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THE EVOLUTION OF CULTURE AND INSTITUTIONS: EVIDENCE FROM THE KUBA KINGDOM

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We use variation in historical state centralization to examine the long-term impact of institutions on cultural norms. The Kuba Kingdom, established in Central Africa in the early 17th century by King Shyaam, had more developed state institutions than the other independent villages and chieftaincies in the region. It had an unwritten constitution, separation of political powers, a judicial system with courts and juries, a police force, a military, taxation, and significant public goods provision. Comparing individuals from the Kuba Kingdom to those from just outside the Kingdom, we find that centralized formal institutions are associated with weaker norms of rule following and a greater propensity to cheat for material gain. This finding is consistent with recent models where endogenous investments to inculcate values in children decline when there is an increase in the effectiveness of formal institutions that enforce socially desirable behavior. Consistent with such a mechanism, we find that Kuba parents believe it is less important to teach children values related to rule-following behaviors.

KEYWORDS: Culture, values, institutions, state centralization.

1. INTRODUCTION

RECENT EVIDENCE suggests that both culture and institutions are important for economic development.[1] While culture and institutions are often studied in isolation, it is likely that they interact in important ways. In this paper, we study the effect that institutions have on

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[1]Institutions are typically defined as the external "rules of the game" that shape individuals' expected material payoffs for different actions (e.g., North and Thomas (1973), Acemoglu, Johnson, and Robinson (2001)). Culture, by contrast, is generally defined as values, beliefs, and preferences that are internal to individuals in a society (e.g., Tabellini (2008a)).

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culture. There are a variety of plausible ways that institutions could affect cultural traits. One possibility is that stronger institutions inculcate cultural values that further reinforce the institutions themselves. For example, if institutions incentivize people to engage in a pattern of behavior, this may, in turn, cause individuals to view this pattern of behavior as natural or normal, and to experience disutility when they deviate from this behavior. A number of scholars have argued for this form of complementarity between institutions and culture (Elias (1994), Weber (1976), Foucault (1995)).[2]

Another possibility is that institutions associated with state formation undermine norms of rule following. There are a number of different theoretical mechanisms that generate such an effect. One is the direct psychological effect that arises due to motivational crowding out, where external material incentives often crowd out intrinsic motivations (Deci, Koestner, and Ryan (1999), Bowles and Polania-Reyes (2012)). Although the phenomenon occurs at the individual-level and over short time frames, and is generally not thought to operate in the longer run, a similar mechanism that operates over multiple generations can be found in the model developed by Tabellini (2008b). The model examines individuals' decisions to cooperate or cheat in a one-shot prisoners' dilemma. Because the game is one-shot, based on purely monetary incentives, it is always in an individual's best interest not to cooperate. However, individuals also have an intrinsic preference against cheating. In the model, there are good types and bad types. The good types get more disutility from cheating than bad types. Parents can make costly investments in their children to inculcate a dislike for cheating.[3]

The model features a form of crowding out that is analogous to motivational-crowding, except that it works over many generations. In the model, if institutions become better at ensuring that bad children behave like good children, then parents reduce their investments aimed at making sure their child is a good type.[4] Since parents only care about the actions of their children, not their preferences per se, the benefit of exerting effort to inculcate an intrinsic dislike for cheating is lower with better state enforcement. Parents know that their children will be prevented from cheating by the state whether or not they invest in instilling such preferences themselves. Therefore, formal institutions crowd out intrinsic preferences for good behavior.

Although Tabellini (2008b) did not provide empirical evidence for this mechanism in his model, there is existing evidence consistent with such a crowd-out effect. For example, Guiso, Sapienza, and Zingales (2004) found that within Italian provinces with weak legal institutions, high levels of social capital are necessary to sustain financial transactions. However, in provinces with an effective legal system, lower levels of social capital are satisfactory. The mechanism of Tabellini's model also fits with historical arguments that states can induce perverse cultural dynamics, which ultimately lead to their col-

[2]Sociologist Norbert Elias (1994) argued that in early modern Europe, state formation generated a "civilizing process" that induced people to internalize rule-abiding behavior (Elias (1994, p. 367)). Historian Eugene Weber (1976) argued that the formation of the French state in the 19th century transformed France's diverse population into a citizenry socialized to obey the rules, and in particular, to pay taxes and to serve in the military. Michel Foucault (1995) argued that a defining characteristic of modern society is the movement from a setting in which people obey the law because they fear punishment to one where individuals obey because they absorb the laws as internal norms.

[3]Because parents evaluate their child's actions using their own preferences, good parents want to have good children, and bad parents want to have bad children.

[4]In the model, this effect occurs when enforcement is particularly effective for matches between "close" players. Given our interest in within-state interactions, not cross-state interactions, we view this as the empirically relevant scenario of the model.

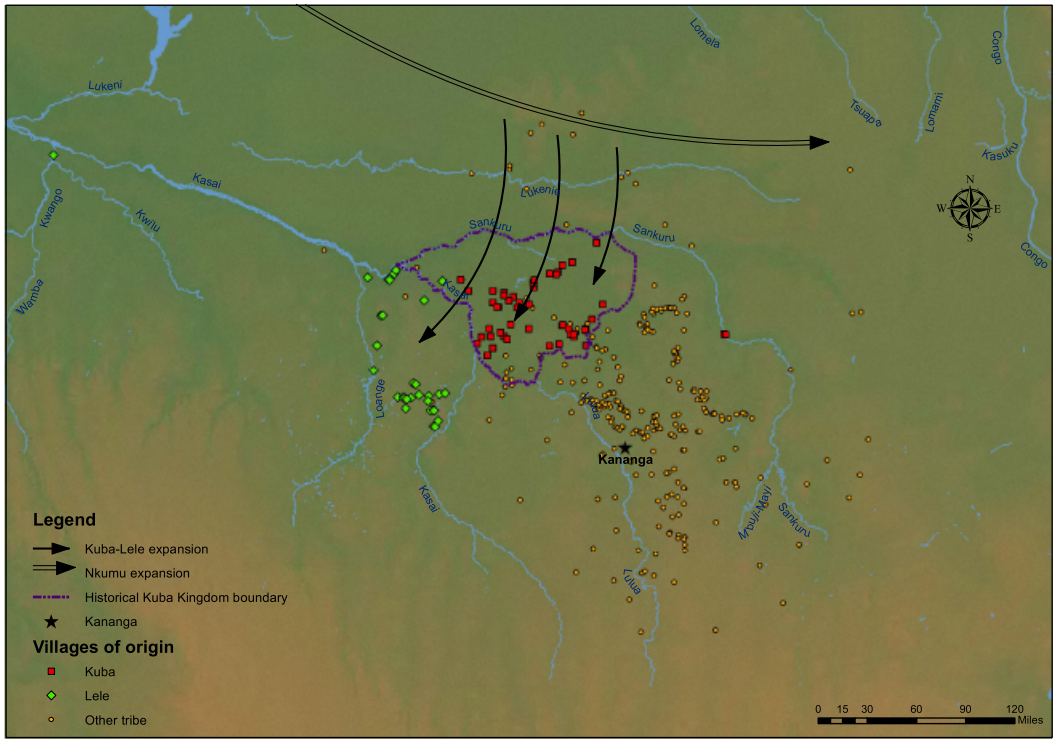


FIGURE 1.—Map showing the migration of the descendants of Woot, the approximate historical boundaries of the Kuba Kingdom, the location of the origin villages within the sample, and Kananga.

lapse, ancient Rome being perhaps the most prominent example (e.g., Gibbon (1996), MacMullen (1990)).

In this paper, we examine the effect of institutions on culture by providing an empirical study of the long-term impact of state formation on individuals' propensity to follow rules and obey laws. Our analysis exploits variation from an historical natural experiment in Central Africa: the creation of the Kuba Kingdom in the 17th century. A number of characteristics of the creation of the Kingdom make this historical episode particularly well suited for estimating the causal effect of state formation on norms of rule following. First, during the medieval period, about two centuries prior to the formation of the Kingdom, there was a large migration of related Mongo peoples to an area near the confluence of the Kasai and Sankuru rivers. This migration is illustrated in Figure 1, along with the boundaries of the Kuba Kingdom some two centuries later. According to oral histories, these groups are descendants of a mythical ancestor named Woot. One implication of this migration is that, prior to the formation of the Kingdom, the population of the region was culturally homogeneous. The common cultural origins of the pre-treatment population helps alleviate concerns of reverse causality, namely that initial cultural differences caused the formation of the Kuba Kingdom in one area, but not the other.

The second significant aspect of the episode is the manner in which the Kingdom was established and its boundaries determined. The Kingdom was formed when Shyaam, an institutional entrepreneur and an outsider, united a group of villages and small chieftaincies (Vansina (1978, p. 127)). Following this, the Kingdom's boundaries were determined

by the particular geography of the area. As shown in Figure 1, the region where the "children of Woot" settled is naturally divided by the Kasai and Sankuru rivers. Shyaam established the Kingdom to the south of the Sankuru and to the east of the Kasai. During his reign and those of subsequent kings, the Kingdom expanded to the natural limits defined by these rivers. The boundaries of the Kuba Kingdom remained stable and clearly defined by the Kasai river (to the west), Sankuru river (to the north), and Lulua river (to the south). Although the specific location of these natural boundaries was otherwise unimportant, the location of the rivers determined which villages were inside and outside of the Kuba Kingdom. Thus, our interpretation of the Kuba Kingdom as a natural experiment relies on the assumption that the establishment of the Kingdom to the east of the Kasai river, rather than to the west, occurred for reasons unrelated to pre-existing differences in the populations or the environment that could affect our outcomes of interest.

The Kuba Kingdom had many characteristics that are associated with modern states, making the estimated effects of the Kuba state on cultural norms of general interest. The Kingdom had a professional bureaucracy, a system of taxation, extensive public goods provision, an unwritten constitution, a sophisticated legal system that featured trial by jury and courts of appeal, a professional police force, and a military. Amongst travelers and ethnographers of the Kuba Kingdom, comparisons have regularly been made to other centralized states like Augustan Rome, Imperial Japan, or the Ancient Egyptian civilization (Torday and Joyce (1910, pp. 13, 60), Sheppard (1917, p. 187)).

Our analysis compares individuals whose ancestors lived within the Kuba Kingdom to individuals whose ancestors lived just outside the Kingdom, and tests for differences in the propensity to follow rules, even when there is a strong monetary incentive to not do so. We measure rule following using two sets of behavioral experiments. The first is the resource allocation game (RAG).[5] In the experiment, there is a cost to following the rules and a benefit to cheating. Although it is impossible for us or anyone else to know if any specific individual cheats, we are able to measure whether groups of individuals cheat by observing aggregate outcomes in a larger sample. The second experiment is a version of the standard ultimatum game, in which participants physically allocate money in a private setting, rather than play on a computer. This provides an opportunity for individuals to steal money during the experiment.

In our analysis, we consider three samples. The first sample is the largest and includes all individuals whose ancestors lived inside and just outside the Kuba Kingdom (499 individuals in total). The second sample exploits the particular history of the region by including only the descendants of Woot, the population that was culturally homogeneous prior to the creation of the Kuba Kingdom. The descendants of Woot who remained outside the Kuba Kingdom are today called the Lele. Therefore, our second sample includes the central Kuba (the Children of Woot who were inside the Kuba Kingdom) and the Lele (105 individuals in total). This is the cleanest comparison, as it exploits the cultural regression discontinuity that arises due to the historical natural experiment described above. The third sample focuses specifically on the core people of the Kuba Kingdom, the Bushong, and compares them to the Lele (82 individuals).[6] This comparison has two motivations. First, the existing anthropological literature has focused on comparisons of the Bushong and Lele (e.g., Douglas (1962, 1963), Vansina (1963, 1964, 1978, 1990, 2010)). Second,

[5]The experiment was recently developed by Hruschka, Efferson, Jiang, Falletta-Cowden, Sigurdsson, McNamara, Sands, Munira, Slingerland, and Henrich (2014).

[6]The first sample includes 80 Kuba and 419 non-Kuba; the second 61 central Kuba and 44 Lele, and the third 38 Bushong and 44 Lele.

focusing on the Bushong helps address the issue of whether the Kuba institutions were viewed as legitimate by its citizens. The Bushong lived in the heart of the Kingdom and were disproportionately represented in the capital city and the government bureaucracy. Thus, of all groups, they were most likely to view Kuba institutions as legitimate.

Using our experimental measures of rule following, a consistent and robust set of empirical results emerge. We find that Kuba ancestry is associated with *more* rule breaking and *more* theft. This is true for both experiments and for all three samples of interest. These findings demonstrate that culture can be shaped by state institutions, and that, at least in this instance, state institutions and culture are not complements, as hypothesized by Elias, Weber, and Foucault, but instead are substitutes as predicted in the model of Tabellini (2008b). Thus, our results are most consistent with the Kuba state crowding out internal norms of rule following.

Comparing the estimates from each of our three sample populations, we find that our restricted samples produce (negative) estimates of the Kuba Kingdom on rule following that are larger in magnitude than for the full sample. Given that we expect the restricted-sample estimates, which exploit the cultural regression discontinuity, to be better identified than the full-sample estimates, this suggests a positive reverse effect of culture on institutions. Groups with stronger norms of rule following are more likely to establish more centralized and formal state structures. This causes non-identified estimates of the effect of state centralization on rule-following norms to be biased upwards. This is a potential explanation for why other studies have found a positive correlation between developed institutions and cultural traits that one expects may be correlated with rule following (e.g, Tabellini (2010), Gachter and Schulz (2016)), while we estimate a causal negative impact.

After estimating the reduced-form relationship between the Kuba state and rule following, we then consider potential threats to inference: selective migration to the research site, differences in the geography of individuals' ancestral villages, and differences in other cultural traits that could affect actions in the behavioral experiments. Using information on individuals' migration histories, the geography of their ancestral villages, and measures of other cultural traits, we check whether these factors confound our estimates. We find no evidence of confounding.

Our analysis then turns to underlying mechanisms. With Tabellini's (2008b) model in mind, we examine whether Kuba institutions are associated with lower investments by parents to instill values related to rule following. Using survey questions that ask parents which traits they feel are important to teach their children, we find that, on average, Kuba parents believe it is less important to teach values related to obedience and rule following than non-Kuba parents. We also check whether the Kuba appear to place less importance on values that are unrelated to rule following, such as instilling imagination or originality in their children. We find no statistically significant difference along these dimensions. These correlations are consistent with the Kuba state causing a decline in investments made by parents to teach values associated with rule following to their children.

We then turn to additional channels that could also explain our findings. We first consider current income and prosperity. By all accounts, the establishment of the Kuba Kingdom facilitated economic growth, and this could explain part of the difference in rule following that we observe. Another potential channel is that the Kuba may have been treated differently by the national state during the colonial and/or post-colonial periods. We test for these channels using various measures of current income, information about the locations of colonial investments, and individuals' implicit and explicit views about former president Joseph Mobutu. We find no evidence that the lower rates of rule following among the Kuba are explained by either of these channels.

Our study complements the findings from recent studies that have shown the beneficial effects of pre-colonial state centralization for contemporary economic development (Gennaioli and Rainer (2007), Michalopoulos and Papaioannou (2013, 2014a)). In particular, our empirical strategy, which focuses on a particularly informative historical setting, complements these broader cross-sectional analyses. Our approach enables sharper causal inference. However, an important caveat is that our estimates concern one particular state, which matters because the causal impact of state formation may depend on the nature of the state being considered. In addition, our analysis estimates the impacts of a package of institutions, and we are unable to provide causal estimates of particular components of the state or its policies.

Our estimates also complement studies that examine the cultural impacts of living under different types of state institutions. For example, Becker, Boeckh, Hainz, and Woessmann (2017) compared the long-term effects of living under the Habsburg Empire versus the Ottoman Empire; Tabellini (2010) examined the effects of living within nation states with greater or fewer constraints on the executive; and Hruschka et al. (2014) examined current nations and the link between public good provision and cheating.[7]

We now turn to a more detailed discussion of the historical episode we exploit in our analysis. This is followed by a description of our sampling frame and data collection in Section 3, and of our experimental measures in Section 4. In Section 5, we report our baseline estimates, and test for potential threats to inference in Section 6. In Section 7, we turn to an examination of mechanisms. Section 8 concludes.

2. HISTORICAL BACKGROUND

This section briefly overviews a brief overview of the historical setting. For the interested reader, we provide a more thorough description in the paper's Supplemental Material (Lowes, Nunn, Robinson, and Weigel (2017)).

Prior to the formation of the Kuba Kingdom, a group of Mongo peoples migrated to the region from the northwest, crossing the Sankuru river sometime in the Medieval period. The migration included ancestors of many different groups, some of whom were later integrated into the Kuba Kingdom—namely, the Bushong, Ngeende, Pyang, Bulaang, and Bieeng—and others of whom were not—the Lele (Vansina (1978, p. 56, 1990, Map 4.4, p. 124)). Following Vansina (1978, p. 5), we refer to the five groups that later became a part of the Kuba Kingdom as the "central Kuba," distinguishing them from other groups that became part of the Kingdom but were not part of the same migration, which are referred to as the "peripheral Kuba."

The central Kuba and Lele trace the origin of the world to Mboom, the father of the first man, who was named Woot. According to oral history, Woot committed incest with his sister Mweel, and they were cast out of the primeval village, leading to their migration. From this relationship, a series of children were born (Vansina (1978, p. 32)), who are the ancestors of the different groups within the central Kuba and Lele (Torday (1925, pp. 127–128), Wharton (1927, p. 66)). The oral history, which attributes a common ancestry to the central Kuba and Lele, is consistent with linguistic evidence. The central Kuba and Lele both speak languages that diverged from a common Bantu-based language called Mongo, which is evidence of common linguistic and cultural roots (Gunthrie (1971)).

[7] A number of studies also examine the impacts of institutions on culture, but in purely experimental settings (e.g., Cassar, d'Adda, and Grosjean (2014), Rand and Peysakhovich (2016)).

The Kuba Kingdom formed in the early 17th century (probably in the 1620s) when an outsider named Shyaam first made himself the chief of the Bushong—one of the groups descended from Woot located to the east of the Kasai river—by overthrowing the existing chief. He then united the independent villages and small chieftaincies in the region into one large kingdom. According to the historical record, Shyaam's success in uniting the region stemmed from several characteristics: he was a magician and medicine man; he had travelled widely; and he had access to long-distance trade networks. Although the story of King Shyaam may seem exceptional, the formation of Kingdoms by outsiders was common in Africa historically (Sahlins (2008)).

After its founding, the Kuba Kingdom expanded to the boundaries shown in Figure 1. The Kingdom was naturally separated from several neighboring societies by three rivers: the Kasai (on the West), the Sankuru (on the North), and the Lulua (on the South). The peoples on the other sides of the rivers, even the Lele (the other descendants of Woot) who had migrated to the region with the Bushong, were never unified under a centralized state. Thus, the borders of the Kingdom were determined by two factors: the location of the rivers in the region and the location of the Kingdom's origin relative to the rivers.

The Kuba Kingdom was not the only large pre-colonial state in Central Africa, but it was the only such state in our region of interest (Vansina (1966)). None of the groups who occupied the region, including those who migrated with the Bushong but stayed outside of the Kuba Kingdom, achieved anything close to the same degree of political centralization.

There are two aspects of the Kingdom that are particularly notable and of relevance for our study. In Vansina's (1978, p. 3) own words, these are the "intricacy of the political system" and "the sophistication of Kuba legal procedures."

A defining feature of the Kuba political structure was its division and balance of power. The territory of the Kuba Kingdom was divided into nine provinces that were themselves subdivided into counties, each of which had a head chief (Vansina (1978, p. 128)). The Kingdom had executive councils, professional bureaucracies, a military, and police forces. The executive, apart from the king, comprised a system of title holders, called *kolm*. There were 120 distinct titles in the late 19th century. Though some of these titles were reserved for members of 18 aristocratic clans, the majority were appointed meritocratically. The king interacted with four main councils. The most significant of these was the *ishyaaml*, which had the authority to veto the king's orders and edicts. If a veto occurred, the issue went to another council, the *mbok ilaam*, which had procedures for reaching a compromise (Vansina (1978, pp. 145–152)).

The judicial system included trial by jury and appellate courts. In this system, there were two judicial fora, the *moots* and the courts, both with multiple levels: the clan, the village, the chiefdom, and the Kingdom. Minor disputes were dealt with by *moots*, informal assemblies of relatives and kinsmen who heard evidence and arbitrated in public meetings. More serious offenses went to courts, in which a panel of judges with particular expertise or experience in the crime or dispute under consideration would be selected. From the basic court, appeals could be made to another court headed by a particular *kolm*, called a *baang*. From this court, appeal could be made to yet a higher court presided over by the *kikaam*, the highest bureaucrat in the Kingdom. A final appeal could then be made to what Vansina (1971, p. 138) described as the "supreme court," where the senior members of the 18 aristocratic clans took part and the king acted as a spectator, ready to grant a stay of execution if necessary. All cases of murder in the Kingdom went directly to the supreme court.

Court cases had well-defined procedures. If a person brought a case to a judge (*kolm*), he or she had to deposit 700 cowrie shells. The case was then directed to the judge most

competent in the relevant dispute, who then formed a panel of judges and chose a day for the trial. The defendants were informed of this date, and when the time came, they and the witnesses, called by the defendants or the judges, appeared and gave testimony. The judges then adjourned and made a decision, which could include fines if a guilty verdict was reached. A defendant, if found guilty, could then follow a well-defined procedure to appeal to a higher court, which began by paying a 150 cowrie shell fee to the court that had just handed down the verdict.

Our study is not the first to recognize that the formation of the Kuba Kingdom provides a near natural experiment suitable for assessing the long-term impacts of state formation. Historian Jan Vansina and anthropologist Mary Douglas have written extensively comparing the Kuba Kingdom with the stateless Lele (Vansina (1963, 1964, 1978, 1990, 2010), Douglas (1962, 1963)). Douglas (1963) compared the Bushong and Lele, writing that "they are historically related, and share many cultural values. On the surface, Lele material culture looks so like a counterpart of Bushong that it is worth comparing the two tribes... Everything that the Lele have or do, the Bushong have more and can do better. They produce more, live better, as well as populating the region more densely than the Lele" (pp. 41–42). She then goes on to compare the institutional structures of the two groups: "The Bushong managed to develop a well-organized political system... By contrast, the largest political unit of the Lele, the village, was smaller than the smallest political unit in the Bushong system" (pp. 50–51).

The Lele dealt with disputes and conflicts in a different and less institutionalized way than the Kuba did. A central point in Douglas (1963) is that there was no overarching system of authority in Lele territory. Chiefs had minimal authority, and there were no professional bureaucrats, judges, or policemen (Douglas (1963)). She noted that "anyone who has lived with the Lele will agree at once that there was no authority. There was no person or body in a village who could give orders and expect to be obeyed by anyone else" (Douglas (1963, p. 84)). The consequence of this was that frequency of quarrels, hostilities, violence, and an overall insecurity were much higher among the Lele than in the Kuba Kingdom (Douglas (1962)).

3. DATA COLLECTION

Our sample comprises individuals living in Kananga, the capital of the local province, Kasai Occidental. As shown in Figure 1, Kananga lies to the south of the Kuba Kingdom, about a 300-kilometer drive from Mushenge, the capital of the Kuba Kingdom. Since our Kananga-based sample is composed of individuals removed from their original institutional environments, but now living in the same city, we can be more confident that our findings are due to differences arising from internal norms, rather than the external setting.[8] It was also more feasible to collect data in the city given the poor transportation infrastructure of the region.

The data were collected in the dry season (June to August) in 2013 and 2014. Because no census has been conducted in recent years, we used Google satellite imagery to identify and randomly choose households for our sample. Details of the sampling procedure, as well as the satellite images used, are reported in the Supplemental Material. Our random sample comprised 2,144 households (1,079 in 2013 and 1,065 in 2014). Because the random sample yielded a relatively small number of observations with ancestors who were

[8]This follows previous studies that have also used this same strategy, including Guiso, Sapienza, and Zingales (2004), Giuliano (2007), Fernandez and Fogli (2009), and Alesina, Giuliano, and Nunn (2013).

from the Kuba Kingdom, we also randomly sampled within specific targeted neighborhoods (polygons) that local leaders said were likely to have Kuba or Lele inhabitants. The random sample from the targeted polygons comprised 813 individuals in 2013 and 2,227 individuals in 2014.

From this sample, we then selected the set of individuals relevant for our study. These included all individuals who: (i) have an origin village or birth village in Mweka, a district whose borders are nearly identical to that of the historical Kuba Kingdom; (ii) have an origin or birth village in the districts contiguous to Mweka; or (iii) have an origin village or birth village in other districts, but who belong to an ethnic group represented in Mweka, namely Kete, Kuba, or Lele. In total, 499 individuals satisfied these criteria.

The individuals in our sample are from 15 different ethnic groups.[9] The largest ethnic group is the Luluwa (160 individuals), which is the dominant ethnic group in the region and in Kananga. The next largest group is the Kuba (80), followed by the Kete (63), the Luntu (58), the Lele (44), and the Bindi (40). Among the 80 Kuba descendants, 62 (77%) are descendants of the "central Kuba." Further, 38 of the 80 (48%) are Bushong.

Participants in our study were visited by enumerators three times after the initial screening survey. During the first visit a survey was administered, and during the second and third rounds we administered behavioral games. The results we present here include all of the behavioral games that were administered as part of this project. They are not a selective subset of some larger set of games.

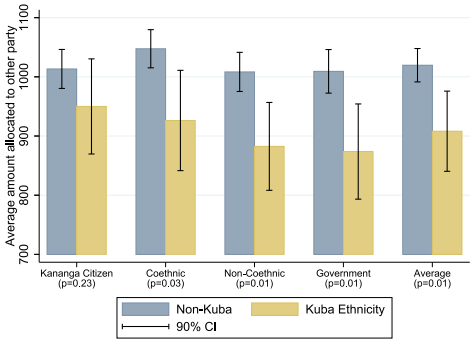
4. DESCRIPTION OF EXPERIMENTAL MEASURES OF RULE FOLLOWING AND CHEATING

Our first experimental measure of rule following is the resource allocation game (RAG), a non-strategic game that measures the extent to which participants follow prespecified rules (Hruschka et al. (2014)). For a single round of the game, the participant is given a six-sided die, with three black sides and three white sides. The participant is also given a stack of thirty 100CF bills (3,000CF in total). This is a significant amount, approximately equal to US $3.25, which is about 2–3 days wages. The participant is told that the stack of bills is to be divided between herself and another party. The other party is either a citizen from Kananga, a coethnic from Kananga, a non-coethnic from Kananga, or the local provincial government (to be used in a public works project). The participant is told to allocate the money according to the following procedure. First, the participant associates black with one of the two parties (e.g., herself or the government) and white with the other party. Then she rolls the die and observes the color that is rolled. If it is white and she had mentally associated white with herself, then she puts the 100CF bill in an envelope marked for her. If she had mentally associated white with the other party, then she puts the 100CF bill in the envelope for the other party.

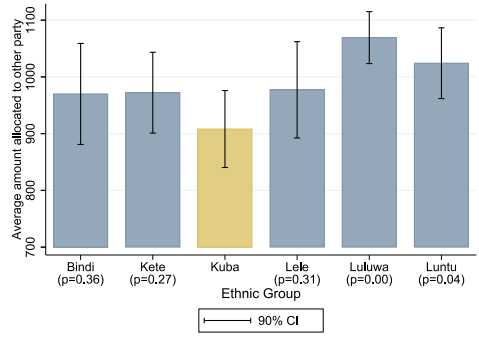
Participants repeat this procedure 30 times, each time making a new color association decision. The task is performed by the participant alone in the privacy of a tent and is not observed by anyone, including the person administering the game. Participants are to seal both envelopes in private, keep the envelope that is for themselves, and place the envelope for the other party in a bag outside of the tent. Participants play the game four times, dividing the money between themselves and one of the four parties mentioned above.[10] After all games are played, the enumerator brings the bag back to the central office. Thus,

[9]The ethnic composition of the full sample is reported in the Supplemental Material.

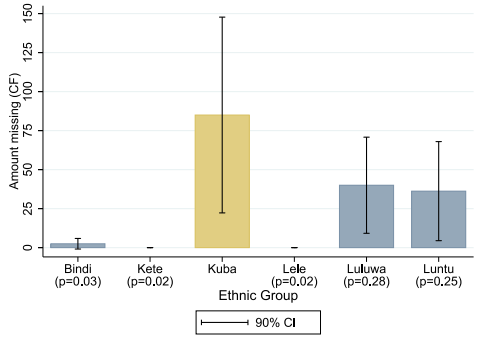
[10]After the games were completed, we distributed the money to the other parties as stated to the participants.



(a) Average allocations (of 3,000CF) to the other party in the RAG, for Kuba and non-Kuba descendants.



(b) Average allocations (of 3,000CF) to the other party in the RAG, for the six largest ethnic groups.



(c) Average amount of money missing from three rounds of the Ultimatum Game, for the six largest ethnic groups.

FIGURE 2.—Average behaviors in the RAG and the Ultimatum Game with theft. The reported p-values are for tests of the equality of means with the Kuba.

the enumerator never physically handles the envelopes directly. Prior to the game being played, it was made clear to the participants that the envelopes would not be opened by the enumerator and would be brought back to a central office, where they would be opened by one person, who would never tell anyone the contents of the envelope.

The baseline difference between Kuba and non-Kuba descendants is shown in Figure 2(a), which reports the average amount allocated to the other party. The figure reports this for each of the four different versions of the RAG, as well as the average across the four versions. If individuals were following the rules, then on average the other party should receive half of the 3,000CF endowment, or 1,500CF. Yet for both Kuba and non-Kuba participants, the average amount allocated to the other party (across the four games) is 1,002CF (or 33%), which is well below 1,500CF (50%).[11] In addition, we find that Kuba descendants consistently allocate less to the other party than non-Kuba de-

[11]Our figure of 33% is similar to findings from previous implementations of the RAG (see, e.g., Hruschka et al. (2014), McNamara, Norenzayan, and Henrich (2014)).

scendants.[12] In Figure 2(b), we report the same summary measure of cheating separately for the six largest ethnic groups in the sample. We see that not only do the Kuba contribute less than the average of the other ethnic groups, but they contribute less than all of the other primary ethnic groups in the sample (including the Lele).

The RAG imposes a set of unfamiliar rules and instructions on our participants. The benefit of this is that because the rules are foreign to all, they are likely similarly salient for everyone in our sample, facilitating a credible comparison of the control and treatment groups. Using a more familiar set of rules generates the possibility that the rules have differential legitimacy across different groups. However, we recognize there is a trade-off, and one may be concerned that the rules of the RAG are arbitrary and unrealistic to participants. Given this concern, we supplement our RAG measure with an alternative measure of rule breaking, where the rule being broken is less foreign to participants.

The second measure of rule breaking is based on participants' actions in a variant of the standard ultimatum game (UG). In the game, player 1 proposes a division of 1,000CF between herself and the other player. Player 2 then chooses whether to accept or reject the division. If player 2 accepts, then the players receive the corresponding amounts offered by player 1 in the suggested division. If player 2 rejects, then both players receive zero.

An important difference between our version of the UG and standard implementations of the UG is that we did not use computers or tablets. Instead, participants made their offers as player 1 in private (in a tent) by dividing a stack of ten 100CF bills into two piles. The portion of the proposed division for player 2 was placed in an envelope marked for player 2, and the portion for player 1 was placed in an envelope for player 1. Both envelopes were sealed by player 1 and placed in a bag sitting just outside of the tent. Prior to the game being played, it was made clear to the participant that the envelope would not be opened by the enumerator and would be brought back to a central office, where their offer would be randomly matched to acceptance-rejection decisions of another anonymous individual in our sample. Then, the payouts of the two players would be determined and given to the two players during the next visit.[13]

Because individuals made decisions in private and physically handled the money, they had the opportunity to steal by hiding some of the money on their person (e.g., in a pocket). Although doing this would reduce the amount offered to player 2 in the game, it ensured that they received this amount with certainty, independent of the decision of player 2. In our sample, 4.8% of participants stole money in at least one round of the UG. Among the Kuba, 10.0% stole, while among the non-Kuba, 3.8% stole. The distribution of the average amount missing by ethnic group is shown in Figure 2(c).[14] Consistent with the results from the RAG, we see that the Kuba are the group most likely to break the rules and steal money during the game.

[12]In Figures A-1(a)–A-1(c) of the Supplemental Material, we report the full distribution of allocations to player 2 for Kuba and non-Kuba participants in each of the three samples of interest. The support of the distributions is similar between the two groups, but lower-than-average allocations are relatively more frequent among Kuba descendants and greater-than-average allocations are relatively less frequent. One can also see that the difference between the two samples is general and not driven by a small number of observations.

[13]Participants played the one-shot anonymous game six times, three times as player 1 and three times as player 2. In the three games as either player 1 or player 2, the player was paired with an anonymous partner: (i) a citizen of Kananga, (ii) a coethnic from Kananga, and (iii) a non-coethnic from Kananga. For each round, respondents chose their strategy as player 1 (the proposed division of the 1,000CF) and as player 2 (making acceptance and rejection decisions for the possible divisions proposed by player 1).

[14]The analogous figure for the fraction that stole looks similar and is reported in Figure A-2 of the Supplemental Material.

TABLE I

BASELINE ESTIMATES IN THE RAG AND UG WITH THEFT[a]

	Average Amount Allocated to Other Party (of 3000CF) in the RAG			Amount of Money Missing in UG		
	Full Sample	Central Kuba & Lele	Bushong & Lele	Full Sample	Central Kuba & Lele	Bushong & Lele
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. No covariates						
Kuba ethnicity indicator	−111.51***	−141.21**	−139.77*	59.46**	103.28*	121.05*
	(42.19)	(70.84)	(81.52)	(25.09)	(57.22)	(65.99)
Observations	499	105	82	499	105	82
R-squared	0.01	0.04	0.04	0.01	0.03	0.04
Panel B. With baseline covariates						
Kuba ethnicity indicator	−88.47**	−165.37**	−209.91**	58.23**	140.24**	150.70**
	(41.39)	(70.92)	(81.33)	(25.34)	(59.27)	(69.48)
Covariates:						
Age	1.72	−6.50	−17.50	6.53**	19.18*	16.91
	(5.18)	(13.47)	(17.08)	(3.17)	(11.26)	(14.59)
Age squared	−0.008	0.071	0.237	−0.070**	−0.230*	−0.213
	(0.055)	(0.150)	(0.190)	(0.033)	(0.125)	(0.162)
Female	−2.99	−127.53*	−136.69	−2.32	−97.55	−86.58
	(30.41)	(73.70)	(89.56)	(18.62)	(61.59)	(76.52)
Survey year = 2014	182.00***	246.06***	259.30***	−16.84	−51.85	−39.62
	(31.03)	(72.58)	(83.12)	(19.00)	(60.66)	(71.01)
Mean of dep var	1,001.75	895.24	912.50	35.07	60.00	56.10
Observations	499	105	82	499	105	82
R-squared	0.08	0.16	0.17	0.02	0.09	0.08

[a]The table reports OLS estimates of equation (1). "Kuba ethnicity indicator" is a variable that equals 1 if the individual's self-reported tribe is Kuba. The regressions in panel B control for a gender indicator, age, age squared, and a survey year fixed effect. Coefficients are reported with robust standard errors in parentheses. *,**, and *** indicate significance at the 10, 5, and 1% levels.

5. BASELINE ESTIMATES

We now turn to a more formal test of the long-term effects of the Kuba Kingdom. Specifically, we estimate the following equation:

$$y_i = \alpha + \beta I_i^{\text{Kuba}} + \mathbf{X}_i'\boldsymbol{\Gamma} + \varepsilon_i, \tag{1}$$

where i indexes individuals. I_i^{Kuba} is an indicator variable that equals 1 if individual i's self-reported ethnicity is Kuba. The vector of individual-level covariates, $\mathbf{X}_i$, includes age (in years), age squared, a female gender indicator variable, and an indicator that equals 1 if the individual participated in 2014 (rather than 2013). Motivated by the historical natural experiment, we estimate equation (1) using three different samples: (i) all observations in the sample, (ii) descendants of the Central Kuba and the Lele only, and (iii) descendants of the Bushong and the Lele only.

Estimates of equation (1) are reported in Table I. Panel A reports estimates without covariates, while panel B reports estimates with the baseline set of control variables. Columns 1–3 report estimates using the average amount allocated to the other party in the four rounds of the RAG as our measure of rule following; each column reports estimates from one of the samples of interest. We find that with or without covariates and for all three samples, the coefficient for the Kuba ethnicity indicator is negative and sta-

tistically significant.[15] In addition, estimates from quantile regression (reported in Table A-II of the Supplemental Material) show that differences between Kuba and non-Kuba participants are present in all parts of the distribution. Thus, the estimated Kuba effect is not due to a small number of observations or to an isolated effect on only part of the distribution.

Columns 4–6 of Table I report estimates using the total amount missing in the three rounds of the UG as the dependent variable.[16] Using this second measure, we also find that Kuba descendants are less likely to follow rules. The coefficient on the Kuba indicator variable is positive and significant. As with the RAG measure, we find larger estimates of the Kuba effect when we restrict the sample to ethnic groups that were culturally homogeneous prior to the formation of the Kingdom.

In our view, it is significant that the estimated impact based on our historical experiment—that is, the central Kuba and Lele comparison, or the Bushong and Lele comparison—is consistently larger in magnitude than the full-sample estimates. This is because the full-sample estimates are most likely to be biased due to the reverse effect of culture on institutions. Since values and beliefs may form the basis of formal rules and institutions, it is possible strongly value of rule following and good behavior will be more likely to develop and implement state institutions that reflect this. In contrast to the negative effect of state institutions on rule following, one could hypothesize that the reverse effect of rule following on state institutions would be positive. Thus, to the extent that the full-sample estimates (which do not fully exploit our historical natural experiment) are also affected by reverse causality, we would expect these estimates to be biased upwards—that is, to be less negative. Our results are consistent with this intuition.

As a robustness check, we disaggregate our Kuba indicator variable and allow the effects to differ for the: (i) central Kuba and peripheral Kuba, and (ii) Bushong, other central Kuba, and peripheral Kuba. The estimates, which are reported in Tables A-III and A-IV of the Supplemental Material,[17] show that the negative effect of the Kuba on rule following is due to the central Kuba and not the peripheral Kuba, which is reassuring since it is the central Kuba that comprise the natural experiment. For the peripheral Kuba, there is the concern that they had stronger norms about cheating ex ante and therefore were more willing to join the centralized Kingdom with its well-functioning political and legal systems.

Our findings can be contrasted to other papers that find a positive correlation between different measures of state quality and socially beneficial cultural traits (Tabellini (2010), Gachter and Schulz (2016)). One explanation is that the cross-sectional correlations, though more general, are more likely to capture the reverse causal effect of culture on institutions, and therefore the estimates may be biased upwards. Another explanation is that the impact of the Kuba on rule following is not more generally representative of the impact of state centralization on rule following or other socially beneficial cultural traits. This could be examined if one had cross-cultural measures of rule following that could be compared to existing ethnicity-level measures of state centralization. However, such measures do not exist. An alternative socially beneficial trait, although conceptually very different from rule following, is trust. This relationship has been previously estimated in

[15] As we report in Table A-I of the Supplemental Material, one reaches the same conclusion by estimating equation (1) using the outcomes in each of the different rounds separately.

[16] The results are qualitatively identical if instead one uses an indicator for the incidence of any missing money.

[17] Supplemental Material Table A-III reports estimates for the full sample, while Supplemental Material Table A-IV restricts the control group to only include the Lele.

Nunn and Wantchekon (2011). In their analysis of the slave trade and trust, one of their control variables is pre-colonial state centralization taken from the *Ethnographic Atlas*. Although the coefficients for the control variables, including state centralization, are not reported in the published version of the paper, we report these estimates in Supplemental Material Table A-XX. The authors examined four measures of interpersonal trust and one measure of trust in local government. Their estimates show that in four of the five specifications, state centralization is *negatively* correlated with trust.

Taken together, the evidence suggests that the Kuba state is associated with a deterioration of intrinsic propensity to follow the rules. These results do not imply that the Kuba Kingdom was not a highly successful and well-functioning state. From the historical and anthropological literature, we know that it was. Although the state was prosperous and orderly, the evidence suggests that it eroded the intrinsic preference of its subjects to follow rules. As we show below, the evidence for mechanisms suggests that it was exactly the success of the Kuba Kingdom—that its institutions proved capable of encouraging socially desired behaviors—that caused a decline in rule-following preferences. Before turning to channels, we first address a number of issues that potentially affect the interpretation of the results just presented.

6. EXAMINING POTENTIAL CONFOUNDERS: MIGRATION, GEOGRAPHY, AND OTHER CULTURAL TRAITS

Our sample includes individuals who no longer live in the treatment or control regions. They either migrated from their origin village themselves, or their ancestors migrated at some point in the past. Most migration to cities from rural villages is due to the better economic opportunities available in urban areas. Among the 195 individuals in our sample who were born outside of Kananga and migrated as adults, 144 (74%) migrated because of the greater educational or economic opportunities available in the city. Most of the remaining sample, an additional 23 individuals (12%), migrated because of marriage.[18]

Despite the economic motivation behind migration, there remains the concern that individuals who moved to Kananga experienced a selection process that differed systematically between Kuba and non-Kuba descendants, thereby biasing our estimates. Motivated by this possibility, we check for differences in observables between the Kuba and non-Kuba populations in each of our three samples of interest.

The first characteristic that we examine is the extent to which an individual is a recent migrant, measured by the fraction of their life that has been spent living in Kananga. We also construct three variables that measure whether individuals are integrated into the broader community in Kananga or living within an ethnic enclave. Using information collected about respondents' five closest friends, we calculate the fraction of their friends that are coethnics. Using information on the ethnic composition of neighborhoods in Kananga from the screening surveys (with a sample of approximately 5,500), we calculate the share of the population in each person's neighborhood that belong to the same ethnicity as they do. We also calculate the ethnic diversity of their neighborhood, measured as one minus the Herfindahl index of ethnic concentration.

Differences between the Kuba and non-Kuba samples are reported in panel B of Table II. Within the full sample, we do observe some statistically significant differences. Kuba descendants have spent less of their life in Kananga on average, have fewer close

[18]See Supplemental Material Table A-V for the distribution of all reasons for migration. In addition, Supplemental Material Table A-VI shows that the frequency of reasons is balanced between the different groups.

TABLE II

BALANCE TABLE FOR POTENTIAL CONFOUNDERS[a]

	Full Sample ($n = 499$)			Central Kuba vs. Lele Sample ($n = 105$)			Bushong vs. Lele Sample ($n = 82$)		
		Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference	
	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates
Panel A. Baseline Individual Characteristics									
Age	41.68	−2.434		36.84	5.159*		36.21	5.106	
		(2.173)			(3.024)			(3.234)	
Female Indicator	0.465	−0.152**		0.314	0.072		0.268	−0.010	
		(0.061)			(0.092)			(0.099)	
2014 indicator	0.597	−0.116*		0.410	0.118		0.402	0.133	
		(0.060)			(0.098)			(0.109)	
Panel B. Immigration									
Immigrant indicator	0.537	0.045	0.032	0.552	−0.0663	−0.0338	0.561	−0.0646	−0.0586
		(0.061)	(0.061)		(0.0991)	(0.0979)		(0.111)	(0.113)
Fraction of life in Kananga	0.663	−0.111**	−0.086*	0.553	0.0979	0.0770	0.540	0.0947	0.0968
		(0.045)	(0.044)		(0.0833)	(0.0817)		(0.0943)	(0.0946)
Proportion of 5 closest friends that are coethnic	0.455	−0.110***	−0.102**	0.377	−0.0180	−0.0305	0.398	0.0214	0.0205
		(0.041)	(0.041)		(0.0618)	(0.0652)		(0.0702)	(0.0720)
Share of own-ethnicity in neighborhood	0.303	−0.249***	−0.236***	0.117	−0.0283	−0.0214	0.133	−0.0027	0.0081
		(0.036)	(0.036)		(0.0304)	(0.0317)		(0.0378)	(0.0391)
Ethnic diversity of neighborhood	0.572	0.097***	0.090***	0.666	0.00978	0.0144	0.664	0.00831	0.0190
		(0.023)	(0.023)		(0.0316)	(0.0331)		(0.0379)	(0.0402)
Panel C. Geography									
Maize suitability index, 0–100	23.10	−0.249	−0.350	23.07	−0.159	0.118	23.12	−0.080	0.120
		(0.217)	(0.224)		(0.609)	(0.676)		(0.613)	(0.670)
Cassava suitability index, 0–100	46.69	−0.139	−0.132	47.34	−1.170	−0.437	47.60	−0.917	−0.375
		(0.554)	(0.566)		(1.508)	(1.591)		(1.529)	(1.596)

(*Continues*)

TABLE II—*Continued*

	Full Sample ($n = 499$)			Central Kuba vs. Lele Sample ($n = 105$)			Bushong vs. Lele Sample ($n = 82$)		
		Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference	
	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates
Panel D. Trust in Foreign Researchers									
Trust in international organizations, 1–4	2.846	−0.010	−0.103	2.867	−0.151	−0.021	2.927	−0.060	−0.038
		(0.119)	(0.117)		(0.194)	(0.196)		(0.224)	(0.230)
Trust in other nationalities, 1–4	2.816	−0.048	−0.0522	2.876	−0.213	−0.240	2.915	−0.184	−0.201
		(0.104)	(0.105)		(0.161)	(0.171)		(0.178)	(0.191)
Trust in universities, 1–4	3.074	0.135	0.0147	3.267	−0.284*	−0.129	3.354	−0.169	−0.041
		(0.114)	(0.109)		(0.154)	(0.153)		(0.165)	(0.162)
Panel E. Altruism Towards Others									
DG allocation to citizen of Kananga	319.8	−5.76	−3.80	282.9	17.44	13.59	280.5	16.75	17.64
		(24.65)	(24.95)		(39.18)	(41.76)		(42.04)	(45.10)
DG allocation to coethnic citizen of Kananga	335.3	−10.74	−12.66	301.9	−24.11	−15.28	295.1	−44.86	−28.72
		(22.09)	(22.37)		(37.41)	(38.52)		(39.90)	(41.38)
DG allocation to non-coethnic citizen of Kananga	314.7	−14.56	−14.09	286.7	−30.77	−26.28	279.3	−54.55	−45.81
		(23.44)	(23.74)		(41.69)	(43.38)		(46.41)	(48.67)
DG allocation to provincial government	304.7	−21.86	−13.24	231.2	−2.075	−3.450	219.7	−26.55	−27.84
		(27.15)	(27.43)		(37.03)	(39.13)		(39.00)	(41.77)
Average DG allocation to all parties	319.8	−14.94	−12.46	272.8	0.917	−0.863	266.5	−12.00	−8.693
		(21.17)	(21.43)		(35.20)	(36.74)		(37.14)	(39.74)
Panel F. Understanding of the Games									
Proportion incorrect of four math questions, 0–1	0.419	−0.0336	0.00276	0.381	0.0298	−0.0152	0.351	−0.0281	−0.0546
		(0.0387)	(0.0358)		(0.0596)	(0.0581)		(0.0630)	(0.0636)
Proportion incorrect of six RAG questions, 0–1	0.138	0.0082	0.0292	0.113	0.0647**	0.0393	0.098	0.0488	0.0244
		(0.0234)	(0.0222)		(0.0309)	(0.0314)		(0.0329)	(0.0335)
Proportion incorrect of six UG questions, 0–1	0.087	0.00327	0.0165	0.070	0.0615***	0.0453*	0.063	0.0624**	0.0523*
		(0.0167)	(0.0163)		(0.0230)	(0.0236)		(0.0256)	(0.0272)

[a]The table reports balance statistics. An observation is an individual in our sample. The statistics are reported for each of our three samples of interest.

friends who are coethnics, live in neighborhoods with fewer coethnics, and live in more ethnically diverse neighborhoods. This is true, whether or not we condition on our baseline set of covariates. However, in the restricted samples, these differences disappear. We find no statistically significant difference in any of the measures between central Kuba and Lele, or Bushong and Lele.

As an additional check, we re-estimate equation (1) while controlling for the five immigration variables. We find that the estimates remain robust (see Supplemental Material Tables A-VII and A-VIII). We also restrict our sample to only include individuals who were born and raised in Kananga.[19] Because those in this subsample did not migrate themselves, selection effects are likely weaker in this population. We find that the estimates are very similar (see Supplemental Material Table A-IX).

Another possible source of bias is geographic differences between the Kuba Kingdom and the surrounding areas.[20] Any differences that exist could bias our estimates if they have an independent effect on cultural evolution. We examine this possibility using fine-grained data on the suitability of land for the cultivation of maize and cassava (the two staples of the region), both measured on a 0 to 100 scale.[21] We find no difference between the suitability of the origin villages of Kuba and non-Kuba descendants (see panel C of Table II).[22]

As noted, one benefit of examining the Kuba Kingdom is that its boundaries were by-and-large determined by a network of rivers and stable over time. As shown in Figure 1, this is true for all borders except the southeast portion of the Kingdom, which did fluctuate over time. This raises the concern that this portion of the boundary may be endogenous to the cultural characteristics of the villages in the area. To address this possibility, we estimate equation (1) while omitting villages that are within 10, 20, 30, 40, or 50 kilometers of this portion of the boundary. As reported in Supplemental Material Table A-XI, the estimates are very similar, and slightly larger in magnitude, when these villages are omitted.

An important assumption of our analysis is that behavior in the games reflect preferences against cheating and for rule following. Although previous studies provide verification of this for cheating games that have a similar structure to the RAG (e.g., Hanna and Wang (2014), Cohn, Marechal, and Noll (2015), Cohn and Marechal (2016)), it is possible that other factors—namely, trust in the researchers, altruism towards the other player, or understanding of the rules of the game—could also affect behavior.

Participants' trust of our research team could very well influence their behavior in the experimental games. Although our enumerators are all from Kananga, participants were aware that researchers from Harvard University were overseeing the project. Thus, their actions in the RAG could have been shaped by their view of us, and, in particular, whether they trusted that we really would give the amount allocated to player 2 in the RAG and

[19] As well, because these are all individuals who were born and raised in the same location, but with different cultural backgrounds, we can be more confident that we are capturing a purely cultural channel.

[20] In fact, Mary Douglas (1962, 1963) conjectured that potential differences in crop suitability across the Kasai river may partially explain differences between the Kuba and Lele.

[21] The data, which are from the FAO's GAEZ database, are available at a resolution of 5 arc minutes (approx. 6 miles). Maps showing the cultivation indices, along with the origin villages for the participants in our sample, are provided in the paper's online appendix.

[22] While the average maize suitability in the sample is approximately 23 (of 100), the average difference between the Kuba and non-Kuba observations range from 0.08 to 0.25. For cassava suitability, the mean suitability measure is higher at around 47, while the gap only ranges from 0.14 to 1.17. None of these differences are statistically significant. As well, the estimates of equation (1) are robust to the inclusion of these controls (Supplemental Material Table A-X).

UG to another participant as we said we would (and in fact did). To test whether trust in our research team differed systematically between the Kuba and non-Kuba samples, we asked participants their level of trust in (i) universities, (ii) international organizations, and (iii) people from other countries. Respondents chose (with assigned numeric values in brackets) between: not at all (1); not very much (2); somewhat (3); and completely (4). Estimates of the differences in the trust measures between the Kuba and non-Kuba samples are reported in panel D of Table II. Of the 18 differences reported, only one is statistically different from zero, and in general, the magnitude of the differences is quite small.[23]

Another possibility is that historical state formation also affected altruism. If the Kuba were less altruistic towards the recipients in the RAG, then this, rather than rule following, could explain why they are more likely to cheat. To check, we also had participants play a version of the standard dictator game (DG), where participants divide 1,000CF between themselves and a second player. Each participant played four rounds of the DG, in each round dividing 1,000CF between themselves and another anonymous individual, either (i) someone from Kananga, (ii) someone from the same ethnic group in Kananga, (iii) someone from a different ethnic group in Kananga, or (iv) the provincial government.[24] The estimated differences between the Kuba and non-Kuba populations are reported in panel E of Table II. We find no statistically significant difference in the measures of altruism between the two groups.[25]

A final possibility is that Kuba participants had a better understanding of the games, and therefore were better able to understand how they could break the rules and cheat. The experimental setup was designed so that all participants had a full understanding of the game before playing. After the rules of the game were explained, participants were asked a series of six questions that tested their understanding of the procedures of the game. If the participants got any of the questions wrong, the rules were re-explained, and the participant was asked the same or a similar set of questions again. This continued until the participant fully understood the experiment and could answer all questions.

We check for general cognitive differences between Kuba and non-Kuba participants by testing for differences in the answers to four simple math questions asked during our first visit. As we reported in panel F of Table II, we find no difference between the two groups. We also check whether the Kuba had a better initial understanding of the games by examining the proportion of the six questions (in each game) that participants got wrong when first asked. Our estimates show no evidence that the Kuba had a better initial understanding.[26] Finally, we also check that our estimates of equation (1) are robust to controlling for these measures (Supplemental Material Table A-XIV).

7. EXAMINING CAUSAL CHANNELS

We now turn to an examination of potential channels for our finding of greater cheating and less rule following among Kuba descendants.

[23] As well, the estimates of equation (1) remain robust when controlling for each of the three measures of trust (Supplemental Material Table A-XII).

[24] The division was done in the privacy of a tent and was made by placing the money for the other party in an envelope, sealing it, and then placing it in a bag outside the tent.

[25] We also confirm that our baseline RAG results are robust to controlling for altruism towards player 2 as measured by play in the DG (see Supplemental Material Table A-XIII).

[26] In fact, the estimated coefficients suggest that, if anything, Kuba participants got more answers wrong, although the coefficients are often insignificant.

7.1. *Transmission of Values From Parents to Children*

The model developed in Tabellini (2008b) illustrates an important effect that better-functioning formal institutions can have on cultural traits like rule following: when the state enforces desirable behavior, the benefit to parents of fostering an intrinsic preference in their children to engage in this behavior is reduced. The state ensures good behavior regardless of individuals' underlying preferences. Therefore, in equilibrium, better state enforcement can crowd out intrinsic preferences for socially desirable behavior.[27]

We explore this mechanism by examining the values that parents report as being important to teach their children. We measure this using the following survey question, which was taken from the World Values Survey: "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider especially important?" Respondents were then given a list of the following eleven traits: (i) Obedience; (ii) Feeling of responsibility; (iii) Tolerance/respect for others; (iv) Unselfishness/generosity; (v) Imagination; (vi) Independence; (vii) Self expression; (viii) Determination/perseverance; (ix) Hard work; (x) Thrift; (xi) Religious faith. Respondents were able to respond "yes" to any of the traits they felt were important to instill in their children.

We begin by first examining the extent to which the Kuba believe it is less important, on average, to teach children these values, which we measure by the proportion of the 11 traits the respondent answered "yes" to. Estimates of equation (1) with this measure as the outcome variable are reported in columns 1–3 of Table III. We find that, on average, the Kuba feel that it is less important to teach these values to their children.

We next turn to the traits that are most clearly related to rule following, which are the first four listed: obedience, feeling of responsibility, tolerance/respect for others, and unselfishness/generosity. Using responses for these traits, we examine the fraction of the four traits that a respondent believes are important to instill in children. Estimates of equation (1) with this as the dependent variable are reported in columns 4–6 of Table III. We find that, for all three samples of interest, Kuba parents feel it is significantly less important to instill these values in their children. This effect is statistically significant and sizable. The difference between the Kuba and non-Kuba is 0.16, which is sizable relative to the mean of the outcome variable, which is about 0.65. The estimates are also very similar if we use only 'obedience' as the outcome, which is arguably the trait that is most directly related to rule following (see Supplemental Material Table A-XV).

Examining differences between the main ethnic groups, we again find that the Kuba are 'exceptional'. Among the six largest ethnic groups in our sample, with the exception of the Bindi, the Kuba are the least likely to report the traits as being important to teach to children. Ethnicity-level means are reported in Supplemental Material Figure A-3.

We next turn to the traits that are least related to rule following. The estimates for these four traits provide a nice comparison to the estimates for the rule-following traits. It may be that the Kuba feel it is less important to teach their children values in general. Alternatively, it may be that the effect is specific to values related to good behavior and rule following. The four traits unrelated to rule following are: imagination, independence, self-expression, and determination/perseverance. Estimates with the outcome of interest

[27]Theoretically, it is not the case that better enforcement always crowds out parental investment (see Bisin and Verdier (2001), Hauk and Saez-Marti (2002), Benabou and Tirole (2003)). In fact, in Tabellini (2008b), enforcement that specifically targets matches between "distant" players crowds-in parental investment. Given our focus on interactions between agents within the Kuba state, and not cross-state interactions, it is less likely that this is the empirically relevant scenario of the model.

TABLE III

EXAMINING THE IMPORTANCE OF TEACHING VALUES TO CHILDREN[a]

	Fraction of Qualities That are Viewed as Being Important to Teach Children at Home								
	All Eleven Qualities Listed			Four Qualities Related to Rule-Following			Four Qualities Unrelated to Rule-Following		
	Kuba vs. all others	Central Kuba vs. Lele	Bushong vs. Lele	Kuba vs. all others	Central Kuba vs. Lele	Bushong vs. Lele	Kuba vs. all others	Central Kuba vs. Lele	Bushong vs. Lele
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Kuba ethnicity indicator	−0.062*	−0.131**	−0.137*	−0.078**	−0.159**	−0.165**	−0.019	−0.074	−0.086
	(0.035)	(0.062)	(0.071)	(0.038)	(0.066)	(0.074)	(0.045)	(0.078)	(0.088)
Baseline covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.54	0.52	0.53	0.67	0.63	0.66	0.42	0.44	0.44
Observations	499	105	82	499	105	82	499	105	82
R-squared	0.06	0.13	0.11	0.04	0.15	0.11	0.03	0.05	0.06

[a]The table reports OLS estimates of equation (1). The dependent variable is the fraction of qualities that the respondent reports being important to teach children at home. In columns 1–3, the dependent variable is the average across eleven quantities. In columns 4–6, the dependent variable is the average across four qualities that are related to rule following: obedience; responsibility; tolerance/respect for others; unselfishness/generosity. In columns 7–9, the dependent variable is the average across four qualities that are unrelated to rule following: independence, imagination, self-expression, determination/perseverance. "Kuba ethnicity indicator" is a variable that equals 1 if the individual's self-reported tribe is Kuba. All regressions control for a gender indicator, age, age squared, and a survey year fixed effect. Coefficients are reported with robust standard errors in parentheses. *,**, and *** indicate significance at the 10, 5, and 1% levels.

comprising the four traits are reported in columns 7–9 of Table III. The estimated Kuba effect is also negative, but much smaller in magnitude and statistically insignificant. Thus, the lower importance that the Kuba place on instilling values in their children appears to be concentrated among values related to rule following and good behavior.[28]

Overall, the results show that the Kuba state is associated with less parental investments to instill rule-following values in children.

7.2. *Income and Prosperity*

A potential mechanism underlying the effects we find is the greater historical prosperity of the Kuba Kingdom. The historical formation of states in sub-Saharan Africa tends to be associated with greater economic activity today (Gennaioli and Rainer (2007), Michalopoulos and Papaioannou (2013, 2014a, 2014b)), and this was also true for the Kuba Kingdom (Douglas (1962)). If historical income differences persist, they might explain the differences in rule following that we observe, especially given existing experimental evidence of the link between income and unethical behavior (e.g., Piff, Stancato, Cote, Mendoza-Denton, and Keltner (2012), Gino and Pierce (2009)).

We examine this by first checking for income differences between Kuba and non-Kuba descendants (panel A of Table IV). Since income is noisy and difficult to measure in resource-poor settings, we use a wide variety of different measures. Our first measure is a 1–5 index of individuals' perceived income status.[29] We also directly measure an individual's earned income, over the past year and over the past month, as well as whether the respondent was unemployed at the time of the survey. We also collected four additional measures of prosperity: an indicator that equals 1 if the house had non-dirt floors, an indicator that equals 1 if the house had a metal roof, the number of meals that is typically eaten in a day, and the number of times in the past week that the respondent went to bed hungry. The last set of measures that we collected were measures of human capital and health: education, height, and ratio of weight-to-height.

We find weak evidence that Kuba descendants are more prosperous today. In some specifications, the Kuba do appear to be more wealthy, but this result is not robust across the measures.[30] As we report in Supplemental Material Tables A-XVI and A-XVII, our findings are robust to controlling for income, measured using the first principal component of all measures.[31]

7.3. *The Colonial and Post-Colonial Periods*

Another potential explanation for our findings is that, because of the Kuba Kingdom's pre-existing state institutions, the Belgian colonists treated the Kuba differently than

[28]Three traits in our list do not map clearly into either group, and therefore we do not include them in either measure.

[29]Respondents were asked to imagine a scale from 1 to 5, where 1 is the poorest level on the scale and 5 is the richest. They were then asked to report the level at which they are situated relative to other people in Kananga.

[30]One explanation for the lack of a robust difference in prosperity between the Kuba and others is the fact that nearly everyone in the population is at subsistence. For example, in our sample of 499, the modal number of meals eaten per day in our sample is one (287 individuals; only 12 eat three meals per day), and the unemployment rate is 63%.

[31]The height and weight data required our respondents to travel to a local hospital in the city center. Because some respondents were unable to, or chose not to, make the trip, we are missing these data for 29 individuals. Thus, we report estimates without and with these variables included as a measure of income.

TABLE IV

BALANCE TABLE FOR POTENTIAL MECHANISMS[a]

	Full Sample ($n = 499$)			Central Kuba vs. Lele Sample ($n = 105$)			Bushong vs. Lele Sample ($n = 82$)		
		Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference	
	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates
Panel A. Income and Wealth									
Subjective income scale, 1–5	2.162	0.238**	0.188*	2.257	0.012	0.020	2.220	−0.066	−0.009
		(0.104)	(0.103)		(0.170)	(0.178)		(0.195)	(0.206)
ln Annual income	13.052	0.161	0.207	13.173	−0.043	−0.308	13.152	−0.100	−0.353
		(0.290)	(0.289)		(0.554)	(0.579)		(0.614)	(0.652)
ln Monthly income	10.736	0.122	0.152	10.700	0.073	−0.086	10.663	0.012	−0.178
		(0.248)	(0.247)		(0.463)	(0.483)		(0.512)	(0.541)
Unemployment indicator	0.631	−0.037	−0.046	0.657	−0.082	−0.141*	0.671	−0.073	−0.148
		(0.059)	(0.056)		(0.094)	(0.082)		(0.105)	(0.090)
Non-dirt floor	0.367	0.218***	0.210***	0.571	0.123	0.062	0.561	0.132	0.087
		(0.058)	(0.059)		(0.098)	(0.102)		(0.110)	(0.117)
Metal roof	0.930	−0.065**	−0.050	0.838	−0.005	0.016	0.854	0.028	0.022
		(0.031)	(0.031)		(0.074)	(0.073)		(0.079)	(0.081)
Meals per day	1.449	0.120*	0.092	1.514	0.025	0.036	1.439	−0.132	−0.079
		(0.066)	(0.065)		(0.107)	(0.109)		(0.121)	(0.124)
Nights hungry in last week	0.615	−0.256*	−0.246*	0.524	−0.115	−0.188	0.537	−0.117	−0.218
		(0.134)	(0.135)		(0.172)	(0.178)		(0.189)	(0.192)
Educational attainment, 0–4	3.024	0.373***	0.187**	3.524	−0.311**	−0.100	3.573	−0.283**	−0.168
		(0.111)	(0.084)		(0.135)	(0.107)		(0.132)	(0.110)
Height	166.03	1.776*	0.473	167.42	−0.567	0.879	167.89	0.310	1.212
		(1.062)	(0.885)		(1.642)	(1.412)		(1.772)	(1.612)
Weight-to-height ratio	0.356	−0.001	0.002	0.347	−0.003	−0.003	0.344	−0.011	−0.011
		(0.007)	(0.007)		(0.012)	(0.012)		(0.012)	(0.013)

TABLE IV—*Continued*

	Full Sample ($n = 499$)			Central Kuba vs. Lele Sample ($n = 105$)			Bushong vs. Lele Sample ($n = 82$)		
		Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference			Kuba vs. non-Kuba Difference	
	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates	Sample Mean	Not Accounting for Baseline Covariates	Accounting for Baseline Covariates
Panel B. Colonial Influence									
Mission station	0.752	−0.091	−0.094	0.781	−0.0250	0.0206	0.854	0.126	0.168*
		(0.071)	(0.070)		(0.093)	(0.096)		(0.081)	(0.086)
Power station	0.100	−0.090***	−0.084***	0.076	−0.182**	−0.187**	0.098	−0.182**	−0.185**
		(0.026)	(0.027)		(0.077)	(0.078)		(0.077)	(0.076)
Railway line	0.543	0.276***	0.264***	0.724	0.424***	0.418***	0.671	0.417***	0.399***
		(0.064)	(0.067)		(0.106)	(0.109)		(0.115)	(0.121)
Mines	0.002	−0.0024	−0.0021	0.000	0.000	0.000	0.000	0.000	0.000
		(0.0024)	(0.0022)		(0.000)	(0.000)		(0.000)	(0.000)
Panel C. Post Colonial									
Impact of Mobutu, 1–5 scale	4.090	−0.123	−0.043	3.860	0.082	−0.018	3.859	0.101	−0.032
		(0.146)	(0.146)		(0.262)	(0.272)		(0.303)	(0.314)
Perception of Mobutu, 1–5 scale	3.894	−0.054	0.026	3.570	0.498*	0.414	3.606	0.700**	0.562*
		(0.162)	(0.161)		(0.292)	(0.305)		(0.324)	(0.335)
Mobutu ST-IAT D-Score	0.104	−0.078	−0.082	0.157	−0.122	−0.056	0.185	−0.095	0.002
		(0.060)	(0.061)		(0.096)	(0.097)		(0.112)	(0.113)

[a]The table reports balance statistics. An observation is an individual in our sample. The statistics are reported for each of our three samples of interest.

other groups. This in turn could have affected beliefs and behaviors concerning rule following. We explore this mechanism by measuring colonial investments in mines, railroads, electricity stations, and mission stations.[32] Using digitized data from Mantnieks (1951), we construct indicator variables for the presence of each type of colonial investment within 30 kilometers of an individual's origin village. The differences in the means of the measures across Kuba and non-Kuba observations are reported in panel B of Table IV. We find that Kuba ancestors were less likely to be near a power station, but more likely to have been near a railway line. Both of these differences are statistically significant in each of the three samples.

Motivated by these differences, we re-estimate equation (1), controlling for the colonial control variables (Supplemental Material Table A-XVIII). The reduced-form Kuba effect remains robust to the inclusion of these colonial control variables. Although the standard errors increase slightly, the point estimates remain stable, and in four of the six specifications, the magnitude of the Kuba effect actually increases after controlling for the colonial covariates. Thus, it is unlikely that the effect we find works through differential colonial contact.

Another possibility is that the Kuba were treated differently by the government of President Joseph Mobutu Sese-Seko during the post-colonial period, and that this explains part of the differences that we observe. Since there is little available data from this period, we focus on individuals' subjective attitudes towards President Mobutu. If the regime treated certain areas or ethnic groups in systematically different ways, this will likely be reflected in individuals' attitudes towards the former president. We collected two survey-based measures of attitudes towards Mobutu. First, we asked respondents to report their view of former President Mobutu, choosing between: very negative, somewhat negative, neutral, somewhat positive, and very positive. We also asked respondents their view of the overall impacts of Mobutu, using the same scale. For both measures, we created variables that take on 1–5 integer values and are increasing in the positivity of the reported view. Because participants might be unwilling to answer questions about potentially sensitive political figures truthfully, we also measured individuals' attitudes towards former President Mobutu using a single-target implicit association test (ST-IAT). The test, which is a variant of the original IAT, is intended to measure the positivity or negativity of individuals' implicit association of a single target (in our case, Mobutu). The measure of interest is the 'D-score', which captures the extent to which the participant has a positive view of Mobutu.[33]

The differences between Kuba and non-Kuba respondents are reported in panel C of Table IV. In general, we find no systematic difference between the two groups. The coefficients are generally small in magnitude and statistically insignificant. If we re-estimate our baseline equation (1) while controlling for these covariates, we obtain very similar estimates (see Supplemental Material Table A-XIX). Thus, the reduced-form Kuba effect does not appear to be due to differential treatment during the post-colonial period.

8. CONCLUSIONS

We have investigated the impact of living under a centralized state on internal norms of rule following. Exploiting a natural experiment that has been well-studied in the anthropology and history literatures, we have estimated the long-run impacts of the formation of

[32] Maps showing the locations of the colonial investments are provided in the paper's Supplemental Material.

[33] Full details of the IAT are provided in the paper's Supplemental Material. Also see Lowes, Nunn, Robinson, and Weigel (2015) for a test of the validity of the ST-IAT in using food, spiders, and snakes as targets.

the Kuba Kingdom. The Kingdom arose due to an institutional innovator named Shyaam, and its boundaries were determined by the local system of rivers. The historical episode is attractive from an empirical point of view because it took place in a region inhabited by a population that was ex ante culturally homogeneous, some of whom, specifically the Lele, did not end up within the Kuba state.

Using two experimental measures of rule following—the resource allocation game (RAG) and the ultimatum game with the potential for theft (UG)—and examining three samples motivated by the historical natural experiment, we found a robust negative effect of the Kuba Kingdom on norms of rule following. Kuba descendants are *less* likely to follow rules and *more* likely to steal. This finding is consistent with recent models where endogenous investments to inculcate values in children decline when there is an increase in the effectiveness of formal institutions that enforce socially desirable behavior. Consistent with such a mechanism, we found that Kuba parents feel that it is less important to teach their children values related to rule following.

We end by reminding the reader of an important caveat of our analysis. We have estimated the causal impact of one treatment—the presence of the Kuba Kingdom relative to the absence of a state—on norms of rule following. Although we view our findings as valuable evidence about a question that is difficult to study empirically, our analysis is only able to assess the causal impact of a particular bundle of state institutions. We cannot estimate the causal impacts of different components of the bundle. In particular, whether the effects we find arise due to the state's formal judicial system, system of taxation, formal protection of property rights, or the economic expansion it engendered remains unanswered. To answer this question, it will be necessary to accumulate evidence from a variety of states with different characteristics, which would allow for a finer examination of particular aspects of state institutions. We view this as a fruitful avenue for future research.

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