distributions of pork and other valuables), influence over policy (decisions about land use that affect the collectivity), and financial solvency (including the ability to raise loans and a tacit right to use the land of those in the patronage network—referred to as the *tuhia* in the Siwai *mumi* system) (Oliver, 1991, 54). There is no evidence that the marginal effort put into the dispensation of these duties results in marginal rewards, however. To the extent that the chief can retain his authority while doing less work, he has an incentive to reduce the amount of effort exerted in customary duties.

[39] In fact, many places have an elaborate system of fines associated with various infractions of village norms. Nash (1990, 128), for example, describes the following case of verbal insult between a husband and wife that was settled through the *wanbel kot* in a Nagovisi village in central Bougainville:

> Bernadette asked her husband, Francis, to clean up their toddler daughter's feces. He said he didn't have a shovel. She then said he should shovel it with his tongue. He got mad and went home to his sister. The sister demanded payment (which she received) for this insult.

advantage of a restorative and immediate approach to justice, many respondents in focus groups and in-depth interviews in 2015 and 2016 suggested chiefs exhibited bias particularly during the resolution of disputes between men and women. For example, a respondent in the 2016 survey described how, in August 2015, a female member of her household was physically assaulted by a group of men. The incident was resolved through a form of chiefly mediation below that of the *wanbel kot*, called *sek han*—shaking hands: "All parties involved were told to cook food and share together and the perpetrators were told to apologise." Perhaps most problematically, compensation is even used in serious cases of sexual assault where reoffending is a major risk: "The drunkard man raped a lady. The matter was referred to the *wanbel kot*. The offender compensated the victim with some money" (police records, March 2006). In another, we read, "Case reported that [male offender] raped [female complainant]. Offender compensated complainant with [80 USD] and 1 *mimis* and both parties shook hands" (police records, March 2009).

1.4 The Community Auxiliary Police

The Community Auxiliary Police (CAP) program that is the subject of this study was conceived as a way to bring better protection to vulnerable citizens in remote villages of Bougainville, where such non-state solutions to the problem of social order otherwise predominate.

The core innovation of the CAP programme is to identify well-respected members of remote communities, who are not direct family of the chiefs, and to hire them into the state's police force. Once hired, CAP wear a uniform almost indistinguishable from that of the regular police and work full time as police in their home communities. CAP officers are authorized by the Police Act of 1988 to use the full powers of the police for offenses whose punishment comprises a prison term of no more than twelve months, and the power of detention and referral to the central police for all other offenses. In addition to enforcing the law through arrest and investigation, the CAP can levy fines in civil cases. This adjudicative role relieves some of the burden on state courts by locating low-level sentencing in the village. As mentioned, only a minority of all villages in Bougainville have community police working in them.

The issue of gender equity looms large in the work that the CAP do. They attend frequent training from international experts in gender-based policing, in which they learn not only how to gather evidence for prosecution of gender-based crimes, but also go through a sociological training

on the constructedness of gender-based power inequalities. Consider, for example, the following excerpt I recorded during a qualitative interview with a CAP officer in his home village. The CAP, a man in his fifties, had recently been to a gender-based violence training given by an expert flown in from Fiji. In this excerpt, recorded after our interview had finished, the CAP was addressing the chief, who had recently arrived to *stori* with us (make small talk):

> During my time as a boy, I used to think differently, but now I can see that gender is not something like sex. Sex is what makes you different—between a man and a woman. A woman has breasts, a man, penis and that, but that's it. That's natural. But talking about "you are a man, therefore you're the leader of the house"? No. That's a gender bias thing. It's just how people see it. We men think that we are masters. That's our culture here, to teach men to be warriors. You know, I've learned some new things about privileges. In the pacific, and in Papua New Guinea, there's no privileges given to the ladies. But in overseas, there is privilege. For example, ownership of land. In name, the woman may own the land, but in practice, the man will control it - so there's no privilege given to the woman here. And even privilege can be seen in small things, like serving food. We don't bring tea or make food for our women. Or even serve them a big plate of food. [Gives anecdote about how, at meal time, a wife will go without food in order to feed her husband, will even feed him in excess while starving herself, because that is what he and society demand]. This thing comes with a lot of problems! She has no privilege, while the husband takes EVERYTHING.
> (CAP in North Bougainville, September 2017)
> (Unabridged version available for listening here)[40]

The chief clearly did not share the views being expressed by the CAP, but seemed to hold his tongue both in the face of the CAP's conviction and possibly his authority as a man in uniform.

Moreover, hiring policies advanced by the New Zealand Police aid programme have made the CAP more representative in terms of gender. Of the forty-five candidates who made the shortlist in the round of recruitment this study analyzes, for example, twenty were women.

CAP are not armed and so in principle cannot wield unaccountable coercive power over the community members they police. According to interviews with CAP, they see their main source of authority as the uniform they wear when on duty. Indeed, many CAP state that they would be unable to make arrests were they not wearing the uniform, as its symbolic weight is so important.

Nevertheless, they appear to wield substantial coercive power in the villages where they work. Analyzing case records reveals many cases in which both male and female CAP intervene to protect or assist women in disputes with men. Consider the following incident from 2007, for example:

> Case reported that offender namely [male suspect] bashed his wife, complainant [female name] and said that's because you are having sexual intercourse with [male name]. I got complainant's statement and arrested offender.

[40] http://jasper-cooper.com/CAP/CAP_interview_excerpt.m4a

That incident was reported by a relatively young CAP officer who works in his spare time as a carpenter. He had attended trainings on communication skills, arrest procedures, crime scene investigation, and conflict resolution skills. A slightly older CAP from a different region, who otherwise works as a subsistence farmer and states in his file that his reason for enlisting was to "serve the people in the Community," reports that

> [Female victim] was returning from school on the 5/04/07 and [male offender] grabbed her on her way home and tried to rape her. [Female victim] squeezed his testes and ran away from him. I arrested the suspect after receiving the report from the victim.

While male CAP frequently intervene to protect women who have been attacked by men, female CAP often appear to go a step further in accompanying victims of assault to report offenses at the central police station. A married CAP in her thirties, who has conducted trainings in communication skills, listening skills, crime scene investigation, statement taking, and police procedure, for example, reports that "on 27/01/09 [she] escorted 3 victims of rape to Arawa Police Station." It is telling that three victims simultaneously came forward to her and that the group traveled together to the police station. While male CAP are trained to intervene in gender-based disputes and certainly do, it seems that female police officers form closer alliances with female complainants.

Thus, the case of the community auxiliary police in Bougainville represents an opportunity to test the theory laid out above. In most villages throughout Bougainville, women are on the losing side of frequent violent conflicts with men. Seeking justice from customary authorities, they often face bias. The CAP program expands the state's capacity to address interpersonal disputes by permanently locating community police officers in remote communities, and training them to use their legal powers to address disadvantages faced by women. In the next section, I describe my strategy for estimating the causal effect of this form of state expansion on dispute resolution behaviors.

2 Research Design

To understand how the expansion of state policing services through the CAP affects behavior and attitudes around dispute resolution, I designed a randomized controlled trial to maximize internal validity and a much larger historical analysis of case records to bolster the external validity of the findings.

2.1 Field Experiment

In 2015 the Bougainville Police Service expanded the serving CAP force by recruiting an additional thirty-five community police officers. They received over 400 applications for the positions. The applicants were put through an intensive interview and literacy testing process, and areas thought in severe need of police had officers hired there.[41] After this preliminary vetting and selection process, there remained forty-five candidates for seventeen unfilled positions. The police were indifferent among these candidates, all of whom were deemed equally qualified for the community police officer role. I worked with the police to hire these candidates through a randomized recruitment lottery. See here for an excerpt of the lottery.[42] The successful and unsuccessful candidates were not present at the lottery and were never informed that this method of selection was employed.

A key feature of the randomization is that community police work in their own communities. Thus, hiring the candidate from community 1 and not community 2 effectively assigns all of the villagers in community 1 to have access to the community police and not the villagers in community 2. In this way the randomized recruitment lottery cluster-assigns villagers to the presence or absence of a community police officer. The randomization procedure is described in detail in the appendix with graphical illustrations (Figure 10).

Candidates were grouped into fifteen constituencies and selected via constituency-level lotteries. Thus, the design is blocked and clustered, with heterogeneous assignment probabilities within and across blocks. Heterogeneous assignment probabilities can generate bias in naive estimators if potential outcomes are correlated with block membership. Thus, in accordance with the pre-analysis plan, I obtain unbiased estimates of the sample average treatment effect through the use of estimators that weight each unit's contribution to the likelihood by $\frac{1}{Pr(Z_i=z)}$ (Hirano and Imbens, 2005; Gerber and Green, 2012). Due to the relative within-block homogeneity of these weights, the efficiency of the estimator is not greatly decreased. Using a Monte Carlo analysis in an approach

[41] The usual procedure for recruiting CAP works in a two-step selection process designed to produce a police force whose members have both the blessing of local authorities and the educational standing deemed necessary by the BPS. In a first step, the BPS and New Zealand Police invite local chiefs and elders to nominate members of their community as potential applicants to the position. Importantly, the chiefs cannot nominate those in their immediate family, so as to ensure some degree of independence from traditional authorities. Typically, many hundreds more applicants are nominated than can be hired. Having sifted through a large number of applicants to ensure they meet basic requirements (high school education, good English, no criminal record), the police then put applicants through two rounds of testing and interviews. A subset of the top candidates to emerge from this process are then hired.

[42] Video here: http://jasper-cooper.com/CAP/anon_randomization.mp4

developed in another paper (Blair et al., 2018), I show in section B.2 of the appendix that this design is powered to detect a one-fifth standard deviation effect size with 80% probability, even with intra-cluster correlation (ICC) of .10 (most outcomes exhibit ICC in the .01-.05 range). In the literature on standardized effect sizes (such as Cohen's d), this is considered a "small" effect size (Cohen, 1992). The Monte Carlo simulations—which closely model the actual sample size and assignment mechanism—further illustrate the design exhibits desirable properties in terms of coverage and unbiasedness, even when outcomes are correlated with cluster and block.

I measure outcomes at the household level through a face-to-face survey conducted in late 2016. With a team of nine enumerators, we listed all households in a village, then randomly selected some to have a woman and others a man interviewed in them. Enumerators then randomly selected eligible male or female adults from the household using a random-number grid. Section A.3 of the appendix provides greater detail on sampling and outcome measurement. The sample fell short of the target, providing a response rate of 89%, but there is no evidence of differential response by treatment. In Table 9 of the appendix, I report balance on all twenty-eight available covariates. The rate of imbalance is consistent with imbalance due to sampling variability, and wherever possible I condition estimates on all covariates.

Not all candidates who were selected for recruitment were eventually hired, and some candidates who were not selected ended up being hired by the police following randomization.[43] In total, five of the fifteen blocks are affected by non-compliance. In all analyses, I report the intent-to-treat (ITT) effect, estimated using inverse probability-weighted regression as pre-specified. However, all regression tables also report estimates of the complier average causal effect (CACE) by estimating a weighted instrumental variables regression with block fixed effects.

Unless indicated, point estimates of ITT effects in all tables are calculated using the pre-registered inverse-probability weighted least squares estimator, with fixed effects for blocks and

[43] In the constituencies of Carterets, Hagogohe, Haku and Selau, a candidate was hired even though the candidate was not selected in the recruitment lottery. This occurred due to low recruitment numbers in the Southern region (not included in this study because the number of eligible candidates was too low to facilitate randomization), which effectively freed up positions for candidates elsewhere. In the constituencies of Kunua, Hagogohe and Haku, a candidate who was selected was not hired, due to pregnancy and successful induction into the commissioned police force.

probability of being in assigned condition as (inverse) weight. The main model can be written:

$$y_{ijk} = \gamma_k + \tau Z_j + X_i \boldsymbol{\beta} + \epsilon_{ijk}, \tag{1}$$

where y_{ijk} is the outcome for the i'th respondent, γ_k is a fixed effect for the k'th block, τ is the intent-to-treat effect, Z_j is a treatment assignment indicator for the j'th cluster, X_i is a vector of covariates (see Table 9 in the appendix), $\boldsymbol{\beta}$ is a vector of covariate effects, and ϵ_{ijk} an error term.

Consistent with the pre-analysis plan, the pre-registered upper-, lower- or two-tailed p-values are calculated for all outcomes by computing 2000 draws from the sampling distribution of the estimator under the sharp null of no (positive) effect for all units using randomization inference. All standard errors are clustered at the village level. As pre-specified, all outcome values that are missing at the item-level are imputed using multiple imputation through chained equations, conditioning only on outcomes from the same family and not on covariates or on treatment status.

2.2 Historical Analysis

An implication of the theory developed above is that access to police is most likely to change behavior when police strongly counteract male-centric bias by providing a policing service favorable to women. To widen the temporal and spatial scope of the experimental findings, I provide supplementary evidence for the theory using historical panel data that affords better statistical power and broader external validity than the experiment.

The Community Auxiliary Police program began in earnest with the election of the parliament to the Autonomous Bougainville Government following elections in 2005. During the first four years of the program, CAP were required to provide very detailed monthly reports on all incidents that they came across. Those 412 CAP who began working at the time generated a dataset on over 30,000 incidents, detailing for each a range of contextual variables, such as the name and gender of the parties involved, an incident category code, and a detailed description of what happened and how the incident was resolved. The frequency distribution of the different kinds of incidents is reported on Figure 11 in the Appendix.

Those directing the CAP program took pains to hire as many women as possible. Many villages were thus not only exposed to a direct link to the police for the first time ever but also had their first ever experience dealing with a female police officer. Sixty-one villages had at least a month of

exposure to policing from a woman CAP officer during the period from early 2005 to late 2009.

One might be tempted to simply compare villages with female police officers to those with male police officers. However, there may be reason to believe that the two kinds of villages are different in important ways that may confound inference. A more conservative approach is to focus on those sixty-one villages that ever had a woman police officer in them, and leverage the fact the presence and absence of women shifted over time in plausibly exogenous ways to identify the effect of having a male versus a female police officer.

Figure 14 in the appendix illustrates that there is a substantial degree of temporal variation in the presence of women police officers in the villages covered by the monthly reporting data, even when we subset to only those villages that had a woman for at least one month at some point.

One strategy for identifying the effect of having a woman versus a man as the police officer in one's village is to assume the probability that a woman and not a man was the police officer in a given village-month is independent of the potential outcomes we care about—in this case how reports of violence against women were dealt with.[44] Another identification strategy I employ is to use a generalized difference-in-differences estimator, regressing the outcome in a given village-month on indicators for female officer presence, village and month. This approach relies on a parallel trends assumption. Missing village-months during periods where police officers were present are imputed using linear interpolation, and all specifications condition on an imputation fixed effect.

Consistent with the identifying assumptions, I conduct statistical inference by comparing the test statistic (a regression coefficient) to the null distribution that arises by simulating random start and end dates for women police officers within the timeframe in which at least one police officer was present in the village.

[44] Most women are in a given village for some years at a time, and usually a minimum of 6 months. At the beginning of the program, they also typically worked in villages where men were already working, as the particularly dire security situation in the immediate aftermath of the war was seen as too difficult for women officers to face on their own.

To understand the factors that determine the duration that a woman police officer will spend in a given village, I interviewed senior police who oversee the CAP program, but also looked through the CAP program archives, including letters of resignation sent by women, and records of personnel movements. Broadly speaking, the main reason for movement out of the force is pregnancy. However, despite Bougainville having principally matrilocal residence patterns, women also move to other villages on occasion due to marriage. They also move in order to look after their parents or to start school in the capital city.

3 Main Results

I provide here a high-level summary of how the empirical results support the theoretical claims, before delving into more detail in the following subsections.

I interpret the experimental manipulation of the assignment variable, Z, to be equivalent to experimental manipulation of the theoretical variable representing state expansion, also denoted Z. Consistent with the core theoretical suppositions about the gendered nature of dispute resolution institutions, men and women experience state expansion in fundamentally different ways, with women more likely to report positive and men negative experiences with police. The experimental and observational findings speak in unison about how these experiences affect demand: the immediate availability of community policing drives men toward customary authorities and women toward the state. Demand for *both* institutions increases. This is consistent with the core comparative statics presented in section 1.

Consistent with the notion that β_P is much farther from 0 for female officers than for male officers, and thereby creates a stronger reporting incentive for women in disputes with men, the effect of state expansion on women's reporting proclivities appears especially pronounced when the agent representing the state is a female police officer.

The theory also predicts that state expansion may not have a deterrent effect when the custom favors men more than the state favors women. And indeed, there is little evidence that community police presence reduces crime.

3.1 The Gendered Experience of Expanding State Capacity

I show here that men and women experience state expansion through community policing in fundamentally different ways. To measure perceptions of police treatment and service quality, I adapt and extend the procedural justice index developed in Rosenbaum et al. (2015).[45] The battery is composed of the following yes or no questions, with "yes" responses coded as 1 and "no" as 0:

> In your recent experience, when you or a [man/woman] like you take a problem to the police, do they:
> - explain how they will deal with the issue?
> - listen to what you have to say?
> - seem concerned about your feelings?
> - treat you politely?

[45]The questionnaire in this study asks respondents two batteries of identical questions, one pertaining to the chiefs, and one pertaining to state police (CAP and regulars). The order of the two batteries was randomized in order to prevent ordering effects.

- take your problem seriously?
- treat you the same as they would a [woman/man]?
- appear to know what they are doing?

Since this measure focuses on experiences with police, and access to policing is different between treatment and control, one may be concerned that the index measures a different phenomenon depending on treatment status. To minimize this risk, the following prompt introducing the index encouraged respondents to consider police generally: "Now I would like to talk about your experience with the police. When I talk about the police, I mean anyone who has a uniform and is paid by government to arrest people. This includes both the CAP and the regular BPS." As explained above, while accessing the central police is very rare for those in remote villages, people often have second- if not firsthand experience dealing with police. I therefore encourage respondents who have not had experience with police to "answer to the best of your knowledge, given what you know from the experiences of people like you when they have brought their problems to the police." Those with and without direct access to the police are thus able to answer with a similar interpretation of the questions.

The top row of Figure 2 presents predictions and the bottom row presents point estimates arising from the pre-registered inverse-probability weighted (IPW) regression specification, conditioning on all available covariates and block-level fixed effects (see Table 11 in section C.1 of the Appendix). The upper row of panels reports the predicted response in control on the left and in treatment on the right, stratified by gender. For example, the top left panel states that just under 60% of men and over 60% of women in villages without community police are estimated to affirm that police will explain how they will deal with issues brought to them by similar men and women. As one moves from left to right on each sub-panel, the shift downwards for men and upwards for women indicates negative and positive treatment effects on this outcome for the respective groups.

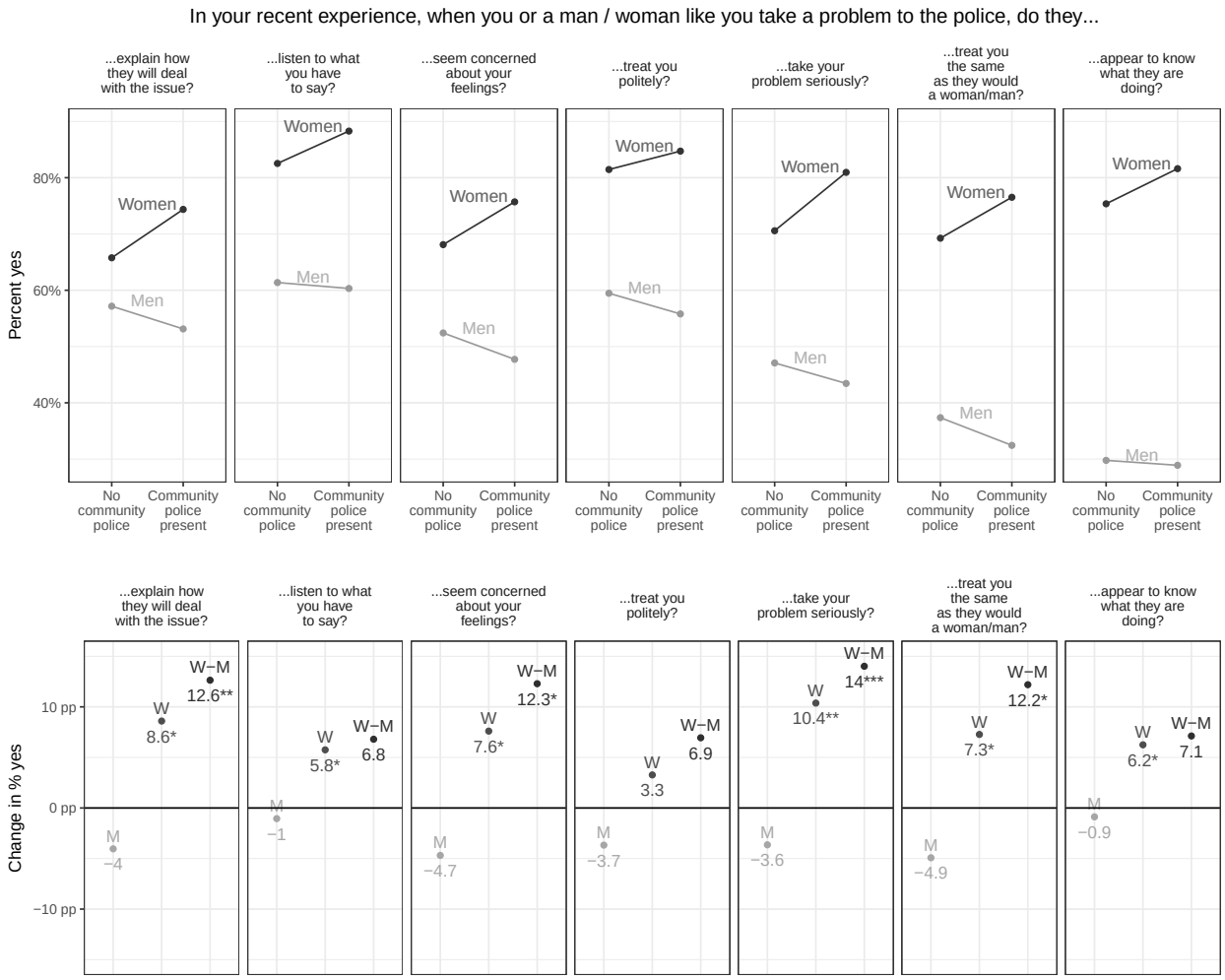

Figure 2: Men and women experience state expansion through community policing in significantly divergent manners.

Top row plots predictions from pre-registered inverse probability-weighted estimator, conditioning on block effects and available covariates. Left side of x-axis shows prediction for the control, right side shows prediction for the treatment. y-axis predicts percent of people who answer yes to the question displayed above the plot.

Bottom row depicts point estimates among men (labeled M), point estimates among women (labeled W), and the difference in these point estimates (W - M). Statistical significance is calculated using randomization inference and pre-registered upper-tailed tests, *p<0.1; **p<0.05; ***p<0.01. See Table 11 in the Appendix for underlying regression specifications.

The corresponding coefficients are presented on the bottom row.[46]

Looking first at the vertical differences on the top row of Figure 2, it is noteworthy that women

[46]For example, the bottom left panel indicates that men are four percentage points less likely and women 8.6 percentage points more likely to state that police explain how they will deal with issues brought to them. The effect is significant at the .10 level for women, and, as the point labeled "W-M" indicates, the 12.6 percentage point difference in effects is also statistically significant. No effect is significant for men, in part because an upper-tailed hypothesis test was pre-registered for these outcomes.

in the control (No community police) consistently appraise their and other women's experiences with police more positively than men appraise their own. While less than half of all men believe that police take their problems seriously, for example, roughly 70% of women do believe police take their problems seriously.

A particularly telling baseline gap occurs in the question of whether the police are gender-equitable. Women are very likely to say that police would treat them the same as they would a man, and having community police in the village increases this belief by an estimated 7.3 percentage points. Men do not see it this way. Compared to the proportion of women who believe they are treated in a gender-equitable manner by police, men are over twenty percentage points less likely to say that the police would treat a man like them the same as they would treat a woman. While we cannot rule out the interpretation that men view police as negatively biased toward women, in the context of the other measures this finding seems to suggest that men see police as the partisans of women. This perception is hardened by the treatment: the gap in men and women's appraisals of gender equity among police widens by twelve percentage points.

The widening gap in experiences with police is pervasive: across all measures, the difference in effects among women and men (labeled "W - M") is positive and in four of seven tests it is statistically distinguishable from 0 at the $\alpha = .10$ level. Across all outcomes, we see evidence of a small, negative effect for men, and a large, positive effect for women.

This divergence in effects may arise because community police officers are more likely to engage with and take the side of women, as the qualitative evidence presented above suggests. This represents a stark contrast to incumbent non-state service providers, such as chiefs, whose adjudicative procedures are typically biased toward men.

If indeed the widening of the gender gap in police appraisals is driven by some co-partisan dynamic between women and police, we would expect it to be stronger in those communities where a woman police officer was hired (Karim et al., 2015). In eighteen communities, at least one woman was a candidate to become a police officer. Thus, we can define for all of them a probability between 0 and 1 of being observed in the condition "did have female community police officer recruited" and "did not have a female community police officer recruited." The other communities must be discarded, as their probability of receiving this particular treatment was 0 and their treatment status is thus non-random.

I subset the analysis here to the eighteen communities in which at least one woman was a candidate to become a police officer and use the alternative definition of treatment to construct inverse-probability weights. The reduced sample size greatly increases the variance estimates but the picture that emerges is telling. Note, for example, the difference in the y-axis between Figures 2 and 3: the positive effect on women's appraisals and the negative effect on men's appraisals are in many cases over three times greater when a woman police officer is present. The divergence in effects is especially large on the question of gender equity.

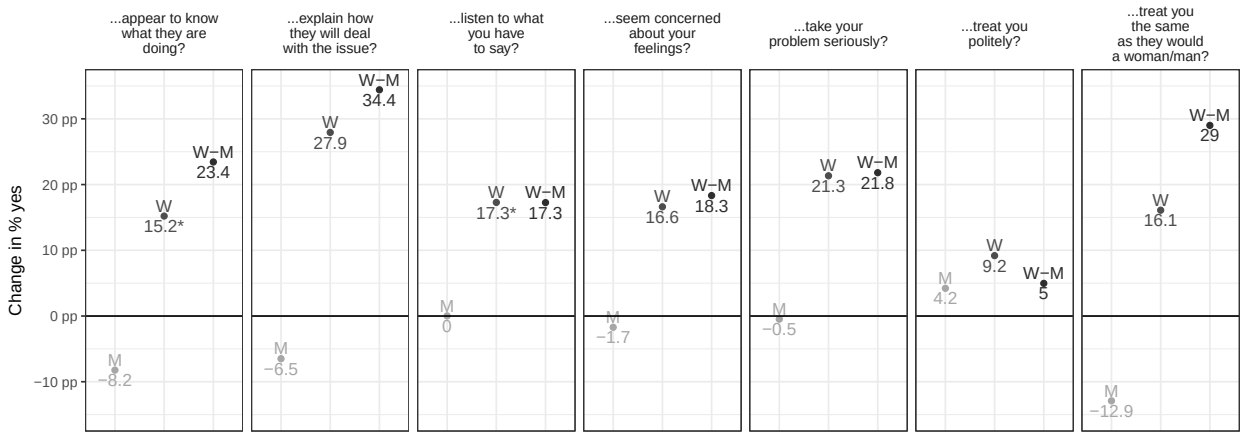

Figure 3: Presence of women police officers produces a much larger divergence in the gender gap in perceptions of police.
See note on bottom row of Figure 2. Analysis is here subset to those eighteen villages that had a probability of having a woman community police officer selected falling in the interval $(0, 1)$. Inverse probability weights correspond to probability of having a woman police officer in the village. See Table 12 in the Appendix for underlying regression specifications.

Together, these findings suggest that men and women experience state expansion in fundamentally different ways. Already predisposed toward police, women who have community police hired in their village are more likely than those who don't to report positive appraisals of their own or other women's experiences, and to see the police as a gender-neutral arbiter in disputes. The opposite is true for men, who already have a generally low appraisal of the way they and other men like them are treated by police. In particular, men attest that the police treat women very differently. By increasing the number of first- and secondhand experiences with police, state expansion sharpens these appraisals and widens the gender gap.

3.2 Shifts in Dispute Resolution Behavior

The gender-differentiated experiences of state expansion produce changes in behavior and beliefs around dispute resolution that are consistent with the theory. The framework elaborated above suggests that, rather than weakening the position of the chief, the increased availability of state service provision should increase the importance of having an empowered chief among men. Figure 13 presents findings in support of this notion. It reports treatment effects on responses to the following forced triplet:

> Sometimes the police might not agree with the way in which the chief has handled an incident in a village. The police may want to step in and resolve the issue in a different way. Which of the following statements comes closest to your opinion?
>
> 1 = A The police should never be able to tell the chief how to resolve issues in the community. The chief always knows what's best.
>
> .5 = B Sometimes the chief should let the police step in and handle issues, even if not everyone agrees.
>
> 0 = C The police most often knows the best way to handle a situation, and the chief should always defer to their authority.

Higher values represent higher demand for intervention by actors representing the customary institution. Recall that we expect demand for the involvement of customary authorities to be especially high among men when the police are accessible to women. It is in those situations that their interests are threatened during dispute resolution.

Consistent with the theoretical predictions, the presence of the community police *increases* men's support for autonomous, empowered customary authorities in matters of dispute resolution. Originally a one-tailed positive test was pre-registered, but I here report the results of a two-tailed test, which suggests that the observed effect was highly unlikely under the sharp null hypothesis of no effects for all units ($p < .01$). The effect is substantively large, at .07 scale points. This amounts to an increase of about 12% relative to the control. Already in the control men were more likely than women to prefer the chief have autonomy in his decision-making about disputes, and when the state expands its presence through the community police this preference grows stronger.

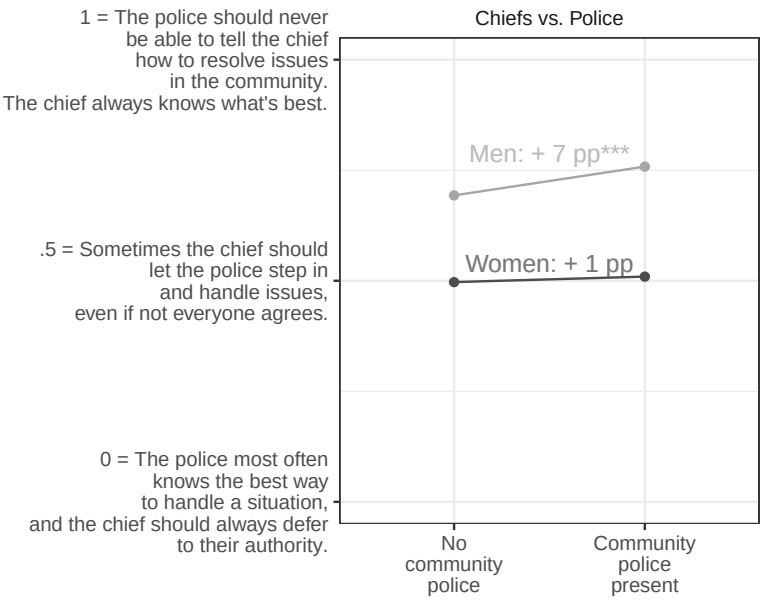

Figure 4: Community police presence increases men's preference for dispute resolution by chiefs rather than by police.
Predictions arising from inverse-probability weighted regression of outcome on treatment and block indicators, and all available covariates. Predictions generated by holding all variables at their mean and varying treatment assignment and gender. Statistical significance is calculated using randomization inference, $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$. The PAP pre-registered a one-sided test but here a two-sided test was conducted. Underlying regression specification reported in Table 13 of the Appendix.

By contrast, women on average choose the equivocal option: the chief should sometimes let the police step in and handle issues in the community. Consistent with the theory, we see no statistically significant evidence that state expansion changes this belief among women.

It thus appears that men's negative experience of the expansion of state policing leads them to vest more authority in the chief. How do these shifts in experiences and preferences change demand for the alternative providers in the presence of actual disputes? According to the theory, we should see changes in the way that women respond to disputes with men.

Decisions about whether and to whom to report crime are made conditional on the occurrence of crime, which is itself possibly affected by the treatment. I therefore adopt an approach to analyzing reporting decisions that, as I show in appendix section B.3, is unbiased because it targets an estimand that does not condition on the first-stage outcome. Specifically, I seek to understand changes in the proportion of women who:

1. Never report, either in the survey or to authorities, having been victimized by men;

2. Report at least one incident in which they were victimized by a man, and in all cases only the chief was involved in dispute resolution;
3. Report at least one incident in which they were victimized by a man, and in all cases only the police was involved in dispute resolution;
4. Report at least one incident in which they were victimized by a man, and both the chief and the police were involved in dispute resolution.

This estimand can be difficult to interpret when there is a large treatment effect on the first stage.[47] However, as we shall see below in the discussion on crime effects, pre-registered hypothesis tests enable us to reject the hypothesis of even very small constant effects on the crime rate (i.e., more negative than -.05 standard deviations). The apparent absence of a treatment effect on crime greatly simplifies the interpretation of effects.

Table 1 reports the results of a multinomial logit regression of the outcome described above on a treatment indicator and block fixed effects, among all women in the sample. The coefficients are log-odds that are relative to the probability that the respondent reported no disputes with men in the post-treatment period. Thus, for example, the coefficient in column 1 indicates that if a woman has community police hired in her village, the probability that she will have a dispute with a man and that it will be resolved by the chief decreases relative to the probability that she will report no disputes with men (to authorities or survey enumerators). The coefficients in columns 2 and 3 indicate, to the contrary, a strong increase in the relative probability that a woman reports an incident and it is handled by the police alone ($p < .05$) or by both the police and chief ($p > .1$).

[47] If policing deterred all crime, for example, then the proportion of women who report incidents that are resolved by the police would drop to 0—not because women become less likely to report to police, conditional on crime, but because crime itself is less likely to occur.

	Relative to no disputes reported, log-odds woman reports case(s) and...		
	...resolved by Chief only	...resolved by Police only	...resolved by Chief and Police
	(1)	(2)	(3)
Comm. Police	-0.845^{*}	0.721^{**}	0.270
RI P-value	0.084	0.047	0.865
N Observations	715	715	715
N Villages	39	39	39
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 1: Relative to other events, state expansion significantly increases the probability that women report disputes with men to the police and reduces the probability that such incidents are handled by chiefs alone.
Inverse-probability weighted multinomial regression of the reporting outcome on indicator for presence of community police officer in that village, conditional on block fixed effects. Consistent with pre-analysis plan, two-sided p-value reported for column 1, and p-values from one-sided positive test reported for columns 2 and 3. All p-values calculated using randomization inference. Regression is subset to women.

Given the lack of effects on the crime rate, the inference that women become significantly more likely to report disputes with men to the police is strongly plausible. Table 2 eases interpretation by providing predictions from the model in 1 in one block of the experiment where reporting was relatively high (Tsitalato). State expansion is predicted to halve the probability that women's disputes with men are resolved by chiefs alone, double the probability that they are resolved by police alone, and increase by 50% the probability that they are dealt with by a combination of chief and police.

	No Community Police	Community Police
No disputes with men reported	82%	83%
Disputes reported and all resolved by chief	10%	5%
Disputes reported and all resolved by police	5%	10%
Disputes reported and resolved by police and chief	2%	3%

Table 2: Predictions from multinomial model in Table 1 suggest state expansion makes women substantially more likely to report disputes with men to police than to chiefs.

To home in more closely on gender-specific dynamics, we would ideally like to be able to analyze how reporting of disputes between men and women in the experiment is affected by the presence of women police officers versus men police officers. However, we run into serious issues of data sparsity when subsetting the experimental sample in this manner.

The observational panel data described in section 2.2 is useful in this regard: using a much larger

sample, we can estimate the effect of having a woman versus a man as community police officer in a given village month, on a reporting outcome constructed in a very similar manner to that reported in Table 1.

Specifically, I take over 30,000 incidents reported by CAP officers from 2005 - 2009 in sixty-one villages that had a female CAP at some point (see Figure 14 above). I use it to construct a panel dataset tracking the following multinomial outcome at the village-month level:[48]

1. No single case of conflict between a man and a woman was recorded by the (male or female) CAP in that village month;
2. The CAP recorded at least one incident of conflict between a man and a woman in that village month, and all such incidents were resolved exclusively by the chief;
3. The CAP recorded at least one incident of conflict between a man and a woman in that village month, and all such incidents were resolved exclusively by the police;
4. The CAP recorded at least one incident of conflict between a man and a woman in that village month, and those incidents were resolved by a combination of the chief and the police.

The findings are plotted on Figure 5 (the underlying regression tables can be found in Table 14 in the Appendix). The observational analysis lends strong support to the theory: among those villages that ever had a woman police officer work in them, the presence of at least one woman police officer in a given village month greatly decreases the probability of no VAW being reported and increases the probability of all other kinds of events. The probability that all reported incidents are dealt with by the police increases substantially, as in the experimental findings. To the difference of the experimental findings, we see that the relative probability with which a chief resolves all reported incidents also increases here. This is possibly related to the fact that this data captures initial reporting by both men and women. Again, the expansion of the state via policing agents who ally with individuals disadvantaged by the customary sector bolsters the dispute resolution role of *both* state and customary institutions. The effects are all statistically distinguishable from 0. In Table 16 of the appendix, I show that the results remain mostly unchanged when using a generalized difference-in-difference estimator that conditions on both period and village fixed effects, although the coefficient on the log-odds of "resolved by police only" falls short of significance.

[48] Again, since the outcome is not observed conditional on post-treatment quantities, it is not subject to post-treatment bias. However, the interpretation of effects as being principally driven by changes in reporting behavior is predicated on the absence of treatment effects on crime that are correlated with reporting.

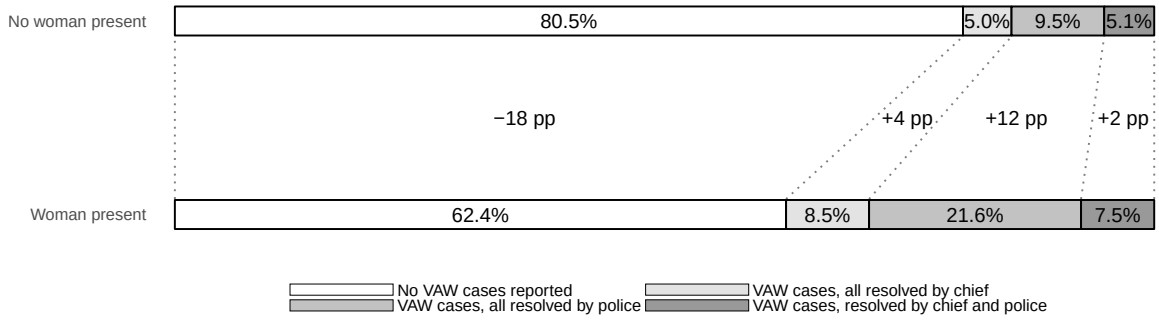

Figure 5: Presence of woman community police officer increases the relative probability of reporting and resolving crimes with the involvement of the police and chief.
Plots represent predicted probabilities from an inverse-probability weighted multinomial regression of the reporting outcome on indicator for presence of a woman police officer in that village-month, an imputation fixed effect, and month fixed effects. Predictions are generated by firstly setting the woman police officer indicator to 0 for the whole sample (top row) and then setting it to 1 for the whole sample (bottom row), and taking the average. Underlying regression model is presented in Table 14 in the Appendix.

3.3 State Expansion and Protection from Harm

The evidence presented in the preceding section lends support to the notion that, rather than crowding out demand for non-state institutions, the expansion of the state via community policing can in fact increase demand for adjudication by state and non-state authorities simultaneously. Recall, however that such increases in demand may not necessarily prevent crime. On the one hand, potential perpetrators may simply not weigh the consequences of their actions before engaging in crime. In Bougainville, many assaults are committed under the influence of alcohol. On the other hand, even if potential perpetrators do backwards induct, the presence of institutions that are biased in their favor may make it profitable to defect against others in the community, even if it is highly likely that this defection will be reported to the authorities. Institutions partial to the interests of different groups may actually hamper the positive welfare impacts of state expansion.

The survey measures crime in two ways. First, respondents are asked to count the number of times they or someone in their household was a victim of an assault or a property crime over the preceding year. I refer to such questions as "victimization" measures. Second, respondents were asked different questions about the rate of crime in their neighborhood. I refer to these as "prevalence measures."

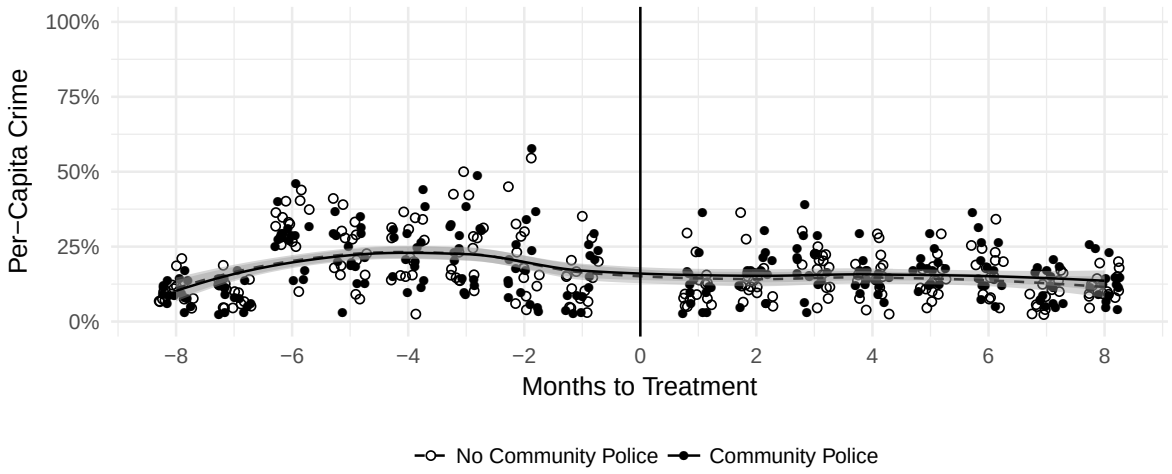

Figure 6: There is very little evidence to suggest that the per-capita crime rate changes as a function of the treatment.

Each point represents the per-household rate of incidents of assault and property crime in a given village in a given month. The y-axis plots the crime rate, the x-axis plots the month in which respondents recalled the incidents occurring. Empty circles correspond to control villages and filled circles to treatment villages.

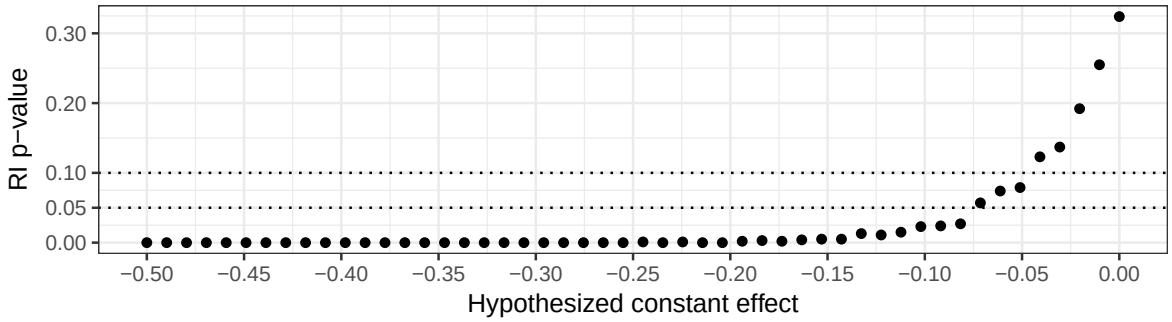

Figure 7: Constant negative treatment effects on the crime rate that are any more negative than .05 standard deviations can be ruled out with 90% confidence.

x-axis reports hypothesized constant effect sizes in the negative range as pre-registered. y-axis represents the p-value arising from the pre-registered hypothesis-testing procedure based on Bowers, Fredrickson, and Aronow (2016) and Rosenbaum (2002). See section B.4 of the Appendix for more detail.

Figure 6 illustrates that the rate at which households reported victimization before and after the randomization is almost identical between treatment and control.[49] Moreover, using the pre-registered hypothesis-testing method, Figure 7 shows that we can rule out with 90% confidence any constant negative effect on the per-capita victimization rate that is more negative than -.05 standard deviations, and with 95% confidence any effect more negative than -.075 standard deviations.

These null findings on victimization are also reflected on Table 3, which reports the results on crime disaggregated by type (to save space and because the effects are homogeneous, I do not differentiate with respect to gender). Overall, however, while we see little evidence of an effect on victimization, we see strong evidence of a reduction in the "prevalence" measures of crime.

Columns 1 and 2 report counts of assault incidents. The victimization measure asks respondents how many times over the year preceding the survey someone in their household experienced a violent assault of any kind, while the second asks the respondent to give their best guess of approximately how many times over the same period someone was seriously assaulted in his or her village. The estimated effects on these variables are substantively small and statistically insignificant.

Columns 3 and 4 measure effects on outcomes related to violence against women. When respondents reported that someone in their household had experienced one or more incident of violence, they were asked specific questions on up to four such incidents (going from the most to the least serious), including the gender of the victim. The VAW victimization measure takes the sum of assault incidents that had a woman victim. The estimated effect of the community police on this outcome is very close to zero and is statistically insignificant. Column 4 reports effects on responses to the following question:

> In many of the villages we have visited, husbands sometimes bash their wives. Thinking back over the past month, would you that this happened more than about once a week in [R's village]?
> If yes: Does it happen almost every day, or just about once a week?
> If no: Does it happen about once every month, even less than once a month, or never?

The responses are coded 0 - 4 as frequency increases from "never" to "almost every day." The baseline average of 2.44 indicates a frequency of about 2-3 times a month. The presence of the

[49] Respondents were asked to provide micro-data on up to eight incidents of assault and property crime to which they or members of their household fell victim (see section A.4 of the Appendix for more details). They were given three temporal markers and asked to situate the incidents with respect to those: first, the Bougainville elections in 2015, which took place roughly 6 months prior to randomization and involved a major mobilization in even very remote parts of the country; second, Christmas 2015, when randomization took place; and third, the day of the survey. By asking respondents to situate incidents relative to these three temporal markers, we were able to reconstruct a recall-based panel on monthly crime in the villages.

community police appears to reduce this perceived frequency by up to roughly 7% relative to this baseline (ITT = -.13, CACE = -.17, $p < .1$).

Columns 5 and 6 bear evidence of a similar pattern. The property crime victimization measure asks respondents how many times over the year preceding the survey a member of their household had property stolen or intentionally damaged. The estimated coefficient is substantively small and falls short of significance. However, as column 6 illustrates, respondents perceive the *prevalence* of property crime to be much lower in the treatment than in the control. When asked how many incidents they knew of, over the past year, in which a neighbor had property stolen or damaged, respondents in the treatment gave answers that were .23 incidents lower on average (CAVE = -.32, $p < .1$). In relative terms, this is a very large reduction: with a control mean of 1.27 incidents, the treatment is estimated to reduce the prevalence of property crime by 25%.

	Assaults		VAW		Property Crime		Public Intoxication
	Victimization	Prevalence	Victimization	Prevalence	Victimization	Prevalence	Prevalence
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Comm. Police	0.052	0.122	−0.009	−0.125*	−0.076	−0.228*	−0.130*
	(0.072)	(0.077)	(0.040)	(0.062)	(0.104)	(0.125)	(0.060)
Block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CACE	0.07	0.17	-0.01	-0.17	-0.11	-0.32	-0.18
RI p-values	0.756	0.924	0.397	0.08	0.303	0.07	0.081
Contr. mean	1.44	0.75	0.63	2.44	1.78	1.27	1.59
Contr. clust. SD	0.47	0.32	0.23	0.35	0.61	0.58	0.26
[Min, Max]	[0,16]	[0,30]	[0,4]	[0,4]	[0,20]	[0,15]	[0,2]
ICC	0.06	0.02	0.03	0.09	0.07	0.07	0.28
Hypothesis	lwr	lwr	lwr	lwr	lwr	lwr	lwr
N Clust.	39	39	39	39	39	39	39
Observations	1,383	1,383	1,383	1,383	1,383	1,383	1,383
Note:							*p<0.1; **p<0.05; ***p<0.01

Table 3: While there is little evidence community policing reduces number of criminal incidents to which respondents' household members fell victim, it strongly reduces the perception that violence against women and property crime are prevalent in the surrounding community. This is consistent with the finding that alcoholism is much less likely to be seen as a major problem in treatment communities relative to those in control.

Point estimates are calculated using inverse-probability weighted least squares regression, conditioning on block indicators and all available covariates (see Table 9 in appendix). Probability of being in assigned condition is (inverse) weight. All standard errors clustered at the village level. All p-values calculated using randomization inference with the hypothesis test as pre-registered in the pre-analysis plan. A detailed description of the summary statistics provided in section A.2 of the Appendix.

How can we reconcile the large reductions in VAW and property crime prevalence perceptions with the weaker and statistically insignificant effects on victimization? One explanation is that the presence of community police improves publicly visible instances of disorder, without necessarily deterring private conflicts between individuals. In section C.2 of the appendix, I explain how the perception of an improvement in order may be related to the treatment effect on alcoholism.

3.4 Do Non-State Institutions Limit State Expansion?

The foregoing analyses largely take non-state institutions as given, and consider how variation in the presence or absence of state institutions—represented by Z—affects behavior and beliefs. However, as mentioned above there is a substantial degree of variation in customary institutions in Bougainville. Concerning disputes between women and men, one particularly salient dimension of variation pointed to by anthropologists such as Jill Nash concerns patri- versus matrilocality.

In addition to property institutions (matrilinearity and patrilinearity), residence institutions likely play a large role in disadvantaging women in disputes with men. Under the patrilocal system that often goes hand-in-hand with patrilineal inheritance, brides move to the village of their spouses following marriage, whereas in matrilocal systems grooms move to the woman partner's village. According to Hudson, Bowen, and Nielsen (2015, 541)

> Patrilocality makes the formation of agnatic clans a fairly straightforward task and thus is universally favored by patrilineal groups. In this system, most males in a particular area are kin, which forms a natural foundation for male alliances in patrilineal clans. Such societies, in which land and resources belong exclusively to men, effect the complete economic dependence of females, resulting in a profoundly subordinate status for women.

In her work with the Nagovisi in Bougainville, where most societies are in fact matrilineal and matrilocal, Jill Nash (1978, 1981, 1990) argues that matrilocal institutions lead to relatively more empowered women because wives in such villages are surrounded by their own kin, rather than by the kin of their husband.

These residence institutions thus produce coalitional dynamics that might influence the effectiveness of state-building. Whereas women police in matrilocal communities can rely on the support of their kin when helping a woman to resolve a dispute with a man, those in patrilocal communities would be isolated from their kin. Given CAP officers' reliance on community support, it is, therefore, possible that women police officers in patrilocal communities wield less authority and are thus less effective relative to their better-supported counterparts in matrilocal communities.

Figure 8 plots the results of an analysis similar to that presented in Figure 5, albeit with two main differences. First, there are very few village-months in patrilocal villages that had a woman at some point when a woman officer was not actually present but a man officer was. Thus, the analysis takes place among all villages and is not as conservative with respect to identification as the specifications above. Second, the analysis in the top panel is conducted among villages with matrilocal residence institutions, and in the bottom among villages with patrilocal residence institutions.

The results suggest that women police officers are half as effective at reducing the number of unreported incidents of VAW in patrilocal villages as they are in matrilocal villages. Furthermore, we see effects that are much closer to a substitutive process: women police presence is estimated to reduce the relative probability of any kind of resolution by chiefs, with all of the increase in relative probabilities going to resolution by police only. One interpretation of these results is that women police officers are much less able to exercise authority when they are undermined by patrilocal institutions, such that they do not constitute a real threat to the interests of men and thus do not engender the same shifts in dispute resolution behavior as in matrilocal contexts.

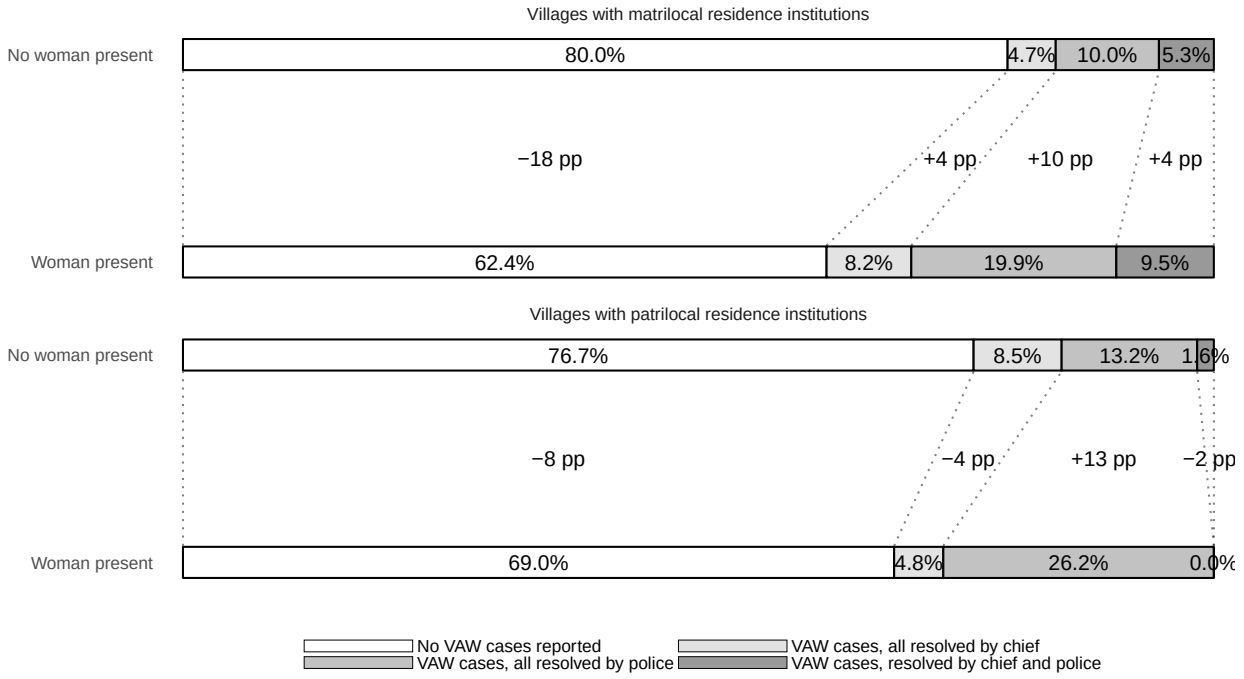

Figure 8: Women police officers are more effective at increasing reporting and resolution of violence against women in matrilocal communities than in patrilocal communities.
Top set of bars subset to communities with matrilocal institutions, bottom set of bars subset to communities with patrilocal institutions. Plot represents predicted probability from a multinomial regression of the reporting outcome on indicator for presence of a woman police officer in that village-month, an imputation fixed effect, as well as month fixed effects. Estimates are calculated by inversely weighting observations by the probability of being in assigned condition. Predictions are generated by firstly setting the woman police officer indicator to 0 for the whole sample (top row) and then setting it to 1 for the whole sample (bottom row), and taking the average. See Table 15 in appendix for underlying regression models.

3.5 Broader Effects

An important question for state-building policy and for theories of state legitimacy is the extent to which access to one form of state service "spills over" onto perceptions of the state more generally. In Table 18 of the appendix, I report the treatment effects of community policing on several indicators of state legitimacy. The first is trust in government, measured using an indicator for whether the respondent agrees with the statement "I trust the government to make the right decisions for the people of Bougainville and for [respondent's village]." In line with findings above, men exhibit a negative and women a positive treatment effect on this outcome, although we cannot reject the sharp null hypothesis of no effect for all respondents. The second indicator measures the extent to which respondents believe one should "vote with the chief" (Baldwin, 2015), with an indicator for their *disagreement* with the following statement: "If the chief tells you to vote for someone in the

elections, that is who you should vote for." The relatively large negative effect (indicating greater agreement) for women is not statistically significant because the pre-analysis plan pre-registered an upper-tailed test. The final column indicates there is no evidence that contact with the state through the police improves knowledge about government: the treatment does not appear to improve respondents' ability to correctly name the President of Bougainville. Thus, the effects of increased availability of police appear largely concentrated among attitudes and behavior directly related to dispute resolution.

3.6 Long-Run Effects

One limitation of the experimental evidence is its relatively narrow temporal scope. What evidence can we glean about the long-run effects of police officer presence from the five years of observational panel data? While I only possess historical data from villages that had CAP officers at some point, I can provide some descriptive sense of the long-run effects of the CAP program by comparing outcomes in the first six months of policing to outcomes in consecutive six-month blocks. In Table 17 I use a generalized difference-in-differences model that conditions estimates on village and month fixed effects in order to estimate the difference in the number of incidents of violence against women reported to police, using all villages and months in the entire historical panel. While estimates are not precise, there is some evidence that the number of cases of violence against women in the first six months is higher than in subsequent six-month blocks. Specifically, the number of VAW incidents reported in the first six months is estimated to be almost half an incident higher on average than the number of incidents reported once the officer has been there for more than four and a half years. However, given the experimental results illustrate the presence of community police increases the rate at which incidents are reported, even in the first months of police presence, this estimate might strongly over-estimate the true reduction in violence. Overall, while it is tempting to interpret the results as evidence of a reduction in the incidence rate, the experimental findings caution against such optimistic interpretations.

4 Alternative Mechanisms

In the preceding sections, I have used experimental and observational evidence to argue that the increasing availability of police causes women to come forward about disputes with men. In turn, this causes men to draw more upon customary authorities. The ability of perpetrators of violence

to protect their interests by drawing on alternative authorities blunts to some extent the deterrent effects of police availability. Multiple pieces of evidence speak in favor of this argument. I here provide evidence against alternative explanations.

In Figure 2 and the underlying regression Table 11 in the Appendix, I show that women become more likely and men less likely to report positive experiences with police when community police are hired in their village. I attribute this to the fact that disputes between men and women make up over one-third of all disputes, and the police provide more equal dispute resolution services than the chief. An alternative interpretation is that gender is correlated with covariates that would lead one to prefer state dispute resolution services for other reasons: for example, chiefs often use pigs as compensation during mediation in the *wanbel kot*, and rates of pig ownership are higher among men. Whereas a man who loses an asset is likely to have it replaced if he goes to a chief, if he goes to the police he is less likely to have his asset replaced. Thus, gender-based differences in asset ownership (or other covariates) may induce differing preferences for justice. To address this concern, however, the main results condition on thirty available covariates, including various indicators of asset ownership. Moreover, as the results in Figure 3 and Table 12, illustrate, the gender-based divergence in experiences is higher when the police officer is a woman. This is consistent with the main interpretation but inconsistent with the proposed alternative.

Table 1 illustrates that women become more likely to report disputes with men when community police officers are hired in their village, which I interpret as evidence of the better treatment they expect to receive. An alternative explanation for this finding might be that households organize a gendered division of labor, in which women and men are not in contention but simply face lower costs for reporting to police and chiefs, respectively. Hence, the gendered effects in reporting would not reflect underlying preferences, but cost differentials. Yet, men do indeed report to the police when they experience theft or assault at the hands of other men (the theory does not hold that men will never report to police, but that men will be more likely to report to chiefs due to women's increased propensity to report gender-based disputes). Moreover, if the results are driven purely by gender-based cost differentials, it is hard to understand why, for example, men's preference for autonomous decision-making by the chief (Figure 4 and Table 13) would increase due to cost asymmetries alone.

Turning now to the historical analysis, the core finding presented in Figure 5 and underlying

Tables 14 and 16 is that the probability that cases of gender-based violence are both reported and dealt with jointly by police and chiefs increases when female as opposed to male police officers are present in a given village-month. Given the reliance on administrative data, one may worry that the effect is driven in part by gender-based differences in reporting standards. My fieldwork suggests two key indicators of the administrative capacities of police officers are their literacy levels and the amount of training they receive. In particular, literacy levels likely affect the quantity of reports, while training sessions—which focus on investigative techniques, trauma counseling, crime scene investigation, "peoples skills," domestic violence, and prosecution—likely affect the quality and detail of the reports. As Table 4 indicates, women CAP in the sample used for the observational analysis have higher literacy rates than men. This may in part explain why they gather more reports overall. However, there is no evidence that women are better trained to detect and describe crime. It thus seems unlikely that the differences in forum-shopping behavior revealed in the data reflect underlying differences in reporting techniques used by the police.

	Mean Among Men	Mean Among Women	Difference	p-value
High literacy	80.3%	95.5%	15.2%	0.027
Training	41.18%	39.39%	-1.78%	0.861
N	85	33		

Table 4: Male and female community police in the observational analyses have roughly the same level of training, although women exhibit a slightly higher rate of literacy.
Data comes from personnel records obtained from the Bougainville Police Service with written approval under IRB protocol AAAQ2006.

5 Discussion

Throughout the 1960s and 1970s, leaders of newly independent states throughout Africa railed against the persistence of powerful village-level customary authorities and predicted agents of the state, increasingly deployed throughout remote rural areas, would supplant traditional leaders (Herbst, 1990; Boone, 2003; Baldwin, 2015). However, as in many other parts of the world, such predictions proved inaccurate: throughout Africa, Asia, Latin America, Eastern Europe and the Pacific, non-state authorities continue to play an important role in the governance of rural and sometimes urban populations. They provide citizens with services that parallel those provided by the state (Cammett and MacLean, 2014), particularly in the domain of security and dispute resolution (Baker, 2009; Lazarev, 2017; Blair, Karim, and Morse, 2018).

The persistence of non-state institutions is linked at least in part to demand for the services they provide. The theory and evidence presented in this paper shed light on one set of dynamics that can sustain citizen demand for multiple providers of dispute resolution services.

By generating experimental variation in the areas where community police officers begin working as uniformed agents of the state in remote parts of Papua New Guinea, I am able to demonstrate that men and women experience state expansion in divergent ways: men expect more negative and women more positive experiences with police—a divergence that is much wider when the police officer is a woman. The theory predicts that these differences in expectations mean that state expansion will lead women to report disputes with men to police and men to appeal more frequently to chiefs.

And indeed, the experimental and observational sources of evidence are consistent with this prediction: state expansion causes an increase in men's preference for customary authorities' autonomy, on the one hand, and strongly increases the probability that women report to the police victimization at the hands of men, on the other. When a woman police officer begins working in a village where only male police officers were present, this is estimated to cause a large increase in the probability that disputes between men and women are reported and handled by *both* chiefs and police.

I find evidence *against* deterrence of violence, at least in the short-run: with 95% confidence, I can reject any constant reduction in the crime rate greater than one-tenth of a standard deviation. The availability of alternative authorities appears to blunt the state's capacity to reduce violence.

5.1 Scope Conditions

How well could the theory of state expansion put forth in this paper travel to other contexts and explain the persistence of hybrid institutional environments there? For one thing, many of the preconditions identified as theoretically relevant—customary authorities relatively more partial to the interests of men than women, poor access to state policing services—exist in many parts of the world where we also see hybrid institutional environments. In the African context—described by Baker (2008) as a 'multi-choice' policing environment—three-quarters of citizens living in rural areas lack easy access to police, according to Afrobarometer data. Moreover, as Figure 9 illustrates, customary authorities are pervasively seen as more biased towards men than state authorities are.[50]

[50]Each point on the graph represents the average response to two questions among men and women in one rural subnational region in North, Southern, West or East Africa. The y-axis plots the average response to the question

In a number of regions in Southern, West and North Africa, for example, almost all women claim that traditional leaders treat women unequally, whereas police and courts never do. These observations suggest that many parts of Africa exhibit preconditions for the sorts of complementarities observed in this study.

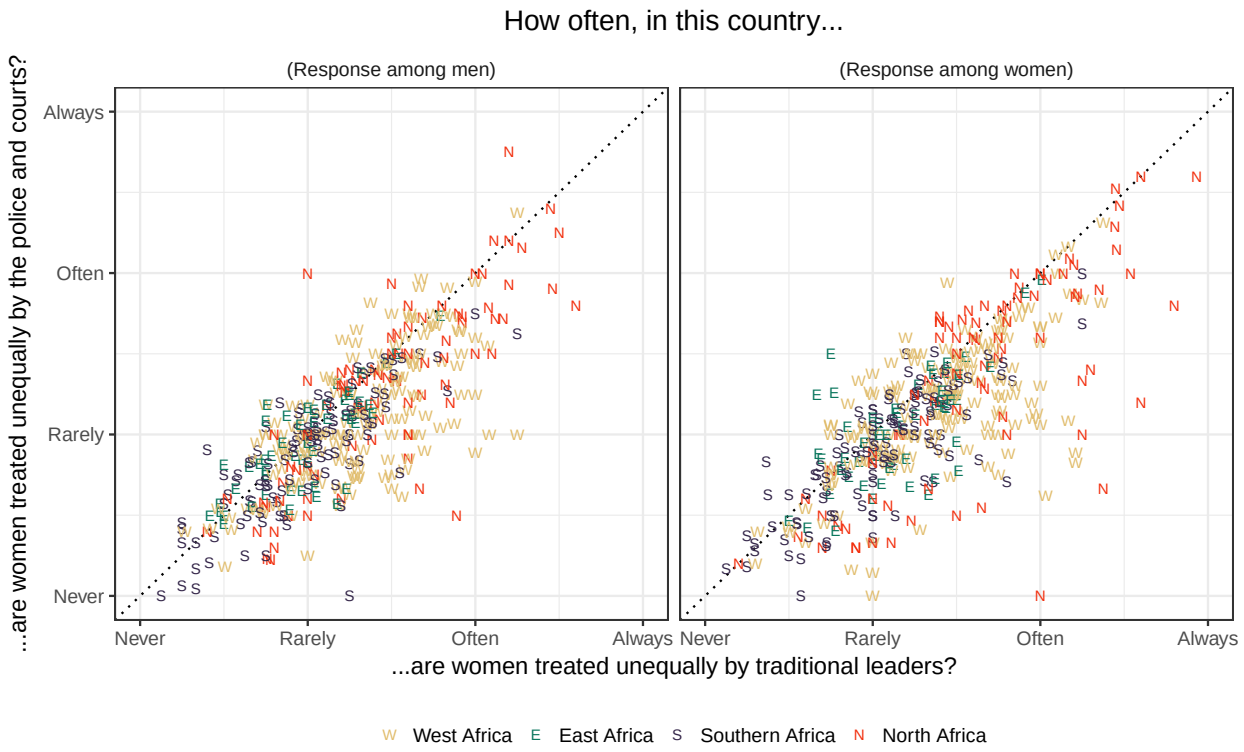

Figure 9: Men and especially women in rural regions of Sub-Saharan Africa see customary authorities as significantly more biased toward men than the state.
Each point on the graph represents the average response at the subnational region level. Sample is subset to rural respondents. Letter indicates supranational region of Africa in which the geographic unit is located.
Source: Afrobarometer 2015.

Moreover, there is no reason that such dispute resolution dynamics should only arise in weak state societies. Israel, for example, presents a possible case of strategic complementarity between state and non-state resolution mechanisms. Lavee and Katz (2003, 200) describe family law there

"How often, in this country, are women treated unequally by the **police and courts**?", while the x-axis corresponds to the question "How often, in this country, are women treated unequally by **traditional leaders**?" The left panel plots responses provided by men, and the right those provided by women.

The first thing to note is that the two measures are highly correlated: certain regions appear to exhibit general bias that is present in the way that both state and non-state authorities are perceived to treat women. Note, however, that both scatterplots exhibit considerable skew rightwards: people in most regions of Africa see customary authorities as more male-biased than state authorities. The skew is particularly strong for women.

in the following way:

> A double system of courts has been established. All issues of property division and child custody may be adjudicated in either a civil court or a rabbinical court, but the writ of divorce remains solely under the authority of the religious court. To prevent the possibility of adjudication of a given case in two courts simultaneously, the law states that whenever one spouse brings suit against the other in a given legal system, all proceedings must continue in that system. Since the civil courts are generally viewed as more favorable to women and the rabbinical courts more favorable to men, it is in each spouse's interest to be the first to file suit in the court of his or her preference.

This is exactly the sort of incentive structure that creates the kinds of strategic complementarities formalized in this paper: if the husband expects the wife not to file suit, he can rely on prevailing social norms to protect his interests. As soon as he believes, however, that there is some chance the wife will file in the civil court, he has a much stronger incentive to file in the rabinnical court.

It is worth noting that civil courts in Israel did not always have jurisdiction over matters ancillary to divorce, such as custody and property division: the state's jurisdiction was expanded to these domains under pressure from women's organizations in the 1990's. Future work could explore whether the expansion of the state, in the form of providing civil courts jurisdiction over post-divorce disputes between men and women, may have set off a dynamic whereby *more* cases were filed with rabbinical courts by men once the civil courts became an option for women. Such phenomena suggest that the scope conditions of some of the core arguments might not be limited geographically to Papua New Guinea, or even to developing contexts.

Moreover, nothing about the core logic of the argument requires focusing on state versus non-state or men versus women as the core cleavages. As discussed in the introduction (see footnote 4), authors have documented bias in customary dispute resolution along other dimensions, such as political partisanship (Baldwin, Muyengwa, and Mvukiyehe, 2018) and religion (Murtazashvili, 2016, 77). In a field experiment in Zimbabwe, Baldwin, Muyengwa, and Mvukiyehe (2018) show that political opponents of the village head are more likely to expect fair outcomes from the village court over which he presides when he has been trained and pressured by civil society actors to adopt more impartial decision-making procedures.

The argument presented in this paper suggests that this situation in Zimbabwe might produce the opposite set of empirical outcomes to those observed in Papua New Guinea. Suppose, for example, that state institutions also exhibit partisan bias toward members of the incumbent party. In that case, an intervention that reduces bias in the *customary* sector might increase reliance on

the state, insofar as co-partisans of the government now have a greater incentive to settle disputes in the relatively more biased formal sector where they are favored. Thus, in a similar manner to the way in which reforming formal institutions in Papua New Guinea seems here to have increased reliance on customary institutions, interventions that seek to reform customary governance might increase reliance on state institutions, at least among those whose interests were harmed by the reform. Wherever multiple dispute resolution fora exist—be they state or non-state—and are seen as partisan to different social strata, the increasing availability of one forum should increase demand for the other.

5.2 Broader Implications

The manner in which state institutions interact with non-state institutions under expanding states has been of central concern both to classical (Tilly, 1975; Skowronek, 1982; Mann, 1993) and more recent political science (Herbst, 1990; Soifer, 2008; Abrahamsen and Williams, 2010) and legal theory (Merry, 2017). Some authors have argued that the state's security apparatus crowds out non-state security services provided by local elites (Herbst, 1990; Ensminger, 1996), and others have pointed to the adeptness with which local elites capture or collude with agents of the state in order to reinforce the institutional dominance of alternatives to the state (Mamdani, 1996; Scott, 2014).

A core inferential challenge in previous work, however, is the endogeneity of state expansion to a host of strategic considerations (Boone, 2003). If state-builders expand capacity where local governance is weak, then a non-causal correlation between expansion and non-state institutional weakness could be spuriously interpreted as evidence of the state undermining customary institutions.

This study is able to overcome such inferential challenges because the random recruitment lottery ensures that the variation in where police are assigned to be present or absent is exogenous to any strategic concerns. As such, I am able to identify the causal effect of a shock to the state's capacity to deliver a fundamental service.

I find that institutions that appeal to antagonistic preferences in the citizenry can foster the emergence of hybrid political arrangements. This explanation contrasts strongly with existing accounts of positive-sum interactions between state and non-state institutions. Logan (2009, 116), for example, has argued that "traditional leaders are not in competition with elected government but, in fact, the two are mutually reinforcing" because rural citizens view the two modes of authority as

part of an integrated whole. She points to the fact that respondents in the Afrobarometer survey are more likely to perceive local level government institutions as legitimate if they also see traditional leaders as legitimate.

However, her account downplays very real differences in the way that customary and state institutions cater to different genders, which, as illustrated on Figure 9 above, is obvious even in Afrobarometer data. Especially in the domain of dispute resolution, non-state institutions—informal courts, mediation by chiefs, reconciliation rituals, trial by ordeal, mob justice—present very different tradeoffs to disputants when compared with their formal alternatives—police and courts. The evidence in this study suggests it is the differences, not the similarities, that produce "mutually reinforcing" institutional hybrids.

This finding bears lessons for our understanding of state-building failures. Particularly in post-conflict contexts such as Bougainville, state-building through the expansion of police forces into peripheral areas often fails. Scholars point to the fact that agents of the state are often unaccountable, corrupt, and foreign to the areas in which they work. For example, Autesserre (2014), begins her book on state-building failure with the following illustrative anecdote:

> In an attempt to reconstruct state authority in the eastern part of the [Democratic Republic of Congo], various international peacebuilding agencies had decided to assist the Congolese police in deploying officers to some of the most unstable areas. [...] Officials at the United Nations (UN) headquarters in New York claimed that they had successfully accomplished an essential step in their mandate to stabilize Congo. In theory, mobilizing a greater law enforcement presence in an unstable area would secure it, allowing for the deployment of other state representatives and eventually contributing to the reestablishment of state authority and the return to peace.
> In reality, the program made a bad situation worse. The newly deployed police were untrained, and they had to compete for control of the area with both local militias and remnants of rebel groups. Not only did they fail to improve the stability of the region, but they also became one more factor of insecurity. The new officers came from faraway provinces and had no ethnic or family links with surrounding groups. While this strategy was supposed to prevent corruption and collusion, it also produced a new force with no support among local populations, no deep-rooted personal stakes in bettering security in the area, and little knowledge of the specific local history and customs of the villagers.

In contrast to such efforts, the CAP project presents significant advantages that have led it to be heralded as a "vision of a more socially embedded approach to policing and justice" (Dinnen and Peake, 2013, 575). Because CAP officers police the same communities that they are from and live in they are directly accessible to and much more representative of their constituencies. Moreover, CAP are not armed and so in principle cannot wield unaccountable coercive power over the community members they police. This innovative approach to state-building through local recruitment deserves further study as a response to low state capacity in other post-conflict contexts.

However, the findings highlight that even when a program such as the CAP project is able to overcome issues of representation and accountability that bedevil state-building in other contexts, the expansion of new powers can pose a threat to those who benefit from the status quo. Far from passive recipients of state expansion, those social actors respond strategically by drawing upon their sources of support and withdrawing from the state (Scott, 2014). In the Bougainvillean context, the fact that the program is less effective in patrilocal versus matrilocal communities suggests that variation in non-state political organization can play an oft-neglected role in shaping state-building success and failure on the ground.

In addition to the contribution to a broader literature on state-building, this study's ability to randomize permanently-assigned community police officers to some and not other parts of a weak state society contributes new policy insights to a burgeoning field of experiments with police in political science (Mummolo, 2018). Writing of the literature on community policing in 2014, Reisig and Kane made the following criticisms:

> police executives and researchers have rarely been able to utilize experimental or strong quasi-experimental designs in their studies of community policing effectiveness. Rather, despite good intentions and significant effort, most community policing evaluations have employed case studies and similarly weak research designs. Limitations have included lack of control groups, lack of randomization, and a tendency to measure only short-term effects. Consequently, the findings of the many community policing studies have not had as much scientific credibility as would be desired. (2014, 161)

Reisig and Kane were speaking mainly of the literature in developed countries. For many years the situation was much worse in developing, post-conflict contexts, where the need for policies to improve state-citizen interactions seems most dire. As Blair, Karim, and Morse (2018, 3) point out, existing studies in such contexts are "almost all observational, and many rely on anecdotal evidence alone."

This study joins a small but rapidly growing set of field experiments bringing new insights into policing in developing states. Banerjee et al. (2012) examined how management reforms changed the behavior of the Rajasthan police force in India, while Sandefur and Siddiqi (2013) showed how increasing access to the formal justice sector through legal assistance changes the distributive dynamics within villages in Liberia. The Liberian police have collaborated with researchers on a series of interventions aimed at measuring how gender balancing and increasing foot patrols into the periphery change attitudes towards police and the state (Karim et al., 2015; Blair et al., 2015; Karim and Gorman, 2016; Blair, Karim, and Morse, 2018). In Latin America, Magaloni, Franc, and Melo

(2015) have conducted a series of evaluations with the police, while Blattman et al. (2018) report the results of a hotspot policing intervention in Colombia. While many of these studies focus on central police forces, rather than on community policing, a series of forthcoming studies supported by the EGAP Metaketa initiative directly addresses the issue of community policing across a range of contexts.

The present study contributes to this research agenda in distinct ways. While previous studies have looked at the effect of short-term, intensive applications of police presence, this study is able to assess the effect of permanently installing agents of the state in areas that were virtually stateless until that point. As the heterogeneity of the findings by gender illustrates, the introduction of a new pole of power in the form of the community police represents a substantial structural shift in the local political economy. Moreover, while others have looked at effects on crime, reporting and trust in state institutions, the interaction with particular kinds of non-state institutions—such as gender-based inheritance or residence institutions (Lowes, 2017; Brulé and Gaikwad, 2018)—has largely been left out of such studies. However, the results suggest that the nature of incumbent non-state institutions may matter a great deal for uptake of state policing services.

Finally, from a policy perspective, the CAP programme itself represents an innovative extension of common community policing models. The model draws and extends upon the basic philosophy of community policing, which can be defined as "full service policing, where the same officer patrols and works in the same area on a permanent basis from a decentralized place, working in a proactive partnership with citizens to identify and solve problems" (Trojanowicz and Bucqueroux, 1998, 3). This philosophy can be contrasted with centralized policing strategies, in which officers principally deal with issues on an incident-by-incident basis, operating from a handful of district stations and involving themselves with communities only when called upon to do so (Colvin and Goh, 2006). The findings suggest innovative policy solutions to the problem of unequal access to justice may work, provided that those at the front line are able to form meaningful alliances with disadvantaged groups. However, even in the best of cases where disadvantaged groups cooperate with state police and generally report a positive experience doing so, this is not guaranteed to bring about large reductions in crime and victimization.

6 Conclusion

Scholars in political science have long debated how states transform societies. In the field of development, it was often assumed that the state will supplant any institution that provides a similar service to its own. This study joins other recent efforts to unpack the black box of state expansion in order to examine such assumptions critically. I show that the assumption that the state inevitably crowds out non-state institutions neglects the strategic behavior of those with a vested interest in the maintenance of the status quo. In Papua New Guinea, expanding state dispute resolution services does not crowd-out the role of chiefs in resolving disputes: it reinforces their role by increasing men's demand for the services they provide. Gender inequality both facilitates state expansion, by creating the demand for alternative services to those provided by the custom among women, but ensures the maintenance, at least in the short-run, of a hybrid institutional environment. The ability of men to retain much of their privilege in dispute resolution by drawing on chiefs blunts the state's ability to deter violence. The results and theory reiterate the important lesson that development is not a unilateral process: while states indeed shape societies by changing opportunity structures for social actors, those same social actors *also* influence the shifting limits of the state.

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Appendix

A Supplementary Information

- Subsection A.1 contains a link to the pre-analysis plan.
- Subsection A.2 explains the summary statistics reported in regression tables.
- Subsection A.3 describes the sampling strategy employed in the endline survey.
- Subsection A.4 describes the measurement strategy.
- Subsection A.5 explains the randomization.
- Subsection A.6 provides descriptive information about the CAP and the kind of policing work they do.
- Subsection A.7 describes the international crime victimization survey data sources.

A.1 Pre-Analysis Plan

The PAP and addendum are available at EGAP and the AEA.

A.2 Explanatory Note on Regression Tables

Summary statistics reported in tables in main text and appendix are as follows. The complier average causal effect (**CACE**) is calculated through weighted instrumental variables regression (p-value not reported). The **RI p-values** are calculated as above and correspond to the *Comm. Police* coefficient. **Contr. mean** represents mean outcomes for the control, while **Contr. clust. SD** reports the standard deviation of the cluster-level means among control villages. **[Min, Max]** indicates the minimum and maximum values observed for that outcome. **ICC** reports the intra-cluster correlation of the outcome, estimated using ANOVA. **Hypothesis** indicates the direction of the test as per the pre-analysis plan: *lwr* is a lower-tailed test, *upr* is an upper-tailed test, and *two* is a two-tailed test. The **M-W p-value** reports the probability of observing, under the null of no true difference, an absolute difference in the effect for men and women at least as large as that observed.

A.3 Sampling Strategy

Interviews were restricted to adults between the ages of eighteen to sixty-five. The survey was translated, programmed onto tablets, and conducted in the local language, *Tok Pisin*. The target number of respondents for the household survey was 1,550, 1,383 of whom we successfully interviewed, giving a response rate of 89%. Women responded at a higher rate than men, 92% vs. 86%, respectively.

The data on candidates was collected during the same period by a single enumerator, and when necessary by the author, in both Pidgin and English. Great lengths were undertaken in order to track down all candidates in the recruitment lottery, including those who were unsuccessful and had thus occasionally moved to different locations. Surveying was successfully conducted in all of the treatment and control villages. In the constituency of Bolave, what were thought to be two separate villages were in fact separate hamlets of one large village, so sampling occurred at the hamlet level, treating each candidate's hamlet as a separate village. In one village in Tinputz the survey team was unable to access the main hamlet of the candidate's village due to its location high in the mountains, and so surveyed in a sub-hamlet located roughly forty minutes away by foot (but still part of the jurisdiction of the officer).

Household members were selected to be interviewed using a two-stage sampling procedure. In the first stage, enumerators worked with a village chief to develop a list of the names of the heads of

each household in the village. This list was then re-ordered according to a random vector of integers pre-generated in R and printed on paper. The first twenty-five households were designated to have a man sampled in them, and the last twenty-five to have a woman sampled in them. On the day that the household listing was conducted, no surveying took place. Rather, this occasion was used to explain the purpose of the study, to set a date for data collection with the chief(s) in the village, and to organize an awareness campaign to ensure that village members would be present on the day the survey team returned for data collection.

In the second step of the random sampling process, enumerators were guided by villagers to the respective households to which they had been assigned. Once there, they asked to know how many members of that household within the eligible age range and of the selected gender lived there at present. When the k number of eligible respondents was obtained, enumerators used a household sampling grid (generated prior to sampling in R and printed on paper) to randomly select the x'th eldest member of the household, with $x \in \{1, ..., k\}$. If the respondent was not available enumerators were instructed to return to the household later in the day and wait. Failing this, the enumerators moved to the next row of the grid and randomly sampled another household member. When they ultimately failed to sample anyone from the household, the household was marked as a non-respondent household.

There are fewer men in the sample than women. This occurred due to a failure to sample as many men after about 10AM in the morning, by which time many had left for the day to hunt or farm. As Table 5 shows, there is no evidence of differential response due to treatment. Response rate differences are calculated using inverse probability weighted least squares regression with block fixed effects. All p-values are two-tailed, and calculated by permuting the treatment assignment 2000 times and re-estimating effects under the sharp null of no effects for all units. The first column reports cluster-level response rate among all household respondents, while the second and third report rates among men and women, respectively.

	Dependent variable:		
	rate	rate_m	rate_w
	(1)	(2)	(3)
Comm. Police	−0.065	−0.034	−0.095
	(0.048)	(0.055)	(0.060)
Block FE	Yes	Yes	Yes
Observations	39	39	39
Adjusted R^2	0.128	0.031	0.050
Note:	*p<0.1; **p<0.05; ***p<0.01		

Table 5: There is no evidence that the response rate among men or women is systematically related to treatment assignment.
Response rate calculated by taking number of respondents surveyed in cluster j over target number of respondents in j. Inverse-probability weighted regression conditioning on block indicators, p-values from pre-registered randomization inference procedure.

Whereas the pre-registration plan indicated that fifty households would be surveyed in each village, in more remote areas of the country it was discovered that this was unfeasible, as many

villages simply did not contain more than thirty households. Because the randomization is blocked on small geographic areas, and village sizes were very similar within blocks, the solution to this issue was simply to designate some blocks as those in which the target for surveying was thirty households per village, and others in which it was forty or fifty. Thus, cluster sizes are constant within blocks but heterogeneous among them. This feature of the design was intended to mitigate bias that can arise due to heterogeneous cluster sizes (Imai et al., 2009).

A.4 Measurement of Outcomes

Household-, respondent- and incident-level outcomes were measured through a seemingly unrelated survey billed as 'the Columbia University Bougainville Community Safety Survey' approximately eight months after the successful recruits had begun working in their communities. Surveys were conducted in the local language, *Tok Pisin*, and were gender-matched. The survey usually took around one hour to complete, although the time varied somewhat due to the conditional nature of the incident questions (explained below). Enumerators were not informed about the recruitment lottery, nor were the community police officers.

In addition to a range of questions measuring respondent-level outcomes, the survey sought to measure aspects of crime victimization at the incident-level, pertaining to all members of the household of the respondent. Specifically, as criminal case records suggest property crime and physical assault are the most common forms of crime victimization in Bougainville (see figure 11 above), two separate batteries of conditional questions sought to gather data on up to four incidents[51] of each kind that had occurred during the approximately one-year interval between the Bougainville presidential elections in 2015 and the day of the survey. The 2015 Bougainville elections were chosen as a temporal marker as they represented an unprecedented effort by the authorities to expand representation into the most remote peripheries, and thus it was reasonable to assume that respondents would not have trouble pinpointing this time. This was also a period of drought and strong winds, in Bougainville, so these meteorological cues were also used to assist respondents' efforts at recall.

For property incidents, the enumerator would begin by asking the respondent about the things they or their household owned at some point over the past year, in order to prime them to think of their valuables, livestock and crops. The enumerator would then ask approximately how many times someone had damaged or stolen any of those things over the past year, using the temporal markers of the election and weather as guides. Typically respondents recalled such incidents with striking clarity. Conditional on the respondent answering that more than 0 such incidents had occurred, a range of incident level questions were asked about each incident, including whether it took place before or after Christmas. Most Bougainvillean communities are Christian, and so observe Christmas. The randomization took place right on Christmas, and so this serves as a pre- post-temporal marker. The survey also asked about the characteristics of the victim and perpetrator at a very abstract level so as to avoid breaches of confidentiality. It asked about whether the incident was reported, and if so to whom (chiefs, family, police, other), and how the incident was resolved if at all.

The same procedure was followed for assault incidents, except that respondents were primed with a definition of assault before beginning that section of the survey. Respondents were never asked directly about whether someone in their household had experienced sexual assault or intimate partner violence. Rather, the survey asked how many times any member of the household had been

[51] While the raw number of incidents was recorded for each respondent and was not limited to four, the incident-level questions were only asked in reference to four property and four assault incidents in order to keep the survey within a manageable temporal duration. To avoid chronological censoring, the survey asked respondents to order incidents in terms of how much distress they caused, beginning with the most distressing and working to the least.

a victim of assault as defined in the prompt since the Bougainville elections in 2015, and then conditional on the response being greater than 0, the survey asked about the victim, the victim's relationship to the perpetrator, and then asked what kinds of behavior the incident involved. This question offered 'select all' options, and so incidents might be recorded as involving, shouting, hitting and sexual touching, for example. As with property incidents, the survey asked if the incident occurred before or after Christmas, and approximately how many months before or after. Every incident-level question asked whether the perpetrators seemed to have planned the attack in advance (pre-meditation), or whether it seemed to be the result of a spontaneous impulse (crime of passion).

A.5 Randomization

The candidates came from fifteen different administrative units, called constituencies. Each constituency is represented by one facet on Figure 10: the first two candidates in the top left corner of the plot came from the Bolave constituency, for example, while the next four to the right all came from the Carterets constituency. By conducting fifteen lotteries in which 1-2 officers were hired in each constituency the central police were able to ensure an even territorial distribution at the constituency level.

Each facet representing a constituency on the plot contains four rows. The first indicates individual candidates: circles represent men and triangles women; shapes are filled when the candidate was selected through the lottery and empty when the candidate was not selected. The second row indicates the villages from which the candidates originated. In the Carterets constituency, for example, each of the four candidates came from a different village. In Peit, by contrast, there are five candidates from two villages: four candidates came from one village and only one came from the other. The third and fourth rows indicate the numbers of men and women sampled using a two-stage random selection procedure in each village, at least eight months after the recruitment lottery.

The differences in lottery size and composition generate differential probabilities of assignment to treatment at both the village and candidate level, which is reflected in the size of the shapes. While these differences can be relatively large at the candidate level, at the village level they are fairly homogeneous. Turning to Peit, for example, the probability of observing the treated candidate in treatment was 1/5 and the probability of observing each of the control candidates in control was 4/5. However, the probability of observing the treatment village in treatment was 1 - 1/5 = 4/5, which is equal to the probability of observing the control village in control, at 4/5.

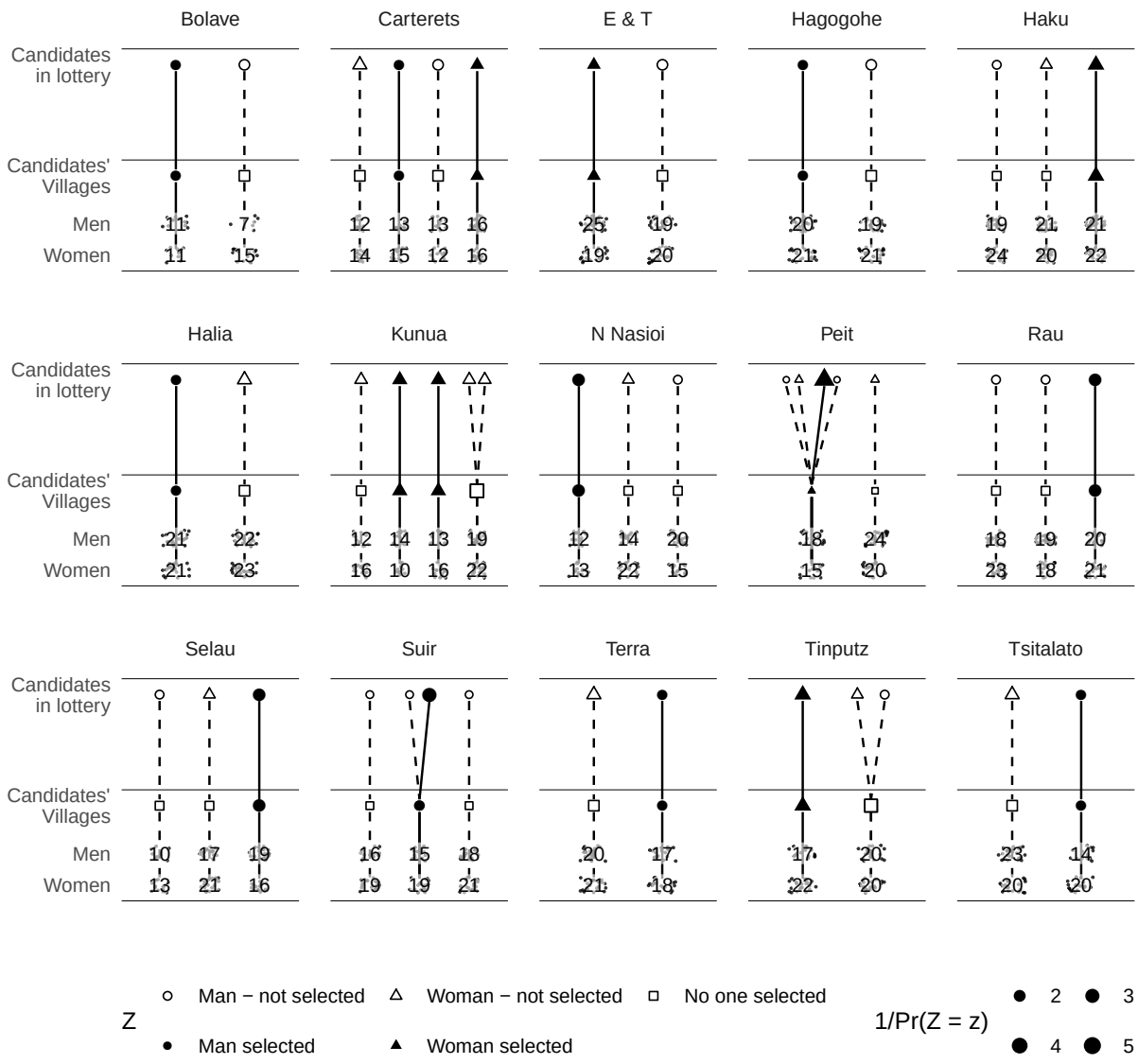

Figure 10: Households were cluster-assigned to community police presence by hiring or not hiring a member of their village to become a community police officer through fifteen constituency-level lotteries. Each panel represents one constituency-level lottery – an experimental block. The first row represents candidates to the CAP: if a shape is filled that candidate was selected, and if it is empty that candidate was not selected. Circles indicate men and triangles women. The second row indicates villages to which the candidates belong, with circles indicating a man was selected to become a community police officer in that village, triangles indicating a woman was selected to become a community police officer, and squares indicating that no member of the village was selected to become a community police officer. The bottom two rows indicate the number of men and women sampled in the village. Shape sizes correspond to the inverse of the probability of observing the candidate or village in the assigned condition (treatment or control).

Assignment	Gender	Cand. ID	Village ID	COE (Block)	Pr(Selected for Recruitment)
Not Selected	M	1	1	Hagogohe	0.50
Selected	M	2	2	Hagogohe	0.50
Not Selected	F	3	1	Haku	0.33
Selected	F	4	2	Haku	0.33
Not Selected	M	5	3	Haku	0.33
Selected	M	6	1	Halia	0.50
Not Selected	F	7	2	Halia	0.50
Not Selected	M	8	1	Peit	0.20
Not Selected	F	9	1	Peit	0.20
Selected	F	10	1	Peit	0.20
Not Selected	M	11	1	Peit	0.20
Not Selected	F	12	2	Peit	0.20
Not Selected	F	13	1	Tsitalato	0.50
Selected	M	14	2	Tsitalato	0.50
Not Selected	M	15	1	Suir	0.25
Not Selected	M	16	2	Suir	0.25
Selected	M	17	3	Suir	0.25
Not Selected	M	18	4	Suir	0.25
Selected	F	19	1	Tinputz	0.33
Not Selected	F	20	2	Tinputz	0.33
Not Selected	M	21	2	Tinputz	0.33
Selected	M	22	1	Carterets	0.50
Selected	F	23	2	Carterets	0.50
Not Selected	F	24	3	Carterets	0.50
Not Selected	M	25	4	Carterets	0.50
Not Selected	F	26	1	Kunua	0.40
Selected	F	27	2	Kunua	0.40
Not Selected	F	28	3	Kunua	0.40
Not Selected	F	29	3	Kunua	0.40
Selected	F	30	4	Kunua	0.40
Not Selected	M	31	1	Selau	0.33
Selected	M	32	2	Selau	0.33
Not Selected	F	33	3	Selau	0.33
Selected	M	34	1	Terra	0.50
Not Selected	F	35	2	Terra	0.50
Not Selected	M	36	1	Rau	0.33
Not Selected	M	37	2	Rau	0.33
Selected	M	38	3	Rau	0.33
Not Selected	M	39	1	Eivo and Torau	0.50
Selected	F	40	2	Eivo and Torau	0.50
Not Selected	M	41	1	North Nasioi	0.33
Not Selected	M	42	2	North Nasioi	0.33
Selected	F	43	3	North Nasioi	0.33
Selected	M	44	1	Bolave	0.50
Not Selected	M	45	2	Bolave	0.50

Table 6: People living in thirty-nine different villages were cluster-randomized to have or not have a CAP officer living in the village by randomly selecting seventeen of forty-five candidates to be recruited into the CAP.

A.6 Descriptive Information on Community Auxiliary Police

	Women		Men	
	CAP Candidates	Civilians	CAP Candidates	Civilians
N	20	715	25	668
Age	28	36	32	37
Average years education	15	12	14	12
Average number of large household assets	1	1	1	1
Household size	5	5	5	4
Chief is close family	50%	40%	48%	34%
Agree "man can hit wife for gossiping"	50%	81%	52%	79%
Agree "man can hit wife for refusing sex"	55%	79%	48%	73%

Table 7: Those who become Community Auxiliary Police are younger and more educated than the average member of their community. While they are closer to the chief in terms of family ties, they are much more likely to believe the chief should defer to the police.
Results from survey with all CAP candidates in recruitment lottery for this study (successful and unsuccessful) and with random probability sample of men and women in households from the candidates' communities. See section A.3 of the Appendix for details on sampling.

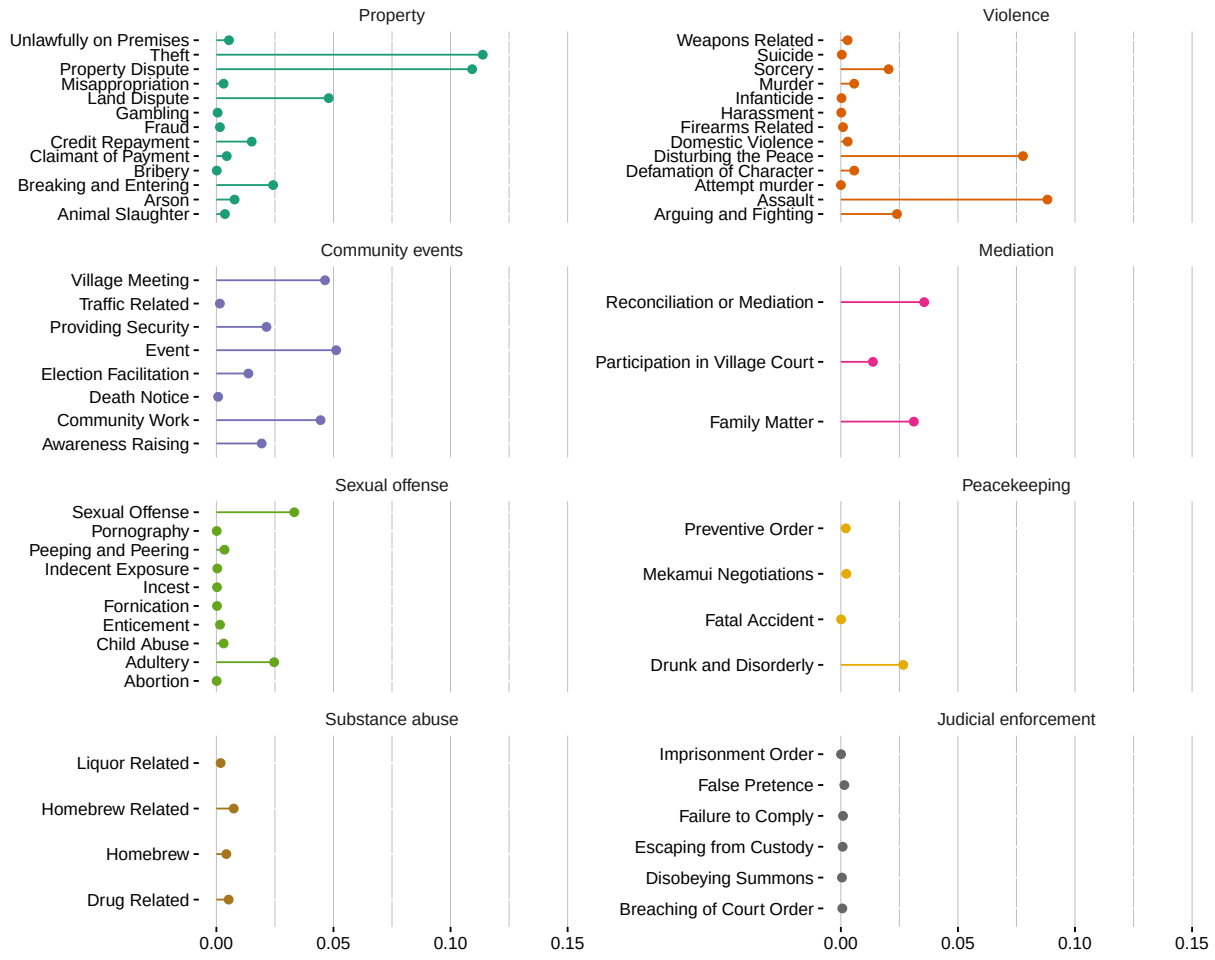

Figure 11: The Community Auxiliary Police are involved in all aspects of village life, but spend most of their time dealing with disputes over property and personal matters.
Panels show frequency distribution of incidents dealt with by the Community Auxiliary Police as reported in mandatory monthly incident reports from 2005 - 2009. Panes are organized in order of the importance of each major category. x-axis plots the proportion of all incidents represented by the type of incident indicated on the y-axis.

A.7 International Victimization Data

	country	global_region	years
1	Austria	west europe	1996 (N = 1507)
2	Belgium	west europe	1989 (N = 2060), 1992 (N = 1485), 2000 (N = 2501)
3	Catalonia	west europe	2000 (N = 2909)
4	Denmark	west europe	2000 (N = 3007)
5	England & Wales	west europe	1989 (N = 2006), 1992 (N = 2001), 1996 (N = 2171), 2000 (N = 1947)
6	Finland	west europe	1989 (N = 1025), 1992 (N = 1655), 1996 (N = 3830), 2000 (N = 1782)
7	France	west europe	1989 (N = 1502), 1996 (N = 1003), 2000 (N = 1000)
8	Germany(west)	west europe	1989 (N = 5274)
9	Italy	west europe	1992 (N = 2024)
10	Malta	west europe	1997 (N = 1000)
11	Netherlands	west europe	1989 (N = 2000), 1992 (N = 2000), 1996 (N = 2008), 2000 (N = 2000)
12	Northern Irel	west europe	1989 (N = 2000), 1996 (N = 1042), 2000 (N = 1511)
13	Norway	west europe	1989 (N = 1009)
14	Portugal	west europe	2000 (N = 2000)
15	Scotland	west europe	1989 (N = 2007), 1996 (N = 2194), 2000 (N = 2055)
16	Spain	west europe	1989 (N = 2041), 1993 (N = 1634), 1994 (N = 1505)
17	Sweden	west europe	1992 (N = 1707), 1996 (N = 1000), 2000 (N = 2001)
18	Switzerland	west europe	1989 (N = 1000), 1996 (N = 1000), 2000 (N = 4234)
19	Australia	new world	1989 (N = 2012), 1992 (N = 2006), 2000 (N = 2005)
20	Canada	new world	1989 (N = 2074), 1992 (N = 2152), 1996 (N = 2134), 2000 (N = 2078)
21	Japan	new world	1989 (N = 2411)
22	New Zealand	new world	1992 (N = 2048)
23	USA	new world	1989 (N = 1996), 1992 (N = 1501), 1996 (N = 1003), 2000 (N = 1000)
24	Albania	east / central europe	1996 (N = 1200), 2000 (N = 1498)
25	Belarus	east / central europe	1997 (N = 999), 2000 (N = 1520)
26	Bulgaria	east / central europe	1997 (N = 1076), 2000 (N = 1505)
27	Czech republic	east / central europe	1992 (N = 1262), 1996 (N = 1801), 2000 (N = 1500)
28	Croatia	east / central europe	1997 (N = 994), 2000 (N = 1532)
29	Estonia	east / central europe	1992 (N = 1000), 1995 (N = 1173), 2000 (N = 1700)
30	Georgia	east / central europe	1992 (N = 1395), 1996 (N = 1137), 2000 (N = 1000)
31	Hungary	east / central europe	1996 (N = 756), 2000 (N = 1513)
32	Kyrgyzstan	east / central europe	1996 (N = 1750)
33	Latvia	east / central europe	1996 (N = 1411), 2000 (N = 1201)
34	Lithuania	east / central europe	1997 (N = 1176), 2000 (N = 1526)
35	Macedonia	east / central europe	1996 (N = 700)
36	Mongolia	east / central europe	1996 (N = 1200)
37	Poland	east / central europe	1992 (N = 2033), 1996 (N = 3483), 2000 (N = 6337)
38	Rumania	east / central europe	1996 (N = 1091), 2000 (N = 1506)
39	Russia	east / central europe	1992 (N = 1002), 1996 (N = 1018), 2000 (N = 1500)
40	Slovakia	east / central europe	1992 (N = 508), 1997 (N = 1105)
41	Slovenia	east / central europe	1992 (N = 1000), 1997 (N = 2053), 2001 (N = 3886)
42	Ukraine	east / central europe	1997 (N = 1000), 2000 (N = 1509)
43	Yugoslavia	east / central europe	1996 (N = 1094)
44	Azerbaijan	asia	2000 (N = 930)
45	Cambodia	asia	2001 (N = 3155)
46	China	asia	1992 (N = 2000)
47	India	asia	1992 (N = 1040), 1996 (N = 1200)
48	Indonesia	asia	1989 (N = 600), 1992 (N = 3239), 1996 (N = 1400)
49	Japan	asia	2000 (N = 2211)
50	Mongolia	asia	2000 (N = 944)
51	Philippines	asia	1992 (N = 1503), 1996 (N = 1500), 2000 (N = 1500)
52	Republic of Korea	asia	2000 (N = 2043)
53	Botswana	africa	1997 (N = 644), 2000 (N = 1197)
54	Egypt	africa	1992 (N = 1000)
55	Lesotho	africa	2000 (N = 1010)
56	Mozambique	africa	2002 (N = 993)
57	Namibia	africa	2000 (N = 1061)
58	Nigeria	africa	1998 (N = 1012)
59	South Africa	africa	1993 (N = 988), 1996 (N = 1006), 2000 (N = 1336)
60	Swaziland	africa	2000 (N = 1006)
61	Tanzania	africa	1992 (N = 1002)
62	Tunisia	africa	1992 (N = 1086)
63	Uganda	africa	1992 (N = 1023), 1996 (N = 1197), 2000 (N = 998)
64	Zambia	africa	2000 (N = 1047)
65	Zimbabwe	africa	1996 (N = 1006)
66	Argentina	latin america	1992 (N = 1000), 1996 (N = 1000), 2001 (N = 8931)
67	Bolivia	latin america	1996 (N = 999)
68	Brazil	latin america	1992 (N = 1017), 1996 (N = 1000)
69	Colombia	latin america	1997 (N = 1000), 2000 (N = 1016)
70	Costa Rica	latin america	1992 (N = 983), 1996 (N = 1000)
71	Panama	latin america	2000 (N = 902)
72	Paraguay	latin america	1996 (N = 587)

Table 8: Years and countries included in International Crime Victimization Survey data.

B Identification and Robustness

- Subsection B.1 reports the balance across all available covariates.
- Subsection B.2 reports a Monte Carlo power analysis and diagnosis of the experimental design's inferential features (unbiasedness, coverage, and so on).
- Subsection B.3 describes the properties of the strategy used to estimate reporting estimands.
- Subsection B.4 describes the procedure employed to construct confidence intervals through inverted hypothesis tests.
- Subsection B.5 provides a graphical representation of the variation in where and when women police officers were present in villages in the observational data.

B.1 Balance on Covariates

Covariate	p-value	Control	Treatment
education	0.00	12.30	11.70
student	0.02	0.00	0.10
cap_is_was	0.04	0.00	0.00
conditions	0.08	0.70	0.60
cap_fam_is_was	0.13	0.20	0.30
had_cap	0.25	0.30	0.20
education_yes_no	0.25	1.00	1.00
television	0.26	0.10	0.10
spouse_present	0.27	0.00	0.00
n_vegetables_crops	0.30	8.30	8.60
n_appliances	0.40	0.80	0.70
woman	0.43	0.50	0.50
n_large_assets	0.43	1.30	1.30
years_had_cap	0.46	1.40	1.00
chief_clan	0.46	0.00	0.00
n_cash_crops	0.46	0.90	0.90
chief_ext_fam	0.47	0.40	0.40
n_assets	0.51	5.90	5.80
age	0.52	36.80	36.10
bps_is_was	0.53	0.00	0.00
cellphone	0.62	0.70	0.70
household_size_log1p	0.63	1.70	1.70
chief_close_fam	0.66	0.40	0.40
chief_wantok	0.74	0.10	0.10
others_present	0.74	0.20	0.20
bps_fam_is_was	0.75	0.20	0.30
chief_dk	0.84	0.00	0.00
pig	0.87	0.40	0.40

Table 9: Balance on covariates among household respondents. Differences estimated using inverse probability weighted least squares regression with block fixed effects. All p-values two-tailed, calculated by permuting the treatment assignment 2000 times and re-estimating effects under the sharp null of no effects for all units. Control and treatment columns report inverse probability weighted means of covariates, ignoring blocks.

B.2 Power Analysis and Design Diagnosis

I conduct here a simulated power analysis that treats some information about the study as known and other information as unknown. In particular, I treat as known the number of blocks and clusters, as well as the average size of clusters. I treat as unknown the true underlying intra-cluster correlation: I consider ICC varying from .01 to .10, which is consistent with the range of ICCs estimated in the data. I also treat the true underlying ATE as unknown, and consider power at effect sizes ranging from .05 to one-quarter of a standard deviation. To address the concern that the estimator could be biased due to the heterogeneous assignment probabilities, the data-generating process stipulates correlation between outcomes and block membership. I use the `DeclareDesign` software and procedure described with co-authors in Blair et al. (2018) to diagnose the design. Results for the power analysis are plotted on Figure 12.

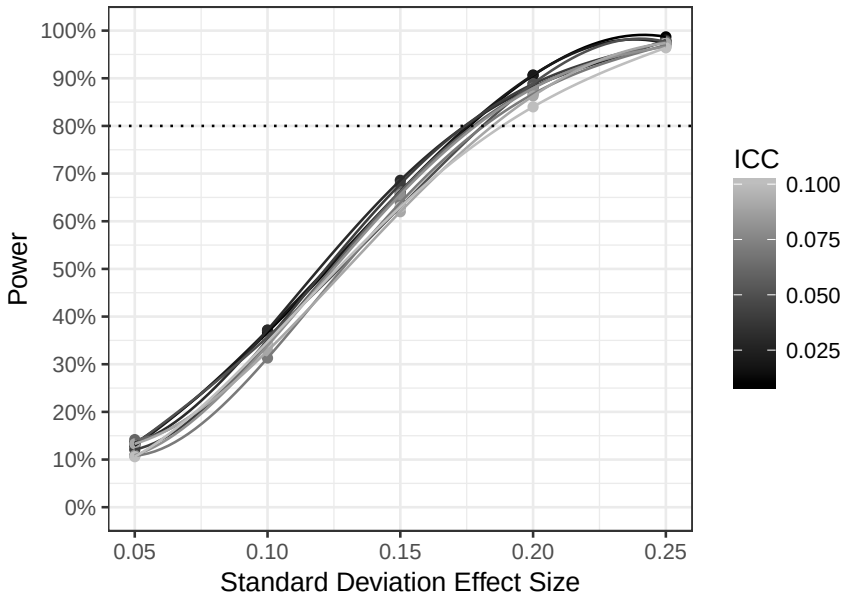

Figure 12: The study is powered at 80% to detect an effect equal to one-fifth of a standard deviation in the outcome. This translates roughly to a 7 - 10 percentage point effect for binary outcomes. Power displayed on y-axis and true percentage point effect on a binary outcome displayed on x-axis. Assumes a one-tailed test with confidence level of 90%, 20 clusters per arm, and an N of 1,400.

The ex-post power analysis reveals that the design is powered at 80% to detect at least a 1/5th standard deviation effect, at all considered levels of ICC. In terms of binomial outcomes, the study is powered to detect a roughly 7-10 percentage point effect.

Setting the ICC to .01 and the effect size to .2 standard deviations, we can examine other properties of the estimator, displayed on Table 10.

Bias	RMSE	Power	Coverage	Mean Estimate	SD Estimate	Mean Se	Type S Rate	Mean Estimand
-0.00	0.06	0.91	0.96	0.20	0.06	0.06	0.00	0.20
(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Table 10: Even allowing for correlation in potential outcomes and block membership, some positive ICC, and stochastic cluster sizes, the design exhibits desirable properties in terms of key diagnosands such as bias, RMSE, power, and coverage.
(See Blair et al., 2018, for more details on the notion of diagnosands)

The estimator is unbiased, even when block membership and potential outcomes are correlated. The design exhibits the correct coverage properties, with a coverage probability that the bootstrap simulation standard errors indicate is statistically indistinguishable from 95%. The high power of the study also means that the probability of statistically-significant effects being wrongly signed is 0 in this range of effect sizes (Gelman and Carlin, 2014).

B.3 Post-Treatment Estimands

I show here that the strategy used to estimate "post-treatment" reporting effects in Table 1, and Figures 5 and 8 is unbiased.

Suppose that there is a population of $N = 1000$ people assigned to treatment with probability $Pr(Z = 1) = .5$. Let individuals indexed $i \in \{1, ..., N\}$ have two sets of potential outcomes as a function of Z. First, crime: $C_i = 1$ if individual i is victimized and 0 otherwise. Thus, $C_i(Z = 1)$, for example, denotes victimization status of individuals assigned to treatment. The average treatment effect on victimization can thus be denoted $E[C_i(Z = 1) - C_i(Z = 0)]$.

Second, conditional on victimization we have reporting: if $C_i = 1$ then $R_i = 1$ when individual i reports and 0 otherwise. We assume that the reporting status of crimes that do not occur is undefined. Using this notation we can define a potential outcome that is a combination of both C_i and R_i.

$$M_i = \begin{cases} 1 \text{ if } C_i = 0, \\ 2 \text{ if } C_i = 1 \text{ and } R_i = 0, \\ 3 \text{ if } C_i = 1 \text{ and } R_i = 1. \end{cases}$$

Denoting an indicator for $M_i = 2$, for example, by $Y_i^2 \in \{0, 1\}$, we can then define as our estimand the average effect of the treatment on the probability that a respondent experiences crime and does not report it:

$$E[Y_i^2(Z = 1) - Y_i^2(Z = 0)] \tag{2}$$

Similarly, we could define Y_i^1 as an indicator for $M_i = 1$ so that $E[Y_i^1(Z = 1) - Y_i^1(Z = 0)]$ would describe the average effect of the treatment on the probability that a respondent experienced no crime, or Y_i^3 as an indicator for $M_i = 3$ so that $E[Y_i^3(Z = 1) - Y_i^3(Z = 0)]$ corresponds to the average effect of the treatment on the probability that a respondent experienced crime and reported it. Because Y_i is observed irrespective of crime in all of these cases, it does not constitute a post-treatment quantity and is not subject to post-treatment bias.

Employing the simulation method described in separate work (Blair et al., 2018), I show here that a multinomial estimator can estimate these estimands in an unbiased manner, even in the presence of an effect on crime and correlation between reporting and effects on crime.

In the simulation exercise I define potential outcomes and estimands as above. I suppose that there are two types in the population: those who are high reporters ($H_i = 1$) are more likely to report crime when victimized and those who are not high reporters ($H_i = 0$) are less likely to report crime when victimized. I assume $Pr(H_i = 1) = .5$, without loss of generality.

Whether or not subject i is victimized is determined by a probit process of the form

$$\begin{aligned} \eta_{i|Z=0} &\sim N(1, 1), \\ \eta_{i|Z=1} &\sim N(1 + H\tau_H + \tau_C, 1), \\ C_i &\sim \text{Binom}(\Phi(Z\eta_{i|Z=1} + (1 - Z)\eta_{i|Z=0})), \end{aligned}$$

where the treatment effect effect is a combination of τ_C, which affects all subjects, and τ_H, which is an extra effect only received by high reporters. For example, if $\tau_C < 0$ and $\tau_H < 0$, the treatment

would reduce crime overall and especially strongly for high reporters.

Reporting outcomes are defined by the following data-generating process:

$$\begin{aligned}
\zeta_{i|Z=0} &\sim N(0 + H, 1), \\
\zeta_{i|Z=1} &\sim N(0 + H + \tau_R, 1), \\
R_i &\sim \begin{cases} \text{Binom}(\Phi(Z\zeta_{i|Z=1} + (1 - Z)\zeta_{i|Z=0})) & \text{if } C_i = 1, \\ \text{Undefined} & \text{if } C_i = 0. \end{cases}
\end{aligned}$$

Thus, whether someone is a high reporter is correlated both with overall reporting levels and with the treatment effect on crime, which determines whether there is anything to report at all. In other words, the data-generating process is highly susceptible to post-treatment bias under naive estimation strategies.

I estimate the estimand in equation 2 by fitting a multinomial likelihood to M_i as a function of Z_i, and using the model to calculate the difference in predicted probabilities for the whole sample: $E[Pr(\widehat{Y^2 = 1 \mid Z = 1})] - E[Pr(\widehat{Y^2 = 1 \mid Z = 0})]$.

For the simulation study, I consider all possible combinations of negative, zero and positive effects for τ_H, τ_C and τ_R. For each combination of parameters, I simulate the data-generating process and random assignment 1000 times, and calculate both the true underlying estimand as well as the bias in the estimates. The results of the simulation study are plotted on Figure 13.

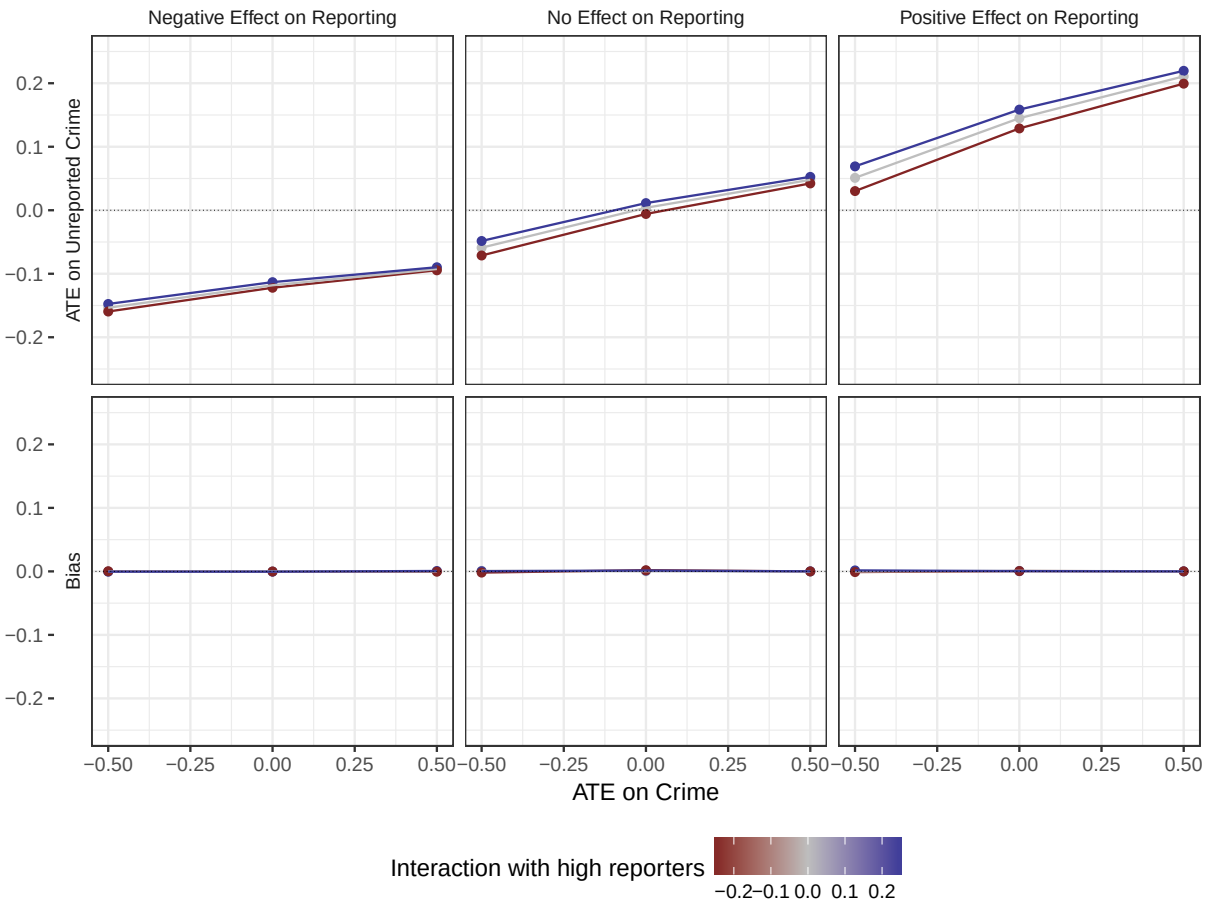

Figure 13: The multinomial estimator is able to estimate the estimand described in equation 2 without bias, even in the presence of treatment effects on crime that are correlated with reporting probabilities. However, the estimand cannot be interpreted as purely about reporting: it is a mix of effects on the crime rate and on reporting. In this study, the weak evidence for effects on crime lends weight to the interpretation of effects as primarily related to reporting dynamics. The x-axis reports the postulated effect on the probability of crime (in terms of latent probits). The y-axis on the top row corresponds to the true ATE on the probability that a respondent experiences crime and does not report it (equation 2). The y-axis on the bottom row plots bias in the estimates with respect to this estimand. The first column of plots corresponds to a world in which there is a negative treatment effect on conditional reporting behavior, the middle column to a world in which there is no effect, and the last column to a positive effect on reporting. The lines are colored to represent negative, neutral or positive effects on crime among high reporters.

The x-axis reports the postulated effect on the probability of crime (in terms of latent probits). The y-axis on the top row corresponds to the true ATE on the probability that a respondent experiences crime and does not report it (equation 2). The y-axis on the bottom row plots bias in the estimates with respect to this estimand. The first column of plots corresponds to a world in which there is a negative treatment effect on conditional reporting behavior, the middle column to a world in which there is no effect, and the last column to a positive effect on reporting. Finally, the lines are colored to represent negative, neutral or positive effects on crime among high reporters.

Focusing firstly on the bottom row, no combination of effects produces bias in the estimator. However, we see that the estimand does change as a function of all of these features: the value of the

estimand depends both on crime and reporting probabilities. In particular, as the middle column reveals, the probability of experiencing and not reporting crime can decline (increase) even when there is no effect on reporting, due to a negative (positive) effect on crime. In general, however, the interpretation of the estimand as is consistent with effects on reporting – especially in those cases when there is no effect on the crime rate.

In this study, we cannot rule out effects on the crime rate conclusively. However, this is an issue for interpretation: the estimator that is used can obtain an unbiased estimate of the quantities it targets. The fact that we can rule out even quite small effects on crime with a large degree of certainty (see plot 7, for example) aids strongly with the interpretation that effects we observe are largely due to underlying changes in reporting behavior.

B.4 Inverted-Hypothesis Testing Procedure

In light of the null results on crime, I test a range of hypotheses to see what sorts constant effects are highly implausible, given the data.

Denote the treated and control potential outcomes of subject i $Y_{i|Z=1}$ and $Y_{i|Z=0}$, respectively. As implied by equation **??**, these outcomes are thought to be a function not just of the treatment, but also of block fixed effects and other covariates. We can thus denote the residualized potential outcomes

$$\begin{array}{lllll} \tilde{Y}_{i|Z=1} & = & Y_{i|Z=1} - \hat{\gamma_k} - X_i\hat{\boldsymbol{\beta}} & = & \tau Z_j + \epsilon_i \\ \tilde{Y}_{i|Z=0} & = & Y_{i|Z=1} - \hat{\gamma_k} - X_i\hat{\boldsymbol{\beta}} & = & \epsilon_i \end{array}$$

Similarly, denote the residualized *observed* outcome for subject i by $\tilde{Y}_i$.

Now, suppose we posit a constant treatment effect, τ_h. If the data was indeed truly generated by $\tau_h = \tau$, the following equality will hold:

$$\tilde{Y}_i - \tau_h Z_j = \tilde{Y}_{i|Z=0} = \epsilon_i.$$

In other words, τ_h can be used to construct a hypothetical residualized control outcome that we can denote $\tilde{Y}_{i|\tau_h} = \tilde{Y}_i - \tau_h Z_j$. Because Z_j is randomly assigned, we know that $Z_j \perp\!\!\!\perp \epsilon_i$, and therefore $Z_j \perp\!\!\!\perp \tilde{Y}_{i|Z=0}$. We can thereby construct a test for how well τ_h approximates τ by using randomization inference to evaluate the hypothesis that $\tilde{Y}_{i|\tau_h} \perp\!\!\!\perp Z_j$.

As in Bowers, Fredrickson, and Aronow (2016), I employ the sum of squared residuals (SSR) as a test statistic. Let $\hat{\tau}_h$ denote the estimated treatment effect in a regression of $\tilde{Y}_{\tau_h}$ on a given realization of the treatment vector Z and α the intercept in this regression. Then we can define the SSR test statistic as,

$$\mathcal{T}(\tilde{Y_{\tau_h}}, Z) = \sum_i (\tilde{Y_{i|\tau_h}} - \hat{\tau}_h Z_j - \alpha)^2.$$

Intuitively, the closer that τ_h approximates the true τ, the closer that $\tilde{Y_{i|\tau_h}}$ approximates $\tilde{Y_{i|Z=0}}$ and the more poorly $\hat{\tau}_h$ will do in explaining variance in $\tilde{Y_{i|\tau_h}}$ because this outcome will be independent of Z_j. $\mathcal{T}$ is thus monotonically increasing (decreasing) as the observed data becomes more (less) plausible given the hypothesized effect.

Since the pre-analysis plan specified a negative relationship between the crime rate and the treatment, I restrict the domain of constant effects hypotheses to be negative. Specifically, I consider hypotheses in the domain from -.5 to 0, in increments of .01: $\tau_h \in \{\tau_1 = -.5, ..., \tau_{50} = 0\}$.

Prior to testing, I residualize and standardize the outcomes by first taking the residuals from a regression of the post-treatment crime outcome on block indicators, "pre-treatment" crime and all

available covariates, and then mean-centering the resulting residuals and dividing by their standard deviation. The hypotheses can thus be understood as standard deviation effects, ranging from negative one-half to zero standard deviations.

For each hypothesis I conduct the following steps:

1. Construct $\tilde{Y}_{\tau_h}$ under hypothesized constant effect τ_h by subtracting $Z\tau_h$ from the observed residualized and standardized outcome, $\tilde{Y}$.

2. Record the sum of squared residuals under the observed assignment, $\mathcal{T}(\tilde{Y}_{\tau_h}, Z)$.

3. Permute the treatment assignment vector while respecting the original blocking and clustering schema, in order to obtain a new assignment vector, Z'. Repeat this process 1000 times and group the resultant vectors into an $N \times 1000$ matrix of permuted assignments, $\mathbf{Z}'$.

4. Record the test statistic for every Z' in $\mathbf{Z}'$, $\mathcal{T}(\tilde{Y}_{\tau_h}, Z')$. The 1000 test statistics correspond to the distribution of the SSR test statistic under the null hypothesis of $Z \perp\!\!\!\perp \tilde{Y}_{\tau_h}$. As discussed above, this hypothesis is true when $\tau = \tau_h$.

5. Calculate the p-value as the probability of observing an SSR so large if indeed the hypothesized constant effect had produced the data: $E[\mathcal{T}(\tilde{Y}_{\tau_h}, Z) \geq \mathcal{T}(\tilde{Y}_{\tau_h}, Z')]$.

B.5 Temporal Variation in Female Officer Presence

The left panel of Figure 14 illustrates the length of time for which the villages were covered in the data, by either a man or woman police officer. Green dots indicate the start and red the end of the woman police officer's tenure in the village, with dotted lines indicating presence of a male police officer and solid lines the presence of at least one woman police officer. The panel on the right shows the cumulative total of villages with and without a woman police officer at a given point in time.

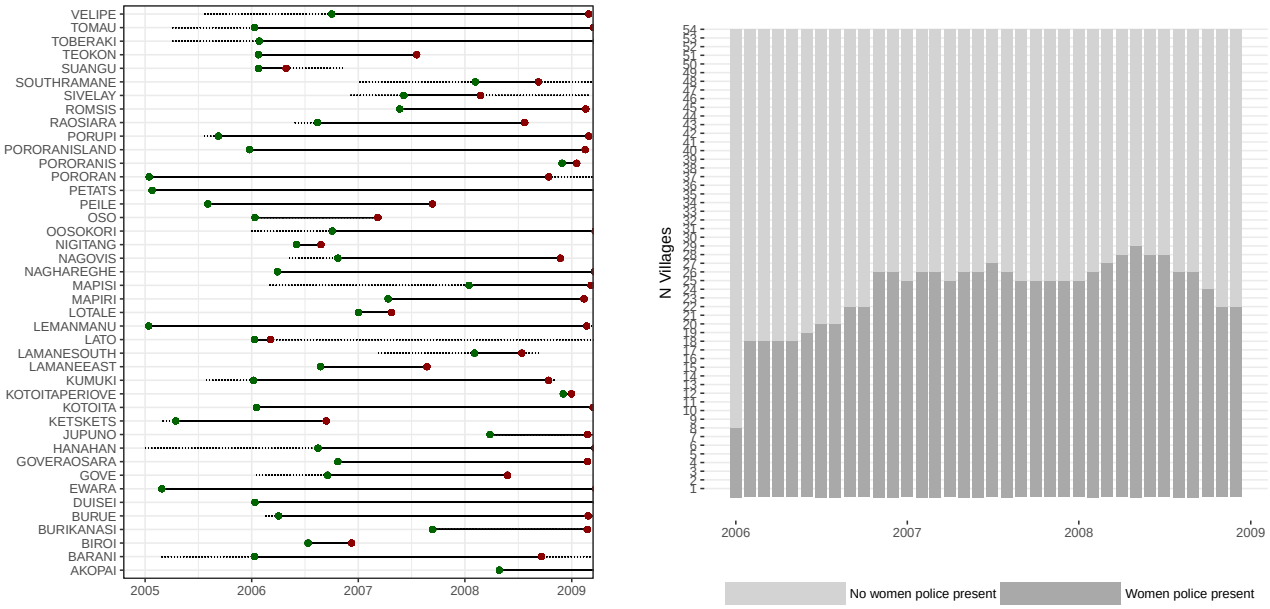

Figure 14: There is substantial temporal variation in the presence of women police officers among villages where women police worked at least once.

Left panel: Plots the presence of men and women police officers in the sixty-one villages in Bougainville in which a woman worked as a police officer at some point from 2005-2009. The y-axis indicates the village, the x-axis indicates the date. Lines indicate presence of a police officer: dotted when there is no woman officer present and solid when there is a woman police officer working. Points indicate the start and end of women police officer presence in the village.

Right panel: Plots the monthly total number of villages in which a woman police officer was present, among villages where a woman worked at least once from 2005-2009. The y-axis indicates the number of villages, the x-axis indicates the date. Bars are colored light gray to indicate the number of villages in a given month in which no woman police officer was present, and dark gray to indicate the number of villages in a given month where a woman police officer was present.

Source: Bougainville Police Service.

C Supplementary Analyses

- Subsection C.1 provides the regression tables underlying the plots in the main results section.
- Subsection C.2 provides an explanation for the difference in treatment effects on "victimization" versus "prevalence" measures of violence and property crime.
- Subsection C.3 reports an attempt to estimate the long-run effect of police officer presence on the number of incidents of violence against women.
- Subsection C.4 reports treatment effects on broader attitudes toward the state.
- Subsection C.5 reports treatment effects on support for mob violence versus police intervention.

C.1 Regression Tables for Figures in Main Results

	Dependent variable:							
	Proc. Just. Index (P)		Treat Same (P)		Treat Polite (P)		Listen (P)	
	M	W	M	W	M	W	M	W
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Comm. Police	−0.033	0.070**	−0.049	0.073*	−0.037	0.033	−0.010	0.058**
	(0.023)	(0.035)	(0.031)	(0.047)	(0.031)	(0.033)	(0.034)	(0.027)
Block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Contr. mean	0.6	0.7	0.47	0.63	0.63	0.77	0.69	0.8
[Min, Max]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
ICC	0.06	0.1	0.03	0.09	0.02	0.05	0.01	0.04
Hypothesis	upr	upr	upr	upr	upr	upr	upr	upr
M-W p-value		0.02		0.1		0.2		0.22
CACE	-0.05	0.1	-0.07	0.1	-0.05	0.05	-0.01	0.08
Observations	668	715	668	715	668	715	668	715
Note:								*p<0.1; **p<0.05; ***p<0.01

	Dependent variable:							
	Seem Concerned (P)		Take Serious (P)		Seem Competent (P)		Explain Process (P)	
	M	W	M	W	M	W	M	W
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Comm. Police	−0.047	0.076*	−0.036	0.104**	−0.009	0.062*	−0.040	0.086*
	(0.036)	(0.041)	(0.043)	(0.043)	(0.028)	(0.032)	(0.032)	(0.049)
Block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Contr. mean	0.59	0.69	0.63	0.64	0.5	0.71	0.66	0.65
[Min, Max]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
ICC	0.03	0.07	0.04	0.09	0	0.07	0.08	0.08
Hypothesis	upr	upr	upr	upr	upr	upr	upr	upr
M-W p-value		0.06		0.01		0.14		0.02
CACE	-0.06	0.11	-0.05	0.15	-0.01	0.09	-0.06	0.12
Observations	668	715	668	715	668	715	668	715
Note:								*p<0.1; **p<0.05; ***p<0.01

Table 11: Regression results underlying Figure 2.

All results estimated at household-level. Columns labeled M report results among male respondents, those labeled W among female respondents. Label P indicates that outcome concerns police. Index created by summing other procedural justice items. Point estimates are calculated using inverse-probability weighted least squares regression, with fixed effects for blocks and probability of being in assigned condition as (inverse) weight. All standard errors clustered at the village level. The analysis conditions on all available covariates (see Table 9). All p-values calculated using randomization inference with the hypothesis test as pre-registered in the pre-analysis plan.

	Dependent variable:							
	Proc. Just. Index (P)		Treat Same (P)		Treat Polite (P)		Listen (P)	
	M	W	M	W	M	W	M	W
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Comm. Police	−0.037	0.177*	−0.129**	0.161	0.042	0.092	0.0002	0.173***
	(0.031)	(0.096)	(0.061)	(0.125)	(0.060)	(0.069)	(0.039)	(0.064)
Block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Contr. mean	0.6	0.66	0.49	0.61	0.64	0.75	0.68	0.76
[Min, Max]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
ICC	0.11	0.15	0.07	0.13	0.07	0.06	0.01	0.04
Hypothesis	upr	upr	upr	upr	upr	upr	upr	upr
M-W p-value		0.12		0.16		0.62		0.34
CACE	-0.06	0.32	-0.23	0.29	0.07	0.16	0	0.31
Observations	328	339	328	339	328	339	328	339
Note:								*p<0.1; **p<0.05; ***p<0.01

	Dependent variable:							
	Seem Concerned (P)		Take Serious (P)		Seem Competent (P)		Explain Process (P)	
	M	W	M	W	M	W	M	W
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Comm. Police	−0.017	0.166	−0.005	0.213*	−0.082**	0.152**	−0.065*	0.279**
	(0.071)	(0.112)	(0.051)	(0.120)	(0.036)	(0.075)	(0.034)	(0.131)
Block FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Contr. mean	0.57	0.66	0.62	0.58	0.54	0.68	0.67	0.59
[Min, Max]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
ICC	0.05	0.12	0.07	0.14	0	0.1	0.12	0.12
Hypothesis	upr	upr	upr	upr	upr	upr	upr	upr
M-W p-value		0.36		0.2		0.15		0.15
CACE	-0.03	0.3	-0.01	0.38	-0.15	0.27	-0.12	0.5
Observations	328	339	328	339	328	339	328	339
Note:								*p<0.1; **p<0.05; ***p<0.01

Table 12: Regression results underlying Figure 8.
All results estimated at household-level, among villages that could have had a woman police officer hired in them. Columns labeled M report results among male respondents, those labeled W among female respondents. Label P indicates that outcome concerns police. Index created by summing other procedural justice items. Point estimates are calculated using inverse-probability weighted least squares regression, with fixed effects for blocks and probability of being in assigned condition (having woman police officer hired) as (inverse) weight. All standard errors clustered at the village level. The analysis conditions on all available covariates (see Table 9). All p-values calculated using randomization inference with the hypothesis test as pre-registered in the pre-analysis plan.

	Dependent variable:			
	Chief vs. Police		Lynching vs. Police	
	M	W	M	W
	(1)	(2)	(3)	(4)
Comm. Police	0.065***	0.012	−0.039*	−0.038**
	(0.024)	(0.029)	(0.022)	(0.019)
Block FE	Yes	Yes	Yes	Yes
Contr. mean	0.59	0.59	0.22	0.18
[Min, Max]	[0,1]	[0,1]	[0,1]	[0,1]
ICC	0.01	0.02	-0.01	0.05
Hypothesis	two	two	lwr	lwr
M-W p-value		0.27		0.98
CACE	0.09	0.02	-0.05	-0.05
Observations	668	715	668	715
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 13: Regression results underlying Figure 4 in main text and Figure 15 in appendix.
Columns labeled M report results among male respondents, those labeled W among female respondents. Point estimates are calculated using inverse-probability weighted least squares regression, conditioning on block indicators and available covariates (see Table 9). Probability of being in assigned condition is (inverse) weight. All standard errors clustered at the village level. All p-values calculated using randomization inference. A detailed description of the summary statistics can be found under section A.2.

	Relative to no reports of VAW in village-month, log-odds of some cases reported and...		
	...resolved by Chief only	...resolved by Police only	...resolved by Chief and Police
	(1)	(2)	(3)
Woman police presence	0.867**	0.922***	0.666*
RI P-value	0.044	0.008	0.08
Year-Month FE	Yes	Yes	Yes
N Village-Months	1322	1322	1322
N Villages	61	61	61
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 14: Regression results underlying Figure 5.
Multinomial regression of the reporting outcome on indicator for presence of a woman police officer in that village-month, an imputation fixed effect, as well as month fixed effects. Randomization p-values calculated by randomly simulating start and end dates for women police officers.

	Relative to no reports of VAW in village-month, log-odds of some cases reported and...		
	...resolved by Chief only	...resolved by Police only	...resolved by Chief and Police
	(1)	(2)	(3)
Woman police presence	0.814***	0.934***	0.822***
Patrilocal	0.646	0.315	−1.151
Woman police x Patrilocal	−1.290***	−0.137	−10.767**
RI p-val - WPP	0.000	0.000	0.000
RI p-val - Patr.	0.278	0.562	0.506
RI p-val - WPP x Patr.	0.004	0.718	0.024
Year-Month FE	No	No	No
N Village-Months	9197	9197	9197
N Villages	275	275	275
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 15: Regression results underlying Figure 8.
Multinomial regression of the reporting outcome on indicator for presence of a woman police officer in that village-month, an imputation fixed effect, as well as month fixed effects. Randomization p-values calculated by randomly simulating start and end dates for women police officers.

	Relative to no reports of VAW in village-month, log-odds of some cases reported and...		
	...resolved by Chief only	...resolved by Police only	...resolved by Chief and Police
	(1)	(2)	(3)
Woman police presence	1.462***	0.356	0.970*
RI P-value	0.008	0.336	0.064
Year-Month FE	Yes	Yes	Yes
Village FE	Yes	Yes	Yes
N Village-Months	1322	1322	1322
N Villages	61	61	61
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 16: Replicating Table 14 using a generalized difference-in-difference estimator.
Multinomial regression of the reporting outcome on indicator for presence of a woman police officer in that village-month, an imputation fixed effect, as well as month and period fixed effects. Randomization p-values calculated by randomly simulating start and end dates for women police officers.

C.2 Explaining Effects on Public Order

The results presented on Table 3 illustrate the community police are estimated to reduce the respondent's perception that alcohol use has been a serious problem in the village over the past 6 months by 8-11% (ITT = -.13, CACE = -.18, $p < .1$). This effect is relative to the baseline of about 1.6 on a scale coded 0 ("Alcohol not a problem"), 1 ("Alcohol is a problem, but not so serious") and 2 ("Alcohol is a very serious problem"). Note further that the intra-cluster correlation is much higher for this measure than for others, indicating a relatively strong consensus among respondents about the extent to which alcohol is a problem.

This result is consequential in the Bougainvillean context, where alcohol abuse is seen as a re-

sponse to trauma induced by the experience of civil war hostilities, and has been linked to perpetration of intra-household violence (Jewkes, Jama-Shai, and Sikweyiya, 2017) and property destruction. Alcohol is frequently pointed to as a causative or aggravating factor in police case records detailing assault and theft in Bougainville. According to estimates provided by the police, one CAP operation in early 2016 involved destroying approximately eighty-five of the LPG canisters used to make homebrew in the communities where they work. The destruction of so many canisters represents a substantial blow to the informal homebrewing sector.

These points lend support to the idea that the estimated reductions in VAW and theft prevalence represent a successful effort at de-escalating or even preventing certain kinds of community disorder through preventative policing. In qualitative interviews, chiefs often mentioned the CAPs' efforts to rid communities of the means to produce homebrew by seizing used LPG canisters as one of the concrete ways in which the CAP had improved order. Dismantling homebrew operations is a delicate task, and it is difficult to see how it could be achieved by either the regular police or by chiefs. As CAP explained in focus groups in 2015, homebrew is often a livelihood model for elderly people who can no longer farm. Putting a stop to these operations and finding alternative, less punitive solutions for "offenders" requires a combination of independent authority and deep connection to the community that outside police officers or risk averse chiefs often lack.

C.3 Long-Run Analysis

	Dependent variable:
	N VAW Incidents Reported in Month
Police Presence: 6-12 months	−0.051
	(0.036)
Police Presence: 12-18 months	−0.086
	(0.056)
Police Presence: 18-24 months	−0.077
	(0.076)
Police Presence: 24-30 months	−0.121
	(0.098)
Police Presence: 30-36 months	−0.142
	(0.120)
Police Presence: 36-42 months	−0.147
	(0.139)
Police Presence: 42-48 months	−0.190
	(0.157)
Police Presence: 48-56 months	−0.418**
	(0.202)
Village FE	Yes
Period FE	Yes
N Villages	275
Observations	9,029
Adjusted R^2	0.196
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 17: Difference-in-differences between village-months that have 1-6 months versus up to five years of community police presence.
The long-run effect of community-policing presence is estimated using the full set of panel data, aggregated to the village-month level. Outcome is the number of incidents of violence against women (VAW) reported to police officers in a village in a given month. Regression specification treats village-months within the first 6 months of CAP presence as the reference category, and estimates the effect of subsequent half-years of exposure on the number of VAW incidents reported, conditional on fixed effects for the village and month in which the village-month is observed. Standard errors clustered at the village-level, and used to calculate parametric p-values.

C.4 Broader Effects

	Dependent variable:					
	Trust State		Vote Independently		Know President	
	M	W	M	W	M	W
	(1)	(2)	(3)	(4)	(5)	(6)
Comm. Police	−0.034	0.082	−0.025	−0.060	−0.026	−0.009
	(0.075)	(0.083)	(0.028)	(0.028)	(0.025)	(0.024)
Block FE	Yes	Yes	Yes	Yes	Yes	Yes
Contr. mean	3.09	3.24	0.89	0.86	0.87	0.77
[Min, Max]	[1,4]	[1,4]	[0,1]	[0,1]	[0,1]	[0,1]
ICC	0.05	0.05	0.05	0.06	0.01	0.01
Hypothesis	upr	upr	upr	upr	upr	upr
M-W p-value		0.3		0.42		0.66
CACE	-0.05	0.11	-0.03	-0.08	-0.04	-0.01
Observations	668	715	668	715	668	715
Note:						*p<0.1; **p<0.05; ***p<0.01

Table 18: There is no strong evidence that experience with community policing affects trust in government, propensity to vote with the chief, or knowledge of government.
All results estimated at household-level. Point estimates are calculated using inverse-probability weighted least squares regression, with fixed effects for blocks and probability of being in assigned condition as (inverse) weight. All standard errors clustered at the village level. The analysis conditions on all of the thirty available covariates (see Table 9). All p-values calculated using randomization inference with the hypothesis test as pre-registered in the pre-analysis plan.

C.5 Effects on Support for Mob Violence

Among both men and women the availability of the community police reduces support for lynching, a non-state institution that punishes accused wrongdoers through extrajudicial group violence.

Men and women become similarly supportive of police involvement over vigilantism as a result of the CAP presence. Figure 15 presents the effects of the community police presence on two forced pair vignettes. The first reads:

> Imagine that a man was driving too fast through a village and killed a small boy. The villagers have stopped the man and the passengers and have them surrounded. Which statement comes closest to your view?
> A: The group should beat the driver and his passengers there and then
> B: The group should contact the police and let them handle it, without beating the driver or his passengers

The second reads:

> Now I'd like you to imagine that a woman in a village has died, and her family says she was killed by another woman who is known to practice sorcery. A group has surrounded the woman, which statement comes closest to your view?
> A: The group should beat the woman there and then
> B: The group should contact the police and let them handle it, without beating the woman

Responses are coded 1 when respondents choose A, the pro-vigilantism option, and 0 when they chose B, the pro-police option. The average of the responses is taken to form an index (Cronbach's

$\alpha = .6$). As Table 13 illustrates, the support for vigilantism is moderate at baseline, with about 22% of men and 18% of women favoring vigilantism over police involvement. Support for lynching decreases in favor of police intervention as a result of the treatment (ITT = -.04, CACE = -.06, significant at $\alpha = .10$). These findings provide causally identified support to an observational finding in Ghana (Tankebe, 2009), Liberia (Blair, 2018), Uganda (Cooper and Wilke, 2018), and Haiti (Cohen and Jung, 2018), whereby police legitimacy is negatively correlated with support for lynching.

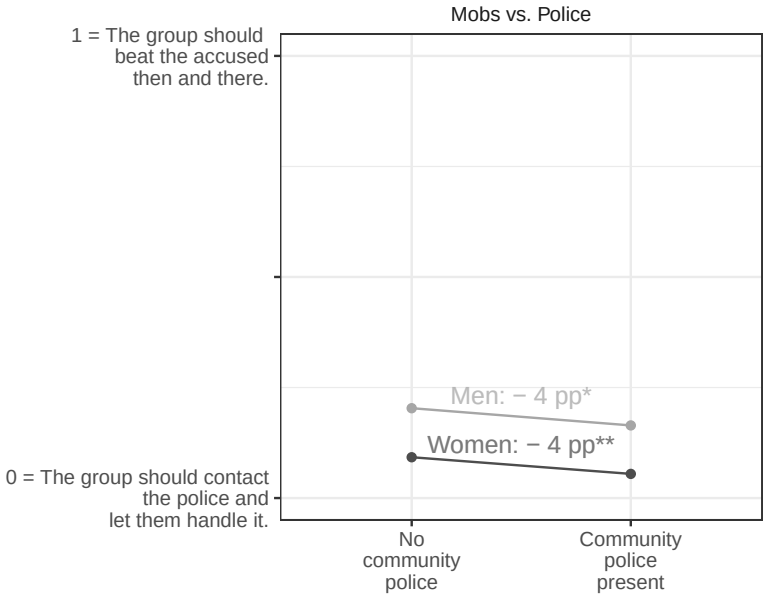

Figure 15: Community police presence reduces support for lynching relative to police intervention among both men and women.
Predictions arising from inverse-probability weighted regression of outcome on treatment and block indicators, and all available covariates. Predictions generated by holding all variables at their mean and varying treatment assignment and gender. Statistical significance is calculated using randomization inference, *p<0.1; **p<0.05; ***p<0.01. Underlying regression specification reported in Table 13.

D A Theory of Dispute Resolution

The purpose of this model is to formalize intuitions about how the expansion of formal policing institutions affects the provision of order through its effects on dispute resolution behavior. Expansion of formal institutions is conceived of as a decrease in the cost of accessing the institution.

D.1 Setup

The game contains two strategic actors, A and B. In a first stage A and B simultaneously decide to defect (D) or cooperate (K). Indexing the actors using i, this first-period crime decision is denoted $\lambda_i^1 \in \{K, D\}$. If both actors cooperate (refrain from crime), the game ends. If any actor defects, the game passes to a second stage in which A and B make a simultaneous reporting decision. They can choose to not report ($\emptyset$), to report to the chief (C) or to the police (P). This is the actors' institutional choice, denoted $\lambda_i^2 \in \{\emptyset, P, C\}$. The game ends following the institutional choice, and payoffs are realized.

The crime function $\tau_i(\lambda_A^1, \lambda_B^1)$ maps the actors' crime decisions to actor i's payoff from the first stage, and the institutional response function $\pi_i(\lambda_A^1, \lambda_B^1, \lambda_A^2, \lambda_B^2)$ maps both actors' crime and reporting decisions to their payoff following the second stage of the game. Actor i's utility can thus be denoted

$$U_i = \tau_i(\lambda_A^1, \lambda_B^1) + \pi_i(\lambda_A^1, \lambda_B^1, \lambda_A^2, \lambda_B^2).$$

The payoffs for the first stage, presented on Table 19 are structured to capture the idea of defection as property crime: when actors bilaterally cooperate the status quo is maintained – they keep their property; unilateral defection constitutes a transfer from the cooperating to the defecting actor – theft; and under mutual defection both actors suffer – through fighting one another or destroying each other's property. The value of theft is assumed to be strictly positive, $0 < s \in \mathbb{R}^+$. Information is perfect and complete, and actors share the same beliefs about the values of the parameters.

		Actor B	
		K	**D**
Actor A	**K**	$(0, 0)$	$(-s, s)$
	D	$(s, -s)$	$(-s, -s)$

Table 19: Normal form representation of simultaneous crime decision in first stage - τ_i.

In the second stage of the game, if either actor plays an institutional strategy the stolen property is transferred from any actor who defected to any actor who cooperated. If both actors defect they are further punished (receiving $-s$). The total payoff an actor receives in the second stage is conditioned by two other types of parameters.

First, the chief and the police officer are **biased** in favor of or against actor B. The bias of

	$(\lambda_A^1,\lambda_B^1)$=(**K**,**D**)			$(\lambda_A^1,\lambda_B^1)$=(**D**,**K**)			$(\lambda_A^1,\lambda_B^1)$=(**D**,**D**)		
	∅	**C**	**P**	**∅**	**C**	**P**	**∅**	**C**	**P**
∅	0 0	β_C-s-t -β_C+s	β_P-s-t-Θ -β_P+s	0 0	β_C+s-t -β_C-s	β_P+s-t-Θ -β_P-s	0 0	β_C-s-t -β_C-s	β_P-s-t-Θ -β_P-s
C	β_C-s -β_C+s-t	β_C-s-t -β_C+s-t	β_C+β_P-s-t-Θ -β_C-β_P+s-t	β_C+s -β_C-s-t	β_C+s-t -β_C-s-t	β_C+β_P+s-t-Θ -β_C-β_P-s-t	β_C-s -β_C-s-t	β_C-s-t -β_C-s-t	β_C+β_P-s-t-Θ -β_C-β_P-s-t
P	β_P-s -β_P+s-t-Θ	β_C+β_P-s-t -β_C-β_P+s-t-Θ	β_P-s-t-Θ -β_P+s-t-Θ	β_P+s -β_P-s-t-Θ	β_C+β_P+s-t -β_C-β_P-s-t-Θ	β_P+s-t-Θ -β_P-s-t-Θ	β_P-s -β_P-s-t-Θ	β_C+β_P-s-t -β_C-β_P-s-t-Θ	β_P-s-t-Θ -β_P-s-t-Θ

Table 20: Normal form representation of simultaneous institutional choice in second stage - π_i. Payoffs for A in rows and for B in columns. Note: $\Theta = \theta(1-Z)$.

the chief toward B is denoted β_C, and that of the police toward B is denoted β_P, with $\beta_j \in \mathbb{R}$. Whenever institution j has been chosen in the second stage of the game, β_j is added to the payoff of B and subtracted from that of A. Thus, when $\beta_j < 0$ bias takes the form of a transfer from B to A, and when $\beta_j > 0$ it takes the form of a transfer from A to B. Institution j is defined as neutral when $\beta_j = 0$, A-biased when β_j is negative, and B-biased when β_j is positive.

This bias can be thought of as relative to some norm $n \in \mathbb{R}^+$ that is subtracted off actor A's payoff in any instance where authorities are involved. For sufficiently high n, A never defects or reports. Thus, to home in on the relevant comparative statics and to simplify exposition, I set $n = 0$.

Second, those who report to institutions in the second stage incur costs related to reporting. Any time an actor reports to an institution they incur a **transaction cost** denoted $t \in \mathbb{R}^+$. The transaction cost is assumed to be small (see specifically equation 5 below).

The second kind of cost, denoted $\theta(1 - Z)$ is a travel cost incurred when accessing the police. The parameter Z takes the values of 0 or 1, whereas θ is assumed to satisfy the following constraint: $\theta > s + |\beta_P| + |\beta_C| + t$. In other words, θ represents a cost that is greater than the sum of all other parameters combined. Variation in Z thus represents the expansion of the state. Specifically, expansion is conceived of as a shift from $Z = 0$ to $Z = 1$ resulting in the elimination of costs that would have made the state police prohibitively expensive to access. This definition of expansion captures the idea that even for those people in very remote "stateless" areas, the option of somehow accessing services does exist: they could travel the necessary hours to the nearest place in which state services are available and demand access. The state is "absent" from such areas in the sense that the costs involved in accessing make it irrational to ever do so. Table 20 illustrates the payoffs in the second stage.

D.2 Assumptions

The purpose of the game is to derive predictions for a specific situation in which the state expands its policing institutions into an environment that was already policed by customary institutions that are biased toward some subgroup. Moreover, I assume that – relative to some socially-determined baseline – the state is comparatively partisan to the subgroup who is disadvantaged by the custom. The partisan institutions assumption is as follows:

$$\beta_P < 0 < \beta_C, \tag{3}$$

so that when β_P is subtracted off A's payoffs and added to those of B, this is a transfer from B to A, for example.

The primary comparative static of interest concerns the move from $Z = 0$ to $Z = 1$, i.e., state expansion. I thus hold constant at some positive values the property (s), the bias of the chief (β_C) and police (β_P), and the transaction cost involved in reporting (t).

A second core assumption concerns the relationship between these parameters. It stipulates that bias cannot be so great as to incentivize an actor to defect and report their own defection so as to obtain the biased transfer. Although in principle one can imagine a logic whereby social actors would instrumentalize theft in order to "buy an audience" with a more powerful co-partisan, in practice there is very little evidence such behavior occurs. The specific form this "no audience-buying" constraint takes is as follows:

$$\beta_C - \beta_P - t < s. \tag{4}$$

Finally, I assume that the transaction costs involved in reporting are relatively small. Anecdotally, men typically see it as worthwhile to go and grab the chief if they are being called upon by the

police. This implies that it is worth calling in one's co-partisans: the marginal benefit from having one's co-partisan involved in dispute resolution should outweigh the marginal cost of going to hail them, given that there are no major transport costs involved. Formally, this implies the following "co-partisan value" constraint:

$$t < \min_j |\beta_j|. \tag{5}$$

To derive comparative statics with respect to Z, I first solve for outcomes via backwards induction when the state is absent, $Z = 0$. I then repeat the process when the state is present, $Z = 1$, and present the comparative statics as a corollary to those equilibrium outcomes.

D.3 Equilibrium Outcomes when Cost of Accessing Police is Prohibitively High

When the cost involved in reaching the state police is high, $Z = 0$, any strategy involving P in the institutional choice subgame depicted on Table 20 is strictly dominated. To see this, note that in the normal form representations of the subgames on Table 20, θ is subtracted from every row in which A chooses P and from every column in which B chooses P. θ is defined such that it is strictly larger than the sum of all other parameters. Therefore, playing P yields strictly lower payoffs than any alternative choice when $Z = 0$. Attention can thus be restricted to the four upper left quadrants of the normal form representation.

Second Stage Behavior when State Police are Inaccessible

Starting in the second stage of the game, I consider first the subgame that arises when B has defected against A, who has cooperated: $\lambda_A^1, \lambda_B^1 = K, D$ (see left panel of Table 20).

Lemma 1. *When the cost of accessing state police is prohibitively high ($Z = 0$) and customary authorities are B-biased ($0 < \beta_C$), in the subgame that arises when A cooperates and B defects ($(\lambda_A^1, \lambda_B^1) = (K, D)$) the equilibrium outcome depends on net cost of reporting relative to the bias of the chief. If bias is high relative to the net benefits of reporting such that $s - t < \beta_C$, there is a unique equilibrium in which not reporting is a strictly dominant strategy for both actors, $(\lambda_A^2, \lambda_B^2) = (\emptyset, \emptyset)$. If bias in the customary sector is not too high relative to the net benefit of reporting such that $\beta_C < s - t$, there is a unique equilibrium in which A reports to the chief and B does not report, $(\lambda_A^2, \lambda_B^2) = (C, \emptyset)$.*

Proof. Suppose that $s - t < \beta_C$. If B plays $\emptyset$ A's best response is to play $\emptyset$ since $s - \beta_C - t < 0$. If B plays C, A's best response is to play $\emptyset$ because $0 < t$. Given $\emptyset$ is a strictly dominant strategy for A in this subgame, B plays $\emptyset$ if $\beta_C - s - t < 0$. Note that under partisan bias, $\beta_P < 0$, implying $\beta_C - s - t < \beta_C - \beta_P - s - t$. Thus, by equation 4 $\beta_C - s - t < \beta_C - \beta_P - s - t < 0 \Rightarrow \beta_C - s - t < 0$.

Suppose that $\beta_C < s - t$. B's best response when A plays C is to play $\emptyset$, given strictly positive reporting costs ($0 < t$). When A plays $\emptyset$, B plays $\emptyset$ if $\beta_C - s - t < 0$. Note that positive reporting costs imply that $\beta_C - t - s < \beta_C - s$ and that the stipulation $\beta_C < s - t$ implies $\beta_C + t - s < 0$, such that $\beta_C - s - t < 0$: $\emptyset$ is thus a strictly dominant strategy for B. A's best response if B plays $\emptyset$ is to play C: $\beta_C < s - t \Rightarrow 0 < s - t - \beta_C$. We have proven lemma 1.

□

We now turn to the second phase subgame that arises when A defects and B cooperates in the first stage.

Lemma 2. *When the cost of accessing state police is prohibitively high ($Z = 0$) and customary authorities are B-biased ($0 < \beta_C$), in the subgame that arises when A defects and B cooperates $(\lambda_A^1, \lambda_B^1) = (D, K)$, there is a unique equilibrium in which A does not report and B reports to the chief, $(\lambda_A^2, \lambda_B^2) = (\emptyset, C)$.*

Proof. If B chooses $\emptyset$ A will choose $\emptyset$ since $-\beta_C - s - t < 0$ given the lefthand terms are strictly positively valued and negatively signed. If B chooses C, A will choose $\emptyset$ since $-\beta_C - s - t < -\beta_C - s$. Thus, $\emptyset$ is a strictly dominant strategy for A. We can thus derive Nash equilibria by examining B's optimal response to $\lambda_A^2 = \emptyset$. Player B reports to the chief when A is playing $\emptyset$ iff $0 < \beta_C + s - t$. The inequality in equation 5 implies $0 < \beta_C - t \Rightarrow 0 < \beta_C - t + s$, so B reports to the chief. We have proven lemma 2. □

Consider now the subgame that arises when both A and B defect.

Lemma 3. *When the cost of accessing state police is prohibitively high ($Z = 0$) and customary authorities are B-biased ($0 < \beta_C$), in the subgame that arises when A and B defect $(\lambda_A^1, \lambda_B^1) = (D, D)$, there is a unique equilibrium in which neither actor reports, $(\lambda_A^2, \lambda_B^2) = (\emptyset, \emptyset)$*

Proof. See firstly that $\emptyset$ is a strictly dominant strategy for A, as the payoffs are identical to those in the subgame when $(\lambda_A^1, \lambda_B^1) = (D, K)$. Similarly, $\emptyset$ is a strictly dominant strategy for B, as the payoffs are identical to the subgame in which $(\lambda_A^1, \lambda_B^1) = (K, D)$. We have proven lemma 3. □

First Stage Behavior when State Police is Inaccessible

Having solved for λ_A^{2*} and λ_B^{2*} – A and B's best responses at the institutional choice stage – we can now solve for the optimal first period choices. There are four possible outcomes of the first period decisions: $\{(K, K), (K, D), (D, K), (D, D)\}$, as represented on Table 19.

Lemma 4. *If the cost of accessing the state police is prohibitively high ($Z = 0$) and customary authorities are B-biased ($0 < \beta_C$), the "no audience-buying" constraint holds ($\beta_C - \beta_P - t < s$), and it is worthwhile calling upon co-partisans ($t < \min_j |\beta_j|$), there is a unique subgame perfect equilibrium in which B – the partisan of the chief – defects against A – the member of the group against whom the chief is biased ($\lambda_A^{1*} = K, \lambda_B^{1*} = D$).*

Proof. Each actor chooses to cooperate (K) or defect (D) in order to maximize their expected utility given each player's best response at the institutional choice stage. We must consider two cases: one in which $s - t < \beta_C$, so that in the unique subgame equilibrium that arises in the reporting phase when $(\lambda_A^1, \lambda_B^1) = (K, D)$ the actors choose $(\lambda_A^{2*}, \lambda_B^{2*}) = (\emptyset, \emptyset)$; and another in which $\beta_C + t < s$, so that in the unique equilibrium that arises in the reporting phase when $(\lambda_A^1, \lambda_B^1) = (K, D)$ the actors choose $(\lambda_A^{2*}, \lambda_B^{2*}) = (C, \emptyset)$.

The cells of Table 21 give the expected payoffs of each crime decision given best responses in the second stage, i.e., $\tau_i(\lambda_A^1, \lambda_B^1) + \pi_i(\lambda_A^1, \lambda_B^1, \lambda_A^{2*}, \lambda_B^{2*})$.

		Actor B	
		K	D
Actor A	K	$(0, 0)$	$(-s, s)$
	D	$(-\beta_C, \beta_C - t)$	$(-s, -s)$

		Actor B	
		K	D
Actor A	K	$(0, 0)$	$(-\beta_C - t, \beta_C)$
	D	$(-\beta_C, \beta_C - t)$	$(-s, -s)$

Table 21: Expected payoffs from the crime decision given best responses in the institutional choice stage of the game. Each cell denotes $\big(\tau_A(\lambda_A^1, \lambda_B^1) + \pi_A(\lambda_A^1, \lambda_B^1, \lambda_A^{2*}, \lambda_B^{2*}), \tau_B(\lambda_A^1, \lambda_B^1) + \pi_B(\lambda_A^1, \lambda_B^1, \lambda_A^{2*}, \lambda_B^{2*})\big)$. In top panel $s - t < \beta_C$, whereas in bottom panel $\beta_C < s - t$.

Considering firstly the payoffs in the top panel that arise when $s - t < \beta_C$, we see that if B cooperates, A cooperates since $-\beta_C < 0$. If B defects A is indifferent between cooperation and defection, which both yield a payoff of $-s$. If A is cooperating, B defects since $0 < s$. If A defects, B cooperates since $-s < \beta_C - t$. To see this, note that s is strictly positive, and that equation 5 implies $0 < \beta_C - t$.

Suppose now that $\beta_C < s - t$, as represented in the lower panel of Table 21. In that case, the payoffs in the (K, D) quadrant are different. Note, however, that this does not change the equilibrium crime behavior. If B cooperates, A cooperates as before. If B defects, A cooperates, since the assumption $\beta_C < s - t$ implies $-s < -\beta_C - t$. If A cooperates, B defects since $0 < \beta_C$. If A defects, then B cooperates as before. We have thus proven lemma 4. □

Note that lemma 4 holds irrespective of whether the net benefit of reporting $s - t$ is greater *or* lower than the cost incurred due to the chief's bias β_C. When the police is inaccessible and the chief is biased, the actor who benefits from the bias always defects against the actor who is disadvantaged by it. However, how the disadvadvantaged actor responds to this defection is affected by the net benefits of reporting, given that the chief is biased.

Theorem 1 (Customary monopoly leads to victimization of and low reporting by outgroup members)**.** *If the state police is inaccessible ($Z = 0$), customary authorities are biased toward some group ($0 < \beta_C$), "audience-buying" is not rational ($\beta_C - \beta_P - t < s$), and calling upon partisans is worthwhile ($t < \min_j |\beta_j|$), there is a unique subgame perfect equilibrium in which the member of the chief-advantaged group commits crime against the member of the chief-disadvantaged group ($\lambda_A^{1*} = K, \lambda_B^{1*} = D$). If the chief's bias is not too high ($\beta_C < s - t$), A reports to the chief and does not report otherwise ($s - t < \beta_C$).*

Proof. According to lemma 4, the unique equilibrium outcome at the first stage is cooperation by the outgroup member (A) and defection by the ingroup member (B). The unique subgame equilibria that arise at this stage of the game are given by lemma 1: if $s - t < \beta_C$, there is a unique equilibrium in which not reporting is a strictly dominant strategy for both actors, $(\lambda_A^2, \lambda_B^2) = (\emptyset, \emptyset)$. If bias in the customary sector is not too high relative to the net benefit of reporting such that $\beta_C < s - t$, there is a unique equilibrium in which A reports to the chief and B does not report, $(\lambda_A^2, \lambda_B^2) = (C, \emptyset)$. We have proven Theorem 1. □

D.4 Equilibrium Outcomes when the State Expands

I now consider the equilibrium behavior when the cost of accessing the chief and the state police is equivalent ($Z = 1$).

Second Stage Behavior when State Police is Accessible

Lemma 5. *Under partisan bias ($\beta_C < 0 < \beta_P$) when there is no extra cost for accessing state police ($Z = 1$), in the subgame that arises when A cooperates and B defects ($(\lambda_A^1, \lambda_B^1) = (K, D)$), there is a unique equilibrium in which A reports to the state police and B reports to the chief $(\lambda_2^A, \lambda_2^B) = (P, C)$.*

Proof. When B does not report ($\lambda_2^B = \emptyset$) A reports to the police because $0 < -\beta_P + s - t$ and $\beta_C + s - t < -\beta_P + s - t$. When B reports to the chief ($\lambda_2^B = \emptyset$), A reports to the police because the benefits of having the police mitigate the bias of the chief offset the costs of reporting: $-\beta_C + s < -\beta_C - \beta_P + s - t \Rightarrow 0 < -\beta_P - t$. If B ever reports to the police, A freerides by not reporting so as to avoid the transaction costs: $-\beta_P + s - t < -\beta_P + s$. Choosing P is a strictly dominated strategy for B, however, given P's bias toward A. Thus, we need only consider what B

will choose given A reports to the police. Given A reports to the police, it is within B's interest to report to the chief in order to minimize the effect of the police's bias: $\beta_P - s < \beta_P + \beta_C - s - t$. In sum, the threat of biased punishment induces reporting by B, even when B has defected. We have proven Lemma 5. □

Lemma 6. *Under partisan bias ($\beta_C < 0 < \beta_P$) when there is no extra cost for accessing state police ($Z = 1$), in the subgame that arises when A defects and B cooperates $(\lambda_A^1, \lambda_B^1) = (D, K)$, there is a unique equilibrium in which $(\lambda_2^A, \lambda_2^B) = (P, C)$.*

Proof. Note that the payoffs in the institutional subgame under $(\lambda_A^1, \lambda_B^1) = (D, K)$ are symmetrical to those under $(\lambda_A^1, \lambda_B^1) = (K, D)$. Here, reporting to the chief is a dominant strategy for B whenever A is not reporting or reports to the police. Knowing that B will report to the chief, A's best response is to mitigate the biased punishment by reporting to P. We have proven Lemma 6. □

Lemma 7. *Under partisan bias ($\beta_C < 0 < \beta_P$) when there is no extra cost for accessing state police ($Z = 1$), in the subgame that arises when both players defect $(\lambda_A^1, \lambda_B^1) = (D, D)$ there are three nash equilibria: one in which (P,C) one in which (0,0), and a mixed strategy equilibrium (A chooses $\emptyset$ with probability q_A^* and P with $1 - q_A^*$, B chooses $\emptyset$ with probability q_B^* and C with probability $1 - q_B^*$.*

Proof. Equation 4 implies no player has an incentive to report when they know that the other is not reporting: $\beta_C - \beta_P - t - s < 0$. However, if either player chooses to report to their partisan, then a second nash equilibrium arises in which each player reports to their partisan in order to mitigate biased punishment: $-\beta_C - s < -\beta_C - \beta_P - s - t$ implies A reports to P when B reports to C, and $\beta_P - s < \beta_C + \beta_P - s - t$ implies the inverse for player B.

In addition to the equilibrium outcomes that arise from the weakly dominant strategy pairs $(\emptyset, \emptyset)$ and (P, C), there is a nash equilibrium in which A and B play mixed strategies. Note that we can restrict attention to the subgame in which A chooses between $\emptyset$ and P and B chooses between $\emptyset$ and C, since these are the only strategies that survive iterated elimination of dominated strategies.

Denote by q_A the probability that A chooses $\emptyset$ so that $1 - q_A$ is the probability that A chooses P, and by q_B the probability that B chooses $\emptyset$ so that $1 - q_B$ is the probability that B chooses C. Then in the mixed strategy equilibrium A chooses the $q_A^* = \frac{\beta_C - t}{s}$, which renders B indifferent between choosing $\emptyset$ or C, given A's behavior. B chooses $q_B^* = \frac{-\beta_P - \theta(1-Z)}{s}$, which renders A indifferent between $\emptyset$ and P, given the strategy chosen by B. We have proven lemma 7.

□

First Stage Behavior when State Police is Accessible

Lemma 8. *Under partisan bias ($\beta_P < 0 \beta_C$), if the state police is accessible ($Z = 1$), actors have no incentive to engage in "audience-buying" ($\beta_C - \beta_P - t < s$), and the bias of policers is relatively equal such that $|\beta_C + \beta_P| < t < \min_j |\beta_j|$, there is a unique subgame perfect equilibrium in which both players cooperate: $(\lambda_A^{1*}, \lambda_B^{1*}) = (K, K)$).*

Lemma 9. *Under partisan bias ($\beta_P < 0 \beta_C$), if the state police is accessible ($Z = 1$), actors have no incentive to engage in "audience-buying" ($\beta_C - \beta_P - t < s$), and the chief is more strongly B-biased than the police is A-biased, such that $t < (\beta_C + \beta_P)$, there is a unique subgame perfect equilibrium in which the partisan of the chief defects against the partisan of the police $\lambda_A^{1*}, \lambda_B^{1*}) = (K, D)$.*

Lemma 10. *Under partisan bias ($\beta_P < 0\beta_C$), if the state police is accessible ($Z = 1$), actors have no incentive to engage in "audience-buying" ($\beta_C - \beta_P - t < s$), and the state police are more strongly A-biased than the chief is B-biased, such that $t < -(\beta_C + \beta_P)$, there is a unique subgame perfect equilibrium in which the partisan of the state police defects against the partisan of the chief $\lambda_A^{1*}, \lambda_B^{1*}) = (D, K)$.*

Proof. First, note that even though multiple equilibria obtain in the institutional subgame that arises when both players defect ($(\lambda_A^1, \lambda_B^1) = (D, D)$), lemmas 8-10 describe unique subgame perfect equilibria because the subgame with multiple equilibria lies off the equilibrium path.

To see this, we can consider whether it is ever rational for A (B) to defect when B (A) is defecting, given expected payoffs for the mixed strategy equilibrium taken over all possible values of q_A^* and q_B^* (the pure strategy equilibria are special cases of the mixed strategy equilibrium where $q_A = q_B = 1$ and $q_A = q_B = 0$).

The expected payoffs from defection when the other player is defecting are some weighted combination of the four quadrants represented on Table 22.

		Actor B	
		$\emptyset$ (q_B)	C $(1 - q_B)$
Actor A	$\emptyset$ (q_A)	$(-s, -s)$	$(-\beta_C - 2s, \beta_C - 2s - t)$
	P $(1 - q_A)$	$(-\beta_P - 2s - t, \beta_P - 2s)$	$(-\beta_C - \beta_P - 2s - t, \beta_C + \beta_P - 2s - t)$

Table 22: Payoffs from mutual defection under mixed strategy. Each cell denotes $\big(\tau_A(D, D) + \pi_A(D, D, \lambda_A^{2*}, \lambda_B^{2*}), \tau_B(D, D) + \pi_B(D, D, \lambda_A^{2*}, \lambda_B^{2*})\big)$. The parameters q_A and q_B indicate the probabilities that A and B choose not to report as opposed to reporting to the police or the chief, respectively.

If B defects, a sufficient condition for A's cooperation is that the expected payoff from cooperation is greater than all four of the payoffs in the matrix on Table 22. From Lemma 5 we know that the equilibrium payoff for A for (K, D) is $-\beta_C - \beta_P - t$.

Turning first to the payoff in $(\emptyset, \emptyset)$ in Table 22, we know that $-s < -\beta_C - \beta_P - t$ because equation 5 implies $\beta_p + t < 0$, equation 4 implies $-s < -\beta_C + \beta_P + t$, and together these constraints imply $-s < -\beta_C + \beta_P + t < -\beta_C - \beta_P - t$. Second, it is simple to show that $-\beta_C - 2s < -\beta_C - \beta_P - t \Rightarrow -2s < -\beta_P - t$, since the lefthand term is strictly negative and the righthand term is strictly positive. Third, we can verify that $-\beta_P - 2s - t < -\beta_C - \beta_P - t$, since equation 4 implies $-2s < -s < -\beta_C$. Finally, $-\beta_C - \beta_P - t - 2s < -\beta_C - \beta_P - t$ implies $-2s < 0$, which we know is true given s is strictly positive. Since q_A and q_B are in the $[0, 1]$ interval, payoffs under mixed strategy are simply a weighted sum of the four extrema considered above. Thus, we have proven that payoffs to A from cooperation when B defects are strictly greater than the payoffs from defection, for all possible mixed strategies, including the special case of the pure strategies when $q_A = q_B = 0$ and $q_A = q_B = 1$.

Furthermore, given the payoffs to A and B are symmetrical, we know that the same holds for B. Thus, we have proven that it is never a best response for one player to defect when the other defects. Defection as a response to defection is thus a strictly dominated strategy.

When B cooperates, A cooperates if $-\beta_P - \beta_C - t < 0$, and defects otherwise. When A cooperates, B cooperates if $\beta_P + \beta_C - t < 0$, and defects otherwise. Thus, the relative size of the partisan bias determines criminal outcomes. For example, if $-\beta_P = \beta_C$, the partisan bias is equal and both actors cooperate. Note that $\beta_P - \beta_C - t < 0 \Rightarrow -\beta_P - \beta_C < t$, $\beta_P + \beta_C - t < 0 \Rightarrow \beta_P + \beta_C < t$ and $|\beta_P + \beta_C| = |-\beta_P - \beta_C|$. This implies that a sufficient condition for mutual cooperation is $|\beta_P + \beta_C| < t$, proving Lemma 8. Furthermore, it implies there is a unique equilibrium in which B

defects and A cooperates when $t < \beta_P + \beta_C$, and one in which A cooperates and B defects when $t < -(\beta_P + \beta_C)$. We have thus proven Lemmas 9 and 10, respectively.

□

Theorem 2 bias follows as a direct result of Lemmas 5-10.

Theorem 2 (Reporting to authorities and cooperation high under partisan bias)**.** *Under partisan bias ($\beta_P < 0 < \beta_C$), if the state police is accessible ($Z = 1$), there is no incentive to engage in "audience-buying" ($\beta_C - \beta_P - t < s$), and it is worthwhile appealing to partisans ($t < \min_j |\beta_j|$), then crime depends on the relative bias of the chief to the police:*

if $\lvert\beta_C + \beta_P\rvert < t$	*there is no crime,*
if $t < (\beta_C + \beta_P)$	B *defects against* A*,*
if $t < -(\beta_C + \beta_P)$	A *defects against* B*.*

Conditional on defection by either actor, the unique equilibrium outcome is for each actor to report to their co-partisan (A to P and B to C).

Proof. We have shown that mutual defection never occurs when the state is accessible. Lemma 8 shows that when $|\beta_C+\beta_P| < t$ there is mutual cooperation in the first stage, and when this condition does not hold, lemmas 9 and 10 illustrate that this results in defection by one of the players, the unique outcome of which is co-partisan reporting (A to P and B to C). We have proven theorem 2. □

The comparison of theorems 1 and 2 gives rise to the 'Partisan Demand Effect' corollary.

Corollary 1 (Partisan Demand Effect)**.** *Under partisan bias ($\beta_P < 0\beta_C$), if the state police is accessible ($Z = 1$), actors have no incentive to engage in "audience-buying" ($\beta_C - \beta_P - t < s$), it is worthwhile to report to co-partisans ($t < \min_j |\beta_j|$), and chiefs are strongly biased toward ingroup members relative to the state's partiality for outgroup members ($s - t < -\beta_P < \beta_C$), state expansion has no effect on crime but increases total institutional demand from zero to both chief and police being called upon to resolve disputes.*