Using Discourse to Incentivize Cooperation in Arab-Muslim Culture:
Experimental Evidence from Egypt

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Abstract

Voluntary cooperation contributes significantly to development and prosperity. Particularly in developing countries, higher levels of voluntary cooperation could help fill the gap in public goods provision left by cash-strapped governments. In this paper we ask two questions: how could high contributors to public goods in such contexts – the small minority that they are – be encouraged to sustain their contributions against a defecting crowd? Second, how can low contributors be lured to increase their contributions without expensive institutional interventions or major structural transformations? To answer these questions, we conduct two public good games with 276 participants in Egypt. In the first experiment, we show that priming high cooperators with a message that makes them take pride in being among the minority of cooperators, helps them not only sustain their contributions, but actually almost double them. In the second experiment, we test how far any of three possible punishment messages – emphasizing religious, patriotic, or social harm discourse – could drive low cooperators to increase their contributions. Our results show that using such punishment messages increases contributions significantly.

Keywords: Cooperation, public good game, pride, punishment, discourse, Egypt.

JEL classification: C91, D02, D91, O17, Z10.

1. Introduction

Social dilemmas – situations where the dominant strategy is to not cooperate even though individuals are worse off if everyone defects – define many societal interactions (Dawes 1980; van Lange et al., 2013). Examples range from seemingly trivial acts, like littering or jumping queues, to more consequential behaviors like evading taxes or – as recently shown by the Covid-19 pandemic – not wearing masks or observing social distancing.

Laws alone are insufficient in making people solve such dilemmas (see Hardin, 1968; Nyborg et al. 2016). Voluntary cooperation has been suggested as a possible contributor in solving common pool problems (Ostrom 1990). Encouraging voluntary cooperation might seem an even more sensible strategy in countries where state capacity is low[1] and where laws get only partially enforced, as is the case in many developing countries (Keefer and Knack 1997). The problem, however, is that defection in such contexts is sometimes so rampant that even cooperators are discouraged to continue their prosocial behavior against a defecting crowd. In this paper, therefore, we ask two questions: how could high contributors to public goods in such contexts be encouraged to sustain their contributions against a defecting crowd? And second, how can low contributors be lured to increase their contributions without expensive institutional interventions or major structural transformations? We test the effect of a number of subtle discourses that could provide answer to both questions.

We chose Egypt as the setting of our experiments for three reasons. First, in previous experiments we ran among Egyptians in 2017, we found not only very low rates

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[1] We mean by state capacity here a state's ability to provide public goods, implement policies, and raise revenues (Tilly, 1975; Evans et al., 1985; Hendrix, 2010; Bersch et al., 2017).

of cooperation among participants, but also provided evidence that Egyptians actually cooperated less with each other than with non-Egyptians (Hassan et al., 2019). Egypt therefore provides a natural environment where defection *is* actually the dominant strategy.[2] Second, as Egypt has low scores for both state capacity and rule of law,[3] it is difficult to change public goods provision through major state transformations, at least in the short term. It therefore qualifies as a suitable setting to test incentivizing cooperation (and disincentivizing defection) through subtler, and less expensive interventions. Third, save some notable exceptions (Hermann et al., 2008; Balliet and van Lange 2013), much of the literature on incentivizing prosocial behavior fails to take into account specific cultural contexts. Whereas we acknowledge the existence of universal norms (Haidt 2012), context is highly relevant in their concrete manifestations (Hermann et al., 2010). Egypt, being the most populous Arab and the fourth most populous Muslim country, provides an opportunity to study an often ignored Arab-Muslim context.

To answer our two questions, we ran two public good experiments with 276 participants. In both experiments, subjects were divided into groups of 4 participants who played the public good game for an unannounced number of rounds. In our experimental setting, the number of rounds ranged between 9 and 11 determined using a termination probability defined by the computer software . In the first experiment, we incentivized high cooperators to not decrease their contributions when faced with defecting subjects by emphasizing their valuable status as the 'select few'. Results indicate that this pride discourse almost doubled the contributions of cooperators compared to the control group.

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[2] The experiments reported on in this paper were run at the same public university as the 2017 experiments.

[3] In 2019, Egypt ranked 121th out of 126 countries in the World Justice Project. For the full index, see https://www.worldjusticeproject.org/rule-of-law-index/.

In the second experiment (which followed a within-subjects design) the highest cooperators in each round were allowed to send one of three pre-defined 'punishment' messages to the lowest contributors. The messages emphasized a religious, patriotic, or social harm discourse. All punishment messages helped increase contributions; the average contribution of a subject receiving a punishment message was 6.7 points compared to 3.3 points when receiving no message.

The rest of the paper is organized as follows. Section II outlines why we think discourse could be a viable intervention driving cooperation. It also spells out the different hypotheses associated with our experiments. Section III explains the experimental design in detail, and Section IV discusses our results. Section V concludes.

II. Theory and Hypotheses: can discourse change behavior?

Whereas many studies claim the (short-term) immutability of behavioral patterns (e.g. Putnam 1994; Guiso et al. 2008), others indicate that behavioral changes can be brought about. In his famous study of amoral familism, Banfield (1958) describes how villagers in Montegrano, a village in Southern Italy, mistrust anybody except their closest kin, and yet things changed remarkably in southern Italy only half a century later (Nuzzo 2006, extended by Felice 2012). Bicchieri (2005, 2016) and Inglehart and Welzel (2005) point to numerous other examples of fundamental changes in social attitudes that transpired over a relatively short period of time.

When behavioral patterns change, they do so in response to a number of factors (for a recent discussion see Sunstein 2019) ranging from change in economic conditions to religious reform (see Norris and Inglehart 2011), or a change in the political context –

especially democracy versus dictatorship (e.g. Friehe and Pannenberg 2020). An interesting question is whether behavioral changes can also occur in response to less serious and grandiose triggers. In this paper, we ask if a change in the discourse one is exposed to, can prime certain feelings and emotions that affect cooperative behavior.[4] By employing a variety of discourses to reward cooperative behavior and to make it costly not to cooperate, we tap into the basic idea of reward and punishment as a means of influencing cooperative tendencies (Van Lange et al. 2014).

So, how should we define discourse? Not surprisingly, multiple definitions exist of what *discourse* refers to, which is natural, given the wide use of the term in many disciplines (for an overview see, van Dijk et al. 1997). In our paper, we rely on a definition that enjoys a general consensus, but more importantly emphasizes the functional aspect of discourse, and is therefore most relevant to our study. Parker (1990, 187) defines discourse as a 'coherent system of meanings' with 'possible ideological effects'. Van Dijk (1997) adds that a discourse involves three components: language use, communication of certain beliefs and interaction in social situations. It is this 'communicative' function of discourse whereby there is an exchange of ideas that we focus on here.

We focus on discourse as a possible modifier of behavior for a number of reasons. First, it is much easier to engage in discourse as a way of modifying behavior than to wait for changes in economic or political conditions. In our uniquely Arab context, the mostly bleak outcome of the Arab Spring does not offer an encouraging example of changing conditions as a means of behavior modification. Second, accumulated scientific evidence suggests that discourse does matter. There are any number of examples of how discourse

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[4] We define emotions as mental reactions derived from interactions with and judgements from the others and oneself (Haidt, 2003; Tangney and Fischer, 1995).

influences behavior: campaign speeches do affect voting behavior (Gelman and King, 1993; Kenski, 2010), the wording of tax forms influences compliance behavior (Dolan et al. 2010), and messages by community leaders influence the public agenda. When dealing specifically with cooperation, there is evidence that discourse affects emotions, which have their own significant effects on cooperative behavior (De Hooge et al., 2007; Fessler and Haley, 2003; Ketelaar and Au, 2003). Furthermore, using reverse logic, if conciliatory discourse does not always inspire good deeds, there is a lot of evidence that inflammatory discourse provokes inappropriate behavior. Given this stream of thought, we contend that discourse provides a subtle intervention that can contribute to increasing cooperative behavior that is prosocial, especially when institutional change is unlikely.

We test for two types of discourses over two experiments. The first experiment uses a pride-based discourse to sustain cooperation among cooperators facing a defecting crowd. The second experiment uses a punishment-based discourse to drive defectors into cooperation.

A. Pride.

There is abundant literature in psychology pointing out that decisions taken by individuals depend on their dominant feelings at the time of the decision (Bless et al. 1996; Forgas 1995; Loewenstein and Lerner, 2002). We argue that one emotion relevant to sustaining cooperators' contributions in the face of defection by non-cooperators is *pride* (see Dorfman et al., 2014). In essence, pride arises when an individual performs better or achieves higher goals than others in their social surroundings (Weiner 1985), or feels responsible for a socially valued outcome (Mascolo and Fischer 1995).

We argue that triggering a feeling of pride by telling an individual that she is part of the 'prosocial elite' who benefit society, can encourage cooperators to sustain their contributions even when others engage in defective behavior (Axelrod, 1984; Chaudhuri, 2010; Dawes, 1980; Dorfman et al., 2014).[5] Our argument rests on two mechanisms. The first is the potential role of 'leaders' or 'prominent' actors in bringing about social change (see Acemoglu and Jackson, 2015). The second is emotional response to loss aversion (Tversky and Kahneman, 1974), whereby one's struggle to not lose is the source of the positive feeling (i.e., pride) and prevents one from decreasing contributions.[6] There is also ample evidence that if positive emotions are associated with specific activities (cooperation as a source of pride), then individuals are likely to continue engaging in those activities to replicate the same emotions (see Baumeister et al., 2007; Damasio, 1994; Eyal and Fishbach, 2010). Baumeister et al. (2007), in particular, have shown that providing feedback and stimulating retrospective appraisal of actions, can make emotions contribute to a learning process that affects future actions. Therefore, our first hypothesis is:

H1: Highlighting a feeling of pride among cooperators for being among the select few is likely to sustain high contributions.

Admittedly, priming cooperators with a pride discourse could be self-defeating, in the sense that its appeal depends on cooperators being a minority in society. If cooperation rates increase, however, then such an appeal would seem to have the intended effect. Also,

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[5] In focus groups that we ran with different subjects before designing the experiments, focus group participants expressed how difficult it is to sustain cooperation and act selflessly when the general perception is that almost everyone defects. Examples of quotes emphasizing this view are: "why would I do the right thing on my own?", "negative flow pulls people", "being cool is to brag about your negative behavior", and "we have no role models to follow, it's all about emotions."

[6] However, some studies have found that rewarding prosocial behavior can lead to a backlash and decrease contributions if such incentives crowd out intrinsic motivation (see Frey 1997; Frey and Reto 2001).

if cooperation becomes a social norm as a result of a pride discourse sustaining cooperation among cooperators and encouraging non-cooperators to switch, then the very social problem the discourse addresses would be solved. Hence, we recognize that different discourses will impact different motivations, and will have varying effects in a variety of contexts.

B. Punishment discourse

Ever since Fehr and Gächter (2000; 2002) showed that punishment is quite a powerful tool in driving free riders towards cooperation, numerous studies have examined different aspects of punishment. The tool's resilience was shown to hold across different group sizes, different ratios of the cost of punishment and even whether punishment is hypothetical (Ballient et al., 2011). Nevertheless, it was also shown that the tendency to punish does vary across societies (Hermann et al., 2008), with especially low levels in societies with low interpersonal trust and with a Muslim culture (Balliet and van Lange, 2013).[7] In focus groups that we ran in Egypt before designing the experiments, participants indicated that prosocial punishment in real life situations is usually difficult, mentioning phrases like 'I am not a social reformer', 'this will only get us into fights', and 'other people will accuse me of patronizing them'. Therefore, we wanted to empirically test how far specific types of discourse could be used by individuals and, perhaps more interestingly, which type they would choose as the preferred form of punishment. We argue for three such punishment discourses, religious, patriotic and one that emphasizes social harm.

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[7] We do acknowledge that Turkey might not be representative of all Muslim societies.

Religious Discourse

Religion plays a significant role in both private and public spheres in most Arab and Muslim countries. It is a source of political legitimacy and mobilization (see Izzat and Barakat, 2016), an important determinant of social behavior, judgement and exclusion (Brooke, 2017), and often misused as a source of prejudice, conflict and violence (Fearon and Laitin, 2000). Experimental evidence also suggests that religious discourse contributes to the formation of perceptions regarding political candidates (McClendon and Riedl, 2015) and the empowerment of women (Masoud et al., 2016). When it comes to public good games *per se*, it has been shown that more frequent attendance of religious services (or participating in recurrent religious discourse) increases contributions in public good games by 30% (Anderson et al. 2010), and decreases the decline in contributions when playing repeated rounds (Anderson and Mellor 2009).

In Egypt, religion plays an important role (even if it is more visible than genuine). According to the 7th wave of the World Values Survey conducted in Egypt in 2018, 97.3% of Egyptians say that religion plays a *very important* role in their lives while 82% wanted to raise their children to be religious.[8] Although answers to this question might be subject to a social desirability bias and preference falsification (Kuran 1997), between 2011 and 2013, significant numbers of Egyptians voted for religious parties rather than secular competitors, even when they were free to choose either (Hassan 2013). If religion plays such a significant social role in Arab-Muslim cultures, regardless of whether or not it is a charade, then individuals are more likely to respond to a religious appeal that calls upon

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[8] Full results available at: http://www.worldvaluessurvey.org/wvs.jsp

them to cooperate. We argue, therefore, that a religious discourse could actually encourage

defectors to become contributors. Our second hypothesis therefore is as follows:

H2: Punishment emphasizing religious discourse decreases defection.

Patriotic Discourse

Evolutionary biology indicates that individuals are social creatures that tend to live

in groups and form social bonds with one another (e.g., Trivers, 1971). The resulting social

structures trigger forces that sometimes make individuals act less selfishly when interacting

with other individuals with whom they share social bonds, even if these bonds are as trivial

as a shared taste in art (Tajfel, 1973). The more socially, politically or economically salient

these bonds become, the greater the expectation that self-interested behavior would

manifest itself less often vis-à-vis fellow group members. Political psychology literature

suggests that acting less selfishly towards members of the same nation, in particular, is an

explanation for why people sacrifice for their country at a time when they have a clear free-

riding option (see Stern 1995; Young 1993).

At least three mechanisms have been put forward to explain such selfless acts. The

first is modified primordialism,[9] which emphasizes the social need for shared identity and

the positive outcomes one gets from investing in emotional ties with one's ethnic or

culturally similar group (Geertz, 1973). Another mechanism is sociobiological, whereby

natural selection favors behavior and emotions that maintain one's social group, even at

the expense of one's immediate material interests. This perspective sees favoring one's

social group as an extension of the tendency to favor kin (e.g., Shaw and Wong, 1989). A

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[9] This perspective was labelled 'modified' in response to the criticism directed against the traditional primordialist approach that initially saw countries matching ethnicities, which is becoming increasingly distant from reality in a world with multi-ethnic states (see Anderson 1983).

third mechanism is rational choice, according to which it is better to support fellow group members even if it is not in one's self-interest because, on average, one gains more from following a simple rule of thumb or heuristic than from calculating self-interest on each occasion (e.g., Simon, 1990).

In our experimental intervention, we wanted to emphasize patriotic discourse *per se* by generating identification with the nation and linking it to emotions, rather than other forms of group membership. Our motivation stems from the idea that nationalist mobilization sometimes produces forces that are more powerful than affiliation with other identities (Stern 1995). The power of a national affiliation is the result of governments developing national ties by investing in national symbols like parades, holidays, flags, national anthems and other symbols and events that outweigh kin and group membership (Anderson 1983; Johnson 1986; Posen 1993). Our third hypothesis therefore is as follows:

H3: Punishment emphasizing patriotic discourse decreases defection.

Discourse emphasizing social harm

Emotions play a substantial role in prosocial behavior.[10] One way this happens is that ex-post reflection on one's own actions, or the actions of others, prompts emotional responses that affect subsequent behavior (Skatova 2017). Indeed, it would be inconsistent to expect that individuals react to the material behavior of others (e.g., contributions and material punishment by fellow subjects), but not to the opinions of others about their own

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[10] Studies in neuroscience examining prosocial behavior have shown that one's behavior in an experimental setting activates areas of the brain that experience emotions. These areas are less activated when playing against a computer, suggesting that rationality is not the only cursor guiding behavior in such contexts (Sanfey 2003). Drouvelis et al. (2016) have also shown that in public good games, angry subjects contribute less and punish harsher than happy subjects.

behavior (e.g., blame for defection). This is how the emotion of guilt, defined as a blameworthy deviation from a socially desirable behavior (Ortony et al. 1988; Ketelaar and Todd 2001), can affect prosocial behavior (see Goetz 2010).

Previous literature outlines several mechanisms by which feeling guilty can increase contributions to a common pool. One is that individuals use the feeling of guilt as 'information' about the costs of continuing their uncooperative behavior in subsequent rounds (Schwarz and Clore 1983). The second mechanism is that guilt often carries an aversive feeling (Cialdini et al. 1973; Cunningham et al. 1980; Regan et al. 1972) that prompts individuals to rid themselves of through action (Lewis 1993). In other words, when people feel guilty, they will try to compensate for the harm they caused (De Hooge et al., 2007). Gneezy et al. (2014) demonstrate that people who first make an immoral choice are then more likely to donate to charity than those who did not. They call this adaptive behavior conscience accounting. When defection is explicitly coupled with guilt, cooperation becomes more attractive immediately thereafter.

Other studies have found that subjects who experienced guilt after exhibiting uncooperative behavior in prisoner's dilemma and ultimatum games actually increase their level of cooperation in subsequent rounds (Ketelaar and Au, 2003; Tangney et al., 1992; Nelissen, 2013; Keltner, 2006). In these studies, guilt was experimentally manipulated by asking subjects to recall situations that made them feel guilty. In our study, we wanted to make the feeling of guilt more real and immediate based on behavior and in response to blame by others. Our fourth hypothesis, therefore, reads as follows:

H4: *Punishment emphasizing social harm inflicted by one's behavior on a group decreases defection.*

To sum up, our four hypotheses are:

H1: *Highlighting a feeling of pride among cooperators for being among the select few is likely to sustain high contributions.*

H2: *Punishment emphasizing religious discourse decreases defection.*

H3: *Punishment emphasizing patriotic discourse decreases defection.*

H4: *Punishment emphasizing social harm inflicted by one's behavior on a group decreases defection.*

We test the hypothesis H1 in our first experiment, and test hypotheses H2-H4 in our second experiment.

III. Experimental Design

We conducted both experiments at the campus of a large public university in Cairo, where we recruited 276 student subjects.[11] The first experiment included 184 subjects who were evenly divided between a treatment group (92 subjects) and a control group (92 subjects). The second experiment, which involved a within-subjects design, had 92 participants that were not involved in the first experiment. In both experiments, subjects were divided into groups of four to play a public good game. Each subject began the game with 20 points, and was given the choice between contributing points to a group account or keeping the points in a private account. Each point contributed to the group account was multiplied by 1.6, and then divided equally between all participants, regardless of whether they had contributed or not. To make sure subjects understood the pay-off structure, they

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[11] Subjects were recruited by posting signs around the campus, as well as through emails sent to students.

were given 2 examples and 4 practice questions before starting the actual experiment. Subjects were not allowed to participate in the actual experiment unless they correctly answered all of the practice questions. To avoid termination effect, each game was played for an unannounced number of rounds, actual games ranged between 9 and 11 rounds. Termination effect may cause contributions to decrease significantly as the game enters its final rounds. After round 8, there was a 30% termination probability.[12] With the exception of only three games, all games ended after the 10th round.

Experiment One: Pride Discourse

In this experiment, subjects were randomly assigned to either the pride treatment group or the control group. Subjects in the control group were informed of their income both from the private account and the group account after each round, and then the next round started immediately. In the pride treatment group, the software classified subjects in each group into the two highest and the two lowest contributors based on their actual contributions. Before moving to the next round, the two highest contributors received the following message: "You were amongst the group members with the largest contributions to the group account. Only few people follow this distinguished behavior." The two lowest contributors were not given any message. If more than two participants contributed the same highest amount, the software randomly selected only two participants to receive the message. If all of the participants in a group contributed zero points, no one received a message, and the next round commenced immediately. Subjects were asked in the post-

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[12] The termination probability was computed by the software. Beginning with round 8, the software generated a random number between 1 and 10. If that number was less than or equal to 3, the experiment was terminated at that period.

experiment survey whether they felt proud of their choices during the experiment. We also used a technique to indirectly measure pride developed by van Osch et al. (2018). After the experiment, subjects were asked to choose one picture from a group of seven pictures that best described their feeling about their behavior in the game.

Experiment Two: Punishment Discourse

The basic structure of the public good game remained the same for the second experiment. The only difference is that a within-subjects design was followed, so subjects were not divided into a treatment group and control group. After each round, the highest cooperators were informed of their status, and were given the choice of sending one of three possible punishment messages to the two lowest contributors, or sending no message at all (i.e., not punishing). Subjects who choose to send a message had to forfeit 1 point. The pre-defined messages contained a religious discourse, a patriotic discourse or a discourse emphasizing the social harm free-riders caused the group. The exact phrasing of the pre-set messages is shown in Table 1 below. After the 5th round, subjects were allowed to write a customized message, as another option.

Table 1 – Punishment Messages in Experiment Two

Religious discourse	Please increase the points you would put in the group account in the next round. As the Prophet said "Those who are loved most by God are those who are most beneficial to others".
Patriotic discourse	Please increase the points you would put in the group account in the next round. If each one of us starts with him/herself, we all will benefit and our country will advance.
Social Harm	Your behavior caused a decrease in the group account by (…) points. All participants would have benefited more if your contributions were the same as those put by the highest contributors.[13]

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[13] We opted not to include in this message the same plea as in the first two messages, to increase one's contribution in the group account, so as not to detract from the 'social harm' content of this message.

In a focus group we conducted before the experiment, Coptic students agreed that sending an Islamic message, provided it had a general meaning and is known to everyone including Copts, is more suitable than sending a message drawn from the Coptic tradition to a Muslim receiver. Indeed, it would be natural for Coptic participants to assume that their partners in the group are more likely to be Muslims, as over 90% of Egyptians are Muslims. Based on this qualitative data we collected before recruiting our subjects, we decided to use a *hadith* (i.e., a saying attributed to the Prophet Muhammad) in our religious discourse that is quite popular among Egyptians, even though Copts would be included in our sample.

At the conclusion of the experiment, subjects were given a post-experiment survey. The survey included demographic questions, as well as questions designed to reveal feelings that the punishment discourses might have generated. We explored our subjects' degree of Egyptian patriotism and religious involvement, measured by frequency of praying and reading scripture. We also measured interpersonal trust via the standard Word Values Survey question. For the exact phrasing of the questions and how the responses where coded, see Appendix 1.

IV. Results

Table 2 shows our subjects' descriptive statistics for the experiments. There were more females than males in our overall sample and per experiment. This was expected, since we recruited from the Social Sciences departments, where 70% of the students are female. The average age was 21 years. Around 94% of our subjects are Muslims, and 85%

live in an urban environment. Balance tests conducted to compare the demographic composition of the control group and treatment group for our first experiment revealed no randomization failures (fail to reject Ho, p-value > 0.05). The demographic characteristics of both groups were sufficiently similar.

Table 2 – Descriptive Statistics

	Experiment One (Pride)	Experiment Two (varieties of Punishment)	Total
Gender			
Female	125 (68%)	71 (77%)	196 (71%)
Religion			
Muslim	177 (96%)	85 (92.4%)	262 (94.9%)
Christian	7 (4%)	7 (7.6%)	14 (5.1%)
Residence			
Urban	158 (85.8%)	77 (83.7%)	235 (85.1%)
Income			
Mean (SD)	5.12 (1.74)	5.8 (2.3)	5.4 (1.95)
Median [Min, Max]	5 [1,11]	6 [1,11]	5.00 [1.00, 11.0]
Age			
Mean (SD)	21.1 (1.34)	21.1 (3)	21.1 (2.00)
Median [Min, Max]	21 [18,31]	20 [18,39]	21.0 [18.0, 39.0]

Experiment One: Pride Discourse

Figure 1 presents the results of the control group. The subjects in our control conformed to the behavior described in public good games literature, namely, decreasing their contributions over time. The average contribution of the control group members was 2.9 points.

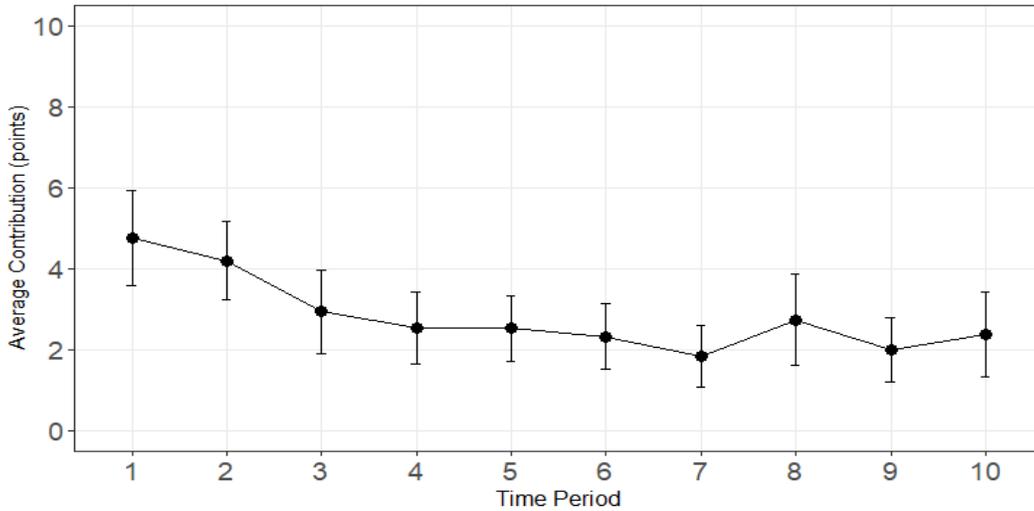**Figure 1 – Average Contributions in the Control Group Across Time**

Figure 2 shows the difference in the level of contributions between the control group and the group treated with the pride discourse. It is clear that the treatment groups' average contributions are significantly above those of the control group.

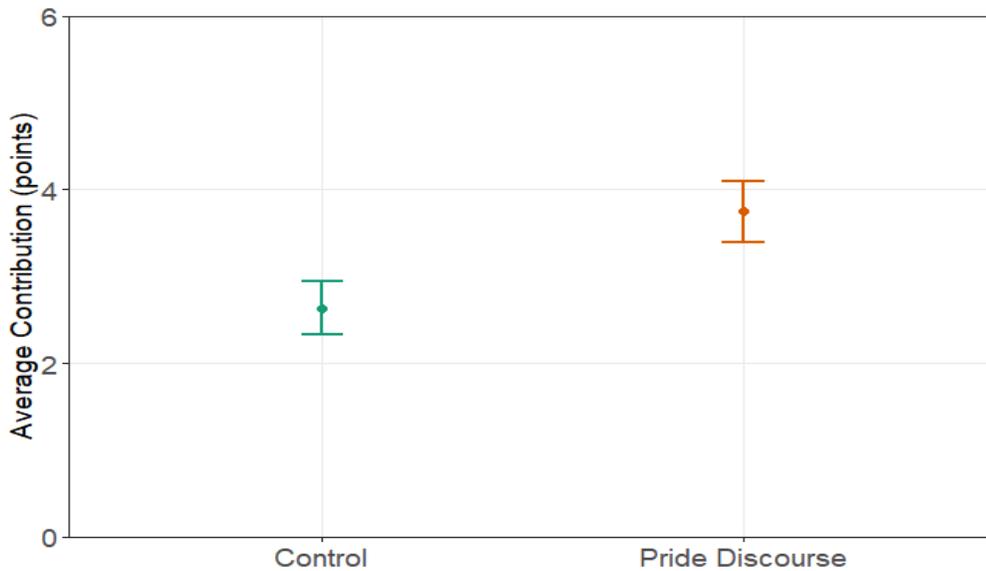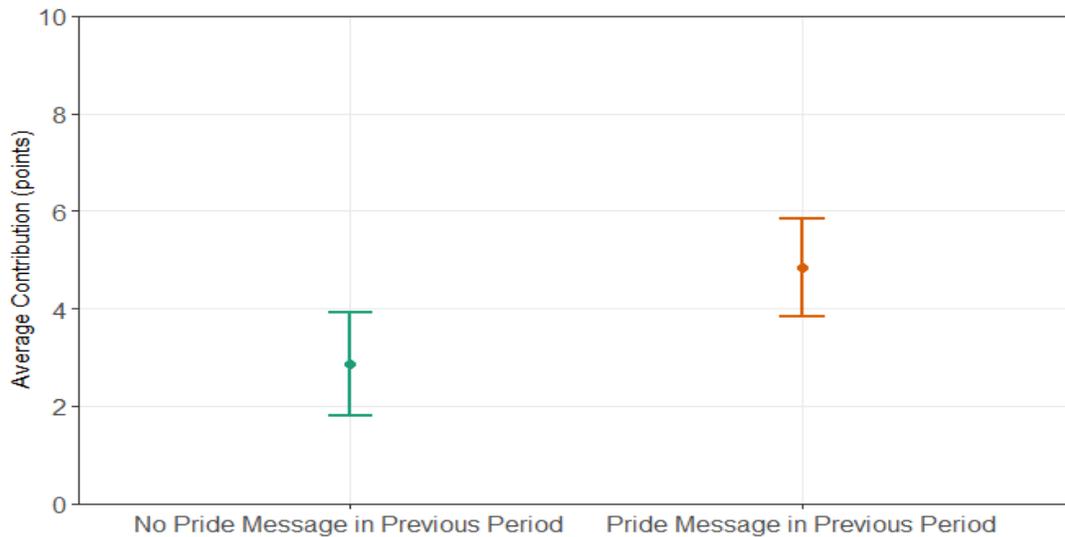**Figure 2 – Average Contributions of the Control Group and the Pride Discourse Group**

Figure 3 compares the mean contributions between treatment group subjects who received the pride message and those who did not. The results offer preliminary support to H1. Those who received a pride message in the previous round significantly increased their average contributions in the subsequent period (95% confidence level). A subject who received a pride message contributed, on average, 5 points in the subsequent period compared to an average of 2.8 points for those who did not receive this message. Figure 4 shows that this effect is sustained over several rounds despite the well-documented termination effect of participants decreasing their contributions as they sense the game is coming to an end.[14]

Figure 3 – Effect of Pride Message on Contributions[15]

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[14] For the relationship between the number of pride messages received by a subject and the average contributions, please see Appendix 2, Figure A2.1 and Table A2.1

[15] Kruskal-Wallis chi-squared= 40.214, df = 1, p-value = 2.276e-10.

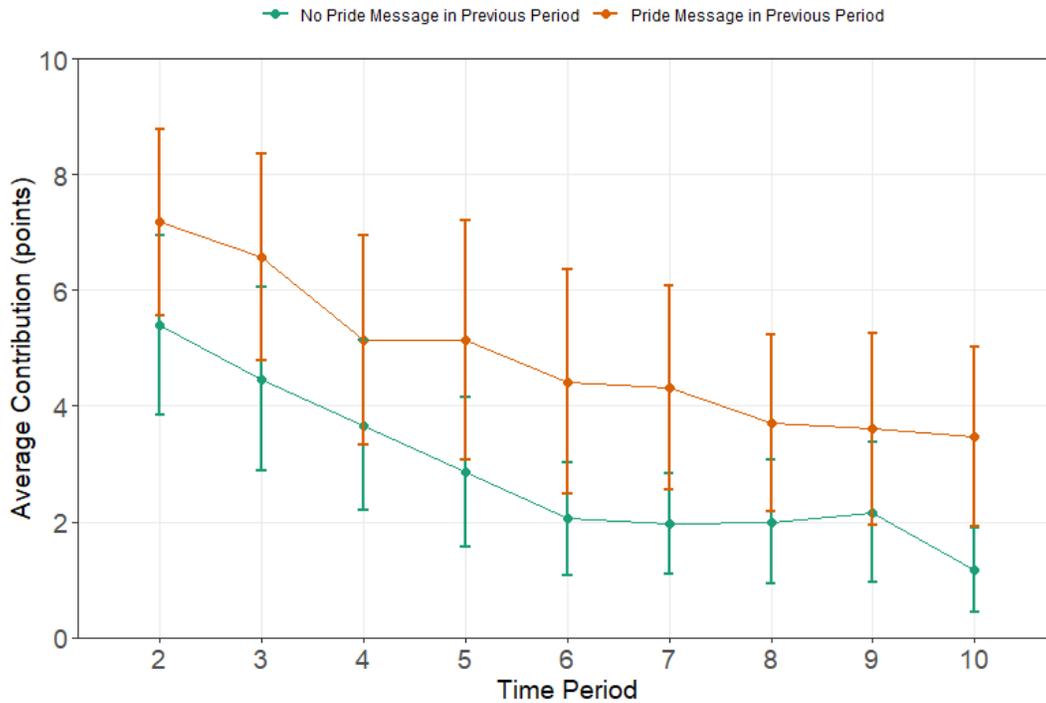**Figure 4 - Sustainability of the Effect of the Pride Message**

Table 3 shows the results of a censored regression with clustered standard errors.[16] The effect the pride treatment has on contribution rates survives, even when controlling for gender, age, religion, urban background, and income. The contribution of participants treated with the pride message increases significantly by around 0.11, on average, compared to those in the control group. Each additional round of the game played decreases the rate of contribution to the public account by around 0.03, confirming a common finding in the public good game literature.

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[16] Censors took the value of -1 if the contribution rate was "0" and the value of +1 if the contribution rate was "1". We used a censored regression, with standard errors being clustered by subject ID, to account for the correlation between observations within the cluster (i.e., for the same subject).

Table 3 – Treatments effects

	Dependent Variable
	Contribution Rate
Time Period	-0.0340***
	(0.00389)
Pride Treatment	0.114***
	(0.0395)
Age	-0.0115
	(0.0212)
Male	-0.0151
	(0.0571)
Muslim	-0.0392
	(0.115)
Urban	-0.0219
	(0.0663)
Religiosity	0.00833
	(0.0299)
Income	0.00403
	(0.0129)
Interpersonal Trust	0.000776
	(0.0478)
Constant	0.418
	(0.507)
Observations	1,760

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

To determine if the increase in contributions is driven by our hypothesized mechanisms, the regression presented in Table 4 focuses on what drives contributions in the pride treatment.[17] The regression results show that, although contribution rates decline with each played round, receiving a pride message in the previous period leads to a

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[17] As with the results presented in Table 3, and all of the other regressions presented in this paper, standard errors are clustered by subject ID to take account that the same subject played the public good game for more than one round.

significant increase in the size of the respective contribution rates. Participants who received a pride message in the previous round increased their contribution rates by around 0.16, on average, compared to those who did not receive the pride message.[18] These results indicate that the mechanism postulated in H1 drives the increase in contributions.

Table 4 – Drivers of Contributions in the Pride Treatment

	Dependent Variable
	Contribution Rate
Time Period	-0.0379***
	(0.00533)
Receive Pride in Previous Round	0.166***
	(0.0442)
Age	0.0120
	(0.0229)
Male	-0.0737
	(0.0590)
Muslim	0.0235
	(0.112)
Urban	0.0810
	(0.0765)
Religiosity	-0.0614*
	(0.0336)
Income	0.00986
	(0.0170)
Interpersonal Trust	-0.0436
	(0.0584)
Feeling Proud about one's Decision	0.0478
	(0.0307)
Observations	800

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

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[18] Feeling proud about one's decisions in the experiment – our manipulation check for generating a pride feeling –is positively associated with the size of the respective contributions rates, albeit not statistically significant.

Experiment Two: Punishment Discourses

Contributors had the option of engaging in a punishment discourse, or not. Figure 5 shows how many cooperators chose to send a punishment message. Around 58% of the high contributors in all rounds chose *not* to send any punishment messages. Although this seems like a significant percentage, previous literature has shown that Muslims seem to use punishment tools only rarely, even when they are readily available (Hermann et al. 2008). There also seems to be relative stability in the percentage of those punishing over the various rounds, with the average only dropping in rounds 4 and 10.[19]

Figure 5 – Percentage of High Contributors Choosing to Send Punishment Messages per Round
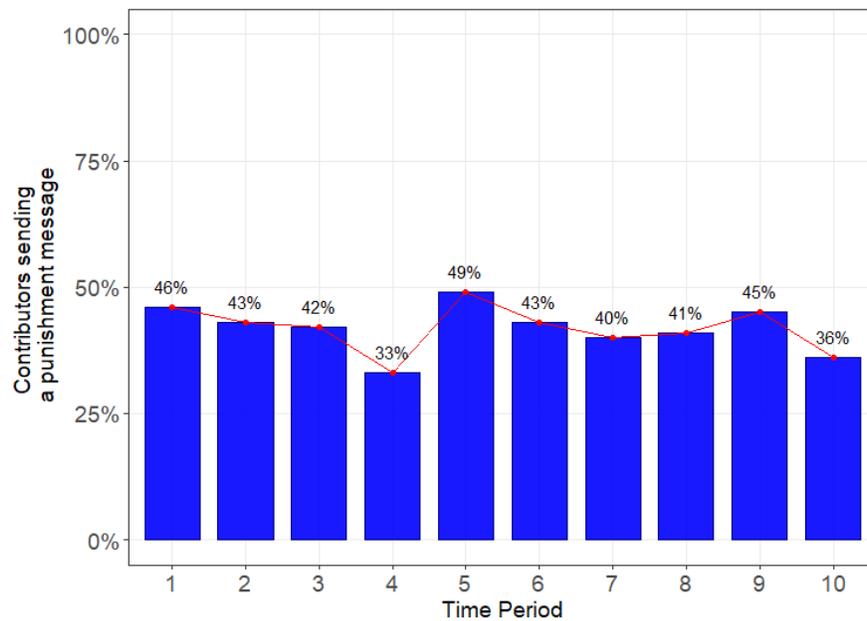
Figure 6 presents the specific punishment discourse that contributors chose when first given the opportunity: religious, social harm, patriotic or customized message. The

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[19] For the test of the proportions, Pr = 0.51 confirms an insignificant difference between the proportion of contributors who chose to send a message in period 3 and the proportion of contributors who chose to send a message in period 4. The same finding applies to periods 4 and 5, where the test of proportions has Pr = 0.22.

message most frequently chosen was social harm (40%), followed by the patriotic message (32.5%), the religious message (22.5%) and the customized message (5%). It is interesting to note that the religious discourse came in third place in a country that is accustomed to making religious appeals and was, indeed, the birthplace of political Islam almost a hundred years ago.

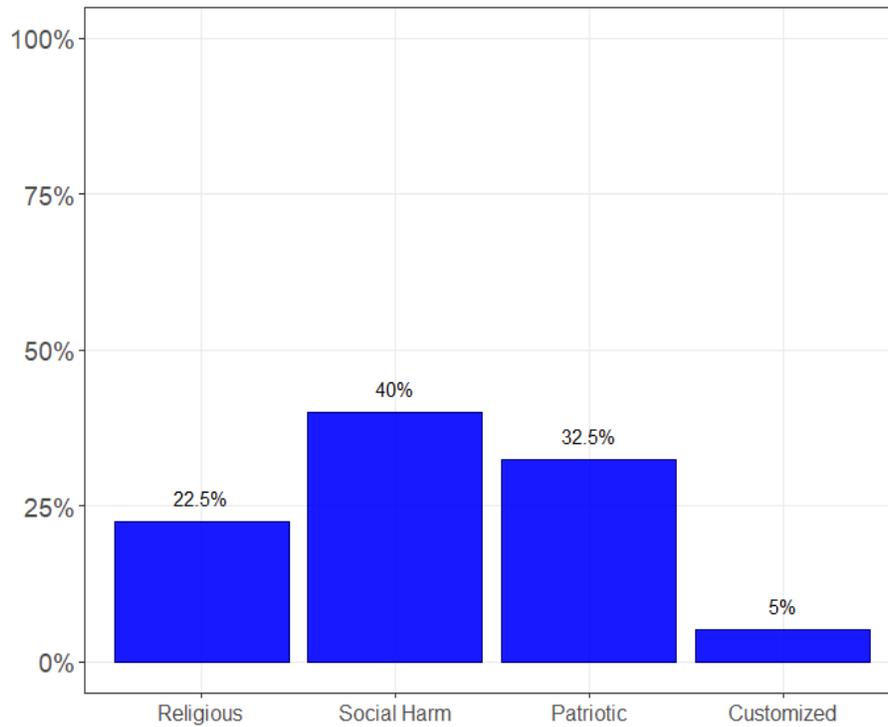**Figure 6 – Percentage Usage of First-Choice Punishment Messages**

Figure 7 presents the punishment message contributors most frequently through all of the rounds of the game. Not surprisingly, customized messages come in first.[20] We expected that subjects would want to express their frustration at defectors using their own language, if given the opportunity. Moreover, writing such messages comes after punishers

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[20] The vast majority of the customized messages stressed (sometimes mathematically) that if each subject increases his/her contributions, the final pay-offs for each would increase.

have potentially exhausted the ready-made messages in the first 5 rounds and, thus, were

potentially more willing to try something new.

Figure 7 – Percentage Usage of Punishment Messages in All Rounds
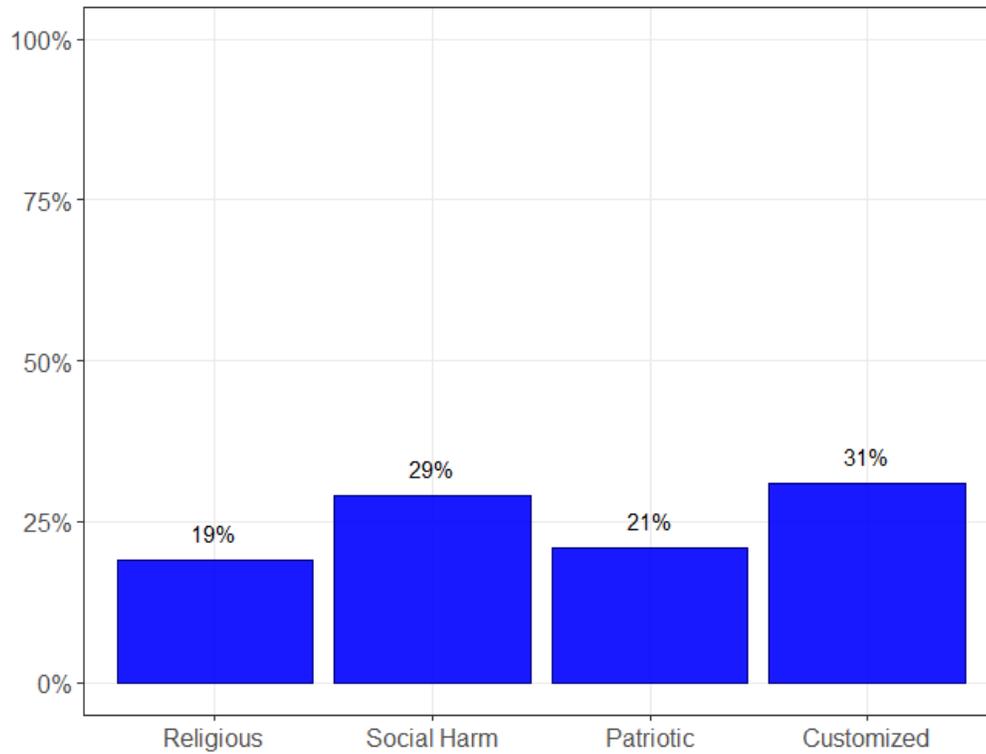
Figures 8 and 9 present how recipients of the messages were affected by the messages. Our results appear to be in line with our hypotheses H2-H4. Subjects who received a punishment message from fellow group members significantly increased their contribution in the following round compared to those who did not receive any message. The average contribution of a subject receiving a punishment message was 6.7 points compared to 3.3 points for those subjects who received no message (Figure 8). Moreover, this difference is sustained over all rounds (Figure 9). There were, however, no statistically significant differences between the effect of the different punishment messages (see Figure 10).

Figure 8 – Effect of Punishment Messages on Contributions of Message Recipients[21]

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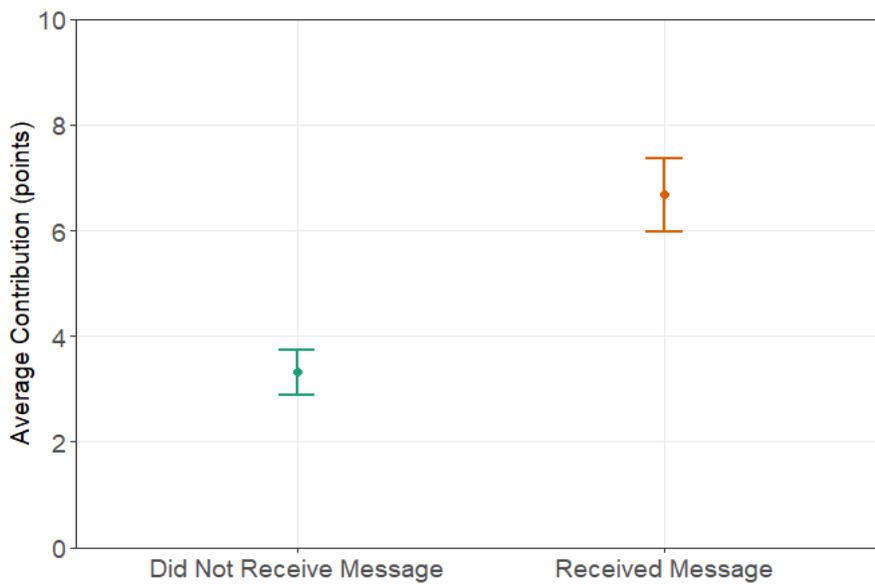
[21] Kruskal-Wallis chi-squared = 57.713, df = 1, p-value = 3.033e-14.

Figure 9 – The Effect of Receiving a Punishment Message Compared to Not Receiving a Message, per round
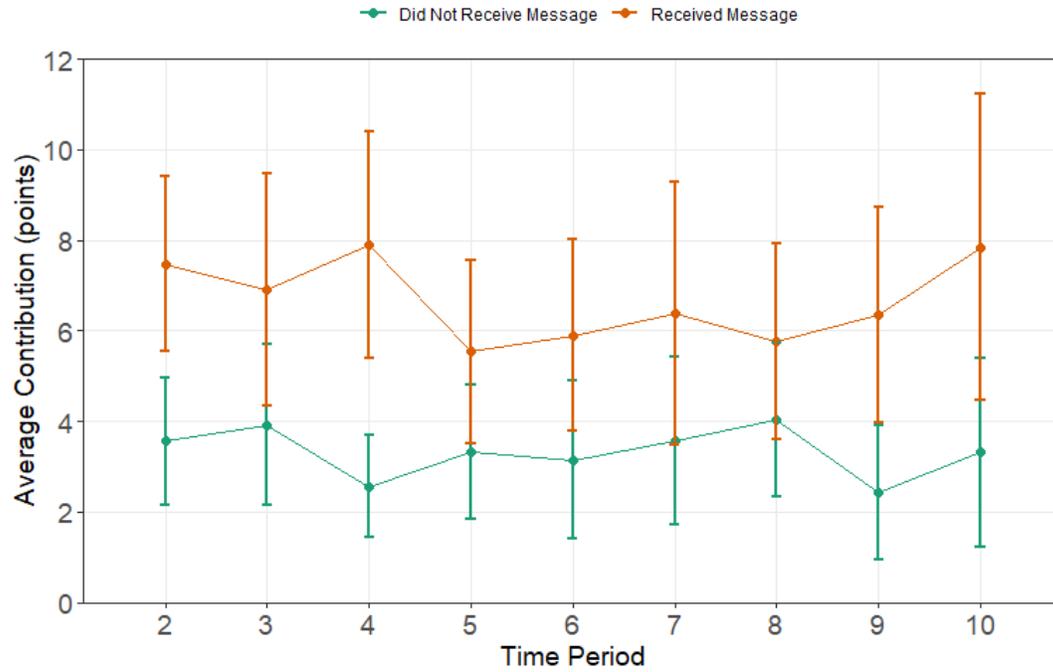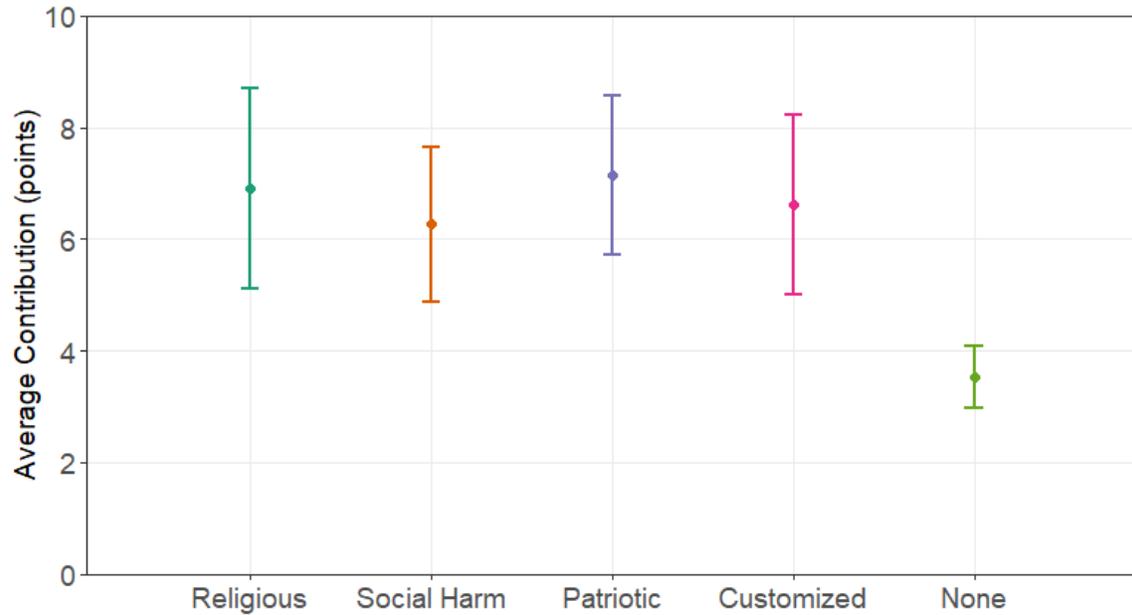
Figure 10 – Comparing the Effect of Individual Punishment Message on Contributions of Those Receiving the Messages

We wanted to see if the contributions of those who sent the punishment messages increased after sending the message, and if so, for how many periods. Indeed, punishing defectors could act as a form of venting, or an expression of one's strong feeling about someone or something (Dickinson and Masclet, 2015; see also Bolle et al., 2014). Joffily et al., (2014) have shown that punishing norm violators can increase one's state of satisfaction (see also de Quervain et al., 2004). Figure 11 shows that contributors who sent a punishment message tended to increase their contribution to the public account. Figure 12 reveals that the more punishment messages a high contributor sends, the more he or she contributes to the public account.

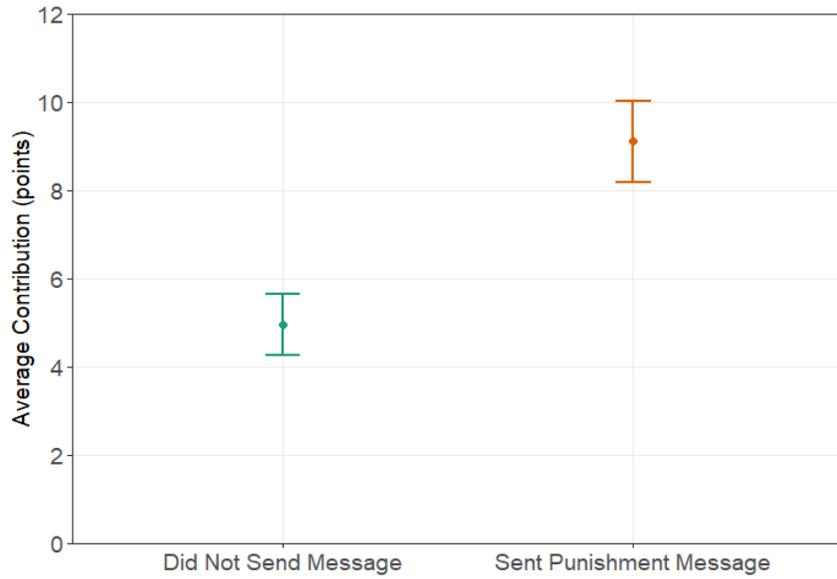**Figure 11- Effect of Punishment Messages on Contributions of Message Senders**

Figure 12- Number of Punishment Messages Sent and Average Contributions
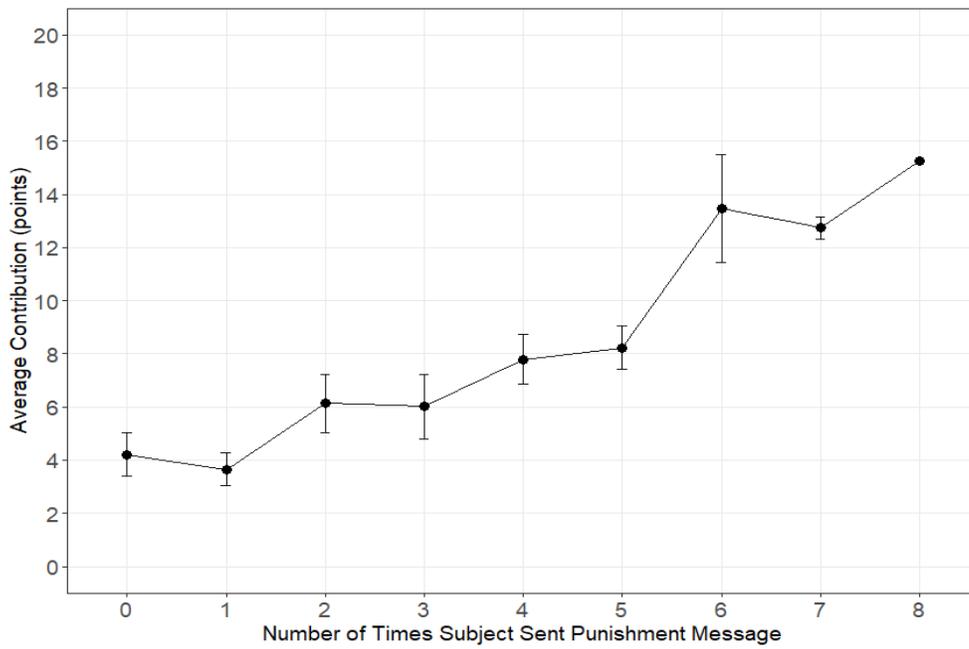
Table 5 presents a deeper analysis of the above observations by running regressions. The table shows that contribution rates decline significantly with each passing round. Low contributors who received any type of punishment message in the previous round significantly increase their contributions (Column 1). This confirms our hypotheses H2-H4. The impact of sending any of the possible punishment messages on the contributions of high contributors, is closely associated with higher contribution rates (Column 1). Interpersonal trust was one of our controls that is associated with larger contributions, although not significantly. Religiosity, on the other hand, is associated with smaller contributions.

Table 5 – Drivers of Contributions in Experiment Two

	Dependent variable:		
	Contribution Rate		
	(1)	(2)	(3)
Time Period	-0.0195***	-0.00774	-0.0200**
	(0.00503)	(0.00638)	(0.00951)
Received Religious Message in Previous Period		0.242***	
		(0.0546)	
Received Social Harm Message in Previous Period		0.177***	
		(0.0457)	
Received Patriotic Message in Previous Period		0.227***	
		(0.0470)	
Received Customized Message in Previous Period		0.228***	
		(0.0504)	
Age	0.000411	-0.00534	0.00391
	(0.00624)	(0.00689)	(0.00786)
Male	0.0557	0.0568	0.0857
	(0.0604)	(0.0640)	(0.0668)
Muslim	0.00429	-0.0908	0.0820
	(0.0600)	(0.0640)	(0.0934)

Urban	-0.0492	-0.123*	-0.0324
	(0.0656)	(0.0721)	(0.0694)
Religiosity	-0.0592**	-0.0538*	-0.0630**
	(0.0274)	(0.0326)	(0.0311)
Income	0.0119	0.0110	0.0187*
	(0.0103)	(0.0118)	(0.0108)
Interpersonal Trust	0.0290	-0.00639	0.0869
	(0.0640)	(0.0557)	(0.0889)
Sent a Punishment Message	0.273***		
	(0.0423)		
Received a Punishment Message	0.131***		
	(0.0244)		
Sent Religious Message in Previous Period			0.195***
			(0.0753)
Sent Social Harm Message in Previous Period			0.120*
			(0.0648)
Sent Patriotic Message in Previous Period			0.121**
			(0.0587)
Sent Customized Message in Previous Period			0.358***
			(0.0653)
Constant	0.370**	0.520**	0.224
	(0.179)	(0.203)	(0.242)
Observations	904	402	381

Notes:
1) The omitted category in Column 2 is *not receiving a punishment message*, whereas the omitted category in Column 3 is *choosing not to send a punishment message*.
2) The number of observations decreased in Columns 2 and 3 compared to Column 1 due to filtering the data where only low contributors were picked in Column 2 and high contributors were analyzed in Column 3.
Robust standard errors in parentheses; $^*p$ $^{**}p$ $^{***}p<0.01$

Table 6 presents the results of our analysis of what drives a high contributor to

punish. and specifically if that driver impacts his/her choice of which punishment message

to send. The dependent variable in Column 1 refers to any punishment message sent, and

Columns 2-4 refer to the specific punishment message chosen. The decision to send any

kind of punishment message is associated with male participants, age, and higher income.

Not surprisingly, participants with a higher degree of religiosity are more likely to send a religious punishment message. Similarly, Egyptians professing to be proud of their country are more likely to send a patriotic message. It seems that subjects used punishment messages that aligned with their personality traits or beliefs. Being a Muslim and living in an urban surrounding were associated with a lower likelihood of sending a patriotic message. There is no significant relation between choosing to send a punishment message and the extent to which participants agree that firmness is an effective way to deal with Egyptians to correct their wrong behavior (biserial correlation coefficient = 0.08, p-value=0.1024).

Table 6 – Drivers of Choice of Punishment Messages

	Dependent variable:			
	Sent Punishment Msg	Sent Religious Msg	Sent Social Harm Msg	Sent Patriotic Msg
	(1)	(2)	(3)	(4)
Age	0.0236	-0.0143	0.0416	-0.0678
	(0.0340)	(0.0816)	(0.0672)	(0.107)
Male	0.967***	-0.464	0.337	0.327
	(0.207)	(0.532)	(0.417)	(0.505)
Muslim	-0.143	0.280	0.922	-1.499*
	(0.368)	(0.908)	(0.894)	(0.802)
Urban	-0.278	0.349	0.225	-1.453**
	(0.280)	(0.579)	(0.563)	(0.597)
Religiosity	-0.157*	0.484**	-0.143	-0.279
	(0.0946)	(0.245)	(0.200)	(0.226)
Believe in Change Through Select Few	0.0141	-0.174	0.0333	0.000286
	(0.0874)	(0.247)	(0.204)	(0.253)
Income	0.121***	-0.105	0.0263	-0.106
	(0.0414)	(0.0958)	(0.0819)	(0.117)
Egyptians Cooperative	-0.0190	0.0684	-0.0146	0.159
	(0.107)	(0.272)	(0.222)	(0.258)
Egypt Impossible to Change	0.147	0.170	0.216	-0.311

	(0.106)	(0.239)	(0.227)	(0.245)
Firmness is Effective	-0.00980	0.0182	-0.164	-0.0262
	(0.0859)	(0.246)	(0.198)	(0.227)
Excuse Others	-0.185	0.0563	0.261	-0.306
	(0.172)	(0.486)	(0.407)	(0.480)
Proud to be Egyptian		0.0176	-0.264	0.508*
		(0.271)	(0.224)	(0.277)
Constant	-2.043	-2.465	-2.431	3.398
	(1.264)	(2.900)	(2.490)	(3.285)
Observations	920	160	160	160

:
Robust standard errors in parentheses; *p**p***p<0.01

V. Conclusion

Voluntary cooperation in the provision of public goods is crucial for the prosperous development of societies. However, if voluntary cooperation is in low supply, those inclined to cooperate might modify their behavior by reducing their contributions to the public good. In this paper, we report the results of two public good game experiments designed to identify the effects various discourses have on the propensity to cooperate. Our first experiment uses a praise discourse directed at high contributors to determine if this downward spiral can be stopped by praising those who contribute more than the mean contribution. The results show that the spiral not only stopped, but that high contributors actually increased contributions after receiving a praise message. The second experiment was designed to determine if a punishment discourse might induce low contributors to increase their contributions. We tested four punishment messages reflecting different aspects of personal experience: religious, patriotic and social harm (these three messages were a scripted part of the experimental design), and a message that the senders could phrase on their own. All four types of punishment messages induced higher contributions

by the recipients. Interestingly, the senders of a punishment message also increased their contributions by almost twice the size of the recipients.

There are many factors that might determine a person's propensity to cooperate with others. Some factors are likely to be stable over time, especially if they are based on norms that are transmitted from generation to generation. Yet, our results provide reasons to be somewhat optimistic about the possibility of using discourse to modify an individual's behavior in a positive direction when it comes to contributing to the public good. Drawing on fairly simple discourses, the propensity to cooperate was significantly improved in the lab. The next logical step, of course, is to test these results in the real world.

There are three important caveats to be considered when discussing our results. The first is that although our results are robustly significant, our sample sizes are quite small. Experiments using a larger and more diverse sample would be a strong test for our findings. Second, although changing or tailoring a discourse to solve social dilemmas is a less daunting process than structural transformations, it is certainly not an easy endeavor. Nevertheless, carefully targeted applications could offer a good start. For example, installing sensibly-phrased signs in places where jumping queues, littering, or violating smoking bans is widespread, could test the real-life effects of our results. Third, this paper does not test whether the ability of a discourse to modify behavior will have lasting effects. One could assume that familiarization with subtle interventions might render them incapable of affecting behavior after a while. While our experiments did not test this question, future research might examine if a regular change in discourse phrasing alters the impact of the core of the message.

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Appendix 1 – Measurement of Variables

Variable	Description/Question asked											Measurement
Age	Age in years											Numeric
Male	Subject is a male											Dummy variable
Muslim	Subject is a Muslim											Dummy variable
Urban	Subject lives in an urban area											Dummy variable
Religiosity	Response to question: How often do you read the Quran/Bible?											1 (lowest) to 4 (highest)
Income	Subject's income level											1 (lowest) to 11 (highest)
	1	2	3	4	5	6	7	8	9	10	11	
	100 EGP or less	1001-1400 EGP	1401-2000 EGP	2001-3000 EGP	3001-4000 EGP	4001-8000 EGP	8001-12,000 EGP	12,001-14,000 EGP	14,001-22,000 EGP	22,001-30,000 EGP	More than 30,000 EGP	
Proud to be Egyptian	Response to question: To what extent do you feel proud for being an Egyptian?											1 (lowest) to 4 (highest)
Believe in Change Through Select Few	Response to question: "Egyptian society can be reformed by the educated elite"?											1 (disagree completely) to 4 (agree completely)
Egypt Impossible to Change	Response to question: "Egyptian society is impossible to reform"											1 (disagree completely) to 4 (agree completely)

Egyptians Cooperative	Response to question: "Egyptians are cooperative with each other"	1 (disagree completely) to 4 (agree completely)
Firmness Effective	Response to question: "Firmness is an effective way to deal with Egyptians to correct their wrong behaviors"	1 (disagree completely) to 4 (agree completely)
Interpersonal Trust	Response to question: In general, do you think that most people can be trusted, or do you need to be very careful with people?	0: I need extreme caution in dealing with people 1: Most people can be trusted
Excuse Others	Response to question: At what rate can you say you make excuses for others?	1 (lowest) to 3 (highest)

Appendix 2 – Robustness Checks

Figure A2.1 shows that a positive relationship exists between the number of pride messages received by a subject and the average contribution. The only exception, visually speaking, is when 8 messages were received. However, pairwise Mann–Whitney U-tests confirm that there are no significant differences between those who received 8 pride messages and those who received any other number of messages. This is most probably due to the small number of observations, as Table A2.1 shows.

Figure A2.1 – Number of Pride Messages Received and Average Contributions
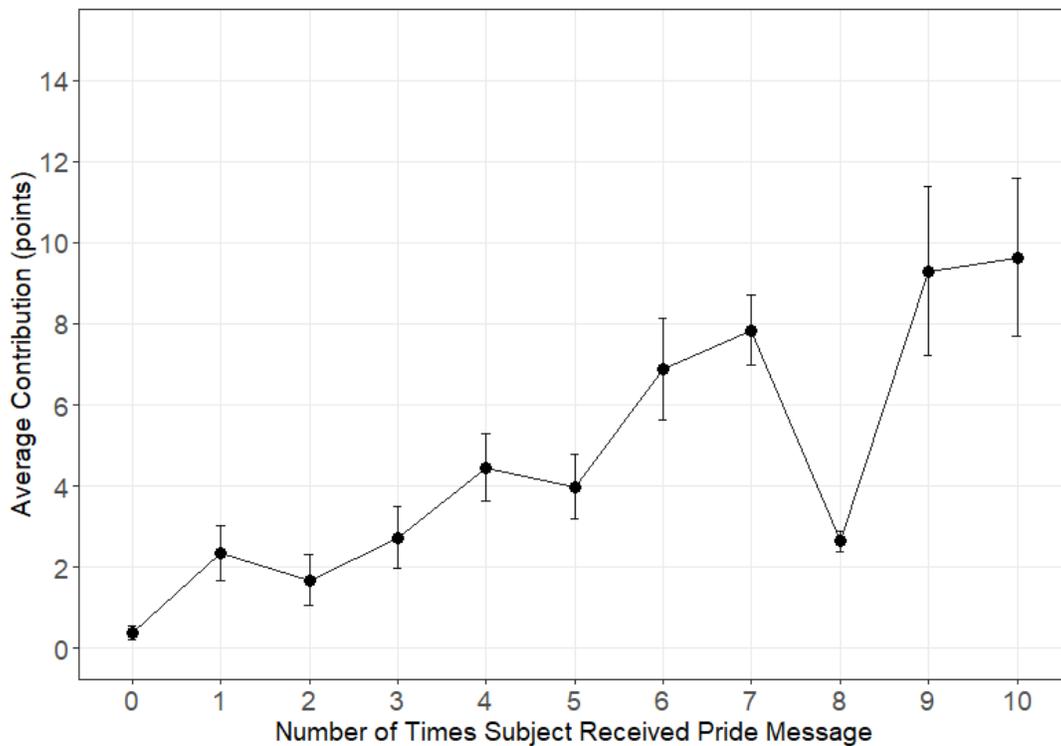
Table A2.1- Distribution of Subjects by Number of Pride Messages Received

Number of Pride Messages Received	Average Contribution Across all time Periods	Number of Subjects
0	0.3875	8
1	2.347222	7
2	1.68	10
3	2.73	15
4	4.461765	17
5	3.983333	12
6	6.89	5
7	7.835417	8
8	2.65	2
9	9.295556	5
10	9.633333	3