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FROM?**

BY

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# Where Do Social Preferences Come From?

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## Abstract

Where do preferences for fairness come from? We use a unique field setting to test for a spillover of sharing norms from the workplace to a laboratory experiment. Fishermen working in teams receive random income shocks (catching fish) that they must regularly divide among themselves. We demonstrate a clear correlation between sharing norms in the field and sharing norms in the lab. Furthermore, the spillover effect is stronger for fishermen who have been exposed to a sharing norm for longer, suggesting that our findings are not driven by selection effects. Our results are consistent with the hypothesis that work environments shape social preferences.

*Keywords:* ultimatum game; social preferences; fairness; workplace spillovers

JEL Codes: Q2, C9, C7, B4, D1

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## 1. Introduction

Human beings demonstrate strong social preferences for fair outcomes (Charness and Rabin 2002; Fehr and Gächter 2002; Fehr and Fischbacher 2003). This has puzzled many scholars in the social sciences, particularly when revealing a preference for an equitable outcome is at odds with individual profit maximization. Two strands of inquiry have emerged in an attempt to explain the origins of preferences for fairness. The first explores whether human beings are innately fair. Neurological, physiological, and genetic differences appear to explain some differences in preferences. Koenigs and Tranel (2007) show that patients with ventromedial prefrontal cortex damage reject a higher proportion of unfair ultimatum offers than those in comparison groups. Van den Bergh and Dewitte (2006) find that males with lower exposure to pre-natal androgen have a stronger preference for fairness. Burnham (2007) shows that men who reject low offers have significantly higher testosterone levels than those who accept. Wallace et al. (2007) provide evidence for genetic heritability playing a non-trivial role in ultimatum game behavior.

The second strand investigates whether social and cultural factors explain differences in preferences for fairness (Henrich 2000; Henrich et al. 2001, 2004, 2010). Researchers have conducted ultimatum games in

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15 different societies across the globe and found that differences in market integration and religious participation  
16 are positively correlated with fairness (Henrich et al. 2010). However, Oosterbeek et al. (2004) ran a meta-  
17 analysis of 37 studies and 75 ultimatum games to show that although regional differences do account for some  
18 of the variation in responder behavior, cultural markers have little influence on overall behavior. Although  
19 few would argue that behaviors are exactly consistent across location and culture, two problems naturally  
20 arise with cross-cultural studies. First, the scope of what we consider to be relevant for quantifying culture,  
21 let alone delineating characteristics that create uniqueness, are not well defined. Second, the literature is  
22 largely silent on the direction of causality.<sup>2</sup> Simultaneous feedback between culture and norms is no less  
23 probable than uni-directional causality.

24 Although we have recently learnt a lot about factors that influence preferences for fairness, there are still  
25 large differences in preferences within genetically and culturally similar populations. Our research question  
26 in this paper is to test whether work environments influence individual preferences. We show that fishermen  
27 who are exposed to 50/50 sharing rules on a daily basis are significantly more likely to reject unequal splits  
28 in an ultimatum game than those working under 60/40 sharing norms. To account for potential selection  
29 bias, we demonstrate that this result is driven by experienced fishermen who have been exposed to the  
30 sharing norms for longer than their counterparts. Thus, we offer evidence in support of a third mechanism  
31 for understanding the origins of fairness: the institutions particular to an individual's work environment can  
32 have strong effects on preferences. In related work, Leibbrandt et al. (2013) compare competitiveness in  
33 traditional fishing societies where local natural forces determine whether fishermen work in isolation or in  
34 collectives. They present strong evidence that fishermen who fish individually are far more competitive than  
35 fishermen who fish in groups, and that this difference emerges with experience. This strongly suggests that  
36 social preferences are, in part, shaped by work environments and institutions.

## 37 **2. Background and Experimental Methodology**

38 Our population of interest is a small-scale fishing community on the eastern shores of Lake Victoria in  
39 Kenya. A single unpaved road connects the town of a few thousand people to the nearest major city. The  
40 dominant industry in this town is fishing, with both subsistence and commercial fishing taking place. Like  
41 other Kenyan fishing communities on Lake Victoria, the residents are predominantly Luo in ethnicity and  
42 Christian in religion. These fishermen are an ideal group for studying the effect of work environments on  
43 behavioral preferences, particularly using the ultimatum game. The small-scale fishermen receive random  
44 income shocks (their daily catch), and (since they typically work in teams) they often have to make decisions

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<sup>2</sup>Lambarraa and Riener (2015) and Shariff and Norenzayan (2007) prime religious culture or religion directly and show increases in charitable giving. It is unclear whether this establishes the effect of culture on behavior or the effect of religious institutional norms on behavior.

45 about how to share joint income (McConnell and Price 2006). Thus sharing norms concerning income  
46 redistribution are reinforced daily.

47 In this community, most of the fishermen do not own their boat. Instead, they use boats belonging to  
48 land-based owners and share the proceeds from their catch as payment for use of the equipment. Fishermen  
49 are divided into two primary groups: night and day. The two groups target different species of fish. Night  
50 fishermen target Omena (*Rastrineobola argentea*). They fish using finely meshed seine nets around the edges  
51 of the lakes, near to the town. There are typically 3 to 4 people per boat. Perhaps because this type of  
52 fishing is a lot easier, fishermen have developed a sharing norm of splitting their catch 50/50 with the owner  
53 of the boat. Day fishermen target Mbuta (*Lates niloticus*). In contrast to night fishermen, they sail many  
54 miles into the lake and use larger mesh gill nets and long-lines with hooks. There are typically 2 to 3 people  
55 per boat. These fishermen split their catch 60/40 with boat owners (the owner receives 40% of the catch).  
56 Fishing is regulated by the local Beach Management Unit (BMU), a governing body that is authorized by the  
57 Kenyan government to provide and enforce rules to manage the beachfront and fishing grounds. Fishermen  
58 must be registered with the BMU in order to land on the beach and sell their fish. In practice, nearly all  
59 of the fishermen who fish in this community live their day-to-day lives here as well; existence of commuting  
60 fishing is rare.

61 Our experiment took place in cooperation with the BMU in the town meeting hall. For 4 days, we invited  
62 fishermen in the community to participate, with all efforts made to reach out to day and night fishermen  
63 alike. In all, 200 fishermen participated in the experiment. On average, they earned 381 Kenyan Shillings  
64 (approx. USD 4.50) for 2 hours of their time. Fishermen registered with some basic demographic information  
65 and were assigned a random ID number. To measure fairness, we employed the strategy method version  
66 of the ultimatum game. Fishermen were taken individually into a private room with a trained enumerator.  
67 Subjects were assigned as proposers or responders if their ID number was odd or even, respectively, with each  
68 subject participating in a single role. Both proposers and responders were introduced to the game, provided  
69 examples, and had to correctly answer comprehension questions before participating. Finally, proposers  
70 and responders were given blank index cards to write their respective offers and minimum acceptable offers  
71 (MAO), and then told to fold and place the cards into a sealed container while the enumerator waited outside.  
72 The stakes in this game were for real money, and the amount to be split was 100 Kenyan Shillings (close  
73 to one day's wages). To maintain full anonymity, participants were randomly paired among all participants  
74 upon conclusion of the experimental sessions. Payments were distributed in the two days following the  
75 experimental sessions and every single fishermen showed up to collect payment.

### 3. Results

The outcomes of interest are offers and MAOs. Of the 200 participants, we have data from 99 proposers and 101 responders. Overall, offers and MAOs are in-line with other ultimatum games. Proposers tend to offer fair splits (the mode offer is 50), while responders reject unfair offers (see Table 1 for details). To study the effect of institutions on fairness norms, we use demographic data collected at registration which asks for the type of gear used by fishermen. As mentioned earlier, day and night fishermen use gear specific to their fishing purpose. We can then classify fishermen who report the use of seine nets as night fishermen and those who report gill nets or long-lines as day fishermen. We avoided asking fishermen directly if they are night or day fishermen to reduce potential priming of existing sharing norms.

Splitting our sample by day and night fishermen reveals interesting results. As shown in Table 2, t-tests reveal no significant differences between proposals by day and night fishermen ( $p$ -value 0.72). However, we find that night fishermen report significantly higher MAOs than day fishermen ( $p$ -value 0.013). Thus, fishermen who operate under a 50/50 sharing norm require a larger offer than those who operate under a 60/40 norm.

To target the causal direction of this relationship, we split the sample by whether the individual is a coxswain or not. Coxswains are more experienced (though not necessarily older) and skilled fishermen who lead their fishing crew. Coxswains are responsible for allocating the proceeds from the daily catch between the crew and the boat owner. Thus, it is reasonable to expect coxswains to have operated under, and be responsible for enforcing, their associated sharing norms for a longer amount of time than their less experienced peers. By splitting the sample into coxswains and non-coxswains, we see that differences in MAOs are indeed driven by the more experienced fishermen. Tables 3 and 4 show no significant differences in MAOs by non-coxswains ( $p$ -value 0.461), while night coxswains require significantly higher offers than their day counterparts ( $p$ -value 0.001).

Likewise, we see that within day and night fishermen, MAOs between coxswains and non-coxswains are significantly different. While non-coxswains in both groups have an average MAO of around 40, coxswain behavior deviates strongly in opposite directions. Day coxswains have MAOs significantly *lower* than non-coxswains ( $p$ -value 0.021) (Table 5), whereas night coxswains have MAOs significantly *higher* than non-coxswains ( $p$ -value 0.016) (Table 6). These results together lend evidence to the notion that fairness behavior arises *causally* through exposure to an individual's work environment. We see that fishermen from a small homogenous community exhibit differences in perceived fairness due to differences in workplace sharing norms, which are linked to the underlying ecology of the species they target.

What drives these differences in MAOs between night and day fishermen? One potential explanation is that responders place themselves in the position of a boat-owner when considering their MAO: fishermen receive the initial income (daily catch) and boat-owners then receive a share based on pre-established norms.

110 Analogous to responders , the boat-owner has the power to reject an offer by restricting the future use of the  
111 boat. This may explain why day fishermen are willing to accept around 40 percent, just as their boat-owner  
112 counterparts do.

113 Why does this behavior manifest in MAOs and not in proposer offers? If fishermen view the proposer  
114 role as that of a fishermen, we might expect day fishermen to propose 40 percent for the responder. But  
115 responder identities are anonymous. A rational proposer should incorporate the beliefs of day *and* night  
116 fishermen into his strategy, and increase his offer to avoid rejection by night fishermen (as observed in the  
117 data). Responders don't need to incorporate group specific beliefs since they are not subject to the same  
118 strategic concerns.

#### 119 4. Conclusion

120 Where does fairness come from? Scholars have investigated the cultural and biological origins of fairness  
121 and we supplement this research by exploring the role of institutional factors. We show that fishermen  
122 from a single culture have different notions of fairness that arise from profit sharing institutions related to  
123 their work environment. Fishermen accustomed to 50/50 splits are more likely to reject unequal splits than  
124 those accustomed to 60/40 sharing rules. Furthermore, we provide evidence that this result is not driven  
125 by selection. The fact that the result holds for experienced *coxswains* and not for their less experienced  
126 colleagues suggests that individuals who are exposed for longer periods to certain institutional norms absorb  
127 these rules into their preferences.

128 We are not the first to demonstrate feedbacks between work institutions and economic behavior. Carpen-  
129 ter and Seki (2005) and Burks et al. (2006) show that among fishermen and bicycle messengers, respectively,  
130 those who are exposed to more competitive work environments are less cooperative in experiments. Gneezy  
131 et al. (2014) show that fishermen who work in groups show higher levels of trust and coordination than  
132 fishermen who work solo. Leibbrandt et al. (2013) show that fishermen who fish individually are more com-  
133 petitive than fishermen who fish in groups. We add to this literature by widening the domain of economic  
134 behaviors that are influenced by institutional factors and by addressing selection effects in demonstrating  
135 that preferences (as measured in an experiment) are driven by the length of time fishermen have been exposed  
136 to a sharing norm.

Table 1: Summary Statistics

	Mean	S.D.	Min	Max	N
Offer	46.1	8.38	20	70	99
MAO	42.2	17.0	0.50	99	101

Table 2: Day vs. Night - All

	Night	Day	Difference	S.E.	N
Offer	46.44	45.83	0.611	1.698	99
MAO	45.95	37.62	8.326**	3.303	101

Table 3: Day vs. Night - Non-Coxswains

	Night	Day	Difference	S.E.	N
Offer	45.71	44.81	0.907	2.727	47
MAO	39.17	41.80	-2.633	3.544	49

Table 4: Day vs. Night - Coxswains

	Night	Day	Difference	S.E.	N
Offer	47.08	46.79	0.298	2.121	52
MAO	51.19	32.64	18.55***	5.197	52

Table 5: Coxswain vs. Non-Coxswain - Day

	Non-Cxsn	Cxsn	Difference	S.E.	N
Offer	44.81	46.79	-1.978	2.626	54
MAO	41.80	32.64	9.157**	3.824	46

Table 6: Coxswain vs. Non-Coxswain - Night

	Non-Cxsn	Cxsn	Difference	S.E.	N
Offer	45.71	47.08	-1.369	2.017	45
MAO	39.17	51.19	-12.03**	4.840	55

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 142 *complexity and adaptation in marine systems*. All errors are our own.

143 **References**

- 144 Van den Bergh, B., Dewitte, S., 2006. Digit ratio (2d: 4d) moderates the impact of sexual cues on men's  
 145 decisions in ultimatum games. *Proceedings of the Royal Society B: Biological Sciences* 273, 2091–2095.
- 146 Burks, S.V., Carpenter, J.P., Goette, L., 2006. Performance pay and the erosion of worker cooperation:  
 147 Field experimental evidence. *IZA Discussion Paper* .
- 148 Burnham, T.C., 2007. High-testosterone men reject low ultimatum game offers. *Proceedings of the Royal*  
 149 *Society B: Biological Sciences* 274, 2327–2330.
- 150 Carpenter, J.P., Seki, E., 2005. Competitive work environments and social preferences: field experimental  
 151 evidence from a japanese fishing community. *Contributions in Economic Analysis & Policy* 5.
- 152 Charness, G., Rabin, M., 2002. Understanding social preferences with simple tests. *The Quarterly Journal*  
 153 *of Economics* 117, 817–869.
- 154 Fehr, E., Fischbacher, U., 2003. The nature of human altruism. *Nature* 425, 785–791.
- 155 Fehr, E., Gächter, S., 2002. Altruistic punishment in humans. *Nature* 415, 137–140.
- 156 Gneezy, U., Leibbrandt, A., List, J.A., 2014. Ode to the sea: Workplace organizations and norms of  
 157 cooperation. *The Economic Journal* .
- 158 Henrich, J., 2000. Does culture matter in economic behavior? ultimatum game bargaining among the  
 159 machiguenga of the peruvian amazon. *The American Economic Review* 90, 973–979.



- 160 Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., 2004. Foundations of human sociality:  
161 Economic experiments and ethnographic evidence from fifteen small-scale societies. Oxford University  
162 Press.
- 163 Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., McElreath, R., 2001. In search of  
164 homo economicus: behavioral experiments in 15 small-scale societies. *The American Economic Review*  
165 91, 73–78.
- 166 Henrich, J., Ensminger, J., McElreath, R., Barr, A., Barrett, C., Bolyanatz, A., Cardenas, J.C., Gurven,  
167 M., Gwako, E., Henrich, N., et al., 2010. Markets, religion, community size, and the evolution of fairness  
168 and punishment. *science* 327, 1480–1484.
- 169 Koenigs, M., Tranel, D., 2007. Irrational economic decision-making after ventromedial prefrontal damage:  
170 evidence from the ultimatum game. *The Journal of neuroscience* 27, 951–956.
- 171 Lambarraa, F., Riener, G., 2015. On the norms of charitable giving in islam: Two field experiments in  
172 morocco. *Journal of Economic Behavior & Organization* .
- 173 Leibbrandt, A., Gneezy, U., List, J.A., 2013. Rise and fall of competitiveness in individualistic and collec-  
174 tivistic societies. *Proceedings of the National Academy of Sciences* 110, 9305–9308.
- 175 McConnell, K.E., Price, M., 2006. The lay system in commercial fisheries: Origin and implications. *Journal*  
176 *of Environmental Economics and Management* 51, 295–307.
- 177 Oosterbeek, H., Sloof, R., Van De Kuilen, G., 2004. Cultural differences in ultimatum game experiments:  
178 Evidence from a meta-analysis. *Experimental Economics* 7, 171–188.
- 179 Shariff, A.F., Norenzayan, A., 2007. God is watching you priming god concepts increases prosocial behavior  
180 in an anonymous economic game. *Psychological Science* 18, 803–809.
- 181 Wallace, B., Cesarini, D., Lichtenstein, P., Johannesson, M., 2007. Heritability of ultimatum game responder  
182 behavior. *Proceedings of the National Academy of Sciences* 104, 15631–15634.