The Evolution of Culture and Institutions: Evidence from the Kuba Kingdom[*]

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Abstract: 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.

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1. Introduction

Recent evidence suggests that both culture and institutions are important for economic development.[1] Institutions are typically defined as the external 'rules of the game' that shape individuals' expected material payoffs for different actions. Culture, by contrast, is generally defined as values, beliefs, and preferences that are internal to individuals in a society. 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 culture.

There are a number of plausible ways that institutions could affect cultural traits. One possibility is that stronger institutions inculcate cultural norms 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. Sociologist Norbert Elias (1994) argues 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), argues 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.[2] Michel Foucault (1995) argues 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.

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. A large body of evidence has accumulated showing that external material incentives often crowd out intrinsic motivations (Deci, Koestner and Ryan, 1999, Bowles and Polania-Reyes, 2012). Motivational crowding-out is a phenomenon that occurs at the individual-level and over short time frames, and is generally not thought to operate in the longer run. However, a similar mechanism

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[1]On the importance of institutions for economic development see e.g., North and Thomas (1973), Acemoglu, Johnson and Robinson (2001), and Acemoglu and Robinson (2012), and on the importance of culture see e.g., Greif (1994), Tabellini (2008a), Tabellini (2010), and Algan and Cahuc (2010).

[2]Also see Johnson (2014), who, in the spirit of Weber, empirically documents a relationship between state institutions and civic mindedness in 17th and 18th century France.

that operates over multiple generations can be found in the model developed by Guido 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 one's best interest not to cooperate. However, individuals also have an intrinsic preference against cheating.[3] 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.[4]

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 becomes 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.[5] 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.[6]

Although Tabellini (2008b) does not provide a test of this mechanism of his model, there is existing evidence consistent with such a crowd-out effect. For example, Guiso, Sapienza and Zingales (2004) find 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 is also fits with historical arguments that states can induce perverse cultural dynamics, which ultimately lead to their collapse, ancient Rome being perhaps the most prominent example (e.g., Gibbon, 1996, MacMullen, 1990).

In this paper, we empirically test the long-term impact of state formation on individuals'

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[3]Each individual is randomly paired with another individual, both of whom are represented as randomly chosen points around a circle. The disutility from cheating is decreasing in the distance between the two players, and there is a threshold distance for which a player will cooperate when playing against players who are within this threshold and will not cooperate when playing against players who are beyond this threshold.

[4]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.

[5]In the model, this effect occurs when better enforcement has more bite for close matches. Given our interest in within state interactions, not cross-state interactions, we view this as the empirically relevant scenario of the model.

[6]Benabou and Tirole (2003) also have a model in which extrinsic rewards can crowd out intrinsic motivations. The setting and mechanism is very different from that in Tabellini (2008b). In their principal-agent framework, the crowding-out effect arises because the rewards offered by the principal provides information to the agent about her ability to successfully complete the task and the disutility she will experience from the task.

propensity to follow rules and obey laws. Our analysis exploits variation from a natural experiment of history 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, as they were all part of a single group that had recently migrated from the northwest. 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 study focuses on this particular historical episode, which provides a natural setting that can be used to estimate the impact of state formation on rule following. While the villages on the Kuba side of the rivers that formed the Kingdom's boundaries were unified into a centralized state, the villages on the other side of these rivers continued to exist as independent villages and small chieftaincies. Thus, 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).[7] 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.

Our sample is drawn from the local provincial capital, Kananga, the largest city in the region. Thus, individuals in our sample no longer live in their ancestral villages. They or their ancestors migrated to the provincial capital. Examining this population has several benefits. First, it is logistically easier to work in one city, rather than a number of rural villages, in a region where the transportation and communication infrastructure is extremely poor. Second, by considering a population of immigrants with different institutional backgrounds, but within the same current environment, we are better able to measure and estimate cultural differences.[8]

In our analysis, we consider three samples. The first sample is the largest and includes

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

[8] Guiso et al. (2004), Giuliano (2007), Fernandez and Fogli (2009), Alesina, Giuliano and Nunn (2013) are examples of other studies that have also undertaken a similar strategy.

all individuals whose ancestors lived inside and just outside the Kuba Kingdom. 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 analysis compares the central Kuba (the Children of Woot who were inside the Kuba Kingdom) to the Lele. 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. This comparison has two motivations. The first is the existing anthropological literature, which has focused on comparisons of the Bushong and Lele (e.g., Douglas, 1962, 1963, Vansina, 1963, 1964, 1978, 1990, 2010). Second, 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.[9]

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, *more* theft, and *more* cheating. 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 that are larger in magnitude than 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 reverse causality 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

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[9]The relationship between each of these groups, and their ancestral origins, is shown in appendix figure A1.

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. First, we check whether the observed differences arise spuriously due to selective migration into our sample. Using information on individuals' migration histories, we find no systematic differences in this dimension between Kuba and non-Kuba descendants, in our more restrictive samples. In addition, controlling for these observable characteristics does not affect our baseline estimates. Second, we also check whether our findings are due to differences in the geography of Kuba and non-Kuba ancestral villages. Using fine-grained crop suitability data, we show that the geography of the two groups is very similar, and that our estimates are robust to controlling for geographic characteristics. The final threat to inference that we consider is the possibility that other individual traits, that are conceptually distinct from rule following but could affect our rule-following measures, are different between the Kuba and non-Kuba. In particular, we consider whether differences in individuals' trust in foreign researchers, differences in altruism toward the other player, or differences in their ability to understand the rules of the experimental games explain the effects we find. Using survey questions to measure trust and participants' ability to understand the rules of the game, and behavior in the dictator game to measure altruism toward the other player, we show that none of these three traits explains the lower incidence of rule following among the Kuba.

Our analysis then turns to underlying mechanisms. With Tabellini's (2008b) model in mind, we test whether Kuba institutions are associated with lower investments by parents to instill values related to rule following and against cheating. Examining 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. This difference is sizable and statistically significant in each of our three samples. 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. Thus, consistent with the Tabellini (2008b) model, the evidence suggests that the Kuba state did cause a decline in investments made by parents to teach values associated with rule following to their children.

We then examine alternative channels that could underlie our findings. We first consider

income and prosperity today. By all accounts, the establishment of the Kuba Kingdom facilitated economic growth and development in the region, 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 measure of current income; information about the locations of colonial investments, namely mission stations, electrical power stations, railway lines, and mines; and individuals implicit and explicit views about former president Joseph Mobutu, who was in power from 1965–1997. Using these measures, we find no evidence that the lower rates of rule following among the Kuba are explained by either of these channels.

Our study contributes to 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 the strategy of these papers, which is to look at a broad cross-section of data. The benefit of our strategy is that causal inference is improved. However, an important caveat is that our estimates are for one particular state, the Kuba Kingdom. This is important since the causal impact of state formation may depend on the nature of the state being considered. In addition, we are evaluating the impacts of a package of institutions, and with only one treatment, we are unable to provide causal estimates of particular components of the state or its policies. However, we believe that the Kuba Kingdom is an informative treatment because it approximates a modern bureaucratized state with established formal institutions and the rule of law.

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 (2015) compare the long-term effects of living under the Habsburg Empire versus the Ottoman Empire; Tabellini (2010) examines the effects of living within nation states with greater or fewer constraints on the executive; and Hruschka et al. (2014) examines current nations and the link between public good provision and cheating.[10]

We now turn to a more detailed discussion of the historical episode we exploit in our analysis.

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[10]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, 2016). In these studies, participants first participate in a experiments where the structure (i.e., institutions) of the game are varied to induce different behavior. They then test whether behavior in subsequent one-shot games are affected by the previous games. The studies find that institutions that generate cooperative behavior in the repeated games generate cooperative spillovers in the one-shot games.

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 and provide a direct test of the mechanism described in the Tabellini model. Section 8 concludes.

2. Historical Background

We now turn to a brief overview of the historical setting. For the interested reader, we provide a more thorough description in the paper's online appendix.

A. *Migrations Prior to the Formation of the Kingdom*

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, Vansina, 1990, Map 4.4, p. 124). Following Vansina (1978, p. 5), we refer to the group of five clans 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, who had a son called Woot, the first man. 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, along with the surrounding groups, speak Bantu languages descended from Mongo and, according to Gunthrie's (1971) classification, both Bushong and Lele diverged from it, indicating common linguistic and cultural roots. The languages of the other central Kuba, like the Ngeende and Bieeng, are considered dialects of Bushong. In a companion project, we are working with population geneticists to verify the oral history of the Kuba and Lele using genetic data. Specifically, saliva samples were taken from participants, and their was DNA sequenced.
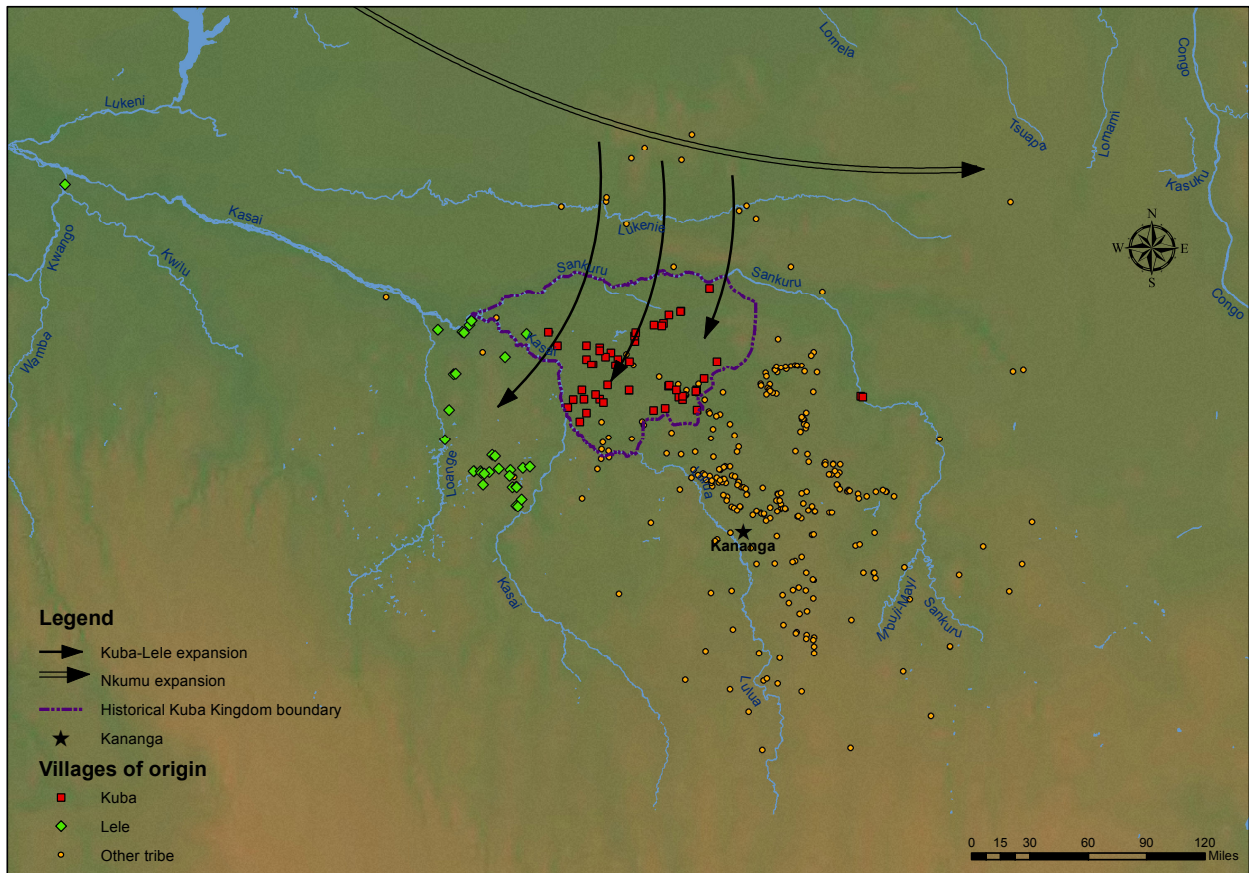
Figure 1: Map showing the migration of the descendants of Woot, the approximate historical boundaries of the Kuba Kingdom, the location of the origin villages within the sample, and Kananga.

Initial analysis confirms the common ancestry of the Kuba and Lele, with a more recent isolation of the Lele population.

B. *The Formation of the Kuba Kingdom*

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. In particular, he connected the Kuba to the Mbuun trade, which itself was connected with the external Atlantic trade via the Kongo Kingdom. It is believed that he

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introduced a number of new technologies, including new world crops (e.g., tobacco, cassava, and maize), skills and ideas (e.g., knowledge of how to make raffia cloth and palm wine), and institutional innovations (e.g., initiation rituals, ceremonial knives, the royal charm, and the belt of office) (Vansina, 1978, pp. 59–65). Although the story of King Shyaam may seem exceptional, the formation of Kingdoms by outsiders was not uncommon in Africa historically. According to Marshall Sahlins (2008), this is because these "stranger kings" were often in the best position to arbitrate pre-existing disputes as they were not associated with any side or vested interest.

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, in relation to these rivers, in which Shyaam began the Kingdom. Our interpretation of the formation of the Kuba Kingdom as a natural experiment relies on the assumption that these factors are unrelated to any pre-existing differences in the populations or the environment, which could affect our outcomes of interest.[11]

The Kuba Kingdom was not the only large precolonial state in Central Africa, but it was the only such state in our region of interest (Vansina, 1966b).[12] 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.[13] In particular, as we discuss below, the Lele were considerably less centralized than the Kuba. Their chiefs had minimal authority, and there were no professional bureaucrats, judges, or policemen (Douglas, 1963).

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[11]Figure 1 shows the maximal extent of the Kingdom. The boundaries that coincide with rivers were established early and remained stable throughout the history of the Kingdom. However, the southeast boundary of the Kingdom was less stable and moved overtime. As we discuss below, all of our results are robust to the omission of observations close to this portion of the boundary.

[12]The nearest states were the Lunda Kingdom, hundreds of miles to the south in northern Angola, which formed around the same time; the Luba Kingdom, hundreds of miles to the southeast in modern-day Katanga, which formed slightly earlier; and the Kanyok state, an offshoot of the Luba, which split in the 18th century (Reefe, 1981, Bustin, 1975, Yoder, 1992).

[13]For example, the Luluwa, the dominant ethnic group in our sample, at the time of colonization, were organized into separate villages under nascent chiefs (Martens, 1980, p. 40). This organization was typical for the groups surrounding the Kuba, including the Chokwe (McCulloch, 1951), the Kete and Coofa (Vansina, 1978, p. 5), the Luntu and the Songe (Vansina, 1966a, pp. 168–169; Torday and Joyce, 1922), the Tetela (Torday and Joyce, 1922), the Sala Mpasu (Pruitt, 1973), and the Cwa and residual Mongo north of the Sankuru (Vansina, 1966a, pp. 87–89).

C. *The Organization of the Kuba Kingdom*

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 Kingdom conducted annual censuses that were used to levy annual taxes on all villages in its domain. It also required *corvée* labor, for public works projects, such as building and maintaining the Kingdom's government buildings and its extensive network of roads and bridges. Overall, the Kuba Kingdom was among the most bureaucratized pre-colonial states in all of sub-Saharan Africa (Vansina, 2010, p. 46, Torday and Joyce, 1910, pp. 53–56).

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) describes 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.

Though the Kuba did not have writing, Vansina describes their "corpus of substantive law" based in part on the principle, "the graver the offense, the heavier the penalty" (Vansina, 1971, p. 141–142). He writes, "Kuba courts do not seem to have invoked specific precedents, but legal analogy was used. The scale of penalties alone indicates that comparison between cases was made" (Vansina, 1971, p. 146). Vansina also notes that the legal terminology used clearly indicates that the courts served to provide "justice". For instance, a "case" is referred to as *matyeen*: "things looked at with care" and "things scrutinized" (Vansina, 1971, p. 144).

D. *The Kuba-Lele and Bushong-Lele Comparisons*

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) compares 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 embracing 70,000 people...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. She notes 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).

E. *The Kuba Kingdom during the Colonial and Post-Colonial Periods*

During the period of the Congo Free State (1885-1908), all parts of Kasai were part of a concession granted to the Compagnie du Kasai, which engaged in intense and brutal rubber collection. This was a vast area that included nearly a quarter of modern DRC, including the Kuba Kingdom and the surrounding regions. Importantly for our analysis, the impact of the Compagnie de Kasai seems to have been fairly uniform across Kasai in general, and across our area of study in particular (Martens, 1980). In addition, the evidence also suggests that the Kuba Kingdom was impacted in similar ways to other surrounding peoples during the subsequent colonial period. Importantly, the Kuba do not appear to have received preferential treatment because of their level of institutional development. The form of indirect rule that was established in the Kuba Kingdom "had a great deal in common with colonial rule elsewhere in Congo" (Vansina, 2010, p. 208). Under this rule, the Kuba were subject to the same colonial impositions, such as forced crop production, head taxes, and labor services.

Less information is available on the post-colonial period. After an ill-fated attempt at secession between 1960 and 1962, the Kasai region fell into sustained decline during the kleptocratic regime of Joseph Mobutu between 1965 and 1997 (Callaghy, 1984, Turner and Young, 1985, Van Reybrouck, 2015). Mobutu's regime was characterized by a severe neglect of infrastructure and public goods provision. There was also very little collection of data; existing censuses from the period are regarded as highly unreliable. Despite this, the Kuba Kingdom persisted, although not immune to the institutional decay that affected all traditional political structures during this period. The Kingdom's persistence was verified by the authors during a visit to Mushenge, the capital of the Kingdom, in the summer of 2013. During the trip, we met with the royal court to confirm information from the secondary literature and to learn more about the Kingdom's surviving customs and institutions.

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.[14] 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 online appendix. Our random sample comprised 2,097 households (1,031 in 2013 and 1,066 in 2014). Because the random sample yielded a relatively small number of observations with ancestors who were 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 788 individuals in 2013, and 1,908 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 this criteria.

Participants in our study were visited by enumerators three times after the initial screening survey. In the first visit, we collected basic demographic information, as well as information on individuals' migration histories. During the second visit, we administered one of our measures of rule following, the ultimatum game with theft. We also administered the standard dictator game to obtain a measure of altruism, a characteristic we were interested in measuring since it could affect behavior in our games that are meant to measure rule following. During the third visit,

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[14]An example of this strategy in a within-country setting is Guiso et al. (2004). Examples in a cross-country setting are Giuliano (2007), Fernandez and Fogli (2009) and Alesina et al. (2013).

we administered our second measure of rule following, the resource allocation game (RAG). 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.

The 499 individuals in our analysis span 15 different ethnic groups. The ethnic composition of the full sample is reported in appendix table A3. The largest ethnic group in the sample is the Luluwa (160 individuals), 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", namely those who descended from Woot. Further, 38 of the 80 (48%) are Bushong.[15]

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 pre-specified rules (Hruschka et al., 2014).[16] 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 equal to 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

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[15]This information is obtained from respondents self-reported "sub-tribe". This distribution is similar to the distribution reported in Vansina (1978, p. 5). In 1953, he calculated that 63% of the villages within the Kingdom were occupied by the "central Kuba".

[16]For a similar experiment that also tests for rule breaking see Fischbacher and Follmi-Heusi (2013).

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.[17] After all games were played, the enumerator brought the bag back to the central office. Thus, the enumerator never physically handled 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 2a, 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%).[18] In addition, we find that Kuba descendants consistently allocate less to the other party than non-Kuba descendants.[19] In figure 2b, 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 viewed equally by 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

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

[18]Our figure of 33% is inline with findings from previous studies. Hruschka et al. (2014) implemented the RAG using eight samples from six countries. In their game, player 2 was a randomly chosen person that belonged to a an outgroup, with the definition varying by sample. The average amount allocated to player 2 ranged from 37.4% in Fiji to 55.1% within a religious and urban population in the U.S. McNamara, Norenzayan and Henrich (2014) implemented a version of the RAG in Fiji, where the average allocation to player 2 was 37%.

[19]In appendix figures A10a–A10c, 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.
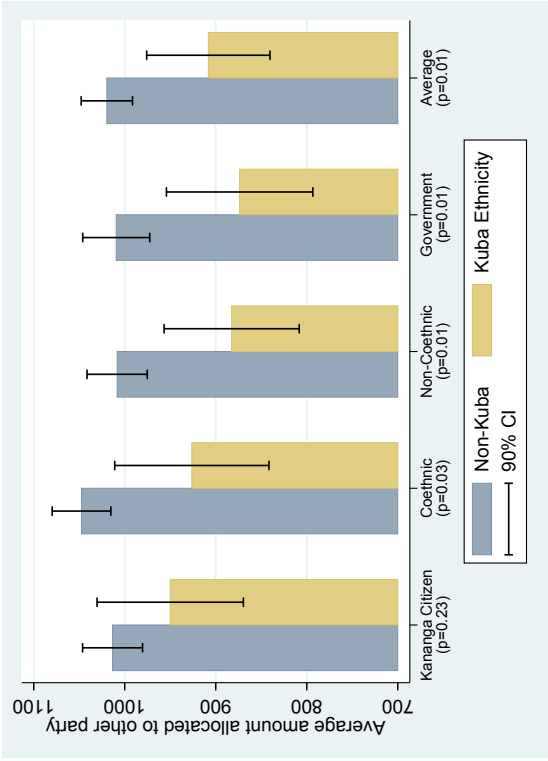
(a) Average allocations (of 3,000CF) to the other party in the RAG, for Kuba and non-Kuba descendants.
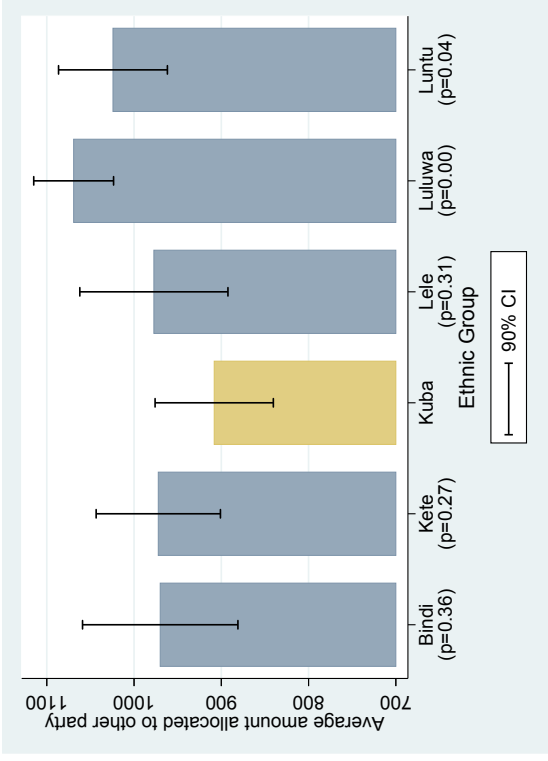
(b) Average allocations (of 3,000CF) to the other party in the RAG, for the six largest ethnic groups.
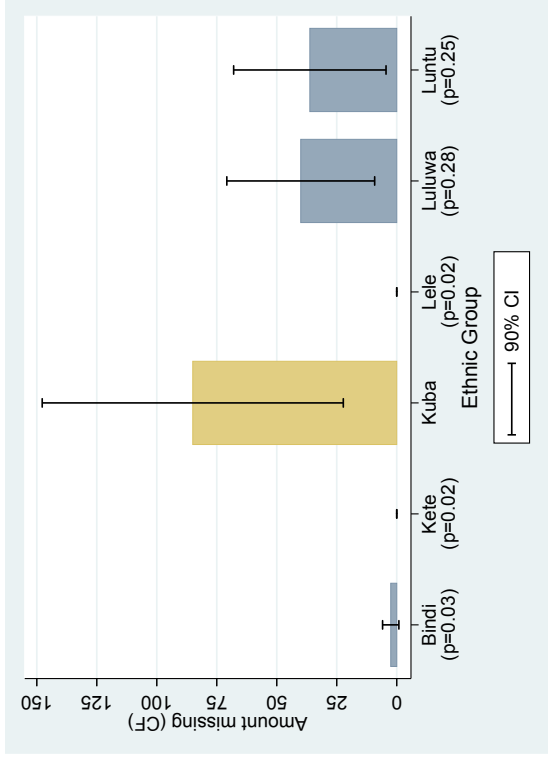
(c) Average amount of money missing from three rounds of the Ultimatum Game, for the six largest ethnic groups.

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.

our RAG measure with an alternative measure of rule-breaking, where the rule being broken is less ad hoc and strange 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 two players during the next visit.[20]

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 2c.[21] 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.

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[20]Participants played the one-shot anonymous game six times, three times as player 1 and three times as player two. 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).

[21]The analogous figure for the fraction that stole looks similar and is reported in appendix figure A11.

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:

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

where i indexes individuals. I_i^{Kuba} is an indicator variable that equals one 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 one 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. The relationship between the three groups is depicted visually in appendix figure A1.

Estimates of equation (1) are reported in table 1. 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 statistically significant.[22] In addition, estimates from quantile regression (reported in appendix table A5) show that the difference between Kuba and non-Kuba participants can be found 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 1 report estimates using the total amount missing in the three rounds of the UG as the dependent variable.[23] 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

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[22] As we report in appendix table A4, one reaches the same conclusion by estimating equation (1) using the outcomes in each of the different rounds separately. A comparison of behavior in the different games provides a check on the sensibility of the RAG measure. For example, we find that cheating is greater when playing against a non-coethnic than a coethnic, and that cheating against a citizen of Kananga is between these two. See the means reported appendix table A4.

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

Table 1: Baseline estimates in the RAG and UG with theft.

	Average amount allocated to other party (of 3000 CF) 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

Notes: The table reports OLS estimates of equation (1). "Kuba ethnicity indicator" is a variable that equals one 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.

when we restrict the sample to ethnic groups that were culturally homogeneous prior to the formation of the Kingdom.[24]

One feature of the results is that the estimated impact based on our historical experiment – i.e., the central Kuba and Lele comparison, or the Bushong and Lele comparison – is consistently larger in magnitude than the estimates for the full sample. 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 that cultures that have a strong belief in the importance of rule following and good behavior will be more likely to develop and implement state institutions that reflect this. (This is what Tabellini (2008) finds in his model

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[24]One characteristic of our estimates is that the fit, measured by R^2, is fairly low. This is not uncommon with individual-level regressions explaining experimental behavior with a parsimonious set of covariates. For example, the R^2 in our regressions is similar to the R^2 in Hruschka et al.'s (2014) regressions examining the determinants of play in the RAG.

when he endogenizes institutions.) Thus, 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) also capture this reverse causality, we would expect these estimates to be biased upwards – i.e., to be less negative. Our results are consistent with this intuition.

This same logic applies to estimates of the impact of institutions on culture from other studies. Estimates that are less well-identified likely capture the reverse causal effect of culture on institutions, and therefore the estimates are likely biased upwards relative to our estimates, which are closer to the true effect. Comparing our findings to other studies, this is what we tend to find. For example, although he examines the type of state institutions (and not the presence/absence), Tabellini (2010) finds a positive relationship within Europe between the constraints on the executive from 1600–1850 and a bundle of cultural traits today, including obedience and respect for others. More recently, Gachter and Schulz (2016) find a positive relationship between intrinsic honesty and the quality of institutions across 23 countries.

As a robustness check we disaggregate our Kuba indicator variable, and allow the effects to differ for the following sets of groups: (*i*) central Kuba and peripheral Kuba, and (*ii*) Bushong, other central Kuba, and peripheral Kuba. The estimates, which are reported in appendix tables A6 and A7,[25] show that the negative effect of the Kuba on rule following is due to the central Kuba and not the peripheral Kuba. This is reassuring because it is the central Kuba that comprise the natural experiment. The peripheral Kuba initially belonged to other ethnic groups that eventually became part of the Kingdom, and so for this group there is concern of reverse causality, namely that groups with norms against cheating would be more willing to join the centralized Kingdom with its well-functioning political and legal systems.

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,

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[25]Appendix table A6 reports estimates for the full sample, while appendix table A7 reports estimates with the control group restricted to be the Lele. The estimates are similar in both cases.

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

A. *Migration*

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, an additional 23 (12%), migrated because of marriage.[26]

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 concern, we check for differences in observables between the Kuba and non-Kuba populations in each of our three samples of interest.

The first set of characteristics we examine are measures of whether individuals in our sample are recent migrants. We asked participants whether they were born in Kananga and, if not, the year in which they moved. From this, combined with their year of birth, we can calculate the fraction of their life spent living in Kananga. We also construct three variables aimed at measuring the extent to which individuals are integrated into the broader community in Kananga rather than 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, for each individual, the share of people in their neighborhood

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[26]See appendix table A8 for the full distribution of all reasons for migration. In addition, appendix table A9 shows that the frequency of reasons is balanced between the Kuba and non-Kuba.

Table 2: Balance table for potential confounders.

	Full sample (n=499)			Central Kuba vs. Lele sample (n=105)			Bushong vs. Lele sample (n=82)		
	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
		Kuba vs. non-Kuba difference			Kuba vs. non-Kuba difference			Kuba vs. non-Kuba difference	
Panel A. Baseline Individual Characteristics									
Age	41.68	-2.434 (2.173)		36.84	5.159* (3.024)		36.21	5.106 (3.234)	
Female Indicator	0.465	-0.152** (0.061)		0.314	0.072 (0.092)		0.268	-0.010 (0.099)	
2014 indicator	0.597	-0.116* (0.060)		0.410	0.118 (0.098)		0.402	0.133 (0.109)	
Panel B. Immigration									
Immigrant indicator	0.537	0.045 (0.061)	0.032 (0.061)	0.552	-0.0663 (0.0991)	-0.0338 (0.0979)	0.561	-0.0646 (0.111)	-0.0586 (0.113)
Fraction of life in Kananga	0.665	-0.114** (0.046)	-0.088* (0.045)	0.553	0.0979 (0.0833)	0.0770 (0.0817)	0.540	0.0947 (0.0943)	0.0968 (0.0946)
Proportion of 5 closest friends that are coethnic	0.455	-0.110*** (0.041)	-0.102** (0.041)	0.377	-0.0180 (0.0618)	-0.0305 (0.0652)	0.398	0.0214 (0.0702)	0.0205 (0.0720)
Share of own-ethnicity in neighborhood	0.303	-0.249*** (0.036)	-0.236*** (0.036)	0.117	-0.0283 (0.0304)	-0.0214 (0.0317)	0.133	-0.0027 (0.0378)	0.0081 (0.0391)
Ethnic diversity of neighborhood	0.572	0.097*** (0.023)	0.090*** (0.023)	0.666	0.00978 (0.0316)	0.0144 (0.0331)	0.664	0.00831 (0.0379)	0.0190 (0.0402)
Panel C. Geography									
Maize suitability index, 0-100	23.10	-0.249 (0.217)	-0.350 (0.224)	23.07	-0.159 (0.609)	0.118 (0.676)	23.12	-0.080 (0.613)	0.120 (0.670)
Cassava suitability index, 0-100	46.69	-0.139 (0.554)	-0.132 (0.566)	47.34	-1.170 (1.508)	-0.437 (1.591)	47.60	-0.917 (1.529)	-0.375 (1.596)
Panel D. Trust in Foreign Researchers									
Trust in international organizations, 1-4	2.846	-0.010 (0.119)	-0.103 (0.117)	2.867	-0.151 (0.194)	-0.021 (0.196)	2.927	-0.060 (0.224)	-0.038 (0.230)
Trust in other nationalities, 1-4	2.816	-0.048 (0.104)	-0.0522 (0.105)	2.876	-0.213 (0.161)	-0.240 (0.171)	2.915	-0.184 (0.178)	-0.201 (0.191)
Trust in Universities, 1-4	3.074	0.135 (0.114)	0.0147 (0.109)	3.267	-0.284* (0.154)	-0.129 (0.153)	3.354	-0.169 (0.165)	-0.041 (0.162)
Panel E. Altruism Towards Others									
DG allocation to citizen of Kananga	321.3	-10.63 (26.06)	-8.463 (26.36)	282.9	17.44 (39.18)	13.59 (41.76)	280.5	16.75 (42.04)	17.64 (45.10)
DG allocation to coethnic citizen of Kananga	336.6	-10.87 (23.21)	-12.49 (23.49)	301.9	-24.11 (37.41)	-15.28 (38.52)	295.1	-44.86 (39.90)	-28.72 (41.38)
DG allocation to non-coethnic citizen of Kananga	316.6	-16.39 (24.79)	-15.64 (25.08)	286.7	-30.77 (41.69)	-26.28 (43.38)	279.3	-54.55 (46.41)	-45.81 (48.67)
DG allocation to Provincial Government	304.7	-21.86 (27.15)	-13.24 (27.43)	231.2	-2.075 (37.03)	-3.450 (39.13)	219.7	-26.55 (39.00)	-27.84 (41.77)
Average DG allocation to all parties	319.8	-14.94 (21.17)	-12.46 (21.43)	272.8	0.917 (35.20)	-0.863 (36.74)	266.5	-12.00 (37.14)	-8.693 (39.74)
Panel F. Understanding of the Games									
Proportion incorrect of four math questions, 0-1	0.419	-0.0336 (0.0387)	0.00276 (0.0358)	0.381	0.0298 (0.0596)	-0.0152 (0.0581)	0.351	-0.0281 (0.0630)	-0.0546 (0.0636)
Proportion incorrect of six RAG questions, 0-1	0.140	0.00541 (0.0242)	0.0273 (0.0230)	0.113	0.0647** (0.0309)	0.0393 (0.0314)	0.098	0.0488 (0.0329)	0.0244 (0.0335)
Proportion incorrect of six UG questions, 0-1	0.087	0.00327 (0.0167)	0.0165 (0.0163)	0.070	0.0615*** (0.0230)	0.0453* (0.0236)	0.063	0.0624** (0.0256)	0.0523* (0.0272)

Notes: The table reports balance statistics between Kuba and non-Kuba individuals in each of our three samples of interest. Differences are reported without and with controls for our baseline set of covariates.

that are of the same ethnicity as them. 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 2. 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 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, we also find that 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 well, the lack of statistical significance is not due to larger standard errors, but to small point estimates. Moreover, when we re-estimate equation (1) while controlling for the five immigration variables, our main results remain robust (see appendix tables A10 and A11).

As an additional check, we also restrict our sample to only include second (or later) generation immigrants to Kananga – i.e., individuals that were born in Kananga. This is a sample of individuals who were all born and raised in the same location, but with different cultural backgrounds. Thus, with this sample we can be more confident that we are capturing a purely cultural channel. In addition, because the individuals in the sample did not migrate themselves, any migrant selection effects that are present may be weaker within this sample. Reassuringly, we find that although the sample is reduced by about 50%, the point estimates remain very similar, and all specifications but one remain statistically significant (see appendix table A10).

B. *Geography*

Agricultural Suitability

Another possible source of bias are geographic differences between the historical Kuba Kingdom and the surrounding areas. In fact, Mary Douglas (1962, 1963) conjectures that potential differences in crop suitability across the Kasai river may partially explain differences between the Kuba and Lele. If these differences do exist, and if they have an independent effect on cultural evolution, then these may bias our estimates. We examine this possibility using data from the FAO's GAEZ database, which reports fine-grained data on the suitability of land for the cultivation of crops, measured on a scale that ranges from 0 to 100.[27] We consider the two staple crops in the region:

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[27]The data are available at a resolution of 5 arc minutes by 5 arc minutes (approximately 6 miles by 6 miles).

maize and cassava. Appendix figure A12 reports maps showing these cultivation indices, along with the origin villages for the participants in our sample. The suitability for both crops is very similar inside and outside the Kuba Kingdom.

We test this formally by measuring the suitability of the grid cell of each participant's origin village. The means of these measures for Kuba and non-Kuba descendants, and the difference between the two groups, are reported in panel B of table 2. The table shows no differences between Kuba and non-Kuba observations for all three samples. 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.[28]

Rivers and the Endogeneity of the Kuba Boundary

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 (1) while omitting villages that are within 10, 20, 30, 40, and 50 kilometers of this portion of the boundary. As reported in appendix table A14, the estimates are very similar, and slightly larger in magnitude, when these villages are omitted.

C. *Other Traits that Could Affect Behavior in the Experiments*

An important assumption of our analysis is that behavior in the games reflect preferences against cheating and for rule following. A number of 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). Nonetheless, 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. We consider each of these factors in turn.

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[28]As shown in appendix table A5, our estimates of equation (1) are robust to the inclusion of these controls. Although the standard errors increase slightly, the point estimates remain nearly identical to the baseline estimates.

Trust in Foreign Researchers

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 UG to another participant as we said we would (and in fact did).

To impact our analysis, trust in our research team would need to differ systematically between the Kuba and non-Kuba samples. To try to measure this, we asked participants' their level of trust in (*i*) universities, (*ii*) in international organizations, and in (*iii*) people from other countries. Respondents chose between (with assigned numeric values in brackets): 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 C of table 2. Of the 18 differences reported, only one is statistically different from zero, and in general, the magnitude of the differences is quite small. As well, re-estimating equation (1), while controlling for each of the three measures of trust, has little impact on our findings (appendix table A15).

Altruism Towards Others

A plausible alternative explanation for our findings is that historical state formation did not affect individual rule following but instead impacted 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 that altruism is not confounding our interpretation of behavior in the RAG, participants also played the dictator game (DG). In the DG, participants divide 1,000CF between themselves and a second player. 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. 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.

The estimated differences between the Kuba and non-Kuba populations are reported in panel

E of table 2. We find no statistically significant difference in the measures of altruism between the two groups. This suggests that the differences in cheating and stealing we observe are not due to underlying differences in altruism towards the other player.[29]

Understanding of the Games

A final concern is that Kuba participants had a better understanding of the games, and therefore were better able to realize that 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 basic 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 first checked for general cognitive differences between Kuba and non-Kuba participants by asking four basic math questions during our first visit. As we reported in panel F of table 2, 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.[30] Finally, we also check that our estimates of equation (1) are robust to controlling for both the proportion of math questions answered incorrectly and the proportion of game questions answered incorrectly (appendix table A17). Overall, there is no evidence that differential comprehension of the games explains our findings.

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.

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[29]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 appendix table A15.

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

A. *Testing Tabellini*

Tabellini (2008b) provides an important insight into how cultural values can respond to formal institutions: 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. This is because 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.

We test for this mechanism by examining which values parents feel are important to teach their children. We measure this using a question, taken from the World Values Survey, that asks parents which values they believe are important to instill in their children: "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 3. 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 3. 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 appendix table A18).

Table 3: Testing the Tabellini mechanism.

	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

Notes: 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 one if the individual's self reported tribe is Kuba. Standard errors are clustered at the origin village level. 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.

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-levels means are reported in appendix figure A14.

We next turn to the traits that are least related to rule following. The estimates for these four traits provides a nice comparison to the estimates for the rule-following traits. It may be that the Kuba simply feel it is less important to teach their children values in general. Alternatively, it may be this 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 comprising the four traits are reported in columns 7–9 of table 3. 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.[31]

The results described above suggest that, consistent with the mechanism of the Tabellini model,

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

the Kuba state resulted in less parental investments to instill rule following values in children. We now check whether there is evidence for other possible mechanisms.

B. *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,b). This was also true for the Kuba Kingdom, which led to greater cross-village trade (within the Kingdom), specialization of production, agricultural productivity, technological innovation, and a higher standard of living (Douglas, 1962). If historical income differences persist, they might explain the differences in rule following that we observe.[32]

We examine this by first checking for income differences between Kuba and non-Kuba descendants (panel A of table 4). Since income is noisy and difficult to measure in resource-poor settings, our strategy is to examine a variety of different measures. Our first measure is a 1–5 index of individuals' perceived income status.[33] We also directly measure an individual's earned income, over the past year and over the past month (both measured in Congolese Francs), 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 one if the house had non-dirt floors, an indicator that equals one 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: education, height, and ratio of weight-to-height. Height is taken as a measure of access to calories and nutrients (and hence past wellbeing) during the growing years of a person's life, while weight-to-height is taken as a measure of access to calories and nutrients in the recent past.

The results provide very little evidence that Kuba descendants are more prosperous relative to other groups. In some specifications we do see that the Kuba appear to be more wealthy, but this result is not robust. The lack of a difference in prosperity between the Kuba and others can be explained by the poverty in our sample: nearly everyone in the population is at subsistence. For

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[32]This possibility is particularly important given evidence that being from a higher social class is associated with more unethical behavior (Piff, Stancato, Cote, Mendoza-Denton and Keltner, 2012), and that the physical presence of money causes individuals to behave more unethically (Gino and Pierce, 2009).

[33]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 are then asked to report the level at which they are situated relative to other people in Kananga.

Table 4: Balance table for potential mechanisms.

	Full sample (n=499)			Central Kuba vs. Lele sample (n=105)			Bushong vs. Lele sample (n=82)		
	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
		Kuba vs. non-Kuba difference			Kuba vs. non-Kuba difference			Kuba vs. non-Kuba difference	
Panel A. Income and Wealth									
Subjective income scale, 1-5	2.162	0.238** (0.104)	0.188* (0.103)	2.257	0.012 (0.170)	0.020 (0.178)	2.220	-0.066 (0.195)	-0.009 (0.206)
ln Annual income	13.05	0.161 (0.290)	0.207 (0.289)	13.17	-0.043 (0.554)	-0.308 (0.579)	13.15	-0.100 (0.614)	-0.353 (0.652)
ln Monthly income	10.74	0.122 (0.248)	0.152 (0.247)	10.70	0.073 (0.463)	-0.086 (0.483)	10.66	0.012 (0.512)	-0.178 (0.541)
Unemployment indicator	0.631	-0.037 (0.059)	-0.046 (0.056)	0.657	-0.082 (0.094)	-0.141* (0.082)	0.671	-0.073 (0.105)	-0.148 (0.090)
Non-dirt floor	0.367	0.218*** (0.058)	0.210*** (0.059)	0.571	0.123 (0.098)	0.062 (0.102)	0.561	0.132 (0.110)	0.087 (0.117)
Metal roof	0.930	-0.065** (0.031)	-0.050 (0.031)	0.838	-0.005 (0.074)	0.016 (0.073)	0.854	0.028 (0.079)	0.022 (0.081)
Meals per day	1.449	0.120* (0.066)	0.092 (0.065)	1.514	0.025 (0.107)	0.036 (0.109)	1.439	-0.132 (0.121)	-0.079 (0.124)
Nights hungry in last week	0.615	-0.256* (0.134)	-0.246* (0.135)	0.524	-0.115 (0.172)	-0.188 (0.178)	0.537	-0.117 (0.189)	-0.218 (0.192)
Educational attainment, 0-4	3.024	0.373*** (0.111)	0.187** (0.084)	3.524	-0.311** (0.135)	-0.100 (0.107)	3.573	-0.283** (0.132)	-0.168 (0.110)
Height	166.03	1.776* (1.062)	0.473 (0.885)	167.42	-0.567 (1.642)	0.879 (1.412)	167.89	0.310 (1.772)	1.212 (1.612)
Weight-to-height ratio	0.356	-0.001 (0.007)	0.002 (0.007)	0.347	-0.003 (0.012)	-0.003 (0.012)	0.344	-0.011 (0.012)	-0.011 (0.013)
Panel B. Colonial Influence									
Mission station	0.752	-0.091 (0.071)	-0.094 (0.070)	0.781	-0.0250 (0.093)	0.0206 (0.096)	0.854	0.126 (0.081)	0.168* (0.086)
Power station	0.100	-0.090*** (0.026)	-0.084*** (0.027)	0.076	-0.182** (0.077)	-0.187** (0.078)	0.098	-0.182** (0.077)	-0.185** (0.076)
Railway line	0.543	0.276*** (0.064)	0.264*** (0.067)	0.724	0.424*** (0.106)	0.418*** (0.109)	0.671	0.417*** (0.115)	0.399*** (0.121)
Mines	0.002	-0.0024 (0.0024)	-0.0021 (0.0022)	0.000	0.000 (0.000)	0.000 (0.000)	0.000	0.000 (0.000)	0.000 (0.000)
Panel C. Post Colonial Influence									
Impact of Mobutu, 1-5 scale	4.090	-0.123 (0.146)	-0.043 (0.146)	3.860	0.082 (0.262)	-0.018 (0.272)	3.859	0.101 (0.303)	-0.032 (0.314)
Perception of Mobutu, 1-5 scale	3.894	-0.054 (0.162)	0.026 (0.161)	3.570	0.498* (0.292)	0.414 (0.305)	3.606	0.700** (0.324)	0.562* (0.335)
Mobutu ST-IAT D-Score	0.104	-0.078 (0.060)	-0.082 (0.061)	0.157	-0.122 (0.096)	-0.056 (0.097)	0.185	-0.095 (0.112)	0.002 (0.113)

Notes: The table reports balance statistics between Kuba and non-Kuba individuals in each of our three samples of interest. Differences are reported without and with controls for our baseline set of covariates.

example, the modal number of meals eaten per day in our sample is one (287 individuals). Within the sample, only 12 people (2.5%) eat three meals per day. The unemployment rate in our sample is 63%. As we report in appendix tables A19 and A20, our findings are robust to controlling for

income, measured using the first principal component of all measures.[34]

C. *The Colonial and Post-Colonial Periods*

Another potential explanation for our findings is that the Kuba may have been treated differently during the colonial period. It is possible that because of the Kingdom's pre-existing formal institutions, the Belgian colonists treated the Kuba differently than other groups. This in turn could have affected beliefs and behaviors concerning rule following. We explore this mechanism by measuring colonial investments and missionary activity. The measures are taken from Mantnieks (1951), who reports the location of mission stations, electricity stations, railroads, and mines.[35]

Using the digitized data, 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 4. 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 significant and exist in each of the three samples. We do not observe significant differences in proximity to missions or mines.

Motivated by these differences, we re-estimate equation (1), controlling for the colonial control variables and clustering standard errors at the village level (appendix table A20). 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.

It is also possible that the Kuba were 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, which should capture unobserved impacts of the Mobutu regime. 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.

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[34]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.

[35]Appendix figure A13 shows the locations of these colonial investments (as of 1951), as well as the Kuba boundary.

We collected two survey-based measures of attitudes towards Mobutu. First, we asked respondents to report their view of former President Mobutu, choosing between: (1) very negative, (2) somewhat negative, (3) neutral, (4) somewhat positive, and (5) 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 was recently developed by Bluemke and Friese (2008), is a variant of the original IAT 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.[36]

The differences between Kuba and non-Kuba respondents are reported in panel C of table 4. In general, we find that the differences between the two groups is estimated to be both positive and negative. The coefficients are typically small in magnitude and statistically insignificant. Not surprisingly, if we re-estimate our baseline equation (1) while controlling for these covariates, we obtain very similar estimates (see appendix table A21). Thus, the reduced-form Kuba effect does not appear to be due to differential treatment of the Kuba in 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 (e.g., Douglas, 1962, 1963, Vansina, 1978, 2010), we have estimated the long-run impacts of the formation of the Kuba Kingdom in the 17th century in a region that lies within the modern Democratic Republic of Congo. The Kuba Kingdom, which shares many features of modern nation states, arose due to an institutional innovator named Shyaam; its boundaries were determined by the local system of rivers in the area. The historical episode is attractive from an empirical point of view because it took place in a region inhabited by a population that was

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[36]Full details of the IAT are provided in section A3 of the paper's online appendix. Also see Lowes, Nunn, Robinson and Weigel (2015) where we describe a test of the validity of the IAT in our setting using ST-IATs with food, spiders, and snakes as targets.

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. Examining potential confounders, we showed that these differences are not due to differential selection of migrants to Kananga, the location of our experiments, to geographical differences in the regions historically inhabited by Kuba and non-Kuba ancestors, nor to other observable traits that might impact behavior in these games.

Turning to mechanisms, we found evidence consistent with the mechanism from the Tabellini (2008b) model. Responding rationally to enhanced state enforcement, parents might invest less effort in instilling values supporting socially desirable behavior in their children. Consistent with this channel, we found that Kuba descendants feel that it is less important to teach their children values related to rule following. We also tested for alternative possible mechanisms, including persistent differences in income and wealth, and differential impacts under the colonial and post-colonial regimes. We found no evidence for these other mechanisms.

In summary, by combining an anthropological case study with behavioral experiments, we have found evidence that formal institutions can crowd out intrinsic preferences for following the rules. This finding and auxiliary tests are consistent with a more general mechanism that is highlighted in the recently developed model in Tabellini (2008b). This finding contributes to the institutions and state capacity literatures, by identifying a consequence of centralized states that has not been well-recognized in a literature that has largely focused on the beneficial aspects of state development.

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 questions, 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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