

Title

Motivating the adoption of new community-minded behaviors: An empirical test in Nigeria

Authors

Graeme Blair,^{1*} Rebecca Littman,^{2*} Elizabeth Levy Paluck^{3,4*}

¹Dept. of Political Science, UCLA, Los Angeles, CA 90095

²Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139

³Dept. of Psychology, Princeton University, Princeton, NJ 08544

⁴Woodrow Wilson School, Princeton University, Princeton, NJ 08544

*These authors contributed equally. To whom correspondence should be addressed:

E-mail: graeme.blair@ucla.edu; rlittman@mit.edu; epaluck@princeton.edu

Forthcoming, *Science Advances*

Abstract

Social scientists have long sought to explain why people donate resources for the good of a community. Less attention has been paid to the difficult task of motivating the first adopters of these important behaviors. In a field experiment in Nigeria, we tested two campaigns that encouraged people to try reporting corruption by text message. Psychological theories about how to shift perceived norms and how to reduce barriers to action drove the design of each campaign. The first, a film featuring actors reporting corruption and the second, a mass text message reducing the effort required to report, caused a total of 1,181 people in 106 communities to text, including 241 people who sent concrete corruption reports. Psychological theories of social norms and behavior change can illuminate the early stages of the evolution of cooperation and collective action, when adoption is still relatively rare.

Introduction

Why do people donate time, money, or other resources to their communities? Scientists view this question about community-minded behavior as part of a broader question about why humans cooperate, which sets apart large-scale human behavior from the behavior of other species (1). Research has uncovered several factors that drive and constrain community-minded behavior, including expectations of paybacks (2) and of punishments for free-riders (3), internalized decision-making tendencies that favor cooperation over selfishness (4), and perceived social norms (5). A rich tradition of research on the evolution of collective action for public goods provision was inspired by the pioneering work of Ostrom (6), but few studies in this tradition focus on how community-minded behaviors are initially adopted. Community-minded behaviors that are rare (because they are novel, or for whatever reason are not widely adopted) may carry special costs and risks. These costs and risks accrue from the fact that people have difficulty choosing and acting on alternatives to the status quo (7, 8), people's contributions may not be matched by other community members without coordinated punishment of free-riders (3, 9), and people may perceive social, legal, or safety risks associated with being one of few to participate. Understanding why people would sacrifice resources for their community, particularly when it is not socially recognized as a common or desirable behavior, is important for understanding the full evolution of a collective action strategy (6, 10).

Learning how community-minded contributions are adopted and become normative is also pragmatically important, because voluntary community contributions are often encouraged in contexts where government or private sector initiatives are infeasible or unsuccessful. For example, reporting social or political problems via text message is a recently-invented solution used by a growing number of political activists, civil society organizations, and technology experts (11). Initiatives in countries like Kenya, Haiti, and India have asked people to contribute

information about local violence, natural disasters, or corruption to help other citizens navigate crises and to identify areas in need (12, 13). Studies of technology adoption show that once a certain threshold of new users is achieved, bandwagon effects, herding, and information cascades can spur new behaviors to become widespread in a society (14, 15). However, the success of these initiatives depends, as a first step, on persuading an initial group of people to try a behavior that is outside of the status quo.

The current study addresses this first step, of how to persuade an initial group of people to try a new form of community-minded action. We identify two major barriers to adopting new actions: the perception that no one else will join (a problem of social norms), and minor logistical or technical barriers (a problem of personal and structural capacity). Psychological theories of social norms and behavior change offer ideas for addressing each barrier—specifically, mechanisms for influencing individuals’ perceptions of social norms, and small interventions for increasing individuals’ personal capacity, given structural and cognitive constraints.

Psychological theory defines a perception of a social norm as an individual’s perception of how widespread or desirable a behavior is or is becoming within the community (16, 17). Research suggests that norm perception is a strong motivator of human behavior (18). Importantly for motivating rare behaviors, perceptions of a norm can be influenced even before changing the actual rate of the behavior in a community (19). Studies suggest that this is possible in part because people overgeneralize from the public behavior of role models to their perception of the overall community norm (20, 21). Role models who influence norm perceptions can be people in one’s community who are high status (22, 23), who receive lots of attention (20), and in some cases who break with tradition (24). However, people can even use fictional characters as role models, such as characters in a soap opera (25). Thus, one mechanism for changing norm perceptions is to highlight the behavior of role models, real or fictional (19).

Psychological theory on behavior change also highlights the importance of removing minor

but psychologically important barriers to a behavior, using a “nudge” (26). A nudge — such as a reminder (27) or a new default (28) — helps a person to accomplish a behavior toward which they are positively inclined by removing barriers to the behavior. While this insight may seem intuitive, behavioral research has demonstrated that what may seem like a materially insignificant cost, such as memorizing a number or filling out a form, can actually be a psychologically large barrier given constraints on individual cognitive or motivational capacity (26). A wealth of studies show that using nudges to remove minor barriers significantly increases rates of consequential behaviors like showing up to a court date (29), successfully enrolling in college (30), and voting (31).

Thus far, psychological theories about norms and behavior change have been successfully applied in Western democracies to improve low rates of community-minded behaviors. Using a large-scale field experiment, we evaluate these two psychological theories in a non-Western context where activists sought to encourage the rare behavior of corruption reporting. In Nigeria, reporting corruption to non-governmental agencies is part of an envisioned citizen-driven campaign to reduce the country’s endemic corruption (32). Activist groups hope that large numbers of people will report their experiences with corruption, which would be used to write advocacy reports testifying to the widespread nature and negative effects of corruption on the population. However, citizen corruption reporting is extremely uncommon in Nigeria. Previous efforts to encourage reporting have been uniformly unsuccessful, regardless of the recipient of the reporting and regardless of the technology used. Nationwide campaigns via phone, text message, and the internet have elicited no more than 140 reports per year, out of a population of 174 million (33, 34).

The failure of previous corruption reporting campaigns in Nigeria cannot be attributed to a lack of concern about the issue, since Nigerians consistently name corruption as one of the top problems facing their country (35). Our pilot research in Nigeria, including a survey of

345 randomly-sampled individuals in the four states where our study took place, indicated that just under 80% of citizens believe the police, civil servants, and their state governments were corrupt. 83% reported being angry they had to pay bribes, and 60% reported being very angry. Our research also suggested the importance of the two barriers to reporting. With respect to perceived norms of reporting, respondents indicated that corruption reporting is rare; with respect to logistical barriers, they reported that there are no means to report. Related to both assertions, 30% of pilot respondents said that they felt reporting corruption was useless, and 50% said reporting was dangerous.

In the present experiment, we tested a norms intervention, which aimed to address individuals' perception that corruption reporting is rare, and a nudge intervention, which aimed to minimize the perceived logistical barriers to corruption reporting. We first worked with a Nigerian anti-corruption group to establish a toll-free text messaging platform. We then launched two campaigns that raised awareness of the platform and that attempted to (1) shift perceptions of the norms of corruption reporting, and (2) reduce barriers to reporting using a nudge. We tracked corruption reports texted into the platform from each community for 160 days. We also fielded a survey in each community several days after both campaigns were implemented.

The first campaign was a two-hour Nigerian ("Nollywood") feature film produced for this project with well-known actors. It was filmed in the Niger Delta region where the study took place. The film's dramatic storyline incorporated corruption as part of the characters' everyday lives. The film campaign was rolled out in a between-community design. The design entailed that half of the study communities received a treatment version of the film and half received a placebo version. The packaging of the two versions were identical except that different phone numbers for texting reports were included on the covers in small letters. The treatment version included scenes in which actors reported corruption using our texting platform as part of the overall corruption storyline (Figs. 1A and 1B). These scenes showing role models reporting

corruption were designed to shift viewers' perceptions of corruption reporting norms. Specifically, the role models' behavior was used to increase audience perception that other Nigerians report and approve of corruption reporting. The role models in the film were fictional, but also high status actors filmed in the audience's local Nigerian context. A placebo version of the film cut these corruption reporting scenes, which were not central to the film's resolution.

Both treatment and placebo versions of the film advertised the corruption reporting platform at the beginning, middle, and end of the film with a banner across the screen, and on the film packaging. Thus, all film viewers had the information needed to use the corruption reporting platform. Because we randomized which version of the film was distributed in each community, we are able to estimate the causal effect of the role models in the treatment film compared to the placebo on corruption reporting and perceived norms.

The second campaign was a mass text message sent to all customers of Nigeria's largest mobile phone provider in each study community, after the community received either the treatment or placebo film. The mass text was sent to people in each community on a randomly-assigned date a few weeks following the film distribution, using a step-wedge design. By virtue of this randomization, we are able to estimate the causal effect of the message, by comparing response rates before and after the randomly-assigned date of the nudge. The message alerted individuals to the corruption reporting platform and explained the ease of reporting (Fig. 2A). In this way, the message was designed to reduce barriers to reporting by clearly explaining the reporting campaign, allowing recipients to simply hit "reply" to report, and emphasizing that correspondence with the corruption platform was free (an unusual feature; see Methods and Materials for more detail on each campaign).

Thus, the film campaign and the text message campaign both attempted to encourage individuals to adopt corruption reporting via text, either by promoting the perception that corruption reporting was becoming more normative, i.e., widespread and accepted (via role models in the

film), or by reducing barriers to reporting (via a text-based reminder with simple and encouraging instructions). Neither campaign promised investigative action in response to a report, and any person who inquired via text message was told that reports would be used by a Nigerian activist organization. Both campaigns made salient the issue of corruption, although daily life already highlights this issue to the majority of Nigerians. Importantly, our film intervention controls for salience of the corruption reporting platform: we compare corruption reports and norms among people who watched either the treatment or placebo film, both of which provided information about the corruption reporting campaign hotline. Within this film experiment, we assess whether corruption reporting is further boosted by a nudge from a text message sent on a randomly-assigned day to both communities that received the treatment film or the placebo film.

Results

Over the course of our seven-month study in 106 communities across the Niger Delta region in southeastern Nigeria (see Figs. S1 and S2), the corruption-reporting platform received 3,316 messages from 1,685 unique senders. In total, 1,181 unique senders texted in messages discussing corruption or the study's campaigns, including 241 unique individuals who sent a concrete corruption report that made explicit mention of a corrupt act, person, or institution (Fig. 3). As a benchmark, our 7-month study in 106 small southern Nigerian communities (for example, in urban neighborhoods as small as a quarter square mile) produced 1.7 times as many concrete corruption reports as one year of the previous nationwide corruption reporting campaign. People most commonly reported bribes and embezzlement perpetrated by politicians, law enforcement, and those in the education sector. Of the corruption-related messages, 86% arrived within the first 30 days after the campaigns began.

What caused people to report? A total of 31,800 copies of the treatment and placebo films

were distributed to the 106 randomly sampled communities in a random order. A randomly assigned half of communities received the treatment film, and the other half the placebo version. Figs. 1C and 1D show that we received messages from communities where we distributed the treatment version of the film, but the average effect is close to zero from the placebo communities. We estimate that in the 15-34 day period between the start of film distribution and the launch of the mass text message, the treatment film caused an increase of 0.007 corruption reports per day in each community compared to the placebo film (CI 0 to 0.013).

In each community, the mass text message was sent on a randomly-assigned day 10 to 20 days after film distribution. On the day the mass text message arrived, we observed an estimated increase of 5.053 corruption-related messages in each community (CI 4.06 to 6.047), including an increase of 0.91 concrete corruption reports (CI 0.597 to 1.224; Figs. 2B and 2C). Afterward, we observed a steep decay such that three days later the effect of the campaign was 0.208 corruption-related messages per day in each community (CI 0.038 to 0.378). The effects of the mass text message were not different in placebo vs. treatment film communities (difference = -0.009, CI -0.03 to 0.012).

To test whether the treatment version of the film shifted viewers' perceptions of social norms, we surveyed 1,399 randomly-sampled film viewers from our study population (see *Supplementary Materials*). We found that watching the film's characters text about corruption shifted viewers' perceptions of norms in their community, specifically that corruption, and anger about corruption, were widespread (corruption = 0.083, CI 0.025 to 0.142; anger = 0.116, CI 0.035 to 0.197; Fig. S4). Respondents who watched the treatment film also believed that their community viewed corruption reporting as dangerous to a significantly greater extent than the placebo film audience (0.097, CI 0.016 to 0.178). But contrary to our prediction that viewers would overgeneralize the behavior of the characters in the film to others in their community, the treatment film did not increase perceptions of how widespread corruption reporting was or was

becoming in their community, compared to viewers in placebo communities (-0.003, CI -0.052 to 0.046). One reason may be that the text reporting was not a visible behavior in their community: only 18% of all respondents knew someone who planned to text a corruption report and only 5% knew someone who actually had texted a corruption report.

Discussion

Two campaigns in 106 communities, involving five additional minutes in a Nollywood film and one unsolicited mass text message, prompted 241 corruption reports and hundreds more text messages signaling interest in addressing corruption. The influence of each campaign operated independently: communities receiving the treatment film were just as responsive to the mass text campaign as those that received the placebo film. While it is impossible to report a precise response rate given that we do not know how many people actually read the mass text or watched the film, we estimate a range from 0.002 (approximately 1 out of 605 people sending a message) to 0.007 (approximately 1 out of 145 people sending a message).¹ Our campaigns elicited a much higher response rate than previous corruption-reporting campaigns in Nigeria, which received fewer than 140 messages from the entire country over the course of one year (33, 34). The response rate in our study is also substantially higher than that of a radio ad campaign in Uganda encouraging citizens to send messages to their Member of Parliament (estimated response rate = 0.0002 over a six month period (36)). Finally, while our effects are statistically and substantively significant, they are smaller than the effects found in recent studies using a text or film campaign to target highly-motivated citizens or behaviors that are driven by more immediate self-interest (37, 38).

¹The rate of .002 was calculated assuming that all 683,000 recipients received the mass text message and all 31,800 films were viewed; the rate of .007 was calculated assuming approximately one-quarter of the text messages were received based on a phone audit we conducted (see *Supplementary Materials*) and that one-half of the films were viewed.

The film campaign likely influenced corruption reporting through a mechanism other than shifting perceived norms about the commonality or desirability of reporting itself. Instead, the campaign may have caused reporting through the observed shift in perceived norms regarding the typicality of corruption and community members' feelings of anger about corruption. Previous work has shown the power of mobilizing collective emotions like anger to increase collective action (39). This mechanism may have encouraged more corruption reporting, despite the concurrent impression promoted by the treatment film that community members view corruption reporting as dangerous.

Encouraging people to try a community-minded action for the first time is a task separate from encouraging a long-term pattern of this behavior (6, 10). Our data cannot shed light on whether repeated mass text messages and greater media saturation of role models from popular culture would sustain the first month's rate of corruption reporting. Potentially, repeating the text messages and inserting more role models into mass media could successfully shift actual rates of corruption reporting, in addition to perceived norms of corruption reporting. Interventions building on the present work could also advertise the existence of early adopters and early increases in corruption reporting. To understand how this new form of community-minded behavior might become an established convention, it would also be relevant to test whether publication of the received corruption reports would succeed in reducing actual levels of corruption, as a community-level payoff. These and other inquiries can contribute to understanding the adoption of rare community-minded behaviors and the evolution of cooperation and collective action.

Materials and Methods

Identification of study population

We estimated the coverage area of all mobile phone towers in four states of the Niger Delta (Akwa Ibom, Bayelsa, Delta, and Rivers), using their geographic coordinates. We then conducted a restricted random sampling of towers, such that communities were sufficiently separated from each other to avoid spillover of the mass text message and the Nollywood film. To do this, we simulated many samples of 215 communities meeting the distance restrictions, and randomly selected one of those samples. Following a technical error with our mass text messaging service, we conducted the study on the unaffected subset of 106 communities within that representative sample (see *Supplementary Materials* for further details). We also conducted a pilot study of our baseline survey that helped us to estimate rates of mobile phone usage, media consumption, corruption, and corruption reporting.

Baseline survey

We conducted a baseline survey in all 106 communities to gather data used to block communities for treatment assignment (see Table S5). The survey was portrayed to participants as an independent survey from Princeton University. The sample for our baseline survey in each community was a randomly-selected group of self-identified Nollywood film-watchers (those who would likely purchase the Nollywood treatment film). In 88% of all communities we interviewed between 12 and 20 people in the community; due to rigorous quality checks 11 communities retained fewer than 12 participants (a minimum of 8). The number of surveys completed is balanced across treatment conditions (average = 15 completed surveys in the placebo condition and 16 in the treatment condition). The survey measured a range of norms about corruption and corruption reporting. Surveyors also confirmed that the 106 communities had a VCD film seller (one of our treatment delivery methods), and reception from our mobile phone company

partner.

Treatment campaigns

We developed two campaigns: a feature-length film with treatment and placebo versions, and a mass text message. The film was produced in collaboration with iROKO Partners, the leading distributor of films from the Nigerian film industry, known as Nollywood. Nollywood is the third largest film industry in the world, following Hollywood and Bollywood. The film produced for this project, titled *Water of Gold*, runs approximately two hours and stars well-known Nollywood actors. It tells the story of a poor fisherman named Natufe living in the Niger Delta, and of his rags-to-riches brother, Priye. The two are close until Priye leaves their village, eventually returning many years later as a rich businessman. Against his brother's protests, Priye enters politics and begins to work with corrupt local politicians. The film depicts corruption harming Natufe and his neighbors' livelihoods, including bad medical care, police harassment, and oil companies disrespecting environmental concerns. Natufe becomes outspoken against the corrupt system in which they live.

In the treatment version of the film, Natufe and a local activist set up a toll-free "short-code" telephone number, and in six scenes totaling five minutes they encourage community members to use the short-code to report on corruption by text message. They explain that their activist group will use the text messages to write a public report. Subsequent treatment scenes separately depict men and women of varying social classes reporting corruption to the short-code. These treatment scenes do not appear in the placebo film, which is otherwise identical. In both versions of the film, an information banner echoing the content of the mass text message appears on the screen four times: "See corruption? Let us hear from you! SMS 50500 to report corruption to Integrity Nigeria. Tell us your story. Text for FREE. Your number kept secret."

The mass text message treatment (see Fig. 2A) was received by all subscribers to the major

mobile phone company within the treated phone tower’s coverage area. A pilot survey we conducted before the experiment revealed that 87% of people in the Niger Delta region with phones subscribed to that phone company (88% of all respondents reported owning a phone).

Treatment assignment

After we blocked communities into pairs using covariates measured in the baseline survey and characteristics of the community such as the number of mobile phone subscribers, we randomly assigned communities within each pair to receive either the treatment or placebo film ($n = 53$ communities in each group). Next, we randomized the order in which films were distributed in communities. The order was randomized first among the pairs of communities, and then between the treatment and placebo communities within each pair. Finally, we randomized the timing of the mass text message for each blocked pair of communities, such that it was sent on a randomly assigned day within 14 to 20 days following the last day that films were distributed in a given community.² This range was selected so as to give people in each community a chance to watch the film before receiving the mass text message.

Film distribution

Films were distributed in each community after the baseline survey, from January 13, 2014 to March 9, 2014. They were distributed by members of a Nigerian research firm who were trained on distribution protocols by the research team, and were not part of the baseline survey enumeration team. Film distributors visited the main film seller in each community and introduced themselves as representatives of our film production partner. The distributors explained that they were promoting a new, unreleased film. As part of the promotion, they were there to give out two free copies of *Water of Gold* to customers who bought any Nigerian film from

²The actual time interval ranged from 10 to 20 days, due to an administrative error in 6 communities.

the film seller (one copy for the customer and one for the customer to give to a friend). In return for entry in a lottery for a Blackberry phone, customers who received the films were asked to provide their name and contact number, as well as the names and numbers of two friends with whom they usually watch Nigerian films.³ These names and numbers were later used to randomly sample people to participate in the endline survey. To augment the number of films given out in such a short time, film distributors gave out an additional 100 free films to arbitrary people aged 18 and over in return for contact details. The distribution of 300 films in each community typically lasted from 3 to 5 days. All films were distributed by a member of our trained film distribution team who sat in the shop all day, not by the shop's film seller. Across the 106 communities in the sample, we distributed 31,800 films.

Mass text message

The mass text message was sent to all subscribers of the largest mobile phone provider in our study communities, as well as to the film buyers and their friends, whose numbers were collected by the film distribution team. Text messages were sent to 683,000 people across the 106 communities, from February 3, 2014 to March 29, 2014. While we know the exact number of phone numbers targeted by the mass text message, we cannot confirm the number of people who actually received the message. Certainly not all people on the list received the message, as a result of insufficient credit purchased for their phone, incorrect profile settings, an invalidly recorded number, no operator coverage, and other possible causes. During an audit of a randomly-selected 1000 mass text message recipients (544 of whom answered our phone call), 23% confirmed receiving the message with no difference between phone numbers assigned to the treatment or placebo film ($p = .9$).

³The lottery was conducted and the phone delivered after the conclusion of the study.

Endline Survey

Approximately 10 days after the mass text message was sent to a given community, the endline survey was conducted, from February 18, 2014, to May 11, 2014. Before arriving in each community, surveyors called participants who received a copy of *Water of Gold*. We collected the phone numbers of friends in order to add them to the list of mass text message recipients, but only interviewed film buyers in the endline survey (with the exception of one community, where we were unable to contact a sufficient number of film buyers and so interviewed customers and others who had received and watched the film). Surveyors made three attempts to contact each film-buyer on the list before moving on to the next person. When surveyors made contact over the phone, they screened the respondent to confirm that they were 18 years of age, which was required for survey participation, and to see whether they had actually watched the film (determined by asking for a cursory description of the plot). Only those who had watched *Water of Gold* were included in the endline survey. In 91% of all communities we interviewed between 12 and 20 people in the community; due to rigorous quality checks 8 communities retained fewer than 12 participants (a minimum of 7). The number of surveys completed is balanced across treatment and placebo (average = 14 completed surveys each). The endline survey repeated all of the questions contained in the baseline.

Coding incoming messages

After eliminating incomplete or nonsense texts received by the platform, we coded all remaining messages. Five members of the research team independently coded a random sample of 200 messages and then discussed and agreed upon their different interpretations of the coding definitions. One coder then coded all messages using the consensus interpretations, and a second coder coded a random subset of 200 messages, achieving a rate of agreement of 90.5% (Fleiss' Kappa = .81). Messages received between January 13 and August 12, 2014 were coded

and included in the analysis. We report the two main codes of interest in this paper: (1) *Any Engagement* (texts in which the sender mentioned corruption or the two media campaigns), and (2) *Corruption Report* (a subset of *Any Engagement* messages in which the sender made explicit mention of a corrupt act, person, or institution). A list of the coding definitions with example messages is presented in Table S1. While it is impossible to verify the veracity of the reports or to determine the motivations of the sender, we note that the majority of messages featured commentary about corruption as a societal problem rather than reports on the malfeasance of specific people. Therefore the vast majority of messages do not appear to be motivated by a desire for personal vengeance or gain, but rather by a desire to engage with a societal problem.

Analysis

We predict the number of corruption messages per day in each community (separately for messages with any engagement and corruption report) received from unique senders, using the following randomly-assigned independent variables: treatment vs. placebo film, which was randomly assigned at the geographic level; and day of mass text message reception, which was assigned at the geographic level on a randomly-chosen day following film distribution. For the corruption messages, we were able to determine each unique sender’s treatment status based on their geographical location, according to the phone company. In all analyses we interact the film and mass text treatments, use fixed effects for community matched pair, and we report cluster-robust standard errors at the level of the community.

$$Y_{it} = \text{treat_film}_{it} + \text{mass_text}_{it} + \\ \text{treat_film}_{it} \times \text{mass_text}_{it} + \text{pair}_i$$

We predict endline survey responses about social norms of corruption and corruption reporting in each community, using the randomly-assigned treatment vs. placebo film variable. These

regressions also control for community matched-pair fixed effects and calculate cluster-robust standard errors at the level of community.

$$Y_{it} = \text{treat_film}_{it} + \text{pair}_i$$

Code Availability

The experimental design was pre-registered at <http://egap.org/registration/629>.

All code can be accessed in the OSF repository at https://osf.io/9a7h5/?view_only=4ed136d7d9c84100893b326d997e5896.

Data Availability

The datasets generated and analyzed during the current study are available in the OSF repository at https://osf.io/9a7h5/?view_only=4ed136d7d9c84100893b326d997e5896.

Ethics Statement

This study was approved by the Princeton University Institutional Review Board. The authors complied with all relevant ethical regulations.

References and Notes

1. R. Boyd, P. J. Richerson, *Ethol Sociobiol* **13**, 171 (1992).
2. M. A. Nowak, K. Sigmund, *Nature* **437**, 1291 (2005).
3. R. Boyd, H. Gintis, S. Bowles, *Science* **328**, 617 (2010).
4. A. Bear, D. G. Rand, *Proc Natl Acad Sci USA* **113**, 936 (2016).
5. H. Allcott, *J. Public Econ.* **95**, 1082 (2011).
6. E. Ostrom, *J. Econ. Perspect.* pp. 137–158 (2000).
7. S. Eidelman, C. S. Crandall, *Soc Personal Psychol Compass* **6**, 270 (2012).
8. D. Kahneman, J. L. Knetsch, R. H. Thaler, *J Econ Perspect* **5**, 193 (1991).
9. E. Fehr, S. Gächter, *Nature* **415**, 137 (2002).
10. R. Axelrod, W. D. Hamilton, *Science* **211**, 1390 (1981).
11. D. Ryvkin, D. Serra, J. Tremewan, *Eur Econ Rev* **94**, 1 (2017).
12. R. I. Rotberg, J. C. Aker, *Wash Q* **36**, 111 (2013).
13. M. Zook, M. Graham, T. Shelton, S. Gorman, *World Med Health Policy* **2**, 7 (2010).
14. T. C. Schelling, *Journal of mathematical sociology* **1**, 143 (1971).
15. A. V. Banerjee, *The quarterly journal of economics* **107**, 797 (1992).
16. R. B. Cialdini, M. R. Trost, *The handbook of social psychology*, D. T. Gilbert, S. T. Fiske, G. Lindzey, eds. (McGraw-Hill, New York, 1998), vol. 1-2, pp. 151–192, fourth edn.

17. M. Sherif, *The Psychology of Social Norms* (Harper, Oxford, 1936).
18. D. T. Miller, D. A. Prentice, *Social psychology: Handbook of basic principles*, E. T. Higgins, A. Kruglanski, eds. (Guilford Press, New York, 1996), pp. 799–829.
19. M. E. Tankard, E. L. Paluck, *Soc Issues Policy Rev* **10**, 181 (2016).
20. E. L. Paluck, H. Shepherd, P. M. Aronow, *Proc Natl Acad Sci USA* **113**, 566 (2016).
21. E. La Ferrara, *J Eur Econ Assoc* **14**, 791 (2016).
22. A. Banerjee, A. G. Chandrasekhar, E. Duflo, M. O. Jackson, *Science* **341**, 1236498 (2013).
23. M. A. Hogg, *Handbook of social psychology* (2010).
24. J. E. Dannals, D. T. Miller, *Journal of Experimental Psychology: General* **146**, 1342 (2017).
25. E. L. Paluck, D. P. Green, *Am. Polit. Sci. Rev.* **103**, 622 (2009).
26. R. H. Thaler, C. R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (Yale University Press, New Haven, 2008).
27. S. Bhargava, D. Manoli, *American Economic Review* **105**, 3489 (2015).
28. G. B. Chapman, M. Li, H. Colby, H. Yoon, *Jama* **304**, 43 (2010).
29. B. Cooke, *et al.*, Using behavioral science to improve criminal justice outcomes: Preventing failures to appear in court, *Tech. rep.*, ideas42 and University of Chicago Crime Lab Report (2018).
30. B. L. Castleman, L. C. Page, *Journal of Economic Behavior & Organization* **115**, 144 (2015).

31. N. Malhotra, M. R. Michelson, T. Rogers, A. A. Valenzuela, *American Politics Research* **39**, 664 (2011).
32. D. J. Smith, *A Culture of Corruption: Everyday Deception and Popular Discontent in Nigeria* (Princeton University Press, Princeton, 2010).
33. Integrity Nigeria, egunjedotinfo: Name & praise or name & shame...just tell your story! (2016). Website accessed 1 September 2016.
34. BribeNigeria.com, Bribenigeria.com: Fighting corruption in nigeria (2016). Web site accessed 1 September 2016.
35. NOIPolls, Democracy day poll (2015). Web site accessed 6 September 2016.
36. G. Grossman, M. Humphreys, G. Sacramone-Lutz (2016).
37. G. Grossman, M. Humphreys, G. Sacramone-Lutz, *Am Polit Sci Rev* **108**, 688 (2014).
38. A. Banerjee, E. Duflo, S. Barnhardt, *Insights in the Economics of Aging*, D. A. Wise, ed. (University of Chicago Press, Chicago, 2015).
39. M. Van Zomeren, R. Spears, A. H. Fischer, C. W. Leach, *J Pers Soc Psychol* **87**, 649 (2004).

Acknowledgements

All authors contributed equally. Funding from an anonymous private donor and the Canadian Institute for Advanced Research to E.L.P. is gratefully acknowledged. All authors declare that they have no competing interests. This research was approved by the Princeton Institutional Review Board, protocol #5813. We thank Robin Gomila for extraordinary research assistance. We are also very grateful to Allison Bland, Molly Clark-Barol, Alexander Coppock, Sasha Cuerda, Jose Drost-Lopez, Amanda Edgell, Maddy Gleave, Jessica Okeke, and Molly Offer-Westort for

additional research assistance. We thank our partners in the interventions and data collection, especially Integrity Nigeria; iROKO TV; Magic Movies; a major mobile phone firm in Nigeria that wishes to remain anonymous; TNS RMS Nigeria, and especially Mariam Fagbemi and Chike Egbulefu; MK&I, and especially Yinka Aderoju and Abiodun Seosan; Funmobile, and especially Adewale Adetule; and Social Action. We also thank Kabat Egbon and Ken Henshaw for assistance in developing the interventions, and Clinton Okpowhor and Charles Uche for help in developing and translating our measurement. We are grateful for useful comments from audiences at Yale, Harvard, Evidence in Governance and Politics (EGAP), the Contemporary African Political Economy Research Seminar (CAPERS), the Paluck lab, the UCLA Improving Designs in the Social Sciences workshop, and the American Political Science Association Annual Meeting.

Figures and Tables

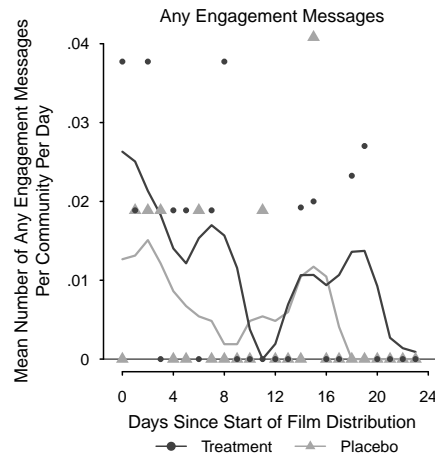
A



B



C



D

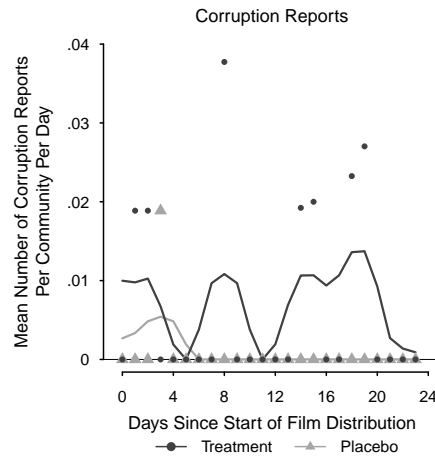


Figure 1: Social norms campaign film scene and results. Figs. 1A and 1B are scenes from the treatment version of the Nollywood film, depicting characters texting in corruption reports (screen captures from the film by the authors). Figs. 1C and 1D are time series, plotting the average daily number of text messages that engaged with the campaign and that reported a concrete corruption event, respectively, from communities where we delivered the treatment vs. placebo version of the film. LOESS lines are overlaid.

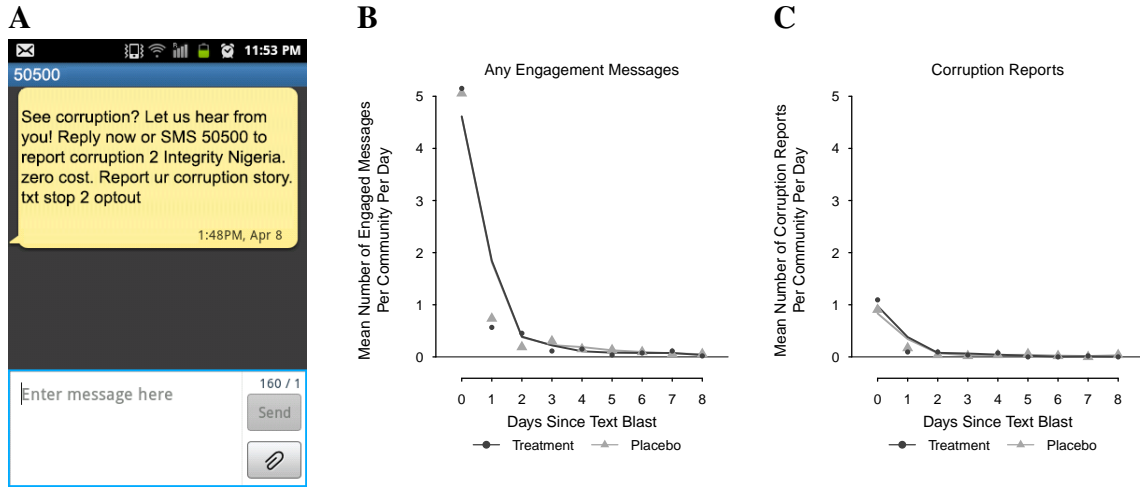


Figure 2: Nudge campaign text and results. Fig. 2A depicts the mass text nudge sent to phones (screen capture of phone by the authors). Figs. 2B and 2C are time series, plotting the average daily number of text messages that engaged with the campaign and that reported a concrete corruption event, respectively, from communities that received the text on a randomly assigned day following the film distribution. LOESS lines are overlaid.

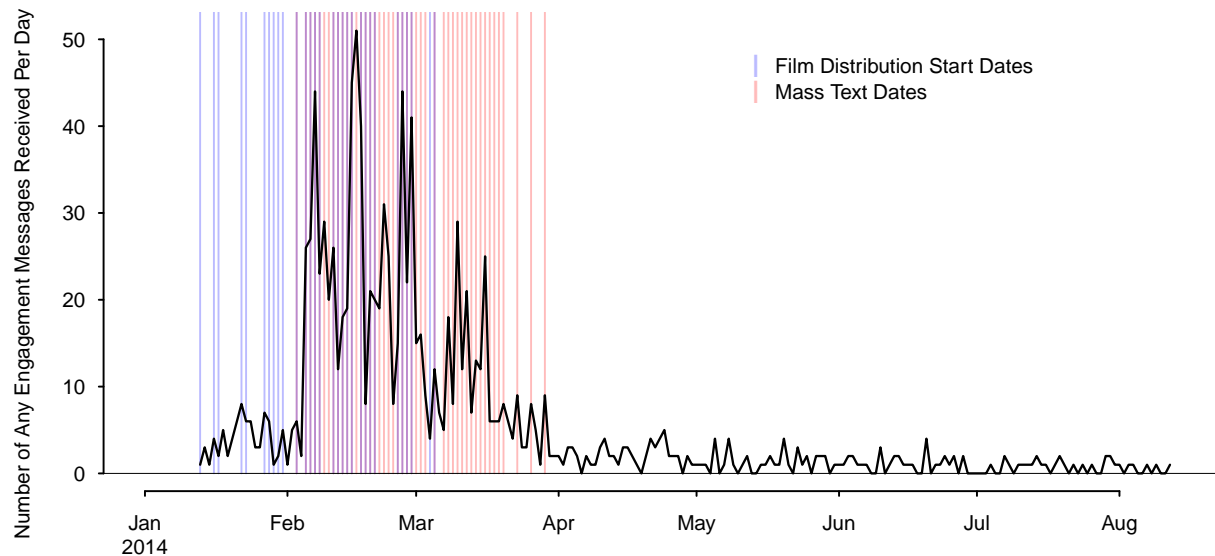


Figure 3: Total number of text messages received per day from January 2014 to August 2014. The number of messages received per day is reported for *Any Engagement* messages that mentioned corruption or the two media campaigns, including *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution.

Supplementary Materials

New Corruption Reporting Platform

In partnership with a Nigerian anti-corruption organization (Integrity Nigeria) and the largest mobile phone company in Nigeria, we opened a set of toll-free short code numbers that citizens could use to report corruption by text message. The free short codes were advertised in the treatment and placebo films produced for the study and in the mass text message sent to phone subscribers in the study communities. All text messages sent to the short codes were delivered to a secure online platform that only the research team could access. Anyone who sent a message to the short codes automatically received the following reply: “Thanks for your report to Integrity Nigeria. Your voice has been heard.”

Our research team monitored all messages coming in and responded individually to senders when necessary using a standardized response key (see Supplementary Text). For example, when a sender asked for specific help investigating or punishing an incident of corruption, we sent a standard response explaining that the corruption reports were not being used to investigate specific incidents but were instead being collected for a report to put pressure on the government. When messages reported criminal activities beyond corruption, the standard response asked whether the incident had been reported to the police. When a text message was cut off or incomplete, we sent a standard request for the individual to resend their report.

At the completion of the study, we stripped all messages of identifying information such as phone numbers and names if given, and sent the messages to Integrity Nigeria to use for their anti-corruption activities.

Social Norms Campaign: Nollywood Film

Nollywood

The Nigerian film industry, known as Nollywood, is the second highest producer of films in the world by volume, and the third overall largest film industry in the world, following U.S.’s Hollywood and India’s Bollywood industries (32). Nigerian films are produced cheaply and quickly, and are distributed to communities throughout Nigeria on video CDs (VCDs). The films are typically two to three hours long and are often highly dramatic, incorporating themes of family, temptation, love, and ambition. Thanks to the speed of film production, the films frequently incorporate political themes. For example, in 2013 a Nigerian military representative stated in a television interview that he could not answer the interviewer’s question without consulting his “Oga on top” (his boss). The comment was widely ridiculed, and the incident was quickly memorialized in a Nollywood film distributed later that month titled *Oga on Top*. Nollywood films are popular among all kinds of people within Nigeria. In descriptive data that we collected from our study region in the Niger Delta, 86% of respondents reported that they watch Nollywood films: 56% of these viewers were women and 71% were between the ages of 15 - 30. Seventy one percent of respondents reported buying, renting, or borrowing a Nollywood film in the last month, and 81% reported owning a VCD player at home with which to watch films.

Water of Gold

The film created for this study, titled *Water of Gold*, tells the story of a poor fisherman named Natufe living in the Niger Delta, and of his rags-to-riches brother, Priye. The brothers are close until Priye leaves their fishing village. After years away, Priye returns as a successful and rich businessman. Against his fisherman brother's protests, Priye decides that he wants to enter politics, and he begins to collaborate with corrupt local politicians. As a fisherman suffering from the effects of corruption, Natufe does not approve of his brother's involvement in politics. The film depicts corruption posing multiple threats to Natufe and his neighbors' livelihoods, for example from bad medical care, police harassment, and oil companies that do not respect environmental concerns. Natufe becomes outspoken against the corrupt system in which they all live.

In the treatment version of the film, Natufe and a local activist set up a free "short code," a toll-free telephone number that their community members can use to report corruption by text message. In six scenes amounting to five minutes, Natufe and the activist encourage citizens to send text message reports of corruption to the short code number. They explain that the reports will be used by the activist to write a public report. Subsequent treatment scenes separately depict two groups of men (fishermen and men of higher socioeconomic status), and two women (a woman selling items at a market and a woman of higher socioeconomic status) reporting corruption using the short code. In the placebo version of the film, these corruption reporting scenes do not appear. Otherwise, the two versions of the film are identical, and they feature the same ending in which a corrupt local politician is arrested, thanks to the work of Priye's new girlfriend, an undercover journalist who was masquerading as the corrupt politician's lover. Thus, the film did not portray a happy ending contingent upon the corruption reports. We did not wish to imply that reporting could result in this kind of outcome, and this also standardizes the ending across film versions.

In both the treatment and placebo versions of the film, an informational banner about the real-world corruption reporting campaign appears at the bottom of the screen on four occasions, including at the very beginning of the film. The message reads: "See corruption? Let us hear from you! SMS 50500 to report corruption to Integrity Nigeria. Tell us your story. Text for FREE. Your number kept secret." Thus, using this banner, we ensured that viewers of both the treatment and placebo versions of the film received information about our new corruption reporting platform. The difference between the two films – the portrayal of Nigerians from the Niger Delta using the short code to report corruption – tests the idea that viewing corruption reporting by other Nigerians in the media might cause audience members to perceive reporting as more typical or as more desirable in their communities.

The film, *Water of Gold*, was produced by iROKO TV and Magic Movies. iROKO Partners is the world's largest distributor of Nigerian entertainment, with an online global audience of over four million unique users from 178 different countries. The company also produces original film content, and they hired one of their most successful screenwriters to write the film script. The research team provided feedback and comments on the storyline regarding corruption reporting, specifically requesting that the film portray a variety of men and women reporting corruption, and that the outcome of the movie function independently of the corruption reporting storyline. The film featured well-known Nollywood actors in key roles. It was recorded on VCDs for distribution, as is typical in Nigeria. We describe the random assignment and distribution of the treatment and placebo films below.

Nudge Campaign: Mass Text Message

Our second campaign was designed as a “nudge” to reduce the psychological costs of corruption reporting, making reporting easier for those individuals who wished to take action. The campaign was a mass text message sent to all subscribers of the largest mobile phone provider in our study communities. Nigeria’s mobile phone industry is thriving. Multiple companies compete for subscribers, and phone towers cover both densely and sparsely populated locations across the Niger Delta and the rest of the country. Basic mobile phones are relatively affordable for many citizens. In our descriptive data collected in the Niger Delta, 88% of respondents reported that they own a phone. In particular, text messages are cheap relative to phone calls and are used frequently for communication. In our data, 76% of mobile phone owners reported sending or receiving a text message one or more times per day. Businesses and organizations commonly send out mass text messages, advertisements, and notifications to lists of hundreds or even thousands of mobile phone users at one time.

The mass text message used in this study invited recipients to report corruption for free by hitting “reply,” thus further reducing the costs of reporting. The text also provided information about the platform, thus eliminating the need to seek or remember information about the platform in order to report. The mass text message read as follows: “See corruption? Let us hear from you! Reply now or SMS 50500 to report corruption 2 Integrity Nigeria. zero cost. Report ur corruption story. txt stop 2 optout” (see Fig. 2A). We pilot tested several versions of the message to make sure it was engaging, easy to read, and associated with a verified source (the organization Integrity Nigeria). On the recommendation of Integrity Nigeria, we started the message with a question about corruption, and described the corruption report as a story. The *optout* message was required by Nigerian law.

Experimental Design

To test the influence of the two campaigns on the behavior of texting corruption reports and on individuals’ perceived norms of corruption reporting, we randomized whether 106 communities in southeastern Nigeria received a treatment or a placebo film, the date on which they received the film, and finally the timing of the mass text message sent to the community (subscribers in all communities received the mass text message). Our experimental design and measurement strategy were registered prior to analysis at the Evidence in Governance and Politics (EGAP) Registry (ID 20130803AA; <http://egap.org/registration/629>).

Sampling of communities

Before determining our sample size, we conducted a pilot study in which we tested our method of distributing VCDs of a Nollywood film and sent a mass text message to 25 communities. In addition to the treatment and placebo versions of the Nollywood film, we initially planned to send out treatment and placebo versions of the mass text message. Based on the pilot study and on our budget constraints, we estimated that we needed a sample of 200 communities to test the effect of our two interventions with that design.

To select our sample of participating communities for the main experiment, we first identified the GPS coordinates of all mobile phone towers in the four core states of the Niger Delta: Akwa Ibom, Bayelsa, Delta, and Rivers. We estimated the coverage areas of these towers using

Voronoi tessellations. The precise coverage area of mobile phone towers can be estimated using detailed, technical information about the configuration of the tower, including its strength, frequency, and physical orientation. However, this is confidential data that neither government regulators in Nigeria nor the cell phone company make public. Instead, we infer the coverage area for a mobile phone tower from the placement of other towers. This strategy is based on the idea that for a given location, the mobile phone tower it is most likely covered by is the closest tower. The shape of the estimated coverage area of a given tower, then, is all of the points that are closer to it than any other tower. This is the concept represented by Voronoi tessellations. We use the Voronoi shapes as estimated coverage areas for each tower, and then restrict the maximum range of a tower to 3 kilometers. This distance was chosen based on the maximum distance between towers in the study region.

We then conducted a restricted random sampling of 215 towers (inclusive of 15 extra communities, in case some communities lost phone tower connectivity or did not have a film seller). The sampling was restricted such that communities were sufficiently separated from each other to avoid spillover of the mass text message and the Nollywood film. In urban areas, selected towers could not be contiguous to any other tower in the sample, and the tower also had to be at least 700 meters from the nearest tower in the sample. In rural areas, selected towns could not be within three kilometers of other towns in the sample. We then drew 2.5 million samples of 215 communities meeting these distance restrictions, and randomly selected one of those samples. An example of a sample of towers is illustrated in Figs. S1 and S2.

While we initially selected 215 communities, we had to drop 109 due to a malfunction of the mass text message platform in which a single version of the text message was sent to the initial set of communities. After the malfunction, we pre-registered our time-series design to implement the experiment in the remaining 106 communities. Treatments reported in this paper were randomized within the new sample of 106 communities.

Baseline survey

We conducted a baseline survey before assigning treatment status. The survey took place in all 106 communities between October 21, 2013 and January 8, 2014. Nigerian surveyors from a research firm were trained by study investigators and then visited the study communities in a random order. Before conducting the baseline survey in a community, members of the survey team first confirmed that the community had a VCD film seller (our method for distributing the film, described below) and mobile phone service for the company we worked with. No communities were eliminated from the sample on this basis.

The sample for our baseline survey in each community was the self-identified population of Nollywood film-watchers. We focused on individuals who watch Nollywood films because our intervention was aimed at this population. Surveyors were instructed to locate the largest film seller in each community and to screen each randomly selected person passing by the area with a single question: “Do you watch Nigerian VCDs?” Individuals who responded yes were interviewed following consent. The surveyor introduced themselves as coming from Princeton University, and made no mention of the film that was coming to the community or of any future research work in the area. Respondents were compensated for their time with 500 Naira, approximately 3 US dollars, in the form of phone credits for their choice of mobile phone company. Surveyors attempted to complete 20 interviews per community. The number of actual surveys ranged from 8 to 26.

The baseline survey measured perceived social norms and personal attitudes about corruption and corruption reporting, as well as respondents' personal experiences with corruption. The corruption questions were repeated to capture norms, attitudes, and experiences regarding different forms of corruption, including at the state- and local-level. We also measured participants' sociodemographic information including age, gender, tribe, an index of education, an economic condition index that included relative ratings of own-household income vs. other household income in the area, and an array of household goods. Finally, we measured participants' citizenship and political engagement, their engagement with Nigerian and foreign films, use of mobile phones and the Internet, and literacy level (see Table S5 for survey questions and response scales).

Surveys were conducted on smartphones using the software SurveyToGo. To monitor surveyor's interviews, we audio-recorded 3 different questions during the baseline and endline interviews: one at the beginning, one in the middle, and one at the end. The software turned on the audio recording automatically, and the surveyor could not control the recording from the smartphone. Surveyors were aware that some parts of the interview were being recorded, but they did not know the exact questions. All audio files were uploaded along with the survey data at the end of each day. The research team listened to these recordings and used them to provide feedback to surveyors in real time. Recordings were also used to eliminate any surveys that were of low quality (31).

Treatment assignment

After the baseline survey, we blocked communities into pairs using covariates measured in the baseline survey (see Table S5). We then randomly assigned communities within each pair to receive either the treatment or placebo film. This resulted in 53 communities assigned to receive the treatment film and 53 assigned to receive the placebo film across the four core Niger Delta states of Awka Ibom, Bayelsa, Delta, and Rivers.

In accordance with this random assignment, 300 films were distributed in each community (described below). The order in which films were distributed in communities was randomized, which allows us to test the impact of the *presence* of a film advertising a corruption reporting platform, as well as the impact of the film's portrayal of corruption reporting behavior in the treatment version. The order of distribution was randomized first among the pairs of communities (e.g., pair 20, 17, 32), and then between the two communities with each pair (e.g., the treatment or the placebo-assigned community within pair 20). Distribution teams from each state proceeded in this randomized order among the communities in their state.

We then randomized the timing of the mass text message to be within 14 to 20 days following the last day that films were distributed in a given community. This range was selected so as to give individuals in each community a chance to watch the film before receiving the mass text message. The timing of the text message was randomly assigned at the blocked pair level.

Film distribution

The distribution of the Nollywood film in each community took place after the baseline survey, from January 13, 2014 to March 9, 2014. Members of the film distribution team came from the same Nigerian research firm used to conduct the baseline, but were not part of the baseline

survey team. They were trained by the study PIs. Distributors visited the main film seller in each community, and introduced themselves as representatives of iROKO TV, our production partner. They explained to the film seller that they were part of a new promotion to spread the word about iROKO and specifically to promote a new, unreleased film called *Water of Gold*. As part of the promotion, they wanted to give out two free copies of *Water of Gold* to customers who bought any Nigerian film from the film seller (one copy for the customer and one for the customer to give to a friend). This distribution strategy ensured that the film reached the Nigerian film consumer base in a timely manner, and that it reached the relevant film buying population.

As part of the purported promotion, the distribution team asked all customers who received a free film to provide their name and contact number, as well as the names and contact information for two friends with whom they usually watch Nigerian films. Customers were told that they might be contacted again, and that all names would be entered into a promotional lottery to win a Blackberry phone (the lottery was conducted and the phone delivered after the conclusion of the study). The collected names and numbers were later used to randomly invite individuals to participate in the endline survey.

Using this film distribution method, the distribution team gave out 200 films in each community, which typically took from 3 to 5 days. In order to augment the total number of films given out in each community in such a short amount of time, film distributors then relocated themselves to a position away from the film seller but within the same community. They gave out an additional 100 films for free to arbitrary individuals over the age of 18, in exchange for their contact information. Across the 106 communities in the sample, the team distributed a total of 31,800 films.

Mass text message

We sent out the mass text message in each community on a randomly assigned day, 14 to 20 days after film distribution ended in the community. The actual time interval ranged from 10 to 20 days, due to an administrative error in 6 communities. Phone numbers came from a list of all subscribers in each community provided by the largest mobile phone company in the Niger Delta, and from the list of film-buyers and their friends collected by the film distribution team in each community. Overall we sent the mass text message to a total of 683,000 individuals across the 106 communities, from February 3, 2014 to March 29, 2014.

While we know the exact number of phones we included in the mass text message, we cannot confirm the number of individuals who actually received the message. Not all individuals on the list received the message, due to insufficient credit purchased for their phone, incorrect profile settings, an invalidly recorded number, no operator coverage, a required feature not supported, or other possible causes. An audit of a randomly selected list of 1000 mass text message recipients, 544 of whom answered our phone call, revealed that 23% of available recipients confirmed receiving the mass text.

Endline survey

The research team conducted the endline survey approximately 10 days after the mass text message was sent out in a given community. The dates of the endline across the entire sample ranged from February 18, 2014, to May 11, 2014. Before arriving in each community, surveyors called

the film-buyers in our sample in a random order. Film-buyers are those individuals who had participated in the iROKO TV promotion during film distribution, receiving *Water of Gold* for free when buying another Nigerian film and providing their phone number as part of the process. In a few communities, the film seller was not located and a distribution was conducted in the street with individuals who reported that they buy Nigerian films. In those few communities, the list of individuals who took the film was used for contacting endline participants. Surveyors made three attempts to contact each film-buyer on the list before moving on to the next person. When the surveyor made contact over the phone, they screened each film-buyer to confirm that they were 18 years of age, which was required for survey participation, and to see whether they had actually watched the film (determined by asking for a cursory description of the plot). Only those who had watched *Water of Gold* were included in the endline survey. Note that this is not a panel survey. Respondents in the endline survey are not the same as the film-watchers interviewed in the baseline survey. The number of surveys retained in each community for analysis ranged from 7 to 23.

The endline survey repeated all of the questions contained in the baseline, with additional questions about the *Water of Gold* intervention film and the mass text message. For example, respondents were asked about how much they identified with the characters in the film and about other people's reactions to the film (the median respondent reported watching the film with 3 to 5 people). Participants were also given the chance to say whether they had received the mass text message and whether they had reported corruption by text. These questions about the two interventions were asked after the critical outcome questions regarding perceived norms and personal attitudes toward corruption and corruption reporting.

Coding messages sent to the corruption reporting platform

After eliminating incomplete or nonsense texts received by the platform, we coded all remaining messages. To date, we continue to receive text reports on the platform, but messages received after August 12, 2014 are not included in the analysis. Five members of the research team independently coded a random sample of 200 messages and then discussed and agreed upon their different interpretations of the coding definitions. One coder then coded all messages using the consensus agreements, and a second coder coded a random subset of 200 messages, achieving a rate of agreement of 90.5% (Fleiss' Kappa = .81). A list of the coding definitions with example messages is presented in Table S1.

The two main codes of interest we report in this paper are (1) *Any Engagement*, and (2) *Corruption Report*. The engagement code was applied to texts in which the sender mentioned corruption or the two media campaigns, such as *A one party system is not good because it increase corruption*, and *i saw ur film tited; water of gold. it talks about the corruption; and how goverment can help create opportunity for people that are graduates*.

Corruption Reports are a subset of *Any Engagement* messages. A message was coded as a corruption report if the sender made explicit mention of a corrupt act, person, or institution. Examples of corruption reports that we received include: *The police at Oyigbo have started collecting money from bus, keke and motorcycle drivers at express bus stop and before Mbano junction*, and *Corruption in education (Degema national high school). 3500.00 naira payment fees for common exam entrance in to SSS1*. Excluded from this code were more general statements such as *Nigeria is full of corruption*.

Analysis

To analyze whether our social norms and “nudge” campaigns motivated people to report corruption by text message, we examine two outcome variables. The first is the number of unique senders who texted a message that engaged with the campaign (coded as *Any Engagement*). The second outcome is the number of unique senders who texted a corruption report (a subset of the *Any Engagement* messages). All outcomes (texts) were classified by the geographical location from which they were sent, which indicates their treatment status (treatment or placebo film, and day that mass text message was sent). Thus, the independent variables we use to predict the *Any Engagement* and *Corruption Report* outcomes are treatment vs. placebo film, which is randomly assigned at the geographical level, and receiving the mass text message, which is assigned on a randomly-chosen day following the film for each geographical location. In all analyses we used fixed effects for community matched pair, since randomization was conducted within matched pairs of communities, and we report cluster-robust standard errors at the level of the community to account for within-community correlation of outcomes.

We use linear regression to estimate the daily rates of text messages per community, as predicted by the community’s film treatment status, the randomized date of the mass text message, and the interaction of the film and text treatments. We hypothesized that the rate of texted corruption reports would increase when either film was introduced into a community, when communities were assigned to the treatment (vs. placebo) film, and when individuals were sent the text message at the community level. Our predictions are illustrated in Figure S3.

To analyze whether the film altered perceptions of social norms of corruption and corruption reporting, we compare individuals in treatment and placebo film communities (all of whom saw the film *Water of Gold*), using endline self-report survey data. These regressions control for community matched-pair fixed effects and calculate cluster-robust standard errors at the level of community.

Supplementary Text

Study Context

As a country awash in corruption at all levels of government, Nigeria is often regarded as a textbook example of how corruption can limit growth and citizen well-being (33). Nigeria enjoys enormous cash returns from oil and natural gas production, yet living standards of the typical Nigerian have improved much more slowly than those of citizens in comparable developing countries. One of the country’s central development bottlenecks is that despite broad and deep oil revenue sharing, much of this money never makes it beyond the pockets of governors and local council chairs. While there is a lack of transparency in oil revenue sharing, citizens do know that funds due to them are lost to corruption and not spent on projects in their communities. Awareness of corruption emerges from daily personal experience, as well as from news reports about corruption perpetrated by officials at high levels of government, by underpaid police and local government officials, and by private businesses (23).

The Niger Delta region, where we conducted this study, is the major oil-producing region in Nigeria. Its oil wealth largely lies in the four core states of Akwa Ibom, Bayelsa, Delta, and

Rivers. Despite enormous inter-governmental fiscal transfers from oil revenues in the Niger Delta, government services in terms of health, education, and infrastructure are severely lacking.

Corruption Reporting in Nigeria

Despite the prevalence of corruption throughout Nigeria, activists still face major challenges when trying to organize citizens to stand up against corrupt local government practices. For example, two organizations with national campaigns encouraging citizens to report corruption, Integrity Nigeria and BribeNigeria.com, had only a combined 385 reports of corruption on their websites after a nearly four-year-long campaign (July 14, 2011 to May 6, 2015). While these organizations have other goals besides gathering citizen corruption reports, the low numbers reveal that their campaigns are not tapping into the deep dissatisfaction Nigerians express about their government and about corruption in particular.

Two aspects of these current efforts to collect corruption reports in Nigeria stand out. For one, the organizations display the corruption reports on their websites. Therefore, the public response to these campaigns is either invisible to citizens without Internet or seemingly sparse given the low number of reports that appear on the websites. In other words, these campaigns do not make corruption reporting seem like a widespread or popular behavior. Second, reporting corruption to these organizations involves some hassle and incurs financial costs. For example, although Integrity Nigeria advertises its corruption reporting platform by a mass text message that reaches thousands of people at one time, interested individuals must call a line to speak with an operator or log on to Integrity Nigeria's website to report. This involves writing down the phone number or website from the text message, and then either making a call that costs around 25 cents or getting access to a phone or computer with internet. Since most individuals in the Niger Delta do not own smartphones or computers, many would need to travel to an Internet cafe and pay for time to log on to the site. All of these hassle factors, if they are not immediately costly to individuals financially, can quickly add up to consequential costs of time, effort, and money.

We hypothesize that participation in Nigeria's existing corruption reporting platforms might be increased if individuals perceive that others support the behavior and are participating, and if the costs of participation are decreased. Our experiment attempts to change perceptions of the typicality and desirability of corruption reporting and to lower the costs of reporting using two media campaigns: a Nigerian film and a mass text message. Both film and text messaging are popular across Nigeria, including in the Niger Delta where we conducted the experiment.

Supplementary Results

Table S2 analyzes the effect of the mass text message on the day it was received, on each of the six days following the first day of the mass text, and then the averaged effect for the eighth day and all days following. We see that the effect of the mass text on messages that engage with the campaign is large, 5.053 messages per community on the first day of the mass text (CI 4.06 to 6.047). However, the effect diminishes very quickly, such that by the seventh day in a community there is an average of 0.162 messages, which is no longer a statistically significant effect (CI -0.008 to 0.332). The effect of the mass text message on corruption reports is smaller but statistically significant, starting at 0.91 corruption reports per community on the first day (CI 0.597 to 1.224), dropping immediately to 0.182 on the second day (still a significant effect,

CI 0.066 to 0.298), and to 0.052 reports per community per day by the 7th day, which is no longer a statistically significant effect (CI -0.008 to 0.113).

In this analysis, we also test for the interaction of the film treatment and the mass text message, to see whether the mass text had a greater effect among communities that had been treated with the treatment film. This prediction was not supported by the data. As is also illustrated in Figs. 2B and 2C, the response to the mass text message was nearly identical in both treatment and placebo film communities

Response Key for Incoming Text Messages

Timing

Respond only between 2am – 2pm Eastern Time (8am – 8pm Nigeria time).

Response guide

1. Responding to messages reporting specific incidents / examples of corruption:
Thanks for sharing your story! Keep reporting corruption to us anytime.
2. Responding to multiple messages from the same sender reporting specific incidents / examples of corruption (sometimes people send in more than one report before we've had a chance to respond):
Thanks for sharing your stories! Keep reporting corruption to us anytime.
3. Responding to general corruption messages. These are messages in which senders mention corruption, but do not report a specific incident / example (e.g., "corruption is bad"):
Thanks for writing in! Is there any other corruption you have seen or heard about in your life you want to report? Tell us your story.
4. Responding to potentially relevant messages do not mention corruption (e.g., "free", their phone number, "50x00", but no mention of corruption):
Thanks for writing in! Is there any corruption you have seen or heard about in your life you want to report? Tell us your story.
5. Responding to irrelevant messages (e.g., a bunch of numbers and letters, just one digit, blank message, messages that have nothing to do with corruption):
Archive the message without responding. If the same person sends in five irrelevant messages, then respond with this: **Thanks for writing in! Is there any corruption you have seen or heard about in your life you want to report? Tell us your story.**
6. When they report corruption AND a need for help is mentioned:
First treat it as a specific corruption report, replying with: **Thanks for sharing your stories! Keep reporting corruption to us anytime.**
If the person writes back and asks for help again, reply with: **We collect corruption reports from all over Naija so we can put pressure on gov'ment to end corruption. We are sorry, but for now we are just collecting reports**

7. When they report criminal activities by other people:
Thanks for writing in. Have you reported this to the police?
8. When they send in messages about homosexuality or non-criminal sexual encounters / relationships:
 Treat this as a general corruption report, replying with: **Thanks for writing in! Is there any other corruption you have seen or heard about in your life you want to report? Tell us your story.**
9. When they ask us to call them or ask for our email address to talk about corruption:
 If they want to call or email to ask questions: **Please send us your questions by SMS to this short code. It is zero cost, so you can send more than one message if you have a lot to say.**
 If they want to call or email to report corruption: **Can you send us your report by SMS to this short code? It is zero cost, so you can send more than one message if you have a lot to say.**
 If they insist on getting in touch outside of the platform, you can give them the email address for the lab: **You can email your corruption report to us at [lab e-mail address].**
10. When they want to know more about us, try to argue about reporting corruption, or show pessimism about reporting corruption:
We are Integrity Nigeria, common people like you who together fight gov'ment corruption. We believe that when the people act, corruption stops!
11. When religion/god is involved as a way to cope or fight corruption:
 Treat these messages like any other kind of report. If they mention a specific incident / example of corruption, treat it like a concrete corruption report. If they mention corruption more generally without a specific report, treat it like a general corruption report. If they don't mention corruption at all, treat it as a potentially relevant message.
12. When they postpone their reports (e.g., "you'll hear from me shortly"):
Thanks for writing in! We look forward to receiving the report of your corruption story.
13. When we receive a cut off or incomplete message about corruption:
Thanks for writing in! We can only see part of your corruption report. Can you please send us your report again so we can read the whole thing?
14. When they ask what the reward is for sending in a corruption report:
Your reward is that we are trying to make Nigeria a better place by fighting gov'ment corruption. The power is in your hands.
15. When they report something criminal that they have done: Don't respond.
16. When they ask for instructions on how to report corruption to us:
You can report corruption by sending an SMS to this same short code!

17. When they ask how they can become involved in the campaign:

Thanks for writing in! You can become active by reporting corruption to us. It is zero cost so you can send more than one message. Tell us your stories.

18. When they express security concerns:

Reporting to us is anonymous. You do not need to give your name, and we do not release your phone number to anyone.

Follow-up Instructions

1. For people who already sent in a specific corruption report and received our thank you / encouragement text:

After the initial thank you / encouragement message, you don't need to respond again unless they ask a question in one of their responses OR if they send in three more reports. After the third report, you can send the same thank you message again: **Thanks for sharing your stories! Keep reporting corruption to us anytime.**

2. For people who already sent in a general corruption message (e.g., "corruption is bad") and received our encouragement text:

If they send in general corruption messages following an initial general corruption message, archive the message without responding. But after they reach three more general reports, send this response: **Thanks for sharing your stories! Keep reporting corruption to us anytime.**

If they send in a specific corruption report in response to the encouragement message that we sent previously, send this response: **Thanks for sharing your stories! Keep reporting corruption to us anytime.**

Figures S1 to S5

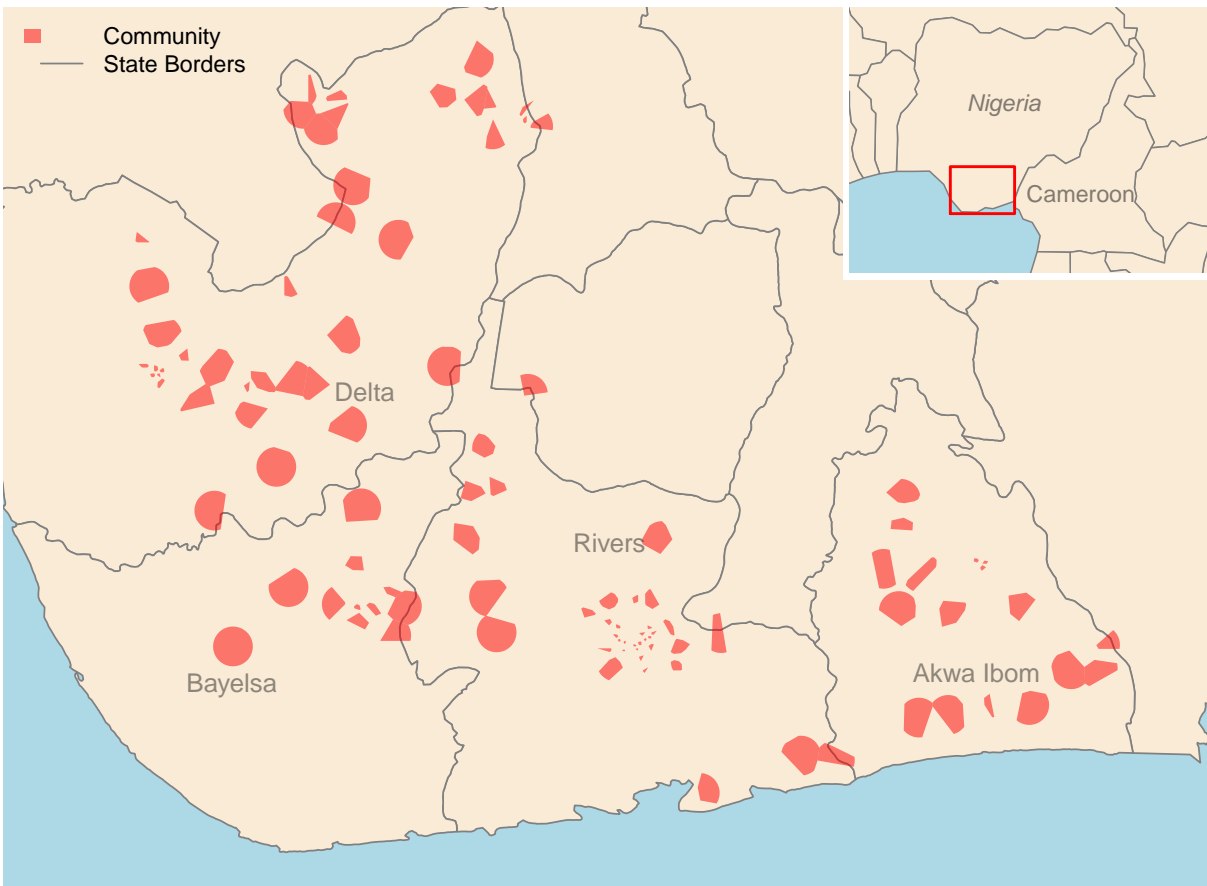


Figure S1: Illustrative Map of 106 Sampled Communities and Mobile Phone Towers. This map serves to illustrate our sampling strategy of phone tower coverage sites. Due to a confidentiality agreement with the mobile phone company, the communities of towers in this map were randomly perturbed. Thus it serves as an illustration, but does not provide an exact picture of the communities used in our study.

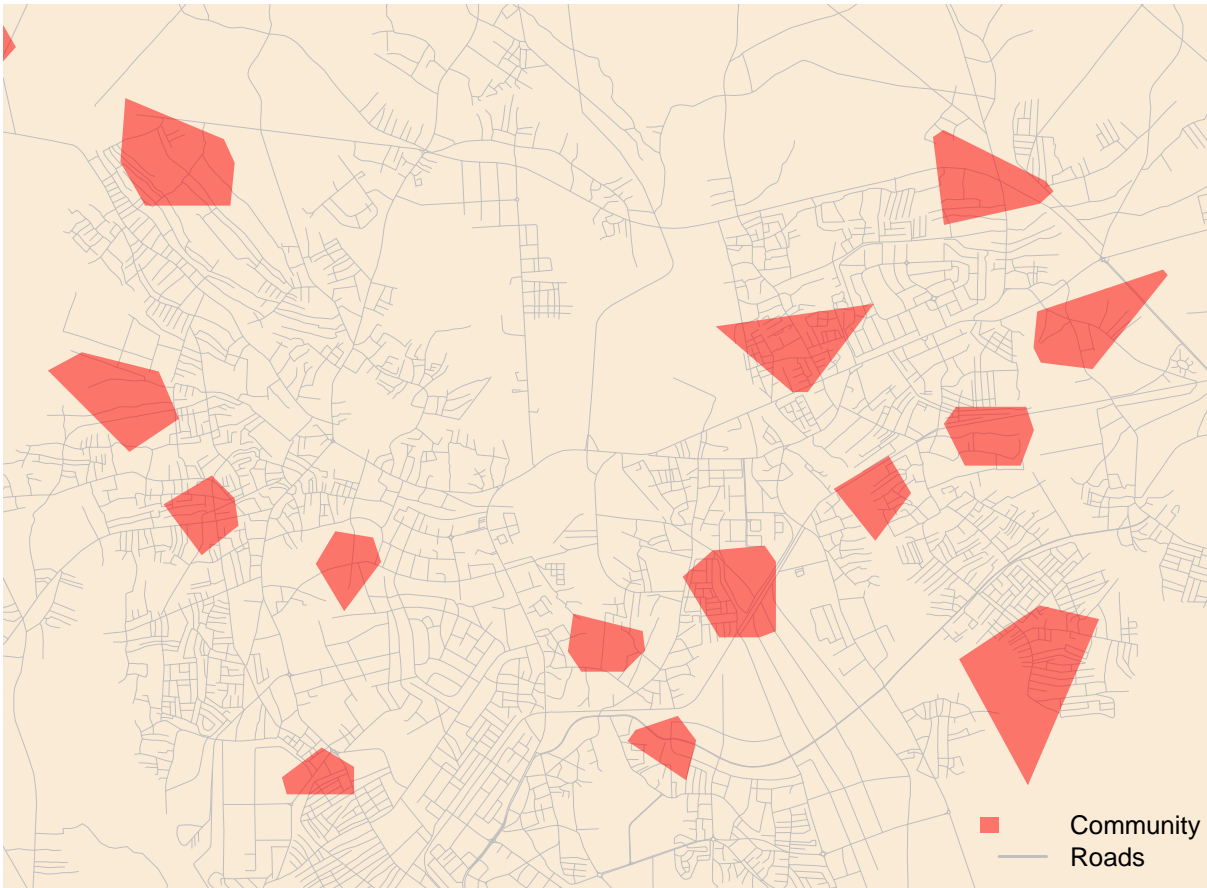


Figure S2: Illustrative Map of Sampled Communities in an Urban Area, Port Harcourt. To protect the confidential data on the GPS coordinates of mobile phone towers used as the sample universe in our study, the communities of towers are randomly perturbed. This map serves to illustrate our sampling strategy in urban centers, not to provide an exact picture of the Port Harcourt communities used in our study.

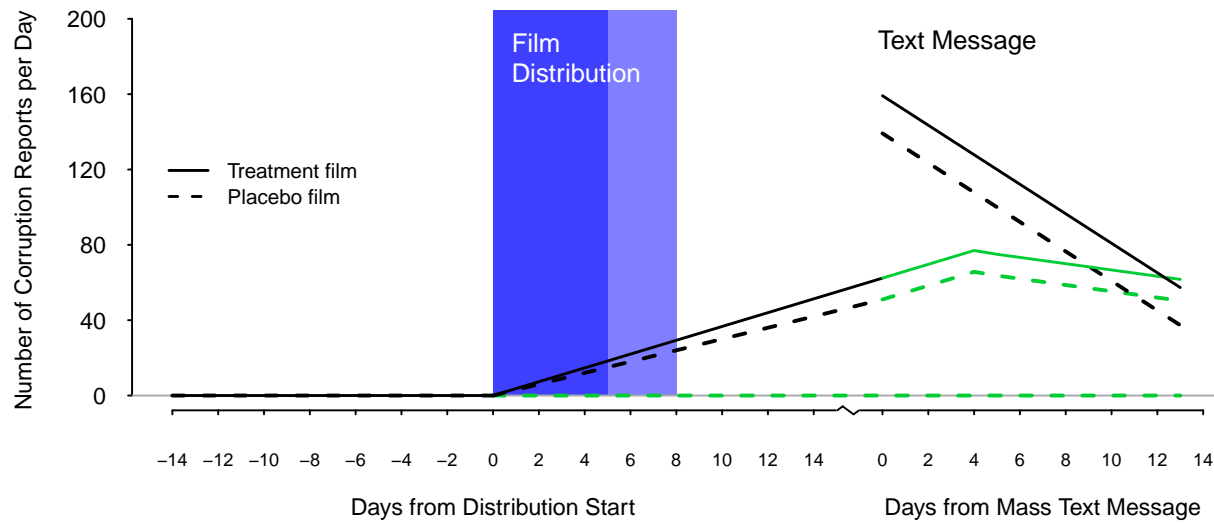


Figure S3: Ex ante predictions for rates of corruption reporting per treatment condition. The black lines in this figure denote our predictions for corruption reports observed in response to the treatment film communities (solid line) and the placebo film communities (dotted line). Film distribution is indicated by the vertical blue bars, with dark blue indicating the standard number of distribution days allowed per community, and the light blue indicating the three extra days allowed for a minority of rural communities where business and thus distribution proceeds more slowly. The green lines running along the x axis from the start of distribution to the day of the mass text message at zero messages and after the mass text message indicates the counterfactual of these two treatments. No-film control communities are hypothetical, as that condition was not run, as well as the no-mass text communities, as all communities eventually received a mass text message. Our predictions focus on corruption reporting; we had similar but weaker priors regarding effects for messages that engaged in the campaign in any way.

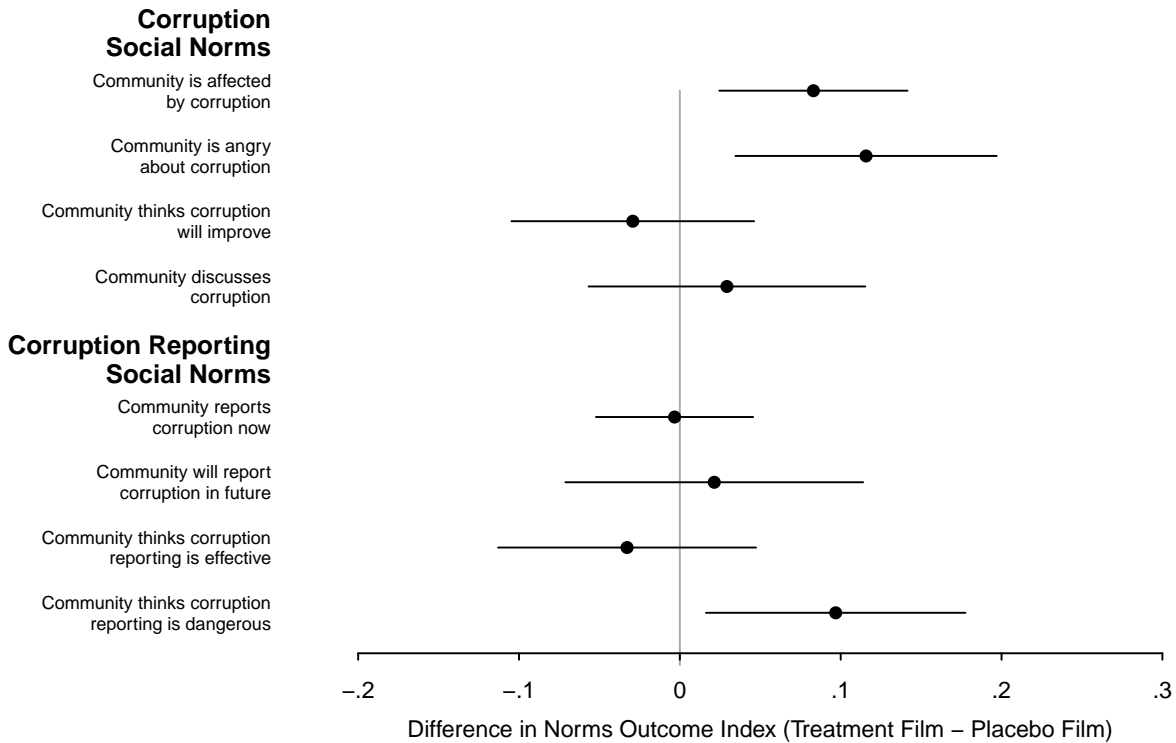


Figure S4: Difference in perceptions of social norms regarding corruption and corruption reporting. Estimates are the average treatment effects between treatment and placebo communities, with 95% confidence intervals. Social norms outcomes are measured at a random time following the mass text among film viewers. Each topic is measured by a single question or an index of two to four questions per topic, and we take the mean of the items to create the indices (see Table S5 for items). Differences are calculated by regressing the mean index on randomly assigned treatment status of the community, controlling for community matched-pair fixed effects. Robust standard errors are clustered at the level of community.

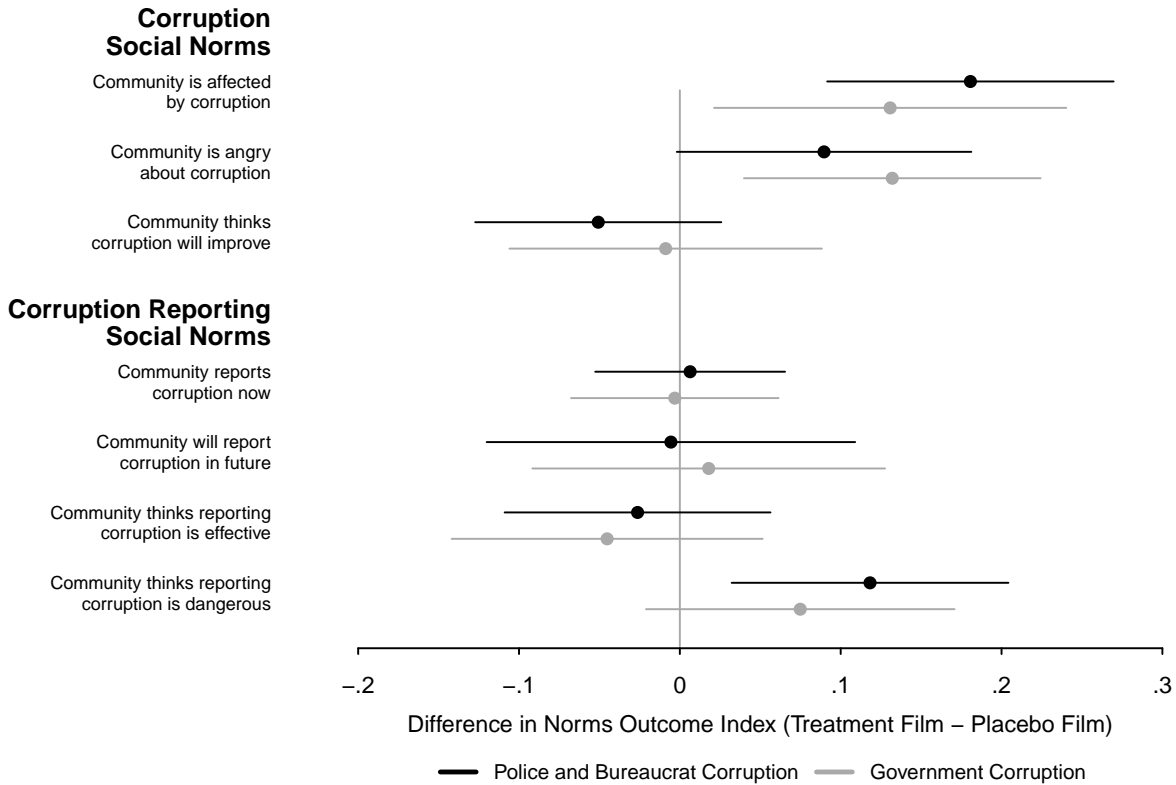


Figure S5: Difference in perceptions of social norms regarding corruption and corruption reporting, for police and bureaucrat corruption and government corruption. Estimates are the average treatment effects between treatment and placebo communities, with 95% confidence intervals. Social norms outcomes are measured at a random time following the mass text among film viewers. Each topic is measured by a single question or an index of two to four questions per topic, and we take the mean of the items to create the indices (see Table S5 for items). Differences are calculated by regressing the mean index on randomly assigned treatment status of the community, controlling for community matched-pair fixed effects. Robust standard errors are clustered at the level of community.

Tables S1 to S16

Message coding	Count	Examples
Messages	3,316	
Unique Senders	1,685	
Senders: Any engagement	1,181	how do i join ur team integrity nigeria.?
Senders: Corruption reports	241	Corruption in education (Degema national high school). 3500.00 naira payment fees for common exam entrance in to SSS1
Type of corruption:		
Bribe	98	somebody was killed in okordia bayelsa st but the culprits parents bribed the commisioner of police.this is the 3rd month nothing has been done.
Embezzlement	55	the chiarman of my local government bought some plots of land for sixty million naira somewhere in gra port harcourt rivers state while his home town isunder developed.
Exam malpractice	22	the corruption of teachers taking money from students in return they provide the students with exam malpractice materials in various schools. i also witnessed it in my own school.
Nepotism	12	for giving people that is not due to work in the name of brother or sister
Sector:		
Politicians	83	i am a youth of 30;and since birth i hav not realy seen true nigerians.our leader are actualy corrupt.d tax gatherd as revenue are suposed 2 b usd 2 develop d youth n provide fund 4 deir upkeeps bw d ages of 18 amp; 25 b4 dey begin 2 fend 4 demselves by jobs;dis wil go a long way 2 savage insecurity;poverty n unemployment.
Law enforcement	49	the police at oyigbo have started collecting money from bus ; keke and motorcycle drivers at express bus stop and before mbano junction...
Education	54	government school is free but they collect money from us in our school;secondary in oyigbo they take 6500 from us.
Governance	52	alleged \$20 billion unremitted oil money.that is corruption of the govenment. there is no fuel in town;now selling for 120 per litre. that is corruption
Oil & gas	23	o much corroption in warri refhnery and petrochmicals in selective tendering and award of contracts by the present managment of the company.its alarming.
Employment	15	bribery is high in rivers state;especially in oygbo. an employer ask his female job seeker for a bribe of 20;000 before she can get the job she was looking for but the young lady had no such money to pay so the man is asking her to have sex with him. this employee happen to be my friend
Voting & elections	8	bribes of politician to vote 4 coming 2015 election.
Justice	5	imprisonment of innocent people instead of d guilty ones who went into bribing
Health	6	this is my discovery in general hospital yesterday in warri when doctors are referring patient to one dirty environment outside the hospital for xray. collecting commission from those one outside the hospital

Table S1: Summary of text messages received in response to the two study campaigns. Categories under corruption reports are codings of corruption reports only, and are not mutually-exclusive.

	Any Engagement		Corruption Report	
	Estimate	Std. Error	Estimate	Std. Error
Treatment film	0.008	0.007	0.007	0.003*
1st day of message	5.053	0.507***	0.910	0.160***
Treatment film x 1st day	0.083	0.700	0.181	0.239
2nd day of message	0.756	0.213***	0.182	0.059**
Treatment film x 2nd day	-0.168	0.242	-0.080	0.072
3rd day of message	0.208	0.087*	0.058	0.031
Treatment film x 3rd day	0.271	0.114*	0.051	0.047
4th day of message	0.349	0.094***	0.045	0.028
Treatment film x 4th day	-0.215	0.087*	0.008	0.033
5th day of message	0.216	0.095*	0.068	0.034*
Treatment film x 5th day	-0.013	0.088	0.032	0.055
6th day of message	0.188	0.088*	0.086	0.038*
Treatment film x 6th day	-0.097	0.062	-0.064	0.033
7th day of message	0.162	0.087	0.052	0.031
Treatment film x 7th day	-0.031	0.063	-0.027	0.021
8th-plus day of message	0.112	0.083	0.045	0.027
Treatment film x 8th-plus day	-0.008	0.006	-0.007	0.003*
R^2	0.62		0.33	
F statistic	121		35.7	
N	17,066		17,066	
Communities	106		106	
Matched pair fixed effects	✓		✓	
Days since distribution start	✓		✓	

Table S2: Corruption messages sent as a result of the treatment film and mass text. The outcomes are the number of messages received per day per community for *Any Engagement* messages that mentioned corruption or the two media campaigns, and *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution. Regressions control for community matched-pair fixed effects and days since the randomly determined first date of film distribution in the community. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.

	Estimate	Std. Error	R^2	F -statistic	N	Communities
Affected	0.083	0.030**	0.11	2.9	1,270	100
Angry	0.116	0.041**	0.1	3.1	1,384	100
Resigned	-0.029	0.038	0.07	2	1,366	100
Talk	0.029	0.044	0.05	1.4	1,369	100
Reporting	-0.003	0.025	0.07	1.8	1,203	100
Future	0.021	0.047	0.08	2.3	1,305	100
Effective	-0.033	0.041	0.06	1.6	1,348	100
Dangerous	0.097	0.041*	0.09	2.7	1,371	100
Matched pair fixed effects ✓						

Table S3: Changes in social norms outcomes as a result of the treatment film. The outcomes are perceptions of norms of corruption and corruption reporting. Regressions control for community matched-pair fixed effects. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.

Index and items	Treatment Mean	S.D.	Placebo Mean	S.D.
<i>Community is affected by corruption</i>				
How many people in this area think that police are corrupt?	2.179	0.958	2.011	1.015
How many people in this area think that the government is corrupt?	1.921	1.039	1.799	1.055
How many people in this area think that there is a lot of corruption in this area?	1.845	0.982	1.778	0.985
How many people in this area have to give money to get out of trouble with police?	1.266	0.993	1.261	0.981
How many people in this area have to give extra money to government workers to get services like water and electricity, or documents like school diplomas?	1.260	1.038	1.201	0.958
<i>Community is angry about corruption</i>				
How many people in this area are angry about this kind of police or government worker corruption?	2.286	0.880	2.205	0.925
How many people in this area are angry about this kind of government corruption?	2.337	0.867	2.216	0.939
<i>Community thinks corruption will improve</i>				
How many people in this area think that this kind of police or government worker corruption will change?	0.935	0.958	0.990	0.940
How many people in this area think that this kind of government corruption will change?	0.902	0.975	0.906	0.940
<i>Community discusses corruption</i>				
How often do you hear people in this area talk about corruption issues?	3.340	0.923	3.312	0.832
<i>Community reports corruption now</i>				
How many of the people in this area report corruption when they see it?	0.514	0.827	0.500	0.792
How many people in this area report this kind of police or government worker corruption when they see it?	0.438	0.712	0.430	0.693
How many people in this area report this kind of government corruption when they see it?	0.411	0.707	0.414	0.701
How many Nigerian people report corruption when they see it?	0.663	0.808	0.709	0.781
<i>Community will report corruption in future</i>				

Index and items	Treatment Mean	S.D.	Placebo Mean	S.D.
In the future, like years after now, do you think that more people in this area will report this kind of police or government worker corruption when they see it?	1.888	1.005	1.896	1.020
In the future, like years after now, do you think that more people in this area will report this kind of government corruption when they see it?	1.968	0.983	1.943	1.000
In the future, like years after now, do you think that more Nigerian people will report corruption when they see it?	2.127	0.943	2.124	0.965
<i>Community thinks corruption reporting is effective</i>				
How many people in this area think that reporting this kind of police or government worker corruption will change things?	1.017	0.947	1.049	0.922
How many people in this area think that reporting this kind of government corruption will change things?	0.955	0.948	0.999	0.959
<i>Community thinks corruption reporting is dangerous</i>				
How many people in this area think it is dangerous to report this kind of police or government worker corruption?	1.479	1.002	1.364	0.945
How many people in this area think it is dangerous to report this kind of government corruption?	1.461	0.991	1.380	0.990

Table S4: Summary statistics for items in social norms outcome indices. Means and standard deviations for each item are calculated separately for respondents who received the treatment versus the placebo film. All questions in the norms indices were measured on a scale of 0 = few people, 1 = some, 2 = plenty, and 3 = almost everybody.

Wording	Scales	P	B	E
<i>Demographic Characteristics</i>				
Age			✓	✓
Gender	0=female, 1=male		✓	✓
Which ethnic group do you identify with?	1=Ahoada, 2=Babur, 3=Ebeno, 4=Ebira, 5=Efik, 6=Ekpeye, 7=Fullani, 8=Hausa, 9=Ibidio, 10=Idoma, 11=Igbo, 12=Ijaw, 13=Ikwere, 14=Isoko, 15=Itsekiri, 16=Kalabari, 17=Kanuri, 18=Kwale, 19=Marghi, 20=Nupe, 21=Ogbia, 22=Tiv, 23=Urhobo, 24=Yoruba, 25=Other		✓	✓
Are you currently in school?	0=no, 1=yes		✓	✓
What level are you in? / What level did you stop in?	1=P1, 2=P2, 3=P3, 4=P4, 5=P5, 6=P6, 7=JSS-1, 8=JSS-2, 9=JSS-3, 10=SS-1, 11=SS-2, 12=SS-3, 13=University, 98=dk, 99=ref		✓	✓
How would you rate your household compared to the other people living in your area when it comes to money?	0=resp much worse, 1=resp worse, 2=resp equivalent, 3=resp better, 4=resp much better		✓	✓
Do you have a job or own a business that provides a cash income?	0=no, 1=yes		✓	✓
Do you or your household get income from a civil servant or employee from the local, state, or federal government? For example, an elected official, a police officer, or a teacher, nurse, or doctor employed by the government?	0=no, 1=yes		✓	✓
Do you or someone living with you own a television?	0=no, 1=yes		✓	✓
Have you used your television in the last week?	0=no, 1=yes		✓	✓
Do you or someone living with you own a VCD/DVD machine?	0=no, 1=yes		✓	✓
Have you used your VCD/DVD machine in the last week?	0=no, 1=yes		✓	✓
Do you or someone living with you own a dish or cable TV?	0=no, 1=yes		✓	✓
Have you used your dish or cable TV in the last week?	0=no, 1=yes		✓	✓
Do you or someone living with you own a generator?	0=no, 1=yes		✓	✓
Have you used your generator in the last week?	0=no, 1=yes		✓	✓
How often do you use the internet?	0=never, 1=yearly, 2=monthly, 3=weekly, 4=daily		✓	✓
How much money in Naira do the other people living with you in your house earn altogether per month, the amount they take home?		✓	✓	✓
Do you ever use a mobile phone?	0=no, 1=yes		✓	✓
Have you used your mobile phone in the last week?	0=no, 1=yes		✓	✓
Can you read well enough to read a newspaper or a book?	0=no, 1=yes		✓	✓
Can you read a text message?	0=no, 1=yes		✓	✓

Wording	Scales	P	B	E
<i>Citizenship Index</i>				
During the past year, have you personally attended a community meeting?	0=no, 1=yes		✓	✓
During the past year, have you personally voted in an election?	0=no, 1=yes		✓	✓
During the past year, have you personally attended a demonstration or protest march?	0=no, 1=yes		✓	✓
<i>Engagement with Nigerian Films Index</i>				
How often do you watch Nigerian films on VCD or DVD?	0=never, 1=yearly, 2=monthly, 3=weekly, 4=daily		✓	✓
How often do you watch Nigerian films on cable, dish or local TV?	0=never, 1=yearly, 2=monthly, 3=weekly, 4=daily		✓	✓
How often do you buy Nigerian films?	0=never, 1=yearly, 2=monthly, 3=weekly, 4=daily		✓	✓
How often do you borrow Nigerian films from other people?	0=never, 1=yearly, 2=monthly, 3=weekly, 4=daily		✓	✓
How often do you watch Nigerian films with your household, meaning the people who live with you in your house?	0=never, 1=yearly, 2=monthly, 3=weekly, 4=daily		✓	✓
<i>Perceived social norms about corruption</i>				
How often do you hear people in this area talk about corruption issues?	0 = never, 1 = yearly, 2 = monthly, 3 = weekly, 4 = daily	✓	✓	✓
How many people in this area think that government workers are corrupt?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think that police are corrupt?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think that the government is corrupt?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think that there is a lot of corruption in this area?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area have to give money to get out of trouble with police?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area have to give extra money to government workers to get services like water and electricity, or documents like school diplomas?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area are angry about this kind of police or government worker corruption?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area are angry about this kind of government corruption?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think that this kind of police or government worker corruption will change?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think that this kind of government corruption will change?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
<i>Perceived social norms about corruption reporting</i>				

Wording	Scales	P	B	E
How many of the people in this area report corruption when they see it?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area report this kind of police or government worker corruption when they see it?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area report this kind of government corruption when they see it?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
In the future, like years after now, do you think that more people in this area will report this kind of police or government worker corruption when they see it?	0 = fewer people, 1 = some more people, 2 = same number of people, 3 = many more people	✓	✓	✓
In the future, like years after now, do you think that more people in this area will report this kind of government corruption when they see it?	0 = fewer people, 1 = some more people, 2 = same number of people, 3 = many more people	✓	✓	✓
How many people in this area think that reporting this kind of police or government worker corruption will change things?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think that reporting this kind of government corruption will change things?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think it is dangerous to report this kind of police or government worker corruption?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many people in this area think it is dangerous to report this kind of government corruption?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
How many Nigerian people report corruption when they see it?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
In the future, like years after now, do you think that more Nigerian people will report corruption when they see it?	0 = fewer people, 1 = some more people, 2 = same number of people, 3 = many more people	✓	✓	✓
Have any people you know said that they plan to report corruption through text message?	0 = no, 1 = yes	✓	✓	✓
Have any people you know actually reported corruption through text message?	0 = no, 1 = yes	✓	✓	✓
Now, please think about people all across Nigeria. How many Nigerian people report corruption through text message?	0 = few people, 1 = some, 2 = plenty, 3 = almost everybody	✓	✓	✓
<i>Personal attitudes about corruption</i>				
Do you think that this kind of police or government worker corruption will change?	0 = not at all, 1 = not much, 2 = a little, 3 = a lot	✓	✓	✓
Do you think that this kind of government corruption will ever change?	0 = not at all, 1 = not much, 2 = a little, 3 = a lot	✓	✓	✓
Does this kind of police or government worker corruption make you angry?	0 = not at all angry, 1 = not angry, 2 = angry, 3 = very angry	✓	✓	✓
Does this kind of government corruption make you angry?	0 = not at all angry, 1 = not angry, 2 = angry, 3 = very angry	✓	✓	✓
Do you think that police are corrupt?	0 = not at all corrupt, 1 = not corrupt, 2 = corrupt, 3 = very corrupt	✓	✓	✓
Do you think that government workers are corrupt?	0 = not at all corrupt, 1 = not corrupt, 2 = corrupt, 3 = very corrupt	✓	✓	✓

Wording	Scales	P	B	E
Do you think that the government is corrupt?	0 = not at all corrupt, 1 = not corrupt, 2 = corrupt, 3 = very corrupt	✓	✓	✓
How much corruption do you think there is in your area?	0 = no corruption, 1 = a little corruption, 2 = some corruption, 3 = a lot of corruption	✓	✓	✓
<i>Personal attitudes about corruption reporting</i>				
Do you think that reporting this kind of police or government worker corruption will change things?	0 = nothing, 1 = few things, 2 = some things, 3 = many things	✓	✓	✓
Do you think that reporting this kind of government corruption will change things?	0 = nothing, 1 = few things, 2 = some things, 3 = many things	✓	✓	✓
<i>Personal experience with corruption</i>				
When you get together with your friends or family, how often do you discuss corruption?	0 = never, 1 = yearly, 2 = monthly, 3 = weekly, 4 = daily	✓	✓	✓
Is the primary health center in your area functioning?	0 = no, 1 = yes	✓	✓	✓
Are there projects that were abandoned by the government in your area?	0 = no, 1 = yes	✓	✓	✓
<i>Personal experience with corruption reporting</i>				
Have you ever reported this kind of police or government worker corruption when you have seen it?	0 = never, 1 = a few times, 2 = sometimes, 3 = many times	✓	✓	✓
Have you ever reported this kind of government corruption when you have seen it?	0 = never, 1 = a few times, 2 = sometimes, 3 = many times	✓	✓	✓
In the future, like years after now, do you think you will report this kind of police or government worker corruption when you see it?	0 = never, 1 = rarely, 2 = sometimes, 3 = almost always	✓	✓	✓
In the future, like years after now, do you think you will report this kind of government corruption when you see it?	0 = never, 1 = rarely, 2 = sometimes, 3 = almost always	✓	✓	✓
Have you reported corruption through text message?	0 = never reported corruption, 1 = sent 1 report, 2 = sent 2 reports, 3 = sent 3 reports, 4 = sent more than 3 corruption reports	✓	✓	✓
Do you know about any people in Nigeria who want Nigerians to report corruption through text message?	0 = no, 1 = yes	✓	✓	✓

Table S5: Full text of survey questions and response scales used in design and analysis. P = Baseline variable used to block communities into pairs for block randomization of treatment; B = Question in baseline survey; E = Question in endline survey.

	Any Engagement		Corruption Report	
	Estimate	Std. Error	Estimate	Std. Error
Treatment film	0.008	0.006	0.007	0.003*
Mass text sent	0.049	0.007***	0.010	0.003***
Treatment film x Mass text sent	-0.009	0.011	-0.006	0.005
R^2	0.49		0.3	
F statistic	2.7		1.2	
N	212		212	
Community	106		106	
Matched pair fixed effects	✓		✓	

Table S6: Corruption messages sent as a result of the treatment film and mass text, averaged over the period before the mass text and the period after. Data averages over days of the campaigns into two periods, before the mass text and after the mass text. The outcomes are the number of messages received per period per community for *Any Engagement* messages that mentioned corruption or the two media campaigns, and *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution. Regressions control for community matched-pair fixed effects and days since the randomly determined first date of film distribution in the community. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.

	Any Engagement		Corruption Report	
	Estimate	Std. Error	Estimate	Std. Error
Treatment film	0.007	0.008	0.006	0.003
1st day of message	5.033	0.536***	0.929	0.169***
Treatment film x 1st day	-0.078	0.727	0.097	0.246
2nd day of message	0.719	0.222**	0.169	0.060**
Treatment film x 2nd day	-0.182	0.250	-0.062	0.073
3rd day of message	0.208	0.087*	0.042	0.025
Treatment film x 3rd day	0.265	0.113*	0.074	0.045
4th day of message	0.350	0.095***	0.046	0.029
Treatment film x 4th day	-0.220	0.087*	-0.010	0.030
5th day of message	0.228	0.097*	0.070	0.036*
Treatment film x 5th day	-0.027	0.090	0.037	0.058
6th day of message	0.200	0.089*	0.088	0.040*
Treatment film x 6th day	-0.106	0.064	-0.069	0.035*
7th day of message	0.154	0.086	0.054	0.031
Treatment film x 7th day	-0.053	0.051	-0.028	0.021
8th-plus day of message	0.108	0.084	0.044	0.027
Treatment film x 8th-plus day	-0.007	0.007	-0.006	0.003
R^2	0.61		0.31	
F statistic	109.3		32.3	
N	16,100		16,100	
Communities	100		100	
Matched pair fixed effects	✓		✓	
Days since distribution start	✓		✓	

Table S7: Corruption messages sent as a result of the treatment film and mass text, dropping communities with no film-watchers. This robustness check drops communities with no film-watchers. The outcomes are the number of messages received per day per community for *Any Engagement* messages that mentioned corruption or the two media campaigns, and *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution. Regressions control for community matched-pair fixed effects and days since the randomly determined first date of film distribution in the community. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ***; <.01 **; <.05 *.

	Any Engagement		Corruption Report	
	Estimate	Std. Error	Estimate	Std. Error
Treatment film	0.007	0.008	0.007	0.003*
1st day of message	5.254	0.538***	0.998	0.169***
Treatment film x 1st day	-0.261	0.718	0.090	0.249
2nd day of message	0.833	0.229***	0.214	0.065***
Treatment film x 2nd day	-0.223	0.258	-0.092	0.077
3rd day of message	0.226	0.092*	0.082	0.035*
Treatment film x 3rd day	0.255	0.117*	0.050	0.049
4th day of message	0.378	0.104***	0.070	0.032*
Treatment film x 4th day	-0.218	0.092*	0.005	0.035
5th day of message	0.259	0.105*	0.097	0.040*
Treatment film x 5th day	-0.043	0.092	0.028	0.058
6th day of message	0.228	0.097*	0.114	0.043**
Treatment film x 6th day	-0.104	0.066	-0.069	0.035
7th day of message	0.207	0.096*	0.082	0.037*
Treatment film x 7th day	-0.060	0.065	-0.033	0.021
8th-plus day of message	0.153	0.089	0.069	0.032*
Treatment film x 8th-plus day	-0.008	0.006	-0.008	0.003*
R^2	0.63		0.33	
F statistic	116.1		35	
N	16,100		16,100	
Communities	100		100	
Matched pair fixed effects	✓		✓	
Days since distribution start	✓		✓	

Table S8: Corruption messages sent as a result of the treatment film and mass text, dropping communities that received the mass text early. This robustness check drops 6 communities that received the mass text a few days early due to an administrative error. The outcomes are the number of messages received per day per community for *Any Engagement* messages that mentioned corruption or the two media campaigns, and *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution. Regressions control for community matched-pair fixed effects and days since the randomly determined first date of film distribution in the community. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 “***”; <.01 “**”; <.05 “*”.

	Any Engagement		Corruption Report	
	Estimate	Std. Error	Estimate	Std. Error
Treatment film	0.013	0.017	0.009	0.004*
1st day of message (assigned)	4.812	0.536***	0.913	0.160***
Treatment film x 1st day	-0.056	0.719	0.123	0.241
2nd day of message (assigned)	0.716	0.213***	0.189	0.059**
Treatment film x 2nd day	-0.171	0.242	-0.083	0.072
3rd day of message (assigned)	0.133	0.091	0.059	0.032
Treatment film x 3rd day	0.257	0.114*	0.052	0.047
4th day of message (assigned)	0.267	0.105*	0.051	0.030
Treatment film x 4th day	-0.175	0.089*	0.004	0.033
5th day of message (assigned)	0.139	0.106	0.070	0.037
Treatment film x 5th day	-0.011	0.090	0.049	0.057
6th day of message (assigned)	0.123	0.098	0.091	0.040*
Treatment film x 6th day	-0.108	0.065	-0.069	0.033*
7th day of message (assigned)	0.096	0.100	0.060	0.034
Treatment film x 7th day	-0.055	0.064	-0.033	0.020
8th-plus day of message (assigned)	0.048	0.091	0.049	0.030
Treatment film x 8th-plus day	-0.014	0.017	-0.010	0.004*
R^2	0.56		0.31	
F statistic	93.6		32.9	
N	17,066		17,066	
Communities	106		106	
Matched pair fixed effects	✓		✓	
Days since distribution start	✓		✓	

Table S9: Corruption messages sent as a result of the treatment film and mass text, using assigned mass text send date. This analysis constructs the mass text message indicators using the assigned rather than observed date, which differed in some cases by a small number of days due to an administrative error. The outcomes are the number of messages received per day per community for *Any Engagement* messages that mentioned corruption or the two media campaigns, and *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution. Regressions control for community matched-pair fixed effects and days since the randomly determined first date of film distribution in the community. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 “***”; <.01 “**”; <.05 “*”.

	Any Engagement		Corruption Report	
	Estimate	Std. Error	Estimate	Std. Error
Treatment film	0.008	0.007	0.007	0.003*
1st day of message	5.053	0.507***	0.910	0.160***
Treatment film x 1st day	0.082	0.700	0.181	0.239
2nd day of message	0.755	0.213***	0.182	0.059**
Treatment film x 2nd day	-0.169	0.242	-0.080	0.072
3rd day of message	0.207	0.087*	0.058	0.031
Treatment film x 3rd day	0.270	0.115*	0.051	0.047
4th day of message	0.348	0.094***	0.045	0.028
Treatment film x 4th day	-0.215	0.087*	0.008	0.033
5th day of message	0.215	0.094*	0.068	0.034*
Treatment film x 5th day	-0.014	0.088	0.032	0.055
6th day of message	0.186	0.088*	0.086	0.038*
Treatment film x 6th day	-0.098	0.062	-0.064	0.033
7th day of message	0.160	0.086	0.052	0.031
Treatment film x 7th day	-0.031	0.063	-0.028	0.021
8th-plus day of message	0.109	0.083	0.044	0.027
Treatment film x 8th-plus day	-0.009	0.006	-0.007	0.003*
R^2	0.62		0.33	
F statistic	117.6		34.7	
N	17,066		17,066	
Communities	106		106	
Matched pair fixed effects	✓		✓	
Days since distribution start	✓		✓	
Week of film distribution start	✓		✓	

Table S10: Corruption messages sent as a result of the treatment film and mass text, controlling for week of film distribution. The outcomes are the number of messages received per day per community for *Any Engagement* messages that mentioned corruption or the two media campaigns, and *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution. Regressions control for community matched-pair fixed effects, days since the randomly determined first date of film distribution in the community, and the week that film distribution started. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ***; <.01 **; <.05 *.

	Any Engagement		Corruption Report	
	Estimate	Std. Error	Estimate	Std. Error
Treatment film	0.008	0.007	0.007	0.003*
1st day of message	5.052	0.507***	0.909	0.160***
Treatment film x 1st day	0.083	0.700	0.181	0.239
2nd day of message	0.754	0.213***	0.181	0.059**
Treatment film x 2nd day	-0.168	0.242	-0.080	0.072
3rd day of message	0.205	0.087*	0.057	0.031
Treatment film x 3rd day	0.271	0.115*	0.051	0.047
4th day of message	0.346	0.095***	0.043	0.028
Treatment film x 4th day	-0.215	0.087*	0.008	0.033
5th day of message	0.213	0.095*	0.066	0.034
Treatment film x 5th day	-0.013	0.088	0.032	0.055
6th day of message	0.184	0.088*	0.084	0.039*
Treatment film x 6th day	-0.097	0.062	-0.064	0.033
7th day of message	0.158	0.087	0.050	0.031
Treatment film x 7th day	-0.031	0.063	-0.028	0.021
8th-plus day of message	0.106	0.084	0.042	0.027
Treatment film x 8th-plus day	-0.008	0.006	-0.007	0.003*
R^2	0.62		0.33	
F statistic	120.5		35.6	
N	17,066		17,066	
Communities	106		106	
Matched pair fixed effects	✓		✓	
Days since distribution start	✓		✓	
Duration of film distribution (days)	✓		✓	

Table S11: Corruption messages sent as a result of the treatment film and mass text interaction, with distribution duration control. The outcomes are the number of messages received per day per community for *Any Engagement* messages that mentioned corruption or the two media campaigns, and *Corruption Report* messages that made explicit mention of a corrupt act, person, or institution. Regression controls for the community matched-pair fixed effects, days since the randomly determined first date of film distribution in the community, and the duration of the film distribution in days. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.

	Non-Reports	
	Estimate	Std. Error
Treatment film	0.001	0.005
1st day of message	4.143	0.424***
Treatment film x 1st day	-0.098	0.586
2nd day of message	0.574	0.182**
Treatment film x 2nd day	-0.089	0.208
3rd day of message	0.150	0.077
Treatment film x 3rd day	0.220	0.105*
4th day of message	0.304	0.087***
Treatment film x 4th day	-0.222	0.075**
5th day of message	0.148	0.076
Treatment film x 5th day	-0.045	0.061
6th day of message	0.102	0.075
Treatment film x 6th day	-0.033	0.050
7th day of message	0.110	0.075
Treatment film x 7th day	-0.003	0.060
8th-plus day of message	0.067	0.068
Treatment film x 8th-plus day	-0.001	0.004
R^2	0.6	
F statistic	111	
N	17,066	
Communities	106	
Matched pair fixed effects	✓	
Days since distribution start	✓	

Table S12: Messages related to corruption that are not detailed corruption reports sent as a result of the treatment film and mass text. The outcome is *Any Engagement* messages that are not detailed corruption reports per day per community. Regressions control for community matched-pair fixed effects and days since the randomly determined first date of film distribution in the community. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.

	Estimate	Std. Error	R^2	F -statistic	N	Communities
Affected	0.079	0.028**	0.14	2.9	1,231	100
Angry	0.087	0.038*	0.14	3.3	1,335	100
Resigned	-0.035	0.038	0.09	1.9	1,317	100
Talk	0.029	0.043	0.08	1.8	1,324	100
Reporting	-0.006	0.024	0.09	1.8	1,169	100
Future	0.008	0.048	0.11	2.3	1,257	100
Effective	-0.026	0.040	0.08	1.8	1,302	100
Dangerous	0.085	0.043*	0.1	2.3	1,324	100
Matched pair fixed effects ✓; Individual-level covariates ✓						

Table S13: Changes in social norms outcomes as a result of the treatment film, controlling for individual-level covariates. The outcomes are perceptions of norms of corruption and corruption reporting. Regressions control for community matched-pair fixed effects. Cluster-robust standard errors are calculated at the level of the community. The covariates include age, gender, ethnic group, number of years of education, relative household income, employment status, an indicator for household getting income from a civil servant or government worker, an economic condition index (household owns T.V., VCD player, satellite T.V. dish, generator), a citizenship index (respondent attended community meeting, voted, attended a demonstration or protest), an engagement with Nigerian films index (frequency of watching, buying, borrowing, and watching Nollywood films), an indicator for Web usage, mobile phone usage, and a literacy indicator. Significance key for p-values from two-sided tests: <.001 “***”; <.01 “**”; <.05 “*”.

	Estimate	Std. Error	R^2	F -statistic	N	Communities
Affected	0.089	0.028**	0.11	2.7	1,270	100
Angry	0.108	0.041**	0.11	2.9	1,384	100
Resigned	-0.006	0.037	0.08	1.9	1,366	100
Talk	0.056	0.042	0.07	1.6	1,369	100
Reporting	0.017	0.024	0.08	1.8	1,203	100
Future	0.029	0.054	0.09	2.1	1,305	100
Effective	-0.036	0.040	0.06	1.5	1,348	100
Dangerous	0.095	0.042*	0.1	2.5	1,371	100
Matched pair fixed effects ✓; Week of film distribution start ✓						

Table S14: Changes in social norms outcomes as a result of the treatment film, controlling for week of film distribution start. The outcomes are perceptions of norms of corruption and corruption reporting. Regressions control for community matched-pair fixed effects and the week that film distribution started. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.

	Estimate	Std. Error	R^2	F -statistic	N	Communities
Affected	0.085	0.030**	0.11	2.8	1,270	100
Angry	0.116	0.041**	0.1	3	1,384	100
Resigned	-0.023	0.037	0.08	2.1	1,366	100
Talk	0.032	0.043	0.05	1.4	1,369	100
Reporting	-0.001	0.025	0.07	1.8	1,203	100
Future	0.022	0.047	0.09	2.3	1,305	100
Effective	-0.028	0.040	0.06	1.6	1,348	100
Dangerous	0.094	0.041*	0.09	2.7	1,371	100
Matched pair fixed effects ✓ ; Duration of film distribution (days) ✓						

Table S15: Changes in social norms outcomes as a result of the treatment film, controlling for the duration of film distribution. The outcomes are perceptions of norms of corruption and corruption reporting. Regressions control for community matched-pair fixed effects and the duration of film distribution. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.

	Estimate	Std. Error	R^2	F -statistic	N	Communities
Affected	0.089	0.024***	0.14	3.1	1,270	100
Angry	0.126	0.032***	0.15	3.8	1,384	106
Resigned	-0.014	0.032	0.1	2.3	1,366	100
Talk	0.047	0.040	0.08	1.8	1,369	100
Reporting	0.004	0.026	0.12	2.5	1,203	100
Future	0.034	0.033	0.17	4.2	1,305	100
Effective	-0.032	0.035	0.08	1.8	1,348	100
Dangerous	0.095	0.040*	0.12	2.8	1,371	100
Matched pair fixed effects ✓; Enumerator fixed effects ✓						

Table S16: Changes in social norms outcomes as a result of the treatment film, with enumerator fixed effects. The outcomes are perceptions of norms of corruption and corruption reporting. Regressions control for community matched-pair fixed effects and enumerator fixed effects. Cluster-robust standard errors are calculated at the level of the community. Significance key for p-values from two-sided tests: <.001 ‘***’; <.01 ‘**’; <.05 ‘*’.