

**Does working with spouses make teams more productive? A field experiment in India using NREGA**

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**Abstract.**

In Uttar Pradesh, teams of four are engaged to dig soil under the NREGA programme. In one treatment spouses work together; in the other treatment they work in separate teams. Working with spouses is associated with significantly higher output.

Keywords: marriage; household experiment; India; NREGA; labour productivity.

JEL codes: C9, D1, D7, M5, O1

## **1. Introduction**

Does working alongside friends or relations lower or raise productivity? We supplement evidence on the issue through a field experiment in Uttar Pradesh, India conducted with married couples. Teams of four are engaged to dig soil. In one treatment husbands and wives work together; in the other treatment they work in separate teams. We find that working with spouses is associated with significantly higher team productivity.

## **2. Background.**

There are two main motives for the experiment. Some recent work in personnel economics examines the impact of non-work relationships on workplace productivity (e.g. Mas and Moretti, 2009, Bandiera et al, 2005). This literature focuses largely on non-related acquaintances, but particularly in developing countries, family members often work alongside one another on farms and enterprises (Haddad et al., 1997). Since family members often pool some or all of their resources within the household, the response to working with relatives might be quite different to the effect of working with non-relatives with whom income is not shared. Some evidence is called for. The other motive concerns experiments on household decision-making. Recent experiments have found significant impacts on spousal behaviour from playing games together (Peters et al. 2004), making decisions together (Bateman and Munro, 2005, de Palma et al, 2011, Carlsson et al, 2012) or altering the information shared between partners (Ashraf, 2009, Iversen et al, 2011) in laboratory-like settings. For the sake of external validity, it is useful to see whether spousal behaviour is sensitive to

context in more natural settings<sup>1</sup> and in particular, when rewards are earned through actual labour.

The experiment was conducted by financing actual work within the rules of the National Rural Employment Guarantee Act (NREGA), a workfare programme designed to alleviate poverty in rural India. Each NREGA worker must pre-register to receive a job card with a specific code number which can be shared between spouses. Women in NREGA often face significant impediments in their attempts to benefit from the scheme. Nevertheless, there are many examples where women are allowed to work and do work alongside men, albeit often with a gendered division of labour (Khera and Nayak, 2009).

### **3. Methodology**

The work was the complementary tasks of digging of soil by men and the transporting and dumping of soil by women to improve existing ponds. Because we wished to compare the effects of working with a spouse to the effect of working alone, we needed treatments in which men worked with women to whom they were not married. Mixed sex teams of two would have produced strong cultural resistance, so we created teams of four with two males and two females. All individuals were paid on the basis of the *team* performance, as measured by the volume of soil successfully removed. In treatment one (the control) each team of four consisted of 2 men and 2 women, none of whom were married to one another. However, for one man and one woman their spouses were working in another site nearby under the same conditions. In treatment two, teams also contained 2 men and 2 women but in this case two members of each team were

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<sup>1</sup> With features such as onsite assignment to treatment and the presence of non-local supervisors, we do not claim this was a natural field experiment.

spouses. The other two individuals were not married to one another or to anyone else taking part in the experiment. The team members were paid at the rate of Rs 2 per cubic foot of soil successfully removed from the site and dumped, subject to local NREGA rules that dictate a minimum wage of Rs100 per working day.<sup>2</sup>

The fieldwork was carried out in five sites (Samaspur, Madiya and Mowiya, Katwarupur and Manghipur) in three culturally homogeneous blocks of rural Uttar Pradesh (UP). Prior to the experiment a sample of 540 workers, stratified by sex and status (registered couples and non-registered) were randomly selected from the local NREGA registers and invited to take part. Out of these 516 participated, with 129 married couples, 129 male and 129 female unaccompanied participants.<sup>3</sup> The experiments were carried out over 4 days: digging at Madiya and Mowiya were carried out on the same day to prevent contamination of data between the adjacent villages.

On a game day the participants were ticked for presence and randomly assigned to treatment. Each team was taken separately to its designated spot, briefed on the rules, assigned a standardized area to dig and given a timed 3.5 hours to work. The teams were asked to dump the mud at an assigned site 15-20 walking steps from each pit. After work stopped the experimenter publicly measured the length, breadth and height of the pit. Earnings were calculated and team members paid-off individually in cash.

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<sup>2</sup> Only 7 out of 86 teams fell below this 50 cubic feet threshold and results reported below are not significantly affected by the inclusion of this group.

<sup>3</sup> Following NREGA rules an additional six workers were designated for water provision at each site.

In this context, when the spouses are separated as in treatment 1, they cannot coordinate their efforts. When they play in the same game, they can coordinate. Typically, therefore we would expect that, for players from a cooperative household average output will be higher when spouses play together than when apart. However, male and female effort is complementary in this game, meaning that there may be multiple Nash equilibria. Treatment may move play from one equilibrium to another. Additionally, the appropriate household model may not be a cooperative one and this may lead to different behaviour between treatments (Ashraf, 2009). It is therefore theoretically conceivable that output is lower when spouses work in the same team.

#### **4. Results.**

In each of the two treatments there were 172 participants making 86 teams of four.<sup>4</sup> Table 1 sets out basic information obtained in an ex-post survey. In addition to obvious questions such as age, land-owned, education and social group, we asked individuals about the time they typically spend working with their spouses in a standard week. We also asked them to specify how many members of their team were known to them prior to the experiment. In Table 1, mean responses do not differ significantly between treatments.

Table 1 here

The key result is summarized in figure 1 which shows the distribution of output for the two treatments. The frequency scale reports the number of individuals in each output class. Mean group output was 169 for treatment 2 and 111.9 for treatment 0, a difference of approximately 50% and we reject the hypothesis of no treatment effect at the 1% level (Mann-Whitney test on teams,  $z=4.024$ ,  $p<0.001$ ).

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<sup>4</sup> 172 participants were randomly assigned to another treatment and are not discussed in this paper.

Figure 1. Distribution of output by treatment.

Table 2 summarizes regression results using only the data for couples where both spouses took part in the field experiment. The first equation has dummies for treatment 2 and the locations. The second equation has a fuller set of control variables. It contains an interactive term with hours in the week spent working together and there are also two variables for the age of the oldest male and female member of the team and a dummy variable which equals 1 only if the couple have a joint account for NREGA payments. The key result is the same as that shown in figure 1: mean output is higher in the treatment when couples work together.

Most controls are not significant, but sites show significantly lower output than Samaspur, a feature possibly explained by higher temperatures at these sites and harder soil conditions. The coefficients on time working and the interactive term have opposite signs and the absolute values are not significantly different from one another. In other words generally, couples who work more often together in daily life have higher productivity. However, for these couples, the impact of treatment is weaker. The number of known players in the game is also positively associated with productivity, while a higher value for the age of the oldest female in the group is associated with lower output. Finally, separate NREGA bank accounts are associated with higher productivity.

Table 2 here.

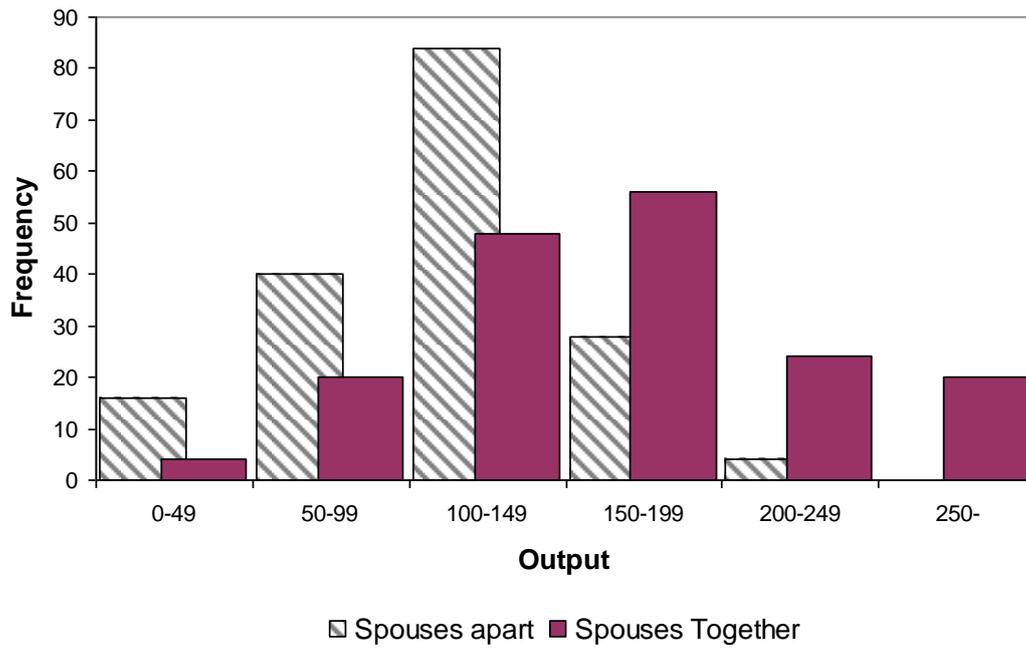
## **5. Conclusions and discussion.**

In a poor region of rural India, we find that teams with paired couples consistently outperform teams where spouses are separated from their partners. The output gap between the two systems is large, by approximately 50%, a result consistent with a simple cooperative household model. We do not know the extent to which our results generalize from a particular context, but it is notable that, in contrast to some of the recent work on social connections and the workplace, we also find a positive relationship between output and other kinds of social contact. A feature of our results is that couples who work together more frequently outside the experiment are more productive and less sensitive to treatment. It is possible that in this locale, spouses who do not work regularly together are more strategic within their marital relationship compared to spouses who work together. That is, spouses who do not work together, shirk when not being observed by their partners.

Acknowledgements. This study forms part of research funded jointly by the UK's ESRC and DFID (RES-167-25-0251). We are grateful to other members of the team (Bereket Kebede, Cecile Jackson, Nitya Rao and Marcela Tarazona-Gomez). We are especially thankful to the hard-working efforts of our fieldwork manager, Dr Biswarupa Gosh, and the advice and support received from Dr Pradip K. Sen, Dr Anup K. Mishra and Mr Umesh Pandey.

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**Figure 1. Distribution of output by treatment.**

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Table 1. Summary of Means.

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	Treatment 1	Treatment 2
Age (years)	38.2	40.0
Land owned (acres)	0.22	0.14
Household size	6.3	6.5
Of which aged 15-60	3.2	3.6
Cast and Tribe (%)		
Scheduled caste	50.9	68.4
Scheduled tribe	2.92	1.17
Other backward caste	37.4	24.6
Upper caste	0.0	0.0
Other	8.77	5.85
Number in team known to you	2.37	2.2
Education level, female	1.18	1.13
Education level, male	1.79	1.63
Hours spent working with spouse per week	37.7	33.3
N	172	172

Education: 1 = not literate, 2 = only primary school; 3 = secondary level or above.  
All variables are self-reported.

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Table 2. Regression results (dependent variable = soil volume).		
	Site dummies only	Full set of controls
Constant	145.950*** (10.432)	102.140*** (2.878)
Treatment	58.000*** (4.636)	111.333*** (3.567)
Hours working together (per week)		1.206*** (3.272)
Treatment x Hours working together		-1.383* (-1.780)
Madiya	-17.250 (-1.065)	-52.297*** (-2.777)
Mowiya	-63.117*** (-3.047)	-79.518*** (-4.112)
Katwarupur	-49.677*** (-3.136)	-69.455*** (-3.844)
Manghipur	-40.859* (-1.925)	-59.898*** (-3.094)
Scheduled Tribe		21.687 (0.527)
OBC (“Other backward caste”)		4.204 (0.330)
Other		-16.651 (-0.919)
Known members of group		11.176*** (2.835)
Age		0.531 (0.958)
Landholding		-6.244 (-0.650)
Education		2.652 (0.516)
Age of oldest female in group		-0.967** (-2.202)
Age of oldest male in group		-0.020 (-0.034)
Separate bank accounts		32.673*** (2.760)
N	172	172
R <sup>2</sup>	0.215	0.403

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01. Omitted category: Scheduled Caste. Standard errors clustered on teams.