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The Role of Social Identity in Shaping Economic Choices: Evidence from Women’s Self-Help Groups in India^{1,2}

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Abstract

Group-based interventions are fast gaining traction in developing countries, often bolstering existing government service delivery systems. Such groups provide development programs with a means of extending their reach to households and individuals that might otherwise not seek public goods and services. However, the very reliance on the notion of “community” in these programs can constrain participation to those with a shared identity. In India, shared caste identity remains a central, and often controversial, element in many community-based programs. We explore the salience of caste identity with a field experiment conducted among women’s self-help groups in an eastern state of India. The experiment focused on the provision of information on nutrition, diet, and kitchen gardens. Specifically, we test the interplay between (a) the provision of information to self-help groups and (b) the caste identity of the information provider *relative* to the group’s caste identity, to assess what matters more – the message or the messenger. We randomize two treatments – an information treatment and a homophily treatment – and measure the effect of these treatments on two outcomes: group members’ willingness to contribute to a group-owned club good (a collectively managed kitchen garden), and individual members’ retention of the information they received. We find that (1) information is very important, (2) homophily, or shared caste identity with the information provider, is not that important, but (3) higher-caste information providers elicit greater willingness to contribute. These findings have several implications for the design of public programs that rely on community-based organizations and agents as implementing partners and may thus be susceptible to identity issues, such as the exclusion of lower castes from certain occupations, public spaces or public goods.

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² Ethical approval for this study was obtained from the International Food Policy Research Institute’s Institutional Review Board (IRB) and from a local IRB. The study was registered in the AEA RCT Registry (AEARCTR-0004025) prior to the start of data collection.

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1 Introduction

Throughout the world, an increasing number of government- and NGO-led health, nutrition, social protection and agricultural extension schemes rely on so-called ‘frontline workers’ for last-mile service delivery to households. In deeply socially-stratified societies, shared or conflicting social and ethnic identities could determine both the extent and the efficacy of the interaction between these frontline workers and the beneficiaries they seek to serve. Quantifying the direction and magnitude of the impact of a shared identity on the effectiveness of message delivery is important to ensure that the mode of information provision does not further disempower the groups that these interventions intend to reach. Our paper provides evidence on how caste-based social identities can affect behavior in the context of a field experiment in rural eastern India, and in doing so, adds to the body of experimental literature dealing with social identity and behavior in developing countries.

The importance of ‘identity’, however defined, is manifested in the organization of modern-day societies, especially in the formation of social groups. Organized along multiple lines – religion, race, income, interests, location, gender and education, among others – identity-based social groups connect us to those with whom we share a common set of characteristics, interests or beliefs. In doing so these groups often impart a social value, for example, a sense of belonging or security, psychological or emotional support, and economic opportunity. While the role of identity in shaping behaviors and preferences has been studied extensively in other disciplines, the topic has gained significant traction within economics since Akerlof and Kranton (2000) developed the first model explicitly incorporating identity into a standard utility framework. Since then the number of theoretical and empirical studies of the role of identity in shaping economic behavior and outcomes has grown rapidly.

While several aspects of identity can either be chosen by individuals or assigned to them through simple labelling and sorting mechanisms (Akerlof and Kranton 2000), other aspects are less fluid. Caste identity is perhaps the most obvious examples of this rigidity, especially in the Indian subcontinent.⁵ Along with religion and gender, a person’s caste is also the most dominant aspect of their identity in India. Individuals are born into a certain caste, and their inherited caste identity shapes much of their economic and social lives: where they live, who they marry, who they interact with and how, what services they can access, the education they receive, and the jobs they are employed at (Ambedkar 1946). The caste system is rigidly hierarchical, with upper castes the recipients of significant and perpetuated social and economic advantage. In fact, in recognition of the barriers to equal access to opportunity that caste presents, India’s constitution enshrined reservations favoring underprivileged castes in government-run educational institutions, government jobs and elected offices since as early as

⁵ Indeed, even when lower-caste Dalit families have converted to Christianity they are known as ‘Dalit Christians’, suggesting that while religious identity can be transmuted, caste identities cannot. The 2011 Census of India records about 200 million such Dalit Christians.

1950. The role of one's caste in shaping behavior, including interactions with other members of society of possibly different castes is, therefore, both an economically important and socially salient issue.

In collaboration with an Indian NGO, Professional Assistance for Development Action (PRADAN), we conducted a field experiment in the eastern state of West Bengal to study whether and how shared caste identities influence individual preferences for club goods. Our experiment was conducted with pre-existing women's self-help groups (SHGs), which are small savings and credit-based groups of 10-20 women living in close proximity. While not mandated in their formation, SHGs are generally ethnically homogenous, so without much loss of generality, we restrict our study to SHGs where all women were the same caste. Thus, we exploit two related types of social identity with this experiment: (1) the identity conferred on an individual by virtue of her membership in the group, and (2) the shared ethnic identity made salient by the homogeneity in caste composition.

Our specific research questions are as follows. First, how does the provision of information affect an individual's willingness to contribute (WTC) to a group-owned club good? Second, how does the identity of the messenger affect the retention of the information and its efficacy in eliciting higher WTC? Is communication more effective when the person delivering the message is a co-ethnic or when it is someone placed higher (or lower) in the established ethnic hierarchy?

To answer these questions, we randomly assign women from two distinct caste categories as frontline workers, or agents, to SHGs from the same two caste categories, resulting in matched SHG-agent pairs where the group was either the same caste as the agent, or higher or lower in the caste hierarchy. Each agent conducted a simple game with the SHGs to elicit women's individual WTC towards an SHG-owned club good: a community kitchen garden. A kitchen garden was chosen because labor was the primary input required of SHG members, and members were familiar with the concept of contributing their labor time to a community endeavor. We use the random assignment of agent to SHG to assess how women's WTC is affected by the caste of the agent conducting the game. Additionally, since WTC can also be influenced by participant knowledge, we cross-randomized the co-caste treatment with an information treatment in which the agent first described the need for the club good – its importance to household health and nutrition – and then conducted the game. Respondent SHG women were administered a nutrition knowledge test based on information given in the session to test retention and to measure also if retention varied based on the ethnicity of the agent delivering the information.

In brief, we find that (1) the information provided is well understood, that women are able to retain the information they are provided, and that retention is better when the agent is of a lower caste than the group, (2) homophily, or shared caste identity with the agent providing information is not as important in driving individual WTC, but that (3) higher caste agents elicit higher willingness to contribute, regardless of the caste of the group they are matched to. This last effect cannot be attributed to a greater valuation (or understanding of the value) of the club good, given that retention of information is better

when the group is paired with a lower caste agent, and we hypothesize that it is instead a rational response to the perceived ability of the agent to deliver on the provision of the club good. We hope that our results can help inform both PRADAN's own service delivery through its dedicated cadre of frontline workers, as well as service delivery through many of India's government social protection programs, for example, health services delivered through the Accredited Social Health Activists and Auxiliary Nurse Midwives, or the Integrated Child Development Services scheme, delivered through the Anganwadi worker.

The rest of the paper proceeds as follows. Section 2 lays the groundwork by describing previous research in this area, section 3 introduces the experiment design and conceptual framework, and section 4 details the empirical design. Descriptive statistics and results are presented in section 5, and section 6 concludes.

2 Identity and information: The literature

Our paper ties into several strands of literature, the most relevant being the investigation of identity. Several papers have incorporated identity into more standard economic models, demonstrating both the mechanism of identity choice as well as ways in which that identity can alter economic preferences and behavior (Akerlof and Kranton 2000, 2002, 2005, 2008; Bénabou and Tirole 2011; Fang and Loury 2018; Horst, Kirman, and Teschl 2006; Shayo 2005). Empirically identifying the causal impact of identity is difficult, first, because several forms of identity – gender, religion, caste and race, for example – cannot be randomly assigned, and second because ethical considerations dictate caution in broaching these potentially sensitive topics. As a result, several empirical studies employ an experimental psychology tool called ‘priming’ – the process of providing subtle mental cues - to make the relevant aspect of identity salient (Cohn and Maréchal 2016). Lab and field experiments using priming or other identification mechanisms have augmented theoretical models with evidence of the role of identity in shaping cognitive or educational outcomes (Afridi, Li, and Ren 2015; Hoff and Pandey 2006, 2014), economic and social preferences (Benjamin, Choi, and Strickland 2010; Y. Chen and Li 2009; Costa-i-Font and Cowell 2013), aspirations and beliefs (Mukherjee 2015), contributions to public goods (Benjamin, Choi, and Fisher 2010), firm dynamics (Eckel and Grossman 2005), and norms (Goette, Huffman, and Meier 2006), among others.

Within this growing body of literature, the evidence on the role of identity in developing countries, especially South and South East Asia, is still fairly limited. Afridi, Li, and Ren (2015) demonstrate that making one's *hukou* - the Chinese household registration system identity - salient reduces the performance of rural migrant students relative to their urban counterparts, though this effect does not persist when competition is introduced. Karachiwalla (2019) uses longitudinal data from Pakistan to assess the impact of having a same- or different-caste teacher on child aspirations, learning outcomes and parental investment, and finds that having a high-caste teacher improves outcomes for low-caste

children. Using data from India, Hoff and Pandey (2006, 2014) show that making caste salient creates a significant wedge in the number of cognitive puzzles solved by high and low caste boys, one that is not present when caste is not primed. Mukherjee (2015) shows that priming for caste in the Indian context can affect not only parent and adolescent child aspirations and beliefs for long-run economic outcomes, but also actual performance, as measured by test scores. Finally, Kumar and Somanathan (2015) show that having the same caste-identity as a service provider can significantly increase a beneficiary's chance of receiving benefits from certain government programs. The implications of these studies are twofold. One, that shared ethnicities can either exacerbate or lower existing inequalities between identity groups, making this an empirical question of interest. Two, that differences between identity groups cannot be explained only by differences in characteristics or ability, but that the identity tag itself affects performance, ostensibly by acting as a reminder of identity-based norms.

Identity-based norms dictate not only how someone with a given identity is expected to behave or perform, but also how they should modify that behavior depending on the identity of the person they are interacting with (Akerlof and Kranton 2005). To the extent that people internalize and follow these norms, identity can result in an individual's utility, and hence their behavior, being 'situation-dependent'. For example, several papers from different country contexts have shown that survey responses depend on ethnic, gender, racial or other identity disparities between interviewers and interviewees (Adida et al. 2016a; Blaydes and Gillum 2013; Cilliers, Dube, and Siddiqi 2015; Davis et al. 2010). Building on these findings, our investigation of co-ethnicities between agents and group members and the impact on women's WTC provides key insights into optimal service delivery design.

Finally, there is a large body of literature that looks at the effect of shared group identity on outcomes such as attitudes towards individuals both within and outside groups, provision of public goods and levels of cooperation (Algan, Hémet, and Laitin 2016; Besley et al. 2004; Candelo, Croson, and Li 2017; Y. Chen and Li 2009; Croson, Marks, and Snyder 2008; Eckel and Grossman 2005; Fehrler and Kosfeld 2013; Goette, Huffman, and Meier 2006; Habyarimana et al. 2006; Kranton et al. 2013; Kumar and Somanathan 2015; Sell 1997; Solow and Kirkwood 2002). With some exceptions, most studies find that there is greater cooperation and trust among individuals from the same social group, and that shared identity with a service provider or government worker improves provision. Our club-good experiment is conducted with pre-existing women's SHGs, so we anticipate that greater cooperation and trust among group members will induce women to be willing to contribute more labor hours towards the group-owned club good.

Our paper also ties into the broader literature on the impact of health and nutrition related behavior change communication (BCC), or more simply, information aimed at altering existing behavior. This information can take several forms – in person communication, media, and community or social mobilization. The importance of integrating information into other interventions in order to effect

change is by well acknowledged (Ahmed et al. 2016; Bhutta et al. 2013; Caulfield, Huffman, and Piwoz 1999; Fabrizio, Liere, and Pelto 2014; Hoddinott et al. 2017; Kennedy et al. 2018; Lamstein et al. 2014; Olney et al. 2015; Saha, Annear, and Pathak 2013), and many agriculture, health and nutrition programs now include information provision as a matter of course. However, while the importance of information is not disputed, most interventions that incorporate it assume that the content and mode of delivery are of paramount importance. In countries like India that are deeply and hierarchically divided based on caste and religious lines, the identity of the messenger could be as important, if not more, especially when the intervention seeks contributions towards a good that would most likely be shared with the community of co-ethnics, as is the case in our experiment.

Given this background, our study provides interesting insights into group dynamics, caste identities, and the effect of information, in a setting that mimics real world service and public good provision. If beneficiaries are less receptive to messages received from persons representative of certain ethnic groups (their own or higher/lower in the hierarchy), this could negatively affect the effectiveness of service provision and development interventions, an important fact to document.

3 Context

3.1 Women's groups in India

Globally, women's groups have emerged as an important platform for improving the economic, political and social empowerment of poor women (Brody et al. 2017; Meinzen-Dick et al. 2014). These groups have proliferated in India over the last three decades - with the dominant form of organization being women's self-help groups, or SHGs - and are now a central component of many rural development programs. A typical SHG consists of 10-20 women who live in close proximity and meet regularly to deposit money into a group account from which individual loans are provided on a rotating basis or to those in need (Nair 2005). SHGs often engage in wider activity portfolios designed to enhance both individual member objectives (Bouman 1995; Shah, Rao, and Shankar 2007; Tankha 2002) as well as community or group objectives through collective action (Chen et al. 2006; Desai and Joshi 2014). For example, SHGs receive training and inputs to pursue income-generating activities, especially in agriculture, and, through organizations like producer companies, work to improve women farmers' access to markets. They are also recruited to help with public works or service delivery, such as school monitoring programs or audits of social protection schemes. SHGs are increasingly being used to deliver information aimed at improving health, sanitation, nutrition and political participation, and to advance gender-related outcomes such as women's empowerment within the family. Overall, SHGs in India have quickly become a rural institution in their own right.

Evidence suggests that SHGs are generally ethnically homogenous (Baland, Somanathan, and Vandewalle 2011; Sharma 2001), partly due to self-selection into groups. However, the selection may also be exogenously imposed by government and non-governmental organizations that engage SHGs

because it is believed that homogeneity improves group cohesion and hence, group performance. The selection may also have a spatial dimension: villages in India tend to be divided into ethnically homogeneous hamlets, so women living close to one another are typically of the same ethnicity (Baland, Somanathan, and Vandewalle 2011; Deshmukh-Ranadive 2004; Sharma 2001). This implies that development programs that use SHGs as vehicles for advancing interventions in agriculture, health, nutrition, or other areas may be susceptible to limitations imposed by society's identity-related conventions, such as the exclusion of lower castes from certain occupations, public spaces or public goods.

3.2 PRADAN and the larger impact evaluation

The experiment described in this paper was conducted in collaboration with PRADAN, an NGO that has worked to form and strengthen SHGs since the 1980s. PRADAN uses a multi-pronged approach to improve agriculture and livelihoods, gender, rights and entitlements, and, more recently, health and nutrition, and works largely among the marginalized communities of scheduled caste (SC) and scheduled tribe (ST) groups⁶ across eight states in eastern, western and central India.

Under the Nutrition Intensification (NI) approach, PRADAN has been providing health and nutrition BCC to SHG women through a dedicated community agent since 2016. This agent, known as a *Poshan Sakhi* (literally, 'nutrition friend/companion'), is typically a woman from the same village or community as the SHGs she works with. She receives training in health and nutrition, and then disseminates the same information in an SHG meeting through a combination of oral, visual, and participatory methods. The BCC content covers topics related to maternal and child health, as well as related topics such as sanitation, government entitlement schemes, and home gardens, and is divided into several micromodules, with each micromodule being 'transacted' at one SHG meeting.

The study described in this paper is nested within the context of a larger evaluation measuring the impact (on knowledge, practices, and health- and nutrition-related outcomes) of integrating health and nutrition BCC into PRADAN's existing agriculture and livelihoods interventions⁷. Our experiment is designed to inform both PRADAN's nutrition programming as well as its broader portfolio of services and may also inform many of India's social protection programs which rely on frontline workers.

⁶ The Constitution of India guarantees affirmative action in the form of positive discrimination in education, political representation and government jobs to members of certain castes and tribes that have been historically marginalized and persecuted and remain socially and economically deprived. These provisions are enshrined in a special Schedule of the Constitution, thus giving these groups the name Scheduled Caste (SC) and Scheduled Tribe (ST). According to the 2011 Indian Census, SCs and STs form 16.2% and 8.2% of India's population respectively.

⁷ There is no overlap between the villages in our study and those in which PRADAN is testing its Nutrition Intensification (NI) intervention.

4 Experimental design

We conducted a qualitative scoping exercise several months in advance in order to help inform the design of key elements of our experiment. The insights from this scoping exercise proved crucial. We found that women from the General caste (the highest caste) were financially secure and unwilling to contribute labor hours to the cultivation of foods they could easily purchase in the market. However, among the other caste groups, there was widespread agreement on the importance of eating fruits and vegetables, and a willingness to contribute to a group-owned kitchen garden. SHGs that had a mixed caste composition were not as cohesive or cooperative as those in which all members belonged to the same caste⁸, in fact, SHG members in caste-homogenous groups preferred an equal sharing rule for kitchen garden production over a rule that compensated members based on their labor input. Tribal populations in this area were distinctly worse off on almost all measurable welfare indicators, and there was broad recognition that they were the lowest rung in the caste hierarchy. Someone familiar with the area could distinguish members of different caste groups from their appearance, but even if not, individual names were a clear indication of caste identity. Finally, land was abundant and, if no member was willing to loan household land for the community garden, could be rented at a very nominal price, making kitchen gardens a feasible club good to implement.

We used the insights from the scoping exercise to design our experiment. To identify the two sources of variation outlined in our two research questions with two caste groups, we needed six different treatment groups (Figure 1). There are two cross-randomized treatments, the provision of information, and the caste identity of the agent relative to the group, depicted using (info, no info) and the letters H and L for High caste and Low caste, respectively (these groups are explained in greater detail below). The first letter in a treatment combination represents the ethnicity of the group, the second the ethnicity of the agent. For example, (H_g, H_a, info) is a High caste group paired with a High caste agent who provides information. (L_g, H_a, no info) is a Low caste group paired with a High caste agent who only conducts the WTC game but does not provide any information. The WTC exercise and nutrition knowledge test are conducted with all respondents regardless of their treatment assignment.

⁸ For example, mixed caste groups had significant disagreement on how produce from a community garden should be shared, as well as on division of labor among group members.

Figure 1: Graphical depiction of the six treatment groups

		Ethnic identity of agent			
		“High” Agent	“Low” agent	“High” Agent	“Low” agent
Information treatment:		No information		Information	
Ethnic identity of Group	“High” group	(H _g , H _a , no info)		(H _g , H _a , info)	(H _g , L _a , info)
	“Low” Group		(L _g , L _a , no info)	(L _g , H _a , info)	(L _g , L _a , info)

Within the information treatment, two sets of groups receive information from an agent of the same caste group as the group members (these are (H_g, H_a, info) and (L_g, L_a, info)), whereas two sets of groups receive information from an agent belonging to a different ethnic group, higher or lower on the established ethnic hierarchy ((H_g, L_a, info) and (L_g, H_a, info)). Since all groups within the information treatment receive the same information, this minimizes concerns that the usefulness of the good is greater for any single caste group.

In addition to this information treatment, there are two other sets of groups – of Low and High castes - that do not receive information. We call these groups the “pure controls” since they are exposed to neither the information nor the caste treatments.

These six groups are enough to identify our main outcomes of interest, even if the effect of the information treatment varies by group type. For example, comparisons of the WTC for [(H_g, L_a, info) and (H_g, H_a, info)] and [(L_g, L_a, info) and (L_g, H_a, info)] allow us to isolate the effect of shared group-agent caste identities, which may differ depending on the relative places of agent and group in the caste hierarchy, keeping information provision constant. Similarly, comparisons of [(H_g, H_a, info) and (H_g, H_a, no info)] and [(L_g, L_a, info) and (L_g, L_a, no info)] allows us to disentangle the effect of information, while not restricting this effect to be the same regardless of group and agent type.

Location

We conducted our experiment in Baghmundi block of Purulia district in West Bengal. This block was chosen because it is one of PRADAN’s oldest blocks, and the average SHG here was formed six years prior to our intervention. These mature SHGs have been operating long enough for within-group norms of cooperation and trust to have developed. In addition, the profile of SHG members obtained from PRADAN’s internal monitoring system revealed that this block had a sizeable number of upper and lower caste groups, providing us with the variation needed for this experiment.

Caste groups

We chose two caste groups to be included in the experiment: Other Backward Classes (OBCs) and Scheduled Tribes (STs). OBCs are higher in the hierarchy than STs, who are the most marginalized caste group, living predominantly in one area of the block which is hilly and hard to access, and acutely dependent on agriculture as the main source of income. The marginalization of ST groups relative to other caste groups is documented in large nationally representative datasets as well. Using the fourth round of the India version of the DHS survey – the National Family Health Survey (NFHS)-4 (2015-16) - we compared ST, SC, OBC and General caste groups in West Bengal across a small set of indicators of household socioeconomic and demographic characteristics (Table A.1 in the Appendix). ST women reported the lowest education and lower husband education among all caste groups, had lower women’s body mass index on average, and belonged to households that predominantly came from the poorest two wealth quintiles, as calculated using state-specific rural population wealth indices.

Scheduled Castes (SCs) form the other major group in this area, however they fall somewhere in between the OBCs and STs (Table A.1), making the hierarchical distinction with either of the other groups less stark⁹. For the purpose of this experiment, then, OBC groups were “High” caste and ST groups were “Low” caste.

We used PRADAN’s internal monitoring data to obtain the full list of SHGs in this block, along with their caste composition.¹⁰ The collection of PRADAN’s monitoring data is collected by Community Data Collectors, or CDCs, who are women from within the community but with a certain minimum number of years of education. We restricted ourselves to only those groups that were entirely OBC or entirely ST, eliminating all mixed caste groups altogether.¹¹ We then selected 40 groups for each of the six treatments for a total of 240 SHGs, or approximately 2240 individual SHG members.¹² We also selected nine CDCs to act as our frontline workers, disseminate the information treatment and conduct the WTC game – of these, five were OBC and four ST.

⁹ Overall SCs are placed slightly higher in the social hierarchy compared to STs. However, during preliminary qualitative fieldwork we found that SC women in this area were particularly disadvantaged due to lack of access to, and ownership of, agricultural land. Most SC women (and men) in this region work as daily wage laborers in other’s farms or in public infrastructure projects.

¹⁰ In blocks where PRADAN is operational, other governmental or non-governmental groups are not involved in organizing women into SHGs. Thus, the list obtained from PRADAN forms the universe of SHGs. SHGs need to be defunct for six months to be considered dissolved – this means some of the SHGs in the list may not have existed at the time of the survey if they had only recently ceased to meet, however, barring issues of omission of this nature, there is no indication that there is a clear reporting bias of any kind in the monitoring data.

¹¹ More than 75% of the SHGs in our survey block were ethnically homogenous – and even among mixed groups one caste group was generally in an overwhelming majority (e.g. 11 ST and 2 SC) - suggesting that this restriction to caste-homogenous groups is unlikely to affect the generalizability of our results.

¹² Ideally our choice of the number of groups would have been directed by ex-ante power calculations. However, publicly available data on our outcomes of interest do not exist for a comparable context. In lieu of formal power calculations, therefore, we resorted to a rule of thumb.

Choice of club good

Aside from members' agreement about its importance, several other features made a group-owned kitchen garden an ideal club good for our purposes. First, kitchen gardens are consistent with PRADAN's thematic focus: agriculture and related activities are among the initial themes on which PRADAN engages with the SHGs, so group members were used to discussing these topics in SHG meetings. Second, dietary diversity is very poor in this area. From the 2015-16 baseline data of the larger impact evaluation, only 7% of women in this block met the minimum dietary diversity requirements of 5 out of 10 food groups, and fewer than 20% reported eating any fruit, or vitamin-A rich vegetables. These consumption patterns are mirrored in their children, with only 6% of children aged 6-24 months meeting minimum dietary diversity requirements, and fewer than 20% reporting eating any vegetables or fruits. A community garden that is owned and run by the collective could potentially increase the intake of fruits and vegetables by these households, and in doing so, solve a clear community need. In addition to this, kitchen gardens had several other desirable characteristics. Non-group members could be excluded from the produce, the construction of the garden required minimal other inputs besides labor (land is abundant in this area), and clear informational content could be designed around the usefulness of the garden. We could then also use this content to test retention of the information on health, nutrition and dietary diversity provided through the CDCs.

Since this is a field experiment, there is always the concern that women could over- or under-contribute to the kitchen garden, knowing that they will not be held to the number of hours they promise. To ensure incentive compatibility, the kitchen garden was implemented in the groups with the highest collective WTC in collaboration with PRADAN. This was conveyed to the members of the group at the time of the experiment.¹³

To facilitate the construction of the kitchen garden at the end of the experiment, PRADAN helped design a feasible model. Based on estimates of the average number of members in an SHG (10), their average household size (5) and the amount of fruits or vegetables each family eats in a day (750 gm), they drew up a design that included (1) a community nursery, where fruit trees would be grown, to be transplanted in each member's home, (2) vegetable beds, where vegetables would be grown year-round and the produce shared among members. The details of this kitchen garden model are in Figure A.1 in the Appendix¹⁴. The total cost of inputs was estimated to be INR 10,960 (~USD 170) per garden, and the total number of labor hours required to build and maintain it was estimated at 928 hours per year. This came to approximately 93 hours per year per member, or about 2 hours per member per week.

¹³ While constructing the kitchen garden in only one group out of 240 might seem like small odds, group members were not told how many groups were included in the experiment and would have had no way of discovering this number given the geographical spread of these groups.

¹⁴ Land for the kitchen garden was assumed to be leased in by the group and factored into the cost. Leasing in of land for agricultural purposes is a common practice in our area of study.

Willingness to contribute

We chose to elicit WTC labor hours (rather than the more traditionally employed willingness to pay) so as to keep the choices realistic. Willingness to pay experiments typically elicit payments in the form of tokens or “fake” money, or by first providing participants with resources and then asking them to pledge those same resources to the good in question. These designs run the risk of participant behavior not accurately mirroring real-life decision making, either because they are unfamiliar with these mechanisms and do not fully understand what they are being asked to do, or because the stakes are not real. Eliciting truthful revelation in such scenarios is expensive either to the participants or to the researchers, who must provide additional resources. We circumvent both issues by asking women to donate days of labor instead; they are familiar with the practice of contributing labor to other PRADAN activities such as the construction and maintenance of community assets.

Training and content of the informational treatment

All CDCs underwent three days of intensive training in scripted information sessions conducted by members of the research team and PRADAN. The preamble to the information content introduced the CDC by name (crucial for caste identification), and then went on to motivate the problem of undernutrition and diet quality, talk about the different kinds of food groups and their importance, discuss ways to improve diet quality, and finally, introduce the concept of kitchen gardens and collective management of kitchen gardens. Each SHG member was then given two bags, one empty and one containing beads, and was asked to transfer to the empty bag a number of beads equal to the number of hours she was willing to work on the building and maintenance of the kitchen garden in a week. This was to be done in private and without consulting other group members.

By the end of the training, CDCs were able to recite the scripted information from memory. Scripted sessions were essential to ensuring that message retention and delivery did not differ substantially across CDCs of different caste groups. CDCs who conducted the ‘no information’ treatments had shorter scripts that introduced them by name and then described and conducted the WTC game, without any information on nutrition, health and diets.

Meetings were held in public venues such as schools or health centers, but efforts were made to ensure only group members were present. The CDC delivered the information to the women and played the WTC game, where each member privately indicated their WTC by transferring beads to the correct bag.

Survey

As soon as the WTC game ended, women left the venue with their bags and participated in the survey, conducted by an independent data collection firm. One enumerator was assigned to each SHG woman, allowing the surveys to be conducted immediately and in parallel, thereby eliminating the possibility of women conferring with one another before being interviewed. The first module of the survey asked the

respondent woman the number of labor hours she volunteered and checked this against the number in the bag. In case of a discrepancy, the enumerator elicited the ‘final’ response on number of labor hours and recorded all three responses. The survey also elicited information around basic demographic and socioeconomic characteristics, women’s time use and opportunity cost of labor, attitudes towards group members and concepts of trust, perception of the agent (including a question about identification of her caste), and market access, among other things.

Finally, respondent women were administered a ten-question nutrition knowledge test based on the information from the scripted BCC session. Questions were designed around aspects of health, nutrition, dietary diversity and agricultural practices. Everyone was scored out of ten with one point for each correct answer and this score used as a measure of their knowledge retention¹⁵.

5. Empirical framework

Our experiment has two main outcomes of interest: individual WTC labor hours towards the creation and maintenance of a community kitchen garden¹⁶ and individual scores on the nutrition knowledge test, and two types of treatments: the information treatment and the shared caste treatment. In this section we present our *a priori* hypotheses regarding the direction of impact of the treatment on these outcomes and describe how we propose to test these in the context of our experiment.

5.1 Testable hypotheses

The hypothesized relationship between the provision of information and individual WTC is straightforward. We anticipate that providing information on the causes and consequences of undernutrition and introducing the importance of kitchen gardens would serve to increase respondent women’s knowledge, i.e. that information provision increases individual knowledge scores. We further anticipate that this increased knowledge increases the value that SHG members assign to the kitchen garden, and hence the number of hours they are willing to contribute to the management of the kitchen garden.

The effect of the co-ethnicity treatments on WTC are more complicated. Table 1 below lays out some of the hypothesized channels through which the co-ethnicity effect might manifest itself. We theorize that while information from co-ethnics might be valued higher because of the perception of trustworthiness, co-ethnic agents might also be perceived to possess no additional knowledge than the SHG member, leading to an undervaluation of this information and a reduction in the willingness to contribute. Or the fear of social sanctions or a desire for upward mobility may cause SHG members to assign greater value to information from a socially higher-placed agent and hence to ‘over-contribute’

¹⁵ We use a simple additive score to measure nutrition knowledge. An alternative would be to use principle component analysis (PCA) based standardized knowledge index.

¹⁶ PRADAN uses this method to elicit contributions of labor hours to other projects, such as the construction of watershed management systems, so women in these areas are familiar with these methods.

to the club good in their presence. On the flip side, respondents higher in the caste hierarchy may undervalue information from an agent of a lower caste. However, they might also want to present themselves as generous and/or wealthy, and hence over-contribute. We should also mention here that these relationships are further complicated in the case of experiments geared towards provision of a good from which members of certain groups can be excluded. A desire to exclude could increase willingness to contribute when respondents assume an affinity with a similarly placed agent; on the other hand, valuations could be depressed if lower-placed respondents mistrust a higher-placed agent.

The hypothesized relationships described above and in Table 1 are not meant to be exhaustive, merely illustrative of the fact that the effect of co-ethnicity on the individual's willingness to contribute is ambiguous, and hence worthy of greater investigation.

Table 1: Contrasting hypotheses on impact of co-ethnicity

Type of group	Hypothesis	Effect on WTC
Low SHG-High Agent: (L_g, H_a) group	Agent is higher on the hierarchy and is assumed to know more, higher quality information is valued more, desire to emulate high agent	+
	Fear of social sanctions from higher placed agent or her community	+
	Mistrust high agent to act in interest of low SHG members	-
	Overall	Ambiguous
High SHG-Low Agent: (H_g, L_a) group	Agent is assumed to know less than SHG member- information from lower-ethnicity agent is undervalued	-
	High SHG uncertain about ability of low agent to provide club good	-
	Group could want to show off to the agent	+
	Overall	Ambiguous
High SHG-High agent (H_g, H_a) /Low SHG-low agent (L_g, L_a)	Undervalue information from co-ethnic- co-ethnic agent is assumed to have no better knowledge than the members	-
	Implicit collusion with co-ethnic agent assumed- desire to exclude others	+
	Overall	Ambiguous

5.2 Econometric specification

The basic estimating equation for the outcomes of interest for individual i from group g is

$$Y_{ig} = \alpha + \beta GROUP_g + \gamma GROUP_g * INFO + \delta Z_{ig} + \epsilon_{ig}, \quad (1)$$

where

Y_{ig} refers to the outcome variable, which is WTC (in hours) or knowledge score (in points).

$GROUP_g$ refers to the messenger-SHG ethnicity grouping, and hence takes the values (H_g, H_a), (H_g, L_a), (L_g, H_a) and (L_g, L_a).

$INFO$ is a binary variable indicating whether the group received the information treatment.

Z_{ig} are the individual level covariates (from the baseline survey); and ϵ_{ig} is an individual-group error term, clustered at the level of the group.

We use ordinary least squares to estimate the coefficients of interest.

The experimental design described above allows us to isolate the impact of information on group members' willingness to contribute to a kitchen garden, as well as the added effect of caste affiliations between the group members and the agent. For example, the difference in WTC between ($H_g, H_a, info$) and ($H_g, H_a, no info$) is the added effect of information, while the difference between ($H_g, H_a, info$) and ($H_g, L_a, info$) is the impact of the agent being from a lower caste than the caste of the group.¹⁷ In addition, the difference between ($H_g, H_a, info$) and ($L_g, L_a, info$) indicates whether the good is valued differently by each of the two types of SHGs.

In all estimates we control for four sets of variables. Italicized variables are binary variables with the base category indicated in parentheses. At the individual level we control for demographic characteristics such as age, *marital status*, *caste (ST)*, *employment status (unemployed)*, education, number of leisure hours available in a day¹⁸, dietary diversity (measured by number of food groups consumed),¹⁹ and *religion (Hindu)*. For household level variables we use household size, number of children under five, asset index, total cultivatable land, *availability of vegetables from home farm (not available)* and *presence of family home garden (not present)* as controls. We also control for group-level characteristics such as tenure of group membership, group size, self-reported group cohesiveness

¹⁷ It is important to note a caveat here: our design does not allow us to separately identify the effect of someone of the same ethnicity from the effect of someone from high caste, when comparing across high-caste groups (and symmetrically for low caste groups). To do this we would have had to have community data collectors from four caste groups – say C1, C2, C3 and C4, so as to compare the pairings (C2, C1) and (C2, C3), as well as (C2, C2). This proved infeasible from a financial and logistical perspective.

¹⁸ Based on calculation from a 24-hour recall time-use survey module.

¹⁹ Dietary diversity is measured by the number of different food groups consumed by the respondent in the 24 hours preceding the survey. These food groups are based on FAO guidelines for measuring individual and household dietary diversity.

and individual perceptions of agent's ability.²⁰ In addition, we control for village level characteristics using village fixed effects.

6. Results

We analyze the effect of information and homophily on our main outcomes of interest: an individual's willingness to contribute labor to the group-owned kitchen garden (measured in the number of beans they confirm having volunteered), and their knowledge scores on the nutrition knowledge test administered as part of the survey. Our six-way group design allows us to separately identify each of these effects. We begin by presenting some descriptive statistics on the various group-agent-information combinations, and then proceed to the regression results by specification.

6.1 Descriptive statistics

Table 2 describes individual, household, and SHG level characteristics for three distinct treatments – no information, information and no homophily, and information and homophily. Each set of treatments has a mix of high and low caste individuals, but *a priori* there is no reason to expect that they will differ on observables. The table presents also p-values for unadjusted tests of comparison across these sets of treatments.

An average respondent woman is 39 years old. Most of the women in our sample are married, and the majority does not have any formal education. By design, our sample is fairly evenly split between women from ST and OBC caste groups. About a fourth of the women in our sample are employed and on average women consume only 3-4 food groups out of 10 food groups in their daily diet. An average household has five members, owns seven assets out of a possible 24 and has 1 acre of cultivable land. About 36-38% of women in our sample have a kitchen garden in their household while about 42-50% grow vegetables on their farm. Most women have been associated with their group for approximately seven years. Most members perceived their group to be moderately cohesive, and around 58-66% of women gave a 'high' rating to the person who provided them with the BCC information.

We see that most characteristics are well balanced across arms. However, there are few differences, notably, in the number of food groups consumed by women, assets owned by the household and how group members rated the information provider. All of these covariates have been controlled for in the econometric model.

²⁰ Group cohesiveness and agent ability is self-reported and measured using a 3-point linear and additive scale.

Table 2: Descriptive statistics by treatment arm

Characteristics	(1)	(2)	(3)	P-values		
	No information (N=746)	Information & homophily (N=728)	Information & no homophily (N=764)	(1) - (2)	(2) - (3)	(1) - (3)
	Mean/ Proportion					
Respondent woman characteristics						
Age in years	39.01 (12.28)	39.16 (12.07)	39.24 (11.78)	0.81	0.90	0.71
Respondent woman is currently married	86.46	84.89	86.52	0.38	0.36	0.97
<i>Education</i>						
No formal education	59.25	61.4	62.17	0.39	0.75	0.24
Less than or up to class 4	14.34	16.76	16.75	0.20	0.99	0.19
Between class 5 and class 8	13.27	10.85	11.39	0.15	0.74	0.26
Between class 9 and graduation	13.14	10.99	9.69	0.20	0.40	0.03**
<i>Caste</i>						
Scheduled Tribe	48.12	49.86	50	0.50	0.95	0.46
Other Backward Caste	51.34	49.86	49.21	0.57	0.80	0.40
Religion of respondent woman: Hindu	82.57	84.48	88.61	0.32	0.01**	0.00***
Respondent woman is employed	26.62	28	28.72	0.55	0.75	0.36
Number of food groups consumed out of sum of 10 (24-hour recall)	3.62(1.31)	3.87(1.33)	3.97(1.33)	0***	0.13	0***
Household characteristics						
Assets out of a sum of 24	7.57 (2.9)	7.6(2.87)	7.21(2.86)	0.83	0.01**	0.01**
Household size	4.73(1.75)	4.81(1.86)	4.71(1.74)	0.38	0.26	0.80

Number of children under 5 years	0.39(0.63)	0.41(0.64)	0.35(0.6)	0.53	0.07*	0.24
Total cultivable land (acre)	1.12(1.45)	1.04(1.26)	1.01(1.11)	0.26	0.65	0.10
Household has a kitchen garden	38.47	36.35	36.66	0.44	0.90	0.50
Household grows vegetables on farm	50	42.58	43.72	0.00***	0.65	0.01**
Group characteristics						
Number of months the woman has belonged to her self-help group	87.34(58.81)	85.39(63.64)	82.84(59.6)	0.54	0.42	0.14
Total group members present for the experiment from each group	9.87(2.55)	9.48(2.22)	10.03(2.6)	0.00***	0***	0.21
Members who said produce from the kitchen garden should be split equally between members	73.19	72.53	68.98	0.77	0.13	0.07*
<i>Group cohesion (scale of 0-4)</i>						
Members who perceived their group to be least cohesive (0-1)	20.38	19.92	17.54	0.82	0.23	0.16
Members who perceived their group to be moderately cohesive (2)	73.59	75.14	77.49	0.49	0.28	0.07*
Members who perceived their group to be most cohesive (3-4)	6.03	4.95	4.97	0.36	0.98	0.36
<i>Agent characteristics (scale of 0-4)</i>						
Members who gave the information provider overall 'low' rating (0-2)	9.12	7.55	7.59	0.27	0.97	0.28
Members who gave the information provider overall 'moderate' rating (3)	33.38	28.71	26.57	0.05*	0.35	0.00***
Members who gave the information provider overall 'high' rating (4)	57.51	63.74	65.84	0.01**	0.39	0.00***

Source: Authors' calculations.

Legend: *p < 0.10; **p < 0.05; ***p < 0.01. Standard deviations are reported in parentheses.

5.2 Effect of information

First, we measure the overall effect of information and of homophily on our outcomes, using the full sample. Table 3 shows the coefficients on (1) a binary variable that takes the value of 1 if the group received information, and 0 otherwise, (2) a binary variable that takes value 1 if the group was matched to an agent of the same type, and 0 otherwise. We find that there is no impact of BCC on an individual's WTC. However, as hypothesized, there is a significant positive impact on an individual's nutrition knowledge score of 0.34 points ($p < 0.01$). It is important to note that this BCC effect does not separately account for the homophily between agent and group.

When we examine just the impact of homophily (regardless of the provision of information), we find, interestingly, that there is no impact of having an agent of the same caste as the group on either outcome. Just being matched to an agent of the same caste does not significantly impact an individual's WTC.

Table 3: The impact of provision of information and of homophily, full sample

	(1)	(2)	(3)	(4)
	WTC	Nutrition	WTC	Nutrition
	(# of beans)	knowledge score	(# of beans)	knowledge score
	b(se)	b(se)	b(se)	b(se)
Group received BCC	-0.63 (0.86)	0.32*** (0.09)		
Group matched with same-caste agent			-0.04 (0.83)	-0.17 (0.10)
Observations	2,238	2,238	2,238	2,238
R2	0.207	0.196	0.206	0.192
Mean value in base group	9.60	7.14	8.84	7.39

Adjustments made for individual, household and group characteristics

Adjustments made for village and SHG clusters

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. Standard deviations are reported in parentheses.

In order to isolate the effect of BCC and abstract from the homophily between agent and group, we then estimate the effect of receiving information on the subsample of respondents who were matched with an agent from the same caste. We find that receiving nutrition information did not have a significant impact on the number of beans individuals volunteered. However, we find that for this sub-group receiving the information intervention led to a significant and positive increase in the retention of information, measured through the knowledge score.

Table 4: Effect of information, subsample of groups matched to same-caste agents

	(1)	(2)
	WTC	Nutrition
	(# of beans)	knowledge score
	b/se	b/se
Group got BCC	-1.68	0.35***
	(0.94)	(0.07)
Observations	1474	1474
R2	0.303	0.196
Mean value in base group	9.60	7.14

Adjustments made for individual, household and group characteristics

Adjustments made for village and SHG clusters

*p < 0.10; **p < 0.05; ***p < 0.01. Standard deviations are reported in parentheses.

Next, we examine is whether information from ST and OBC agents is inherently valued differently. If so, then we would hypothesize that the effect of information on WTC and nutrition knowledge will be mediated by the caste of the agent *regardless of* the caste of the group. To test this, we estimate our basic regression equation, but include binary variables for the group being matched with a low caste agent and for receiving information, and then an interaction of both (Table 5). The results from this specification are noteworthy. First, we find that being matched to a low agent significantly *reduces* an individual's WTC, by almost 5 beans. This is a large effect. One hypothesis is that being matched with a low agent reduces retention of information and hence the valuation of the club good. However, in column 2, we find the opposite effect. Being matched to a low caste agent significantly *increases* the individual's score on the nutrition knowledge test by 0.41. This suggests that other factors may be affecting the WTC, one of which could be a lack of confidence that the low caste agent will be able to deliver the club good or facilitate its construction. We test the impact of perceived agent ability later in the paper.

Table 5: Effect of information from a low (ST) agent, full sample

	(1)	(2)
	WTC	Nutrition
	(# of beans)	knowledge score
	b/se	b/se
Group matched with ST agent	-4.98**	0.39*
	(1.54)	(0.16)
Group got BCC	-1.68	0.21
	(1.37)	(0.12)
Group matched with ST agent AND group got BCC	2.11	0.27
	(1.72)	(0.18)
Observations	2238	2238
R2	0.240	0.214
Mean value in base group	11.71	7.21

Adjustments made for individual, household and group characteristics

Adjustments made for village and SHG clusters

*p < 0.10; **p < 0.05; ***p < 0.01. Standard deviations are reported in parentheses.

5.3 Effect of homophily

We are also interested in estimating the pure effect of homophily, conditional on receiving nutrition information. Table 6 presents the results from estimating our regression model on the subsample of individuals who received information. We find that there is no impact of being matched to an agent of the same caste on the WTC or on the nutrition knowledge score.

Table 6: Effect of homophily, conditional on receiving information

	(1)	(2)
	WTC	Nutrition
	(# of beans)	knowledge score
	b/se	b/se
Group matched with agent from same group	-0.52	0.03
	(0.84)	(0.12)
Observations	1492	1492
R2	0.222	0.204
Mean value in base group	8.84	7.39

Adjustments made for individual, household and group characteristics

Adjustments made for village and SHG clusters

*p < 0.10; **p < 0.05; ***p < 0.01. Standard deviations are reported in parentheses.

Lastly, we disentangle the impact of being matched with an agent who was higher or lower on the caste hierarchy, conditional on receiving nutrition information. For brevity, we denote higher- or lower-caste as being *relative to the individual* on the caste hierarchy²¹. Table 7 presents these estimates for the subsample that received the information treatment. The first two columns show the effect of being matched with a higher-caste agent, while the last two columns show the same effect when the group is matched with a lower-caste agent.

We find that conditional on receiving information, being matched with a higher-caste agent has two seemingly opposing effects. First, it raises the WTC by a large and significant 3.5 beans. Second, it significantly reduces the nutrition knowledge score by 0.75. The greater WTC is therefore clearly not an outcome of improved knowledge retention or valuation of the club good. Instead, this result appears to be consistent with an alternative set of hypotheses: for example, that individuals have greater faith in the ability of the higher caste agent to actually facilitate the construction of the kitchen garden, or that they feel coerced into volunteering a higher number of labor hours.

The effect of being matched to a lower-caste agent operates in exactly the opposite manner. It reduces the WTC (column 3, though this result is statistically insignificant), but significantly increases retention of the information being provided. The lack of a link between increased information retention and WTC could again be due to factors such as limited confidence in the ability of the agent to provide the club good.

²¹ Note that this is different from *high* (OBC) or *low* (ST), which is an objective classification and not relative to the caste of the group.

Table 7: Effect of higher agent, conditional on receiving information

	(1) WTC (# of beans) b/se	(2) Nutrition knowledge score b/se	(3) WTC (# of beans) b/se	(4) Nutrition knowledge score b/se
Group matched with Higher agent	3.16*	-0.76***		
	(1.20)	(0.16)		
Group matched with Lower agent			-1.96	0.62***
			(1.13)	(0.13)
Observations	738	738	754	754
R2	0.298	0.255	0.254	0.200
Mean value in base group	7.44	7.57	10.80	7.49

Adjustments made for individual, household and group characteristics

Adjustments made for village and SHG clusters

*p < 0.10; **p < 0.05; ***p < 0.01. Standard deviations are reported in parentheses.

5.4 Other covariates

As mentioned in section 5.2, each regression equation controlled also for several individual-, household- and group-level characteristics. We discuss several associations of interest below.

Education

Relative to the category of no education, those individuals who had completed between grades 5 and 8 exhibited significantly greater retention of the nutrition information. Similarly, those individuals with grade 9 and higher schooling also volunteered a significantly greater number of labor hours towards the construction of the club good relative to the base category. The coefficient on those with grade 9 or higher years of schooling was greater than on those who had completed between grades 5 and 8.

Dietary diversity of the woman, existing home garden

Women who reported eating a greater number of food groups also volunteered a greater number of labor hours towards the kitchen garden, and this was significant in all but one regression specification. This can be attributed to a better understanding of the importance of dietary diversity based on their own experiences. Surprisingly, women eating more diverse diets scored lower on the nutrition knowledge test.

We also asked women if they currently had a kitchen garden. In almost all specifications, women with a kitchen garden were more likely to volunteer labor hours, and also scored higher on the nutrition knowledge test. Since these were women who understood the amount of time and effort that would go into the maintenance of a garden of this type, their voluntary contribution of time was perhaps an informed choice.

Caste of individual

Individuals belonging to an ST caste group volunteered significantly lower labor hours towards the group kitchen garden, with effect sizes in the range of 2-3 hours, a fairly large effect. This did not coincide with their nutrition knowledge scores, as they often scored significantly higher on the test than other caste groups. This may reflect the higher opportunity cost of their time.

Group cohesion

Individuals were asked a series of questions regarding the cohesiveness of the group they belonged to. These included: (1) Do you trust other members of your group to make decisions that are in the best interest of the whole group, (2) Do you trust other members of your group to make decisions that are in YOUR best interest, (3) During the last six months, did your SHG collectively or along with other community members demand any entitlements related to health from government frontline workers, and (4) In the past six months has there been any instance where community group members came together to negotiate for their rights at a village facility. Each of these questions was scored as 1 if the respondent said yes, and 0 otherwise, and the scores on all 4 questions were added up to an index ranging from 0 to 4. Based on the variability in this index, we classified groups with scores of 0 and 1 as ‘not cohesive’, those with a score of 2 as ‘moderately cohesive’, and those with scores of 3 and 4 as ‘very cohesive’.

With the exception of the last two models (where we looked at the effect of being paired with a higher or lower agent, conditional on receiving information) individuals belonging to more cohesive groups consistently and significantly volunteered a greater number of labor hours towards the kitchen garden, with the coefficient on ‘very cohesive’ being on average twice as large as the coefficient on ‘moderately cohesive’. Regardless of information provision or the presence or absence of homophily, therefore, individuals who belong to a group that has engaged in collective action or who display a greater amount of trust in their fellow group members are significantly more likely to volunteer their time to the club good.

Perceived quality of the agent

Each individual was asked a series of yes/no questions about their perception of the agent. These were – (1) The agent communicated messages clearly and patiently until all members understood them, (2) The agent was an engaging speaker and was able to keep the attention of the women, (3) The agent summarized important actions to be taken at the end of the meeting, and (4) Compared to yourself, do you think the agent knows more about nutrition and kitchen gardens. Each question was given a score of 1 if the individual responded yes, and 0 if she disagreed. These scores were then added up to create an index of agent ability ranging from 0 to 4. Based on the variation in this index, we treated scores of

0, 1 and 2 collectively as the base category. A moderately able agent was one who got a score of 3, and an agent with a score of 4 was ‘most able’.

With the exception of one specification, those individuals paired with more able agents scored significantly higher on the nutrition knowledge test relative to the base category, with the coefficient on ‘most able’ being approximately twice as large as that on ‘moderately able’. This indicates that regardless of caste homophily, the ability of an agent to convey information clearly and demonstrate a command over the subject matter and the attention of women had a strong impact on the amount of information individuals were able to retain.

6. Conclusion

In this paper we test the effect of providing information in group settings on the willingness to contribute to group-owned public goods such as a community kitchen garden. We also test how the effect of information is mediated by shared ethnicity with the agent providing the information. We do this using a multi-arm RCT conducted with SHGs in the eastern Indian state of West Bengal. We cross-randomize our two treatments – the *information treatment*, i.e. whether the group receives any nutrition information motivating the need for a kitchen garden, and *the homophily treatment*, i.e. the caste of the agent relative to the caste of the group and elicit individual willingness to contribute labor hours to the construction and maintenance of the SHG-owned kitchen garden. We also administer a knowledge test to assess the individual’s retention of information. Our cross-randomization allows us to identify the separate effects of information and of homophily on willingness to contribute and knowledge retention. We design our experiment to account for incentive compatibility constraints, and other location- and group-specific constraints discovered during our qualitative field testing and scoping visits.

In almost all cases we find that providing information leads to a significant increase in a respondent’s knowledge score. This finding is consistent with the conventional wisdom that information is important in changing behavior and that interventions that attempt to change behavior without providing information are often unable to generate impacts. Our novel findings relate to the interplay of the agent’s caste with the provision of information. When groups are matched with low-caste (ST) agents, information provision has a larger impact on knowledge retention, indicating that information from low-caste agents is retained better. Conversely, being matched with a higher-caste agent than oneself has a significant and large negative effect on the knowledge score. This could arise from an inherent mistrust of information provided by higher-caste agents, leading women to discount the content of their messages.

Contrary to our expectations, we find no pure effect of homophily on WTC, indicating that having a same-caste agent does not inherently impact one’s valuation of the public good or one’s willingness to contribute. When restricted to the subsample where same-caste agents and groups, eliminating the possible confounding impacts of homophily, the effect of nutrition information is salient.

While there is no pure effect of being matched with a same-caste agent of the same caste, caste does seem to matter. Being matched with a low-caste (ST) agent significantly lowers an individual's willingness to contribute labor hours, even if it significantly increases their score on the knowledge test. This effect is seen regardless of the caste affiliation of the respondent. We may observe these opposing effects on information retention and implicit valuation based on that information, because of individuals' limited confidence in the ability of the low-caste agent to provide the public good. High-caste agents may be perceived to be less trustworthy (so information they provide is disregarded), but to have greater access to the resources needed to deliver services (thereby encouraging individuals to volunteer a higher number of labor hours).

We also find that group cohesion significantly increases an individual's willingness to contribute. Engaging groups in activities that build trust and cohesion may thus be a critical component to increasing and sustaining participation in collective action initiatives. This may mean that less mature or less cohesive groups may be less able to effect change and may not be ready to act as vehicles for NGO- or government-led interventions.

The ability of the agent to conveying information clearly and to appear in command of the subject matter is critical in determining knowledge retention. Respondents paired with agents whom they perceived to be more articulate and confident scored significantly higher on the knowledge test. This means that just providing training is not enough, interventions need to invest also in the development of soft skills. Our partner NGO already incorporates this learning, with each training session being divided into content and delivery, but other programs and interventions would do well to follow this model, so that they equip frontline workers with the skills needed to effectively communicate with and reach out to a diverse group of beneficiaries with whom they may or may not share a common social identity.

Both the data and qualitative evidence from the field indicates that the opportunity cost of time varies widely for different caste groups, mediating their ability to participate in group-based interventions and activities that require time and effort. Interventions that advocate the adoption of time-intensive practices, as in the maintenance of kitchen gardens, should expect different ethnic groups to respond differently to these interventions, and this should be considered in the design of similar programs.

Finally, although we only tested the effect of caste and identity using only one message, the long-term retention of information and possible spillover effects on other behaviors are open questions that deserve further research. In addition, as we noted in the design section, our experiment cannot distinguish between homophily effects and effects of being paired with a low (high) caste agent in the case of low (high) groups. Whether these differ remains an open empirical question as well, one that we hope to address in future work.

Our findings have several implications for projects that aim to deliver services to the rural poor by leveraging existing women's groups. Our results are consistent with the global evidence that nutrition-sensitive interventions are more successful when combined with social and behavior change communication, a fact this is increasingly being acknowledged in the global and Indian policy landscape as well. It is noteworthy that the first meeting of the National Council on India's Nutritional Challenges recently recommended the establishment of a Social and Behavior Change Strategy Group. This makes our results policy relevant. The larger implications of our work, however, pertain to the design of service delivery systems. In developing country settings, many services are provided through frontline workers who belong to the communities they serve, and it is crucial to understand how social identity and other divisions can bolster or undermine otherwise well-designed interventions. While many of our findings have already been adopted by grassroots organizations that have a strong local presence and a deep understanding of the local context, they are yet to make it into the larger policy discourse. We hope that this research informs development policies going forward.

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Appendix

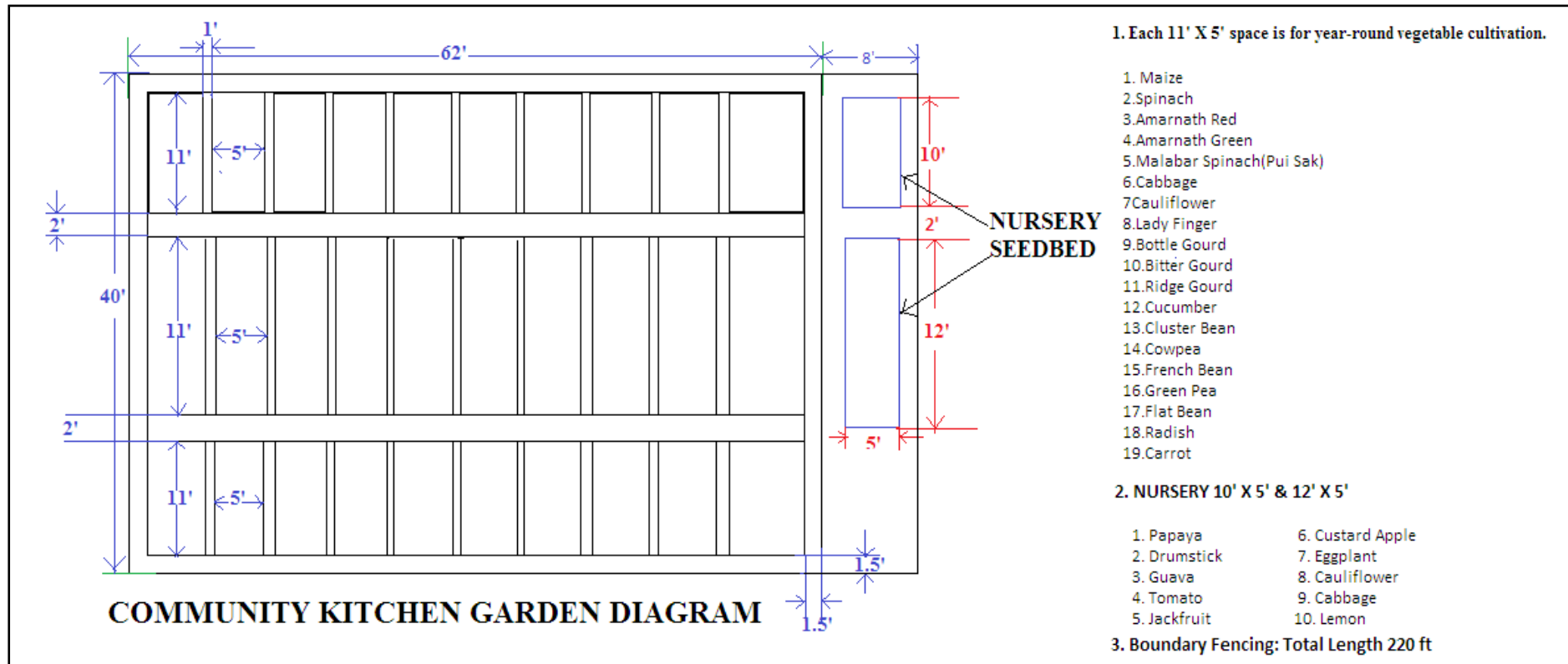


Figure A.1: Kitchen garden model developed by PRADAN

Table A.1: Descriptive statistics from NFHS-4 (2015-16), disaggregated by caste groups

	ST		SC		OBC		General		Tests for difference (p values)		
	Mean (SD)/Propn	N	Mean (SD)/Propn	N	Mean (SD)/Propn	N	Mean (SD)/Propn	N	ST vs SC	ST vs OBC	ST vs General
Respondent woman education (years)	4.21(4.3)	1373	5.26(4.4)	5203	6.97(4.4)	2208	7.23(4.5)	5615	0	0	0
Age of respondent at 1st birth	19.56(3.8)	998	18.88(3.3)	3942	19.3(3.4)	1584	19.73(3.8)	4230	0	0.22	0.52
Total number of children ever born	1.7(1.5)	1373	1.74(1.4)	5203	1.72(1.6)	2208	1.65(1.4)	5615	0.64	0.87	0.45
Husband's educational attainment (years)	1.72(1.6)	207	1.94(1.6)	659	2.4(1.5)	282	2.46(1.6)	795	0.41	0.02	0.01
Body mass index	20.2314(3.84)	1350	21.1143(3.646)	5120	21.6516(4.289)	2178	22.1925(4.455)	5452	0	0	0
Wealth index: HH belongs to __ quintile:											
poorest	46.8	1373	27.2	5203	13.6	2208	12.7	5615	0.005	0	0
poorer	23.7	1373	24.2	5203	21.3	2208	16.5	5615	0.886	0.489	0.064
middle	14.0	1373	21.8	5203	23.3	2208	21.1	5615	0.023	0.005	0.091
richer	11.1	1373	17.1	5203	25.1	2208	23.6	5615	0.059	0.002	0.004
richest	4.4	1373	9.7	5203	16.7	2208	26.1	5615	0	0	0
HH has electricity	83.3	1373	90.1	5203	92.6	2208	92.8	5615	0.001	0.001	0

Source: Authors' calculations using the district-representative National Family Health Survey (NFHS) round 4, 2015-16.

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