

Written in Stone: Lay intuitions about the emergence of formal rules

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Abstract

Humans navigate social life through shared expectations that guide behavior. Some expectations become formalized into explicit rules, but little is known about people’s intuitions regarding why and when rules become formal. Across three experiments with U.S. adults, we examined these intuitions. Participants consistently predicted that formal rules would arise in contexts involving internal coordination challenges (e.g., large or diverse groups), but not in contexts involving external threats (e.g., natural disasters, resource scarcity). In Experiment 2, participants judged formal rules more likely when defiance or costly violations were expected—but these beliefs did not explain when participants actually inferred formalization. In Experiment 3, expectations of formality were better predicted by perceived group dynamics: low interpersonal closeness and high disagreement (“quibbling”). These dynamics predicted formality more strongly than concerns about defiance, ignorance, or cost. Our findings suggest that people see formalization less as a mechanism for enforcing norms, and more as a strategy for managing group interaction dynamics.

Keywords: rules, norms, formality, coordination, intuitive theory

Introduction

Humans live in interdependent groups, where shared expectations about how people will and should behave play a crucial role in guiding behavior. These expectations can influence actions even in the absence of explicit instruction (for a review, see Schmidt and Rakoczy (2023)). In some cases, expectations are formalized into explicit verbal or written rules (DeHart-Davis, 2008; DeHart-Davis et al., 2013; Vlaar et al., 2006).

Codification of norms into written rules has been theorized to serve several key functions. Written rules can increase precision, consistency, and rates of compliance by clarifying behavioral expectations (Daston, 2022; DeHart-Davis, 2008). For instance, formal rules may heighten compliance by drawing attention to the rule content (McPhee, 2004; Vlaar et al., 2006) or by enhancing perceptions of legitimacy when rules appear to carry the authority of the institution (Johnson et al., 2006). People report they are more likely to comply with written rules than unwritten norms, both hypothetically and when reporting their past behavior (Borroy et al., 2018).

Less is known about people’s intuitive theories of why and when rules become formal. In related domains, people hold intuitive theories that guide social reasoning—for instance, about resource distribution (Nettle & Saxe, 2020), decision

procedures (DeScioli & Bokemper, 2019), punishment (Bregant et al., 2016; Marshall et al., 2022; Radkani et al., 2022), and social hierarchies (Shutts & Kalish, 2021; Zhang et al., 2024). If people also have intuitive theories about the conditions that lead to rule formalization, such intuitions could shape how people interpret, respond to, and enforce institutional rules.

Here, we tested five group conditions hypothesized to challenge coordination: group threat from a competing group, ecological threat, resource scarcity, group diversity, and group size (Nettle & Saxe, 2020). These five conditions were chosen to manipulate two broad classes of challenges that groups may face: external threats and internal coordination difficulties.

Ecological threats and intergroup competition may lead to formal rules because these conditions may make norm violations more costly for the group. Nations facing resource scarcity, frequent natural disasters, or intergroup conflict tend to have “tighter” cultures, characterized by stricter and more pervasive enforcement of behavioral compliance (Gelfand et al., 2011). Thus, one possibility is that participants intuitively expect formal rules to emerge in groups facing external threats—when cooperation becomes more critical to survival.

On the other hand, coordination challenges internal to the group, such as reconciling differing viewpoints and achieving consensus, are more pronounced in larger groups and in those with greater diversity. People infer that larger and more diverse groups face increased complexity in decision-making, as reconciling a broader range of opinions requires more structure and effort (Richardson et al., 2023). Thus, another possibility is that participants expect formal rules to emerge primarily in response to internal difficulties in coordination, not external threats.

Examining these cases may also yield insight into the mechanisms behind group adoption of formal rules. One possibility is that formal rules solve social problems that arise from individual behavior. They might reduce ignorance of norms, deter defiance, or may arise to reduce norm violations which would mitigate their cost. On this account, formality is a response to breakdowns in norm compliance (DeHart-Davis et al., 2013). Another possibility is that formal rules regulate within group dynamics. Formal rules may arise not because of norm violation, but because group members lack shared assumptions, familiarity, or cohesion. In this view, formality

is a coordination mechanism for groups that face challenging internal social dynamics, rather than a fix for rule-breaking. Groups that are impersonal or disagreement-prone may be seen as requiring formal structures simply to operate.

In three experiments, we first ask whether participants systematically associate formal rule emergence with five common group-level features: intergroup threat, natural threat, scarcity, group diversity, and group size (Experiment 1). We then test whether these intuitions can be explained by concerns about rule knowledge, defiance, or the cost of violations (Experiments 2a and 2b). Finally, we examine whether broader features of group interaction—closeness and quibbling—predict expectations of formal rules (Experiment 3). Together, these studies provide an initial empirical look at how people intuitively reason about the social conditions under which rules become formalized.

General Methods

Across all the present experiments, adult participants completed a within-subjects survey featuring five trials, each focused on one of the manipulated variables described above. In each trial, participants were presented with two groups living in different towns that differed only in the focal dimension for that trial (e.g., high-threat vs. low-threat). Both groups were described as knowing that a behavior labeled "daxing" was bad and should not be done. In the scenario, only one of the towns had implemented a formal rule, represented by a sign forbidding daxing. Participants were asked to infer which of the two groups was more likely to have a formal rule. The group-attributes that we manipulated were: (1) Group Threat: one group faced external threat from competitive neighbors while the other did not; (2) Natural Threat: one group faced recurring natural disasters (e.g., a volcano) while the other did not; (3) Resource Scarcity: one group experienced a scarcity of resources like food and water while the other had plenty; (4) Group Diversity: one group's members liked to do different things and eat different foods while the other's members all had similar preferences; and (5) Group Size: one group was large and the other small. For Experiments 2 and 3, participants also answered questions about where a group was more likely to have social problems (rule defiance, knowledge, and importance) or a specified social dynamic (social closeness and quibbling). Participants made forced-choice responses for each question, selecting either Group A or Group B, and then a confidence scale from 1 (Very Sure Group A) to 4 (Very Sure Group B). We used this type of Likert scale because we plan to test similar intuitions in children, and this type of scale has been successfully used with children in many studies.

The order of the five trials, and the side (left or right) of the affected group, were randomized for each participant. The questions were randomized except for the formality question, which always came at the end. Attention checks were embedded throughout the task.

All experiments were pre-registered. Data, stimuli, and

procedures are available at <http://bit.ly/4hJwGJg>.

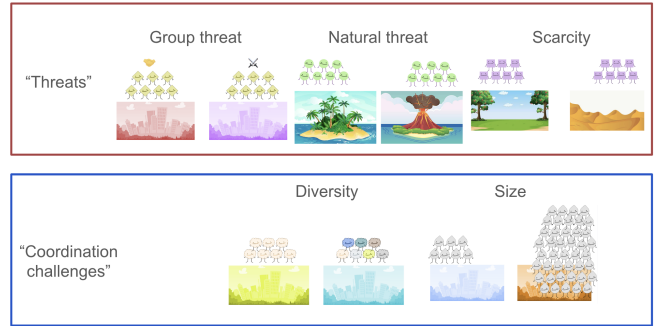


Figure 1: Schematic of images shown across the five trials. Participants were introduced to one of the stories at a time and asked to pick in which town there was likely to be a sign against Daxing.

Demographics Adult participants were recruited from Prolific (U.S.-based, 95% or higher approval rate). Demographic data were pooled across samples due to similarity. Participants ranged from 18 to 77 years old ($M \approx 35$). Most identified as White (60.3%) or Black/African American (25.3%). Gender distribution was 53.0% female, 44.4% male, and 1.3% non-binary/other. Most participants reported annual incomes between \$40,000 and \$100,000 (55.9%) and held at least a bachelor's degree (38.7%).

Experiment 1

Before investigating the mechanisms underlying formal rule emergence, we first examined whether people show any systematic intuitions about which kinds of situations are more likely to lead to formal rules. Specifically, we tested whether participants expect formal rules to be more common in groups facing external threats (intergroup threat, natural disasters, resource scarcity) or internal coordination challenges (large group size, high diversity).

This experiment provides a baseline measure of whether laypeople make structured, non-random inferences about the social conditions under which rules become formalized.

Methods

Participants completed five within-subjects trials. In each trial, they read about two fictional groups that differed on the focal dimensions. Participants made a forced-choice judgment about which group they believed was more likely to have a formal rule.

Results

To assess whether participants were more likely than chance (50%) to select the predicted response (coded as 1), we used binomial tests. Both types of within-group coordination challenges led participants to predict formal rules. Participants selected the big group as more likely to have a formal rule in 106 out of 120 trials (88.3%, $p < .001$, 95%CI :

[0.812, 0.935]), and the more diverse group as more likely to have a formal rule in 90 out of 120 trials (75%, $p < .001$, 95% CI : [0.663, 0.825]). Participants reported that a group experiencing high intergroup threat was more likely to have a formal rule in 84 out of 120 trials (70%, $p < .001$, 95% CI : [0.610, 0.780]). However, in the other threat conditions (natural threat and resource scarcity, participants selected the group experiencing threat in 71 out of 120 trials for both, not quite above chance (59.2%, $p = .055$, 95% CI : [0.498, 0.680])).

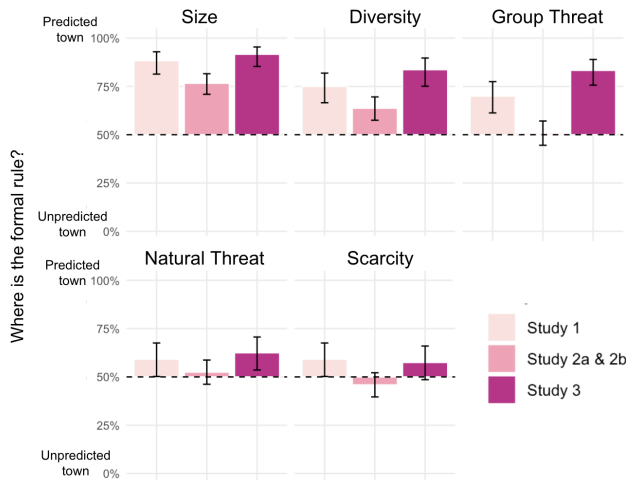


Figure 2: Percentage of participants from Experiment 1, Experiment 2a and 2b, and Experiment 3 having selecting the predicted town (i.e., high group threat, high natural threat, high scarcity, high diversity, and large size) or unpredicted town as having a formal rule, plotted relative to chance (50%).

Discussion

Adults make systematic inferences about the group conditions that are likely to yield formal rules versus informal norms. Specifically, participants were significantly more likely to associate formal rules with coordination challenges from group diversity and size. These findings suggest that adults intuitively link formal rules to scenarios where coordination challenges are heightened, consistent with theories emphasizing the role of formalization in streamlining behavior (McPhee, 2004; Vlaar et al., 2006). Interestingly, external threats to the group did not lead adults to expect formal rules. While these features are theoretically associated with increased norm enforcement in high-risk ecologies (Gelfand et al., 2011), they may not be as intuitively linked to formal rules in participants' reasoning. This opens the door for further exploration of the underlying mechanisms driving intuitions about formalization.

In Experiment 1, we tested the conditions that adults expected would lead groups to make formal rules. However, formal rules may be perceived to be a tool that can address many problems. In Experiment 2a and 2b, we investigate

whether adults think that formal rules address three types of social problems: rule knowledge, rule defiance, or the cost to the group when people break rules. Specifically, we ask adults how they think about these possible effects of formal rules across the conditions we used in Experiment 1.

Experiment 2a and 2b

Groups might have various motivations for formalizing their norms into written rules: (1) formal rules reduce the probability that group members remain ignorant of norms (Rule Knowledge), (2) formal rules reduce the probability that group members will knowingly violate the norm (Rule Defiance), and (3) formal rules are more likely when any norm-breaking would have more severe consequences for the group as a whole (Cost). Experiments 2a and 2b replicated the design of Experiment 1 and included these three additional dependent measures to assess adults' intuitions about the drivers of formal rules.

Methods

Adult participants ($N = 120$) saw identical stimuli to Experiment 1 in Experiment 2a. They were asked about three problems that could arise in groups: (1) in which group is it more likely that someone daxed but "did it because they didn't know it was bad" (Rule Knowledge)? (2) Assuming both groups have someone who knows daxing is wrong, which group has the person who "daxes, even though they know it is bad" (Rule Defiance)? (3) In which group it is worse "for everyone if people daxed" (Rule-breaking Cost)?

Experiment 2b ($N = 120$) was a pre-registered replication of 2a with a minor wording adjustment to the Rule Knowledge measure. Results for Rule Defiance and Rule-breaking Cost converged closely across experiments. For Rule Knowledge, participants showed a significant effect in Experiment 2b but not in 2a; however, given the similarity of the overall patterns and the non-centrality of Rule Knowledge to our main predictions, we pool data across 2a and 2b for primary analyses. Separate analyses are available in supplemental materials.

Results

Replicating Experiment 1, people expected formal rules more often in diverse groups (153/240, 63.8%, $p < .001$, 95% CI [0.57, 0.70]) and in larger groups (184/240, 76.7%, $p < .001$, 95% CI [0.71, 0.82]). There was no effect in the threat cases. **Rule Knowledge.** Surprisingly, none of the threats or challenges led people to anticipate *more* ignorance of rules. Participants judged rule ignorance to be *less* likely than chance in groups facing natural disasters (92/240, 38.3%, $p = .001$, 95% CI [0.32, 0.45]) and resource scarcity (88/240, 36.7%, $p < .001$, 95% CI [0.31, 0.43]). By contrast, participants expected rule ignorance at above-chance levels in diverse groups (143/240, 59.6%, $p = .011$, 95% CI [0.53, 0.66]), but this was the only coordination-related context to show such an effect. There was no significant deviation from chance in groups facing intergroup threat (119/240, 49.6%, $p = 1.0$)

or larger group size (121/240, 50.4%, adjusted $p = 1.0$). **Rule Defiance.** In contrast to rule knowledge, all contexts led participants to expect rule defiance at significantly above-chance levels, including threat from a group (181/240, 75.4%, $p < .001$, 95% CI [0.69, 0.81]), natural disasters (153/240, 63.8%, $p < .001$, 95% CI [0.57, 0.70]), or resource scarcity (179/240, 74.6%, $p < .001$, 95% CI [0.69, 0.80]); and groups facing coordination challenges due to diversity (164/240, 68.3%, $p < .001$, 95% CI [0.62, 0.74]) or group size (189/240, 78.8%, $p < .001$, 95% CI [0.73, 0.84]). **Rule-breaking Cost.** Participants judged the cost of rule breaking to be significantly higher than chance in groups facing natural disasters (158/240, 65.8%, $p < .001$, 95% CI [0.59, 0.72]), resource scarcity (167/240, 69.6%, $p < .001$, 95% CI [0.63, 0.75]), and larger group size (155/240, 64.6%, $p < .001$, 95% CI [0.58, 0.71]). There was no significant deviation from chance in the case of intergroup threat (133/240, 55.4%, adjusted $p = .11$), while participants judged the cost of rule-breaking to be significantly *lower* in diverse groups (85/240, 35.4%, $p < .001$, 95% CI [0.29, 0.42]). All binomial tests were corrected using Holm-Bonferroni correction.

In sum, the contexts that generated the most concerns about rule knowledge, rule defiance and cost were not the same as those that were expected to generate formal rules. Nevertheless, the problems of rule knowledge, defiance and cost did play a role in people's expectations about formal rules. We fit a logistic regression model with main effects of ratings for the three group problem questions (Rule Knowledge, Rule Defiance, and Rule-breaking Cost) predicting formality, with participant and trial as random factors. Participants were significantly more likely to expect formal rules in contexts where they anticipated greater ignorance of rules ($\beta = 0.17$, $z = 2.63$, $p = .008$), rule defiance ($\beta = 0.39$, $z = 5.45$, $p < .001$) and where the cost of rule-breaking was perceived to be higher ($\beta = 0.24$, $z = 3.84$, $p < .001$). Expectations of ignorance of rules also predicted expectations of formality, though less strongly ($\beta = 0.17$, $z = 2.63$, $p = .008$). A likelihood ratio test confirmed that the full model fit the data significantly better than a null model with only random intercepts ($\chi^2(3) = 50.18$, $p < .001$), indicating that these three drivers together reliably accounted for variation in expectations of formal rules.

Discussion

The results of Experiment 2 provide insights into adults' intuitions about formal rule emergence. Participants in both Experiments 1 and 2 expected larger and more diverse groups to have formal rules (but not groups under threat). Participants in Experiment 2 expected groups with more rule knowledge, rule defiance and higher rule-breaking cost to have formal rules. The more an individual participant thought that an attribute of a group would lead to Rule Knowledge, Rule Defiance and Rule-breaking Cost, the more she predicted that the group would have a formal rule; this correlation held across all groups and contexts. However, in aggregate, participants did not expect that larger or more diverse groups would have

more rule defiance or costlier defiance. In fact, people judged that a diverse group would have lower costs to rule breaking. This leaves a gap: if people are not predicting formal rules because they anticipate these group-level problems, then what are they responding to?

In Experiment 3, we test a different possibility. Rather than viewing formal rules purely as tools for reducing problems with individual behavior, participants might treat them as signals or solutions to broader challenges of coordination. We focus on two dimensions of group interaction dynamics that could demand formality: interpersonal closeness (how familiar or socially bonded group members are), and quibbling (the extent of disagreement or ambiguity about rules). If formality is not just about preventing bad behavior but about enabling coordination among loosely connected or interpretively divergent individuals, then closeness and quibbling may be stronger drivers of inferred formality than ignorance, defiance, or cost.

Experiment 3

The prior experiments focused on participants' expectations about when formal rules emerge and what kinds of social problems might motivate them. These are plausible mechanisms behind the emergence of rules. However, they may not uniquely predict *formalization*—that is, the explicit codification of rules, as opposed to the existence of rules in general.

In Experiment 3, we tested two new drivers—what we term *group interaction dynamics*—that may more specifically support the inference that a group would benefit from formalizing its rules. Our rationale for including these measures is that formality may be a response not only to social problems but also to the perceived demands of coordinating behavior in the absence of shared assumptions. Prior work on legal reasoning suggests that written laws can serve as *focal points*—clear anchors for coordination when group members cannot rely on mutual understanding alone. For example, when individuals are incentivized to coordinate, they are more likely to interpret legal text in literal, "textualist" terms, privileging the letter of the law over its broader intent (Bystranowski et al., 2023; Hannikainen et al., 2022). This suggests that one function of formalization may be to enable coordination among individuals who expect disagreement or ambiguity, not just to prevent harm.

Accordingly, in this experiment we test whether participants associate the emergence of formal rules with social dynamics that indicate weak interpersonal closeness or high likelihood of interpretive disagreement (quibbling). Unlike rule knowledge, defiance, or cost—which are possible social problems related to rule-breaking—these measures focus on the social interactions within a group that may demand formality for coordination in the first place. If participants are reasoning specifically about the utility of *formalizing* rules, not just the need for rules generally, group interaction dynamics may prove to be stronger drivers of inferred formality.

Methods

This study used a within-subjects design identical in structure to Experiments 1 and 2. In addition to the standard formal rule prediction question, participants were asked two new questions for each trial. **Closeness:** “In one of these towns, they all know each other very well and are close, like a family. In the other town, they don’t know each other very well and are not close, like strangers. If you had to guess, which town is more like family?” **Quibbling:** “In one of these towns, people like to argue about rules, ask lots of questions, and don’t always agree on what’s right. If you had to guess, which town is more likely to argue about rules?”

Results

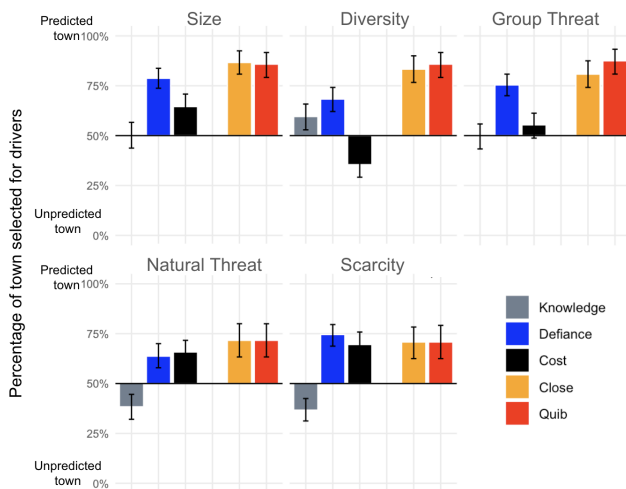


Figure 3: Percentage of adult selection of predicted vs. unpredicted towns across group attributes for social problems from Study 2a and 2b (rule knowledge, rule defiance, and rule-breaking cost) and group interaction dynamic questions from Study 3 (closeness and quibbling), plotted relative to chance (50%).

Closeness. Across all five contexts, participants were significantly less likely than chance to judge the focal group as having high interpersonal closeness. This was true for larger groups (16/120, 13.3%, $p < .001$, 95% CI [0.08, 0.21]), diverse groups (24/120, 20.0%, $p < .001$, 95% CI [0.14, 0.29]), groups facing natural threat (31/120, 25.8%, $p < .001$, 95% CI [0.19, 0.35]), scarcity (35/120, 29.2%, $p < .001$, 95% CI [0.21, 0.38]), and group threat (26/120, 21.7%, $p < .001$, 95% CI [0.15, 0.31]). These results suggest that participants generally view the types of groups associated with formality as low in interpersonal closeness. **Quibbling.** Conversely, participants expected significantly more rule disagreement (“quibbling”) in the focal group across all five trials. This included diverse groups (104/120, 86.7%, $p < .001$, 95% CI [0.79, 0.92]), large groups (103/120, 85.8%, $p < .001$, 95% CI [0.78, 0.91]), groups facing group threat (105/120, 87.5%, $p < .001$, 95% CI [0.80, 0.93]), natural threat (86/120, 71.7%,

$p < .001$, 95% CI [0.63, 0.80]), and scarcity (85/120, 70.8%, $p < .001$, 95% CI [0.62, 0.79]). These findings suggest that expectations of formal rules may be systematically linked to perceived interpretive conflict within a group. All binomial tests were conducted against a chance level of 50%, with Holm–Bonferroni correction for multiple comparisons.

We fit a logistic regression model predicting expectations of formal rules from ratings of *closeness* and *quibbliness*, with participant and trial as random intercepts. Participants were significantly more likely to expect formal rules in contexts they rated as more quibbly ($\beta = 1.09$, $z = 6.01$, $p < .001$), and significantly less likely to expect formal rules in contexts they rated as closer ($\beta = -0.79$, $z = -4.97$, $p < .001$).

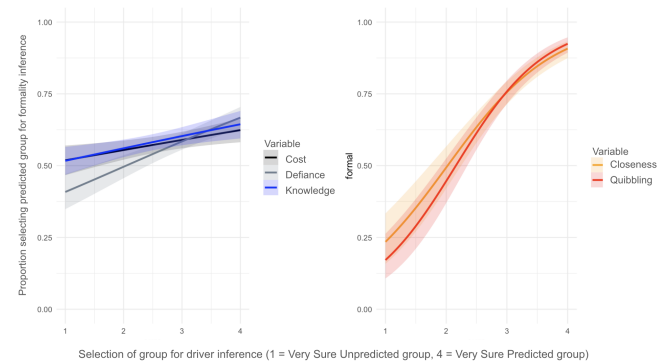


Figure 4: Relationship between participant’s selection of where the formal rule is (1 - predicted town, e.g., the town with high group threat has a formal rule) on y-axis, and participant’s ratings for where social problems for Study 2a and 2b (rule knowledge, rule defiance, and rule-breaking cost) and group interaction dynamic questions for Study 3 (closeness and quibbling), rated on a 1-4 scale (e.g., 1 - very sure unpredicted; 4 - very sure predicted) on the x-axis.

To compare predictive strength across studies, we examined model fit. The regression using closeness and quibbling (Study 3) explained substantially more variance in formality expectations (marginal $R^2 = .33$) than a comparable model using rule knowledge, defiance, and cost (Study 2; marginal $R^2 = .06$). This difference suggests that group interaction dynamics are more tightly linked to lay intuitions about rule formalization than the specific social problems examined previously.

Further, we exploratorily examined the distribution of participant “sureness” ratings (e.g., 1 = Very Sure Unpredicted Group; 4 = Very Sure Predicted Group) by group selected for the formality question (e.g., In figure 5, tan splits are participants who said the formal rule would be in the Predicted Group, or the predicted town that has higher threat). The cases where participants did not systematically infer formal rules—natural threat and resource scarcity—also showed more diffuse distributions in closeness and quibbling ratings. This suggests that participants may have weaker or more am-

bivalent intuitions about the social organization of groups in these contexts, further supporting the idea that inferences about formality depend on clear expectations about group dynamics.

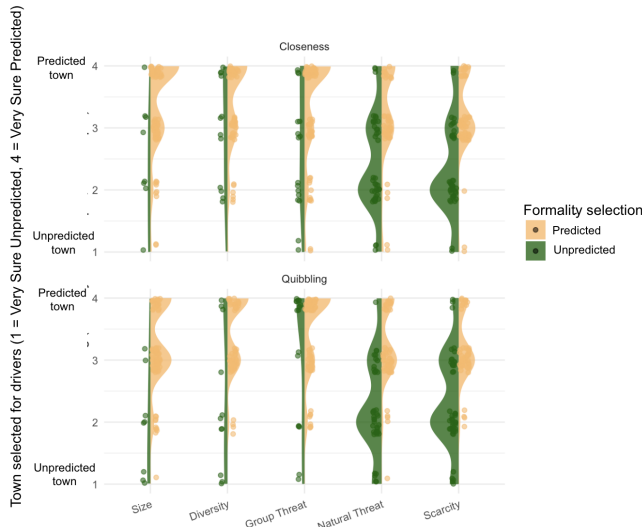


Figure 5: Distributions of participants selections of predicted or unpredicted town for group dynamic questions (Closeness and Quibbling) split by participant formality choice (tan - participants who selected the predicted town as having the formal rule; green - participants who selected the unpredicted town as having the formal rule).

Discussion

The results of Experiment 3 suggest that participants infer formal rules not only from social problems, but also from properties of group interaction dynamics—specifically, low interpersonal closeness and high quibbling. These findings indicate that people may associate formalization with anticipated challenges in group dynamics, rather than just behavioral non-compliance.

General Discussion

Across three experiments, we investigated the conditions under which adults expect formal rules to emerge, and what kinds of group features they infer from the presence of formalization. Across all experiments, adults consistently expected formal rules to appear in large and diverse groups—cases involving coordination challenges. By contrast, participants did not consistently expect formal rules in groups facing external threat (e.g., scarcity, natural disasters). The exception was group threat, which yielded mixed results across experiments. In Study 1 and Study 3, participants associated group threat with formality; in Study 2a and 2b, they did not. One possibility is that the inclusion of additional dependent measures in Study 2 disrupted or diluted the inference about group threat, but this remains speculative.

Experiment 2 tested whether people think formal rules arise to solve specific social problems: ignorance, defiance, and costly violations. All three problems predicted formality across trial, such that participants who inferred knowledge, defiance, or cost were more likely to infer formal rules. In Experiment 3, we tested a different explanatory framework: that formality may be a response to dynamics in groups, not just what problems they face. Participants strongly associated low interpersonal closeness and high rule disagreement (“quibbling”) with formality. Critically, a model using group dynamic drivers accounted for over six times more variance in formality expectations than the model using knowledge, defiance, and cost from Study 2. This suggests that participants may view formalization less as a reaction to social problems or rule-breaking deterrence and more as a coordination strategy suited to groups that lack familiarity or cohesion.

Further, the social problem drivers did not align cleanly with the situations tested in Experiment 1. For example, participants expected high formality in diverse groups but did not expect such groups to experience high rule-breaking cost. By contrast, the group interaction dynamics—closeness and quibbling—showed patterns that at least partially mirrored formality intuitions. In conditions like group size and diversity, where participants consistently inferred formal rules, sureness ratings for closeness and quibbling were more convergent, which may indicate clearer intuitions. In natural threat and scarcity, where participants were less likely to infer formality, the distributions of sureness ratings were more diffuse. This suggests that formality intuitions may depend in part on the clarity of participants’ expectations about group dynamics.

This interpretation also helps explain why external threat did not elicit strong inferences of formality. Though threats like scarcity or disaster can undermine informal norms, they may also activate tighter informal enforcement, reducing the perceived need for formalization (Gelfand et al., 2011). Moreover, prior work suggests that laypeople’s beliefs about threat are mixed: they may expect threat to erode moral behavior (Nettle & Saxe, 2021), but threat can also increase within-group cooperation. Participants may therefore have more mixed intuitions in cases like this. They may be more unsure whether formal rules are necessary under threat—either because norms are deteriorating and no longer matter, or because norms are being enforced so tightly that formalization is redundant.

Our studies examined participant intuitions, not real-world rule emergence. These intuitions may be inaccurate, but they remain behaviorally consequential. People use them to evaluate institutions, assess legitimacy, and navigate governance. Mapping the structure of these beliefs provides insight into the implicit theories people bring to social life—and into where they may misalign with empirical realities. Understanding these gaps may inform interventions that either correct mistaken intuitions or leverage existing beliefs to support effective rule use.

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