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Md Moslah Uddin & David Lawson

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# Creating social capital for the poorest women – evidence from BRAC’s Ultra Poor Graduation program

Md Moslah Uddin and David Lawson

Global Development Institute, University of Manchester, Manchester, United Kingdom

## ABSTRACT

Social capital is critical in facilitating access to social resources; this is particularly the case for extremely poor and vulnerable women. However, whether we can intentionally create social capital, for such vulnerable groups through external interventions remains a fundamental and largely unanswered question. Using quasi-experimental data from BRAC’s Ultra Poor Graduation (UPG) program, we analyse the impact of a multifaceted program approach that links personal and livelihood development, and access to finance interventions, in the creation of social capital for women in extreme poverty. Overall, we find evidence that program interventions have a positive impact on creating social capital. We find that interventions can create more heterophyllous interactions, resulting in the creation of weaker social ties. However, the ability to form social ties decreases as women age, with differences in individuals’ capital skills and life aspirations proving to be crucial in explaining variance.

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## 1. Introduction

Social exclusion through multiple deprivations in developing countries tends to disproportionately affect women, who often have lower levels of both income and access to essential services (Banerjee et al. 2015; Zhang and Gordon 2020). The World Bank (2017) identified social exclusion as one of the common attributes of extreme poverty that results in a lack of access to different social resources. Extremely poor women are usually not part of the same micro-economy, or social groups, as other groups, such as the moderately poor (Banerjee and Duflo 2007). Furthermore, mainstream market systems commonly do not work for the very poorest and traditional NGO services have been found to regularly exclude them due to problems of identification and reach (Bandiera et al. 2017).

To reduce social exclusion, we must fully understand the multiple sets of interlocking constraints faced by the extremely poor. BRAC’s UPG program, in Bangladesh, follows a method of providing interventions to the extremely poor through a “Graduation Approach”. This approach follows a multifaceted, time bound, and sequenced set of interventions to address the multidimensional needs of individuals and households in extreme poverty. There is a series of literature that provides impact evaluation assessments of the UPG program; however, this has focused on specific outcomes, such as income, labour market involvement, health, asset accumulation, and nutrition (e.g. Bandiera et al. 2017; Banerjee et al. 2015; Siddiquee 2016; Sulaiman, Rabbani, and Prakash 2010). Although such work recognises that the lack of social capital is an underlying reason for extreme poverty,

**CONTACT** David Lawson  david.lawson@manchester.ac.uk  Global Development Institute, University of Manchester, Oxford Road, Manchester, M13 9PL United Kingdom.

aside from Hossain and Matin's (2007) study, research focusing on the impact on social capital creation is extremely rare. The research in this paper fills such a void.

Putnam (1993) and Bourdieu (1986) suggest that the creation of social capital relates to historical phenomena and that it cannot be created or modified through external interventions. However, several studies – including Islam et al. (2011); Elder, Zerriffi, and Le Billon (2012); and Kaganzi et al. (2009), all of which are based on general population samples – have challenged such a historical reasoning. The literature tends to agree that social capital creation is a context-dependent process. From a policy perspective, it is essential to further understand what social capital policies work, and for which specific population groups, to enable practitioners to develop more effective and customised interventions that target specific segments of the population.

In this paper, we extend the existing anti-poverty program evaluation literature through several dimensions. First, by focusing on the impact of NGO-led interventions and the creation of social capital among extremely poor women, we are able to provide one of the first detailed analyses that considers several social capital attributes. These include the nature of social ties, types of interactions, and dimensions of social capital. Hence, we are able to add value in understanding “what works” in “which context” and “how it works” for social capital. Second, and following the network approach, we conceptualise individual-level social capital as a resource embedded in social networks and test with a matched treatment and control group (Uddin and Lawson 2024). Such an approach enables us to examine the nature of social interaction and how this links with resource access patterns (strong ties/weak ties) for rural women in extreme poverty. Equally, the approach allows us to further understand the social capital formation process. Third, we add significantly to the literature by comparing impact heterogeneity across several dimensions of social capital, age groups, and vulnerability of extremely poor women.

Although social capital is typically viewed as a collective concept, different studies have measured and analysed it at both individual and collective (community and macro) levels (Villalonga-Olives, Wind, and Kawachi 2018). Prior studies, such as Lin and Dumin (1986); Coll-Planas et al. (2017); and Fox et al. (2023), have chosen the level based on the specific study context. We argue that extremely poor women face exclusion from society (Banerjee and Duflo 2007), and may not benefit from social capital at the collective level. Therefore, and acknowledging that collective action can generate more solidarity-oriented and sustainable social capital, for our study, it is more appropriate to adopt an individual-level measurement and analysis of social capital.

Our study finds a positive impact of program interventions in creating social capital among active-age groups of extremely poor women. We find that extremely poor women make more heterophilous interactions, creating weaker ties and contributing more to qualitative aspects of social capital.

The remainder of the paper is structured as follows. The next section provides a brief overview of the Ultra Poor Program. Section 3 describes the theoretical framework used for this study. Data sources, variable definition, and empirical strategy adopted have been described in Section 4. The results of different econometric models are discussed in Section 5. The paper concludes with policy recommendations in Section 6.

## **2. Program description: BRAC's Ultra Poor Graduation program**

The Ultra Poor Graduation (UPG) program aims to tackle the multidimensional nature of extreme poverty by providing a set of complementary and integrated interventions. The program includes rural households, based on the selection criteria, after which an adult woman household member (aged above 16 years) becomes a program participant and receives interventions for a two-year program cycle.

### **2.1. Participant selection**

Participant selection follows a two-step process. First, the program conducts participatory rural assessment (PRA) and community wealth ranking to create a preliminary list of those identified as extremely poor, after which program participants are selected based on criteria that include per

capita income, value of household productive assets, amount of savings, age, NGO membership, land ownership, regularity of income, and health status. Inclusion and exclusion criteria are then applied to form three participant groups: Group 1: extremely poor women above 50 years of age; Groups 2 and 3: extremely poor women in the active-age (16–50 years) group, with the former of these groups being more vulnerable, as defined by land and productive asset ownership.<sup>1</sup>

## **2.2. Program components**

### **2.2.1. Cluster 1: linkage creation interventions**

Village solidarity committees (VSC) are formed, with representatives from local elites combined with program participants in surrounding areas. The aim is to create a vertical linkage between program participants and upper segments of the local community. Furthermore, the program links the participants with local service providers.<sup>2</sup> In addition, bi-weekly group visits are organised where program participants take part in paying their loan instalments, discussing their problems, and creating a horizontal peer network.

### **2.2.2. Cluster 2: empowerment and personal development interventions**

Field-level program staff conduct home visits and provide coaching to discuss daily life problems, as well as encouragement and counselling, with the main objectives of increasing participants' self-confidence, encouraging communication, and mixing with the outer community.

### **2.2.3. Cluster 3: access to finance creation interventions**

Linkages between microfinance institutions and participants are created by organising meetings in local BRAC microfinance offices, with introductions to branch managers and credit officers. The primary objective of this intervention is to create a linkage with MFIs that the participants can capitalise on after graduating from the program. Program participants also open a savings account in the local BRAC microfinance branch office and receive a savings match<sup>3</sup> as a grant from the program. Participants also receive interest-free loans from the program to procure assets as a livelihood-development scheme.

### **2.2.4. Cluster 4: livelihood development interventions**

Program participants choose an enterprise for their livelihood and receive an asset transfer grant. In addition, they receive livelihood-development training to improve their technical skills in generating income.

## **3. Literature review on social capital intervention and formation of social capital**

Social capital research has evolved from an early focus that defined and conceptualised social capital to measuring the impacts on outcomes (e.g. Nieminen et al. 2013; Wind, Fordham, and Komproe 2011) and, more recently, focusing on a wide variety of intervention studies that have examined the social capital formation process (e.g. Andersen et al. 2015; Coll-Planas et al. 2017). Of this latter research, Villalonga-Olives, Wind, and Kawachi (2018) classified interventions into behavioural induction (“activating peer-to-peer interactions within existing network structures”, 215) and structural alteration intervention that involves contact creation with people of different social classes.

Behavioural induction interventions usually facilitate homophilous interactions that occur between people with similar characteristics – as people usually interact with others of equal, or marginally higher, social status (Lawrence and Shah 2020). Although homophilous interaction provides solidarity benefits, it can also increase inequality. Such types of interaction can create networks for extremely poor women, but only within the same social structure – thus preventing upward structural mobility (Ertug et al. 2022). However, structural induction interventions usually promote heterophilous interaction between actors with different characteristics.

Granovetter (1973) found that different interactions result in the creation of two different groups of social ties – strong and weak ties. Strong ties refer to the relationship with close family and friends. Usually, a homophilous interaction creates strong ties through horizontal connections with people who have similar characteristics. Literature suggests that strong ties tend to dominate as weak ties require more significant effort and opportunities (Lozares et al. 2014). Contrasting views by Jones and Tvedten (2019) argue that extreme poverty is often characterised by uncertainty, distrust, and a tendency to avoid potentially problematic situations that might cause emotional and financial burdens for such groups. Extremely poor people have been found to be more suspicious of creating a network among family and friends for fear of manipulation and disruption of household patterns (Ross, Mirowsky, and Pribesh 2001). In addition, family and friendship status is more stable over time but requires significant time to expand families and create friendships.

Weak ties refer to a relationship with acquaintances who are not close. Heterophilous interaction usually creates weaker ties as people build vertical connections, such as through the creation of group membership within the community. The relationship between group membership and accumulating more vertical linkage is well-established in the literature (Deshpande and Khanna 2021). Developing weak ties allows for the transmission of feelings of solidarity and group commitment. However, community group development and vertical linkage creation highlight two contradictory working theories of the relationship between the extremely poor and village elites. The first theory relates to the issue of “elite capture”, which occurs when an advantaged group influences community activities for their own benefit and often at the expense of the poor group members (Araujo et al. 2008). On the other hand, the second theory describes how extremely poor people traditionally depend on the patronage and charity of village elites, and that involving them in group activities with careful planning and controlled activities might help to create social capital for the poor participants (Beard and Dasgupta 2006).

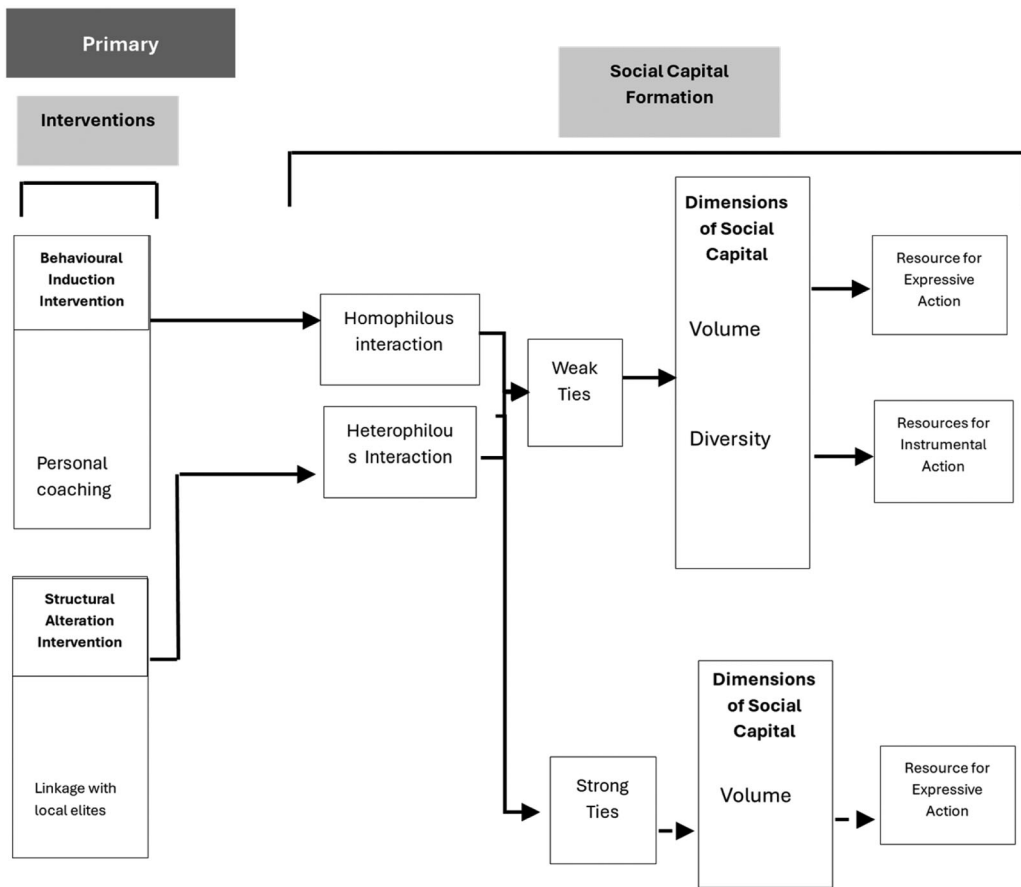
Strong ties usually provide access to lower-level social capital and contribute to lower reachability of the social capital dimension. In addition, these ties also contribute to gaining the volume of social capital, as extremely poor women are expected to have more strong ties than weak ties (Sulaiman and Ameen 2007). Ghore et al. (2023) suggest that extremely poor women lack basic human capital skills in comparison to the average population group in society. Therefore, they suggest it is easier for these women to gain further quantity dimensions of social capital by building strong ties, such as achieving the quality dimensions of social capital that require creating and maintaining a network with people in higher job positions, thus requiring a higher level of human capital skills.

In contrast, weak ties usually contribute to forming diversity and upper reachability of social capital (Lin 2001; Rademacher and Wang 2014). Research by Woolcock and Narayan (2000) shows that these types of social capital help people to connect with individuals and groups in different social hierarchies and power groups, access information, identify new opportunities, and access resources not usually available to them.

#### **4. Social capital formation: theoretical framework**

Based on the literature review above and as suggested by Lin (2001), we develop two pathways through which structural alteration and behavioural induction interventions lead to social capital formation. As Figure 1 describes, these social capital interventions can cause two types of interactions between network members. First, behavioural induction interventions can initiate a homophilous interaction between extremely poor women and their peers. Second, structural alteration interventions can create heterophilous interaction, facilitating interaction between extremely poor women and the upper class of the community. Figure 1 shows that the aforementioned social interactions result in two types of interpersonal ties: strong and weak ties.

Homophilous interaction leads to strong ties (Ertug et al. 2022). Strong social ties help to build homogenous social networks, which in the context of extremely poor women, usually contribute to both lower reachability and volume of social capital (Alecu et al. 2022). Conversely, heterophilous



**Figure 1.** Formation of social capital. Source: Authors, abridged from Lin (2001).

interaction creates weak ties by building further vertical connections. Weak social ties form a more diverse social network and contribute to diversity, upper reachability, and volume of social capital dimensions (Lin 2017; Rademacher and Wang 2014).

## 5. Analytical strategy

### 5.1. Evaluation design and data collection

Several quasi-experimental research techniques are available to evaluate policy or program intervention. After undertaking a series of methodologically based sensitivity and robustness checks, propensity score matching (PSM) was adopted to construct a counterfactual and estimate the program's impact on creating social capital.<sup>4</sup> As with Dehejia and Wahba (2002), PSM is further justified based on optimality criteria – utilising a dataset that includes a wide range of covariate variables and being able to create the control group from the same labour market data and outcome variable.

For this study, random sampling was adopted, with a treatment group formed from program participants and non-eligible households who did not meet other program selection criteria. An overall sample of 3,429 individuals was collected by independent enumerators, covering 21 districts for the years 2017–2020. One of the critical issues regarding the data collection procedure was to consider the likelihood of the undue influence of field program officers on participants' responses. Combining the dual role of disbursing/collecting loans and providing social/personal development support has

the possibility of creating a conflict of interest for program officers, who may have to achieve targets for disbursing/collecting loan instalments and simultaneously consider the vulnerable personal situations of the participants (Ito 2003; Siwale and Ritchie 2012). Such potential bias is minimised for this study as the data used is not from a microfinance program; program officers did not have any target for loan disbursements or instalment collection; end line data were collected five months after the program interventions had ended, hence program officers did not have any contact with the participants for significant periods of time and could not have any undue influence on their responses; and an independent monitoring and evaluation team produced quality control reports, which also confirmed that there was no bias.

Another bias that may arise relates to the consent and participation information completion phase that precedes data collection. Literature suggests that the information shared during these processes may make participants aware of the study objectives, which could result in response bias, for example by aligning responses with research objectives (Fisher and Katz 2000; Nickerson 1998). We minimise such bias by first using a carefully pre-structured and designed information sheet to avoid subjective misinterpretation, combined with very specific enumerator guidelines. Expected outcomes of the study were not discussed and enumerators were independent of the BRAC program team. Finally, the data were collected several months after the completion of program intervention, thus reducing the risk of confirmation bias as the participants did not have any incentive to provide information that favoured positive intervention outcomes.

The next important step is to select the covariates to be used in the PSM model as it can profoundly affect the accuracy and bias of estimates (Heckman, Ichimura, and Todd 1997). We consider three aspects while selecting 16 covariates: (i) previous UPG impact assessments undertaken (e.g. Raza, Das, and Misha 2012; Siddiquee 2016) using the PSM methodology; (ii) previous studies focused on identifying and analysing the determinants of social capital (e.g. Alesina and La Ferrara 2000; Ferragina 2013; Kaasa and Parts 2008); and (iii) program selection criteria for the UPG program.

**Table 1.** Balance assessment.

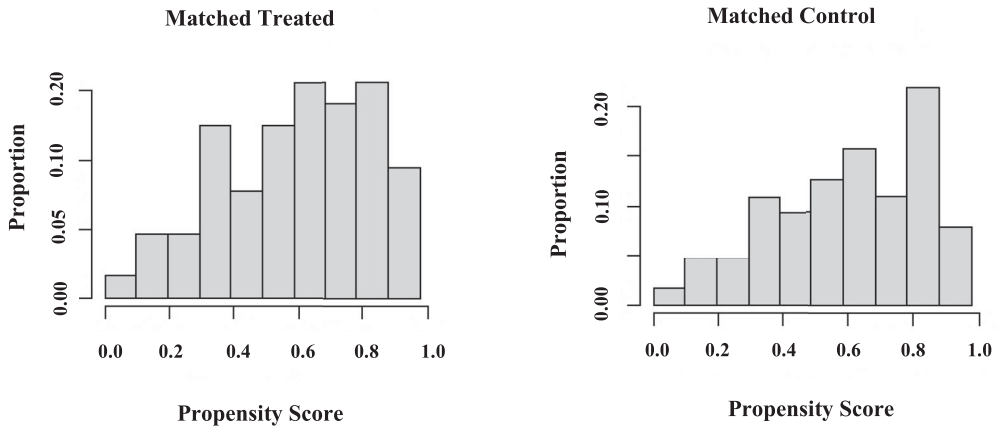
Variables	Std. mean diff.			Var. ratio			eCDF mean		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Overall	0.0042	0.0028	0.0009	0.981	1.005	0.998	0.0094	0.0014	0.0013
Participants with long-term health issues	0.2560	0.1230	-0.0301				0.0317	0.0132	0.0018
Household ownership of livestock	0.1774	0.0144	-0.0047				0.0476	0.0044	0.0018
Age of participant	0.2818	-0.0704	-0.0127	0.970	1.103	0.976	0.0540	0.0264	0.0092
Access to safe water	0.1280	0.0073	0.1425				0.0159	0.0015	0.0253
Access to sanitation	0.3579	0.1138	0.0403				0.1746	0.0528	0.0181
Household access to social safety net	0.0970	0.0115	0.0718				0.0476	0.0044	0.0162
Number of family members in active-age (16–50)	0.1794	-0.0567	-0.0384	1.8086	1.1260	0.8769	0.0159	0.0070	0.0102
Number of family members younger than 16 years	0.0644	0.1265	-0.0442	0.8909	1.1985	1.0545	0.0159	0.0199	0.0075
Women-headed household	0.1370	0.0109	-0.0271				0.0635	0.0044	0.0054
HH membership in NGO	0.1825	-0.0431	0.0080				0.0317	0.0088	0.0018
Per capita household income	0.1409	-0.0121	0.0108	1.3123	0.8846	0.8908	0.0495	0.0180	0.0202
Household ownership of mobile phone	0.0407	-0.0260	-0.0119				0.0159	0.0117	0.0054
Household ownership of land	0.0367	0.0081	0.0282				0.0159	0.0029	0.0090
Household savings	0.0000	0.0502	-0.0084				0.0000	0.0191	0.0036
Household ownership of vehicle	0.0000	0.0109	0.0075				0.0000	0.0044	0.0036
Education	0.1174	0.1013	0.0925	1.5509	0.9603	0.9550	0.0106	0.0323	0.0239

Source: Authors' own calculation.

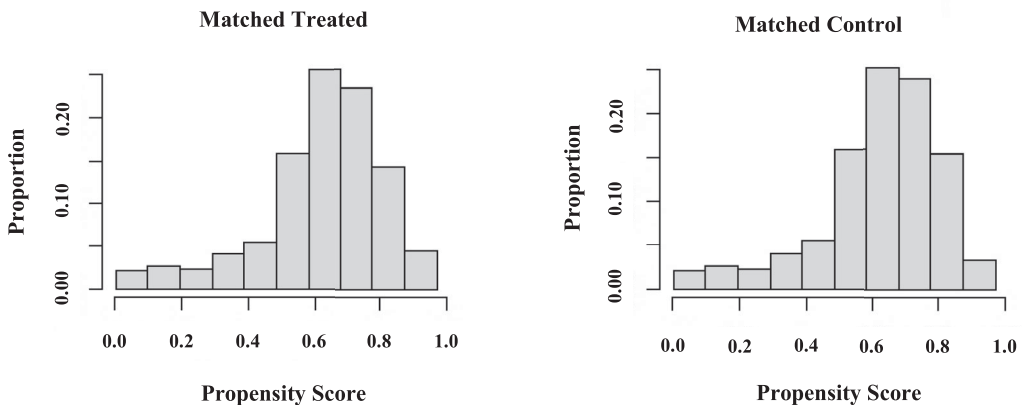
A binary logistic regression model is used to calculate the propensity score for participation in the program. We use the nearest neighbourhood (NN) matching with calliper (0.2) adjustment and with replacement technique to create all paired combinations of treatments and the control group.<sup>5</sup> The age of the extremely poor participants is used in the first step as one of the exclusion criteria to select the participants in the different treatment groups. Individual participants are then matched, in the second step, within the subgroup, based on the closest propensity score.

Results in Table 2 show that a total of 27 control samples have been matched with 63 Group 1 treatment samples, 278 control samples have been matched with 682 Group 2 treatment samples, and 279 control samples have been matched with 554 Group 3 treatment samples.

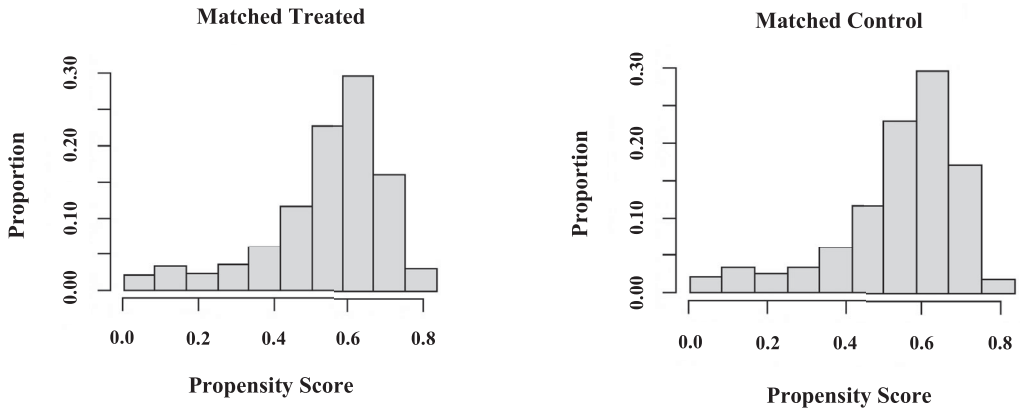
A series of PSM sensitivity analyses were undertaken to ensure the robustness of the results and are presented in Table 1. We conduct a balance assessment using standardised mean differences (SMD), variance ratios, and empirical cumulative density functions (eCDF) means for each covariate. Our findings show a good balance between the treatment and control groups. In addition, we conduct tests for common support (Figures 2–4) and find good common support for treatment and control groups.



**Figure 2.** Test for common support for Group 1 sample.



**Figure 3.** Test for common support for Group 2 sample.



**Figure 4.** Test for common support for Group 3 sample.

We use a linear regression model to estimate the treatment effect and its standard error. Our model includes a measure of social capital as the outcome and the binary treatment variable, along with 16 covariates as predictors. The coefficient of the treatment variable is used to be the estimate of the treatment effect. A cluster robust standard error is calculated to estimate its standard error. Table 2 presents the results from the regression analysis. In line with Greifer (2022), we do not report the coefficients and test on the other predictors as they should not be interpreted due to confounding errors.

**5.2. Development of social capital indicators**

We use a position generator tool (Li and Verhaeghe 2015) to measure the individual level of social capital of extremely poor women in rural Bangladesh. In line with prior literature (Li and Verhaeghe 2015), we use occupational positions as an indicator of the resources embedded in one’s social network, as knowing someone with that job position allows individuals to access those resources. The tool uses a representative list of occupations customised to the local context and asks the participants whether they know someone from this occupation list. If they know someone, the tool further asks if that person is a relative, neighbour, or acquaintance.

After mapping the occupational positions of network members, we use the International Socioeconomic Index (ISEI) based on ISCO 08 to code the 28 occupation categories used in our position generator tool (Ganzeboom 2010). We develop three measures of social capital: volume, quality, and diversity. Volume of the social capital is calculated as the sum of all ISEI scores of all accessed occupations. Quality of social capital is computed by determining the ISEI score of the highest job position accessed by respondents. Diversity of social capital is

**Table 2.** Matching summary.

Details	Group 1		Group 2		Group 3	
	Control	Treatment	Control	Treatment	Control	Treatment
Full sample	122	64	822	687	822	554
Matched ESS	18.99	63	163.2	682	188.06	554
Matched	27	63	278	682	279	554
Unmatched	95	1	544	5	543	0
Discarded	0	0	0	0	0	0

Source: Authors’ own calculation.

**Table 3.** Correlation matrix.

	Total Network Size	Upper Reachability	Range
Volume of social capital	1***	0.693***	0.727***
Upper reachability	0.69***	1***	0.904***
Range	0.727***	0.904***	1***

Source: Authors' own calculation; Note: \*\*\*, \*\*, \* denote significance at the 1 per cent, 5 per cent, and 10 per cent levels, respectively.

**Table 4.** Total variance explained.

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Component 1	2.553494	85.116459	85.116459	2.553494	85.116459	85.116459
Component 2	0.352048	11.734923	96.851382			
Component 3	0.094459	3.148618	100.000000			

Source: Authors' own calculation; extraction method: principal component analysis.

**Table 5.** Component score coefficient matrix

Social capital indicators	Component 1
Volume of social capital	0.339834
Upper reachability	0.369193
Range	0.373938

Source: Authors' own calculation; extraction method: principal component analysis; rotation method: Varimax with Kaiser normalisation.

estimated by calculating the difference in ISEI scores of the highest and lowest job positions accessed by the respondent.

Initially, as with Lin (2001), we find a significant correlation between social capital volume, quality, and diversity (Table 3), and, therefore, we construct a composite variable. Our factor analysis, following the principal component methodology, yields a single-factor solution (Table 4) and calculates a factor score (Table 5) as a weighted sum of three measures = (0.340 Extensivity + 0.369 Upper Reachability + 0.374 range). The new variable is renamed as access to social capital.

## 6. Results and analysis

### 6.1. Descriptive statistics

Table 6 presents the baseline characteristics of women in extreme poverty in our treatment and control group. Except for treatment and control Group 1, the average age of all the participants ranged from 31.44 to 35.14. Very few long-term mental or physical issues are reflected (treatment: 0.85 per cent; control: 1.6 per cent), meaning that those sampled are mostly physically active women of working age. Table 6 indicates that approximately 67.3 per cent of respondents in the treatment group and 69.7 per cent of the control group went outside their homes at least once during the last month to avail themselves of some services (health services, agricultural information services, shopping, etc.). This type of engagement improves their autonomy at the household and community level. Hence, the data suggest that such characteristics can be capitalised upon to create access to new social networks through social capital interventions.

**Table 6.** Basic household characteristics at baseline.

Participants Characteristics	Group 1		Group 2		Group 3		Full Sample	
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Age	57.65	59.20	35.14	35.81	31.44	31.55	34.64	35.12
Married	37%	49%	81%	81%	97%	96%	86%	86%
Participant with long-term health issues	1.61%	4.8%	1.17%	2.49%	0.36%	0.18%	0.85%	1.6%
Per capita income	874	814.28	1,001	1,006	1,172	1,168	1,068	1,066.29
Education								
No education	92%	95.2%	49%	55%	28%	33%	42%	48%
Below primary	8%	4.8%	24%	22%	25%	24%	24%	22%
Primary	0%	0%	20%	14%	32%	29%	25%	20%
Secondary and above	0%	0%	6%	8%	14%	14%	9%	10%
Access to social safety net program	39%	44%	17%	17%	5%	4%	13%	13%
Household membership in NGO	3%	0%	4%	5%	5%	5%	5%	5%
Women-headed household	68%	75%	20%	20%	4%	5%	16%	16%
Number of household ownership of birds	53%	58.7%	57%	60%	64%	55%	60%	58%
Number of household ownership livestock	8%	3.2%	11%	10%	18%	18%	13%	13%
Number of household ownership of vehicle	5%	4.8%	20%	20%	36%	36%	26%	26%
Number of household ownership of mobile	19%	21%	28%	30%	29%	30%	28%	29%
Number of household ownership of land	76%	77%	85%	85%	88%	88%	86%	86%
Household have savings	19%	19.05%	18%	16%	24%	25%	20%	19%
Access to safe water	98%	100%	96%	96%	97%	94%	96%	95%
Access to sanitation	63%	79.4%	68%	63%	72%	70%	70%	67%
Household members above 50 years of age	1.35	1.54	0.37	0.37	0.24	0.30	0.36	0.39
Household members active age	0.19	0.10	1.96	2.01	2.23	2.26	1.99	2.02
Household members younger than 16 years of age	0.35	0.40	1.50	1.36	1.58	1.63	1.48	1.43
Went outside of home to access services	71.41%	60.31%	69.80%	69.64%	63.71%	64.62%	67.2%	67.1%
Percentage of savings in NGO	28%	73%	43%	34%	55%	43%	47%	36%
<b>N</b>	<b>63</b>	<b>27</b>	<b>682</b>	<b>278</b>	<b>554</b>	<b>279</b>	<b>1,299</b>	<b>464</b>

Source: Authors' calculation.

### 6.1.1. Types of interactions

The most common job positions (accessed by 60 per cent or more) for both the treatment and control groups are tailors, informal manual labour, owner of the retail grocery store, and manual rickshaw/van drivers who possess very low job prestige scores. The majority of women participants are also engaged in low-prestige jobs such as household work or manual labour, with findings in [Table 7](#) indicating that participants make more homophilous interactions to form their ties. This finding aligns with the previously discussed common theory that people usually interact more with people with the same characteristics (Lawrence and Shah 2020).

To understand the impact of interventions on different interactions, we compare the access to job positions between the treatment and control groups. Based on the job prestige score, we classify these job positions into four occupation categories, as used by Lin and Dumin (1986): upper white, lower white, upper blue, and lower blue. [Table 7](#) shows treatment participants have higher access to all the occupational categories than the control group. However, the difference is the highest among upper white, lower white and upper blue occupation categories. These categories include local elites and necessary service providers like health support workers, veterinary assistants, and agricultural input sellers. This indicates that program intervention might help to generate more heterophilous interaction among treatment groups by connecting the extremely poor women with different service providers and local elites.

**Table 7.** Access to different job positions through social ties.

Job position	Treatment					Control				
	No access	Have access	Access through			No access	Have access	Access through		
			Family	Friend	Acquaintance			Family	Friend	Acquaintance
Total	59%	41%	24%	4%	72%	67%	33%	26%	7%	67%
Upper white-collar occupation	52%	48%	15%	2%	83%	60%	40%	16%	3%	81%
Member of local council	37%	63%	16%	3%	84%	44%	56%	18%	4%	78%
Veterinary doctor	57%	43%	6%	1%	63%	69%	31%	14%	0%	86%
Doctor	54%	46%	8%	2%	65%	58%	42%	14%	2%	84%
School teacher	36%	64%	12%	1%	89%	45%	55%	14%	1%	85%
Religious leader	46%	54%	20%	1%	65%	53%	47%	17%	5%	78%
Member of political party	83%	17%	9%	1%	18%	88%	12%	30%	4%	65%
Lower white-collar occupation	78%	22%	18%	5%	77%	84%	16%	19%	7%	74%
Health support worker	57%	43%	11%	3%	55%	64%	36%	17%	9%	74%
Assistant of a lawyer	92%	8%	5%	0%	7%	95%	5%	56%	2%	42%
Veterinary support worker	85%	15%	2%	0%	21%	94%	6%	4%	0%	96%
Upper blue-collar occupation	59%	41%	20%	4%	76%	70%	30%	26%	6%	68%
NGO field workers	38%	62%	1%	0%	99%	67%	33%	3%	1%	96%
Owner of grocery store	30%	70%	23%	5%	85%	37%	63%	26%	8%	66%
Small agricultural traders	76%	24%	8%	1%	29%	83%	17%	29%	2%	68%
Salesman	72%	28%	9%	2%	34%	78%	22%	12%	4%	84%
Small/medium farmer	46%	54%	28%	7%	53%	60%	40%	41%	8%	51%
Large farmer	66%	34%	14%	4%	37%	76%	24%	31%	9%	59%
Security guard	59%	41%	15%	3%	47%	66%	34%	25%	6%	69%
Phone banking store	67%	33%	13%	1%	39%	74%	26%	35%	1%	64%
Agricultural input seller	79%	21%	6%	0%	28%	83%	17%	22%	7%	71%
Lower blue-collar occupation	56%	44%	36%	5%	59%	62%	38%	38%	6%	56%
Hawker	87%	13%	2%	0%	18%	89%	11%	11%	0%	89%
Barber	72%	28%	6%	1%	38%	75%	25%	15%	1%	84%
Construction worker	45%	55%	37%	3%	49%	58%	42%	46%	2%	51%
Blacksmith	90%	10%	4%	0%	12%	93%	7%	38%	0%	62%
Mechanic	76%	24%	14%	2%	23%	83%	17%	37%	4%	59%
Tailor	12%	88%	48%	9%	85%	17%	83%	34%	8%	58%
Motor-car driver	78%	22%	18%	1%	16%	85%	15%	50%	4%	46%
Labourer	13%	87%	59%	10%	72%	14%	86%	44%	8%	48%
Rikshaw/van driver	31%	69%	38%	7%	66%	43%	57%	38%	8%	54%

Source: Authors' calculation.

## 6.2. Measuring the treatment effect

### 6.2.1. Impact of program interventions on creating different dimensions of social capital

We find a significant impact of program interventions on creating both quantity and quality of social capital among extremely poor women. However, program interventions have more of an impact on the quantity of social capital than on the quality, reinforcing the common theory that it is easier to create quantity of social capital than quality. We consider three measures of quality of social capital: upper reachability, range, and the composite social capital index. We find a significant impact of program intervention on all of these measures of social capital for both treatment groups (2 and 3) of extremely poor women in the active-age range. Among different quality measures, program intervention has the most impact on the composite measure of the social capital index (which leans towards more quality of social capital measures), followed by upper reachability and range of social capital.

A key issue here is the creation of social capital among extremely poor women and particularly the intervention sustainability. As the data used were collected two years after the end of the program interventions, this limits our ability to explicitly assess and evaluate the enduring intervention effects. However, using several proxy indicators (Table 8) we can gain some insights. In particular we find that the treatment group receives more assistance from non-relatives (treatment: 53.4 per cent; control: 41 per cent), makes more contacts with local government officials in accessing the social safety net program (treatment: 58.6 per cent; control: 50.3 per cent), seeks more help from neighbours (treatment: 2,847; control: 2,663), and provides more help to neighbours (treatment: 3,539; control: 3,032). This suggests that extremely poor women in treatment groups are leveraging their social capital to strengthen their integration with neighbours and non-relatives, get more help, and get more access to different social services, hence providing a degree of inference and evidence relating to the sustainability of program intervention.

### 6.2.2. Difference in the impact of program interventions on creating social capital among treatment groups

Although we find a significant impact of program intervention on the creation of all dimensions of social capital among the active-aged treatment groups<sup>6</sup> of extremely poor women (Groups 2 and 3), the effect of program interventions among the older age<sup>7</sup> participants (Group 1) is significant only on the creation of volume of social capital. To analyse the differential impact across age groups of participants, we consider the personal and household characteristics of extremely poor women.

Statistics show that the number of women labour participants is significantly lower than the average among older women in Bangladesh<sup>8</sup> (Bangladesh Bureau of Statistics [BBS] 2018). Although extremely poor women of an active age are involved in outside work, older women living in villages are less likely to be involved in work outside of their homes (O'Neil, Aubrecht, and Keefe 2021). This might limit their social network opportunities. In addition, older people usually try to "get by" in their

**Table 8.** Information on social inclusion.

Participants' characteristics	Full sample	
	Treatment	Control
Received support from social safety net program		
Received invitation from non-relative	73.7%	65.3%
Received help from non-relative	53.4%	41%
Possibility of receiving help through Salis	80.4%	74.4%
Contact chairman for VGD	58.6%	50.3%
Contact chairman for old age support	24.1%	19.9%
Work with others in village to solve a problem	23.2%	12.5%
How many people came to you to seek help?	3,539	3,032
How many times did you seek help from neighbours?	2,847	2,663
<b>N</b>	<b>1,299</b>	<b>464</b>

Source: Authors' calculation.

lives with what they have instead of “moving up” the social ladder. As a result, they might have less motivation to create new quality social capital. If we look at the educational profile of participants, 98 per cent of older aged participants had no education compared to 49 per cent of Group 2 and 28 per cent of Group 3 participants. Prior literature suggests that education is positively associated with higher social capital (Alesina and La Ferrara 2000; Fox et al. 2023). Such differences in education may also explain the impact of the intervention on these two different groups.

Comparing the intervention impact on the social capital accumulation of extremely poor women in the active-age group, differentiating by vulnerability (Group 2 and Group 3) participants, we highlight in Table 9 all social capital indicators. Program interventions have the highest impact on actively aged women who are vulnerable (Group 2). One of the main reasons for this could be due to the most vulnerable groups possessing lower than average levels of social capital, that might be easier to improve in the short-to-medium period. This is in line with findings from Banrjee et al. (2015); Raza, Das, and Misha (2012); and Asadullah and Ara (2016), who also found heterogeneity in the treatment effects of the program but concluded that such heterogeneity cannot be predicted by the baseline position of the participant. As a result, the simplest version of the standard threshold-based theory of poverty traps does not apply here, as it is not the more affluent groups among the participants who always extract the most benefits from the program.

### 6.2.3. Social capital formation when accessed through strong ties

We also consider how different social ties of extremely poor women are associated with social capital formation. Calculating social capital indicators based on whether the job positions have been accessed through strong or weak ties, we assess the impact of program interventions on creating social capital through different social ties. We find that program interventions do not have any significant impact on creating social capital when accessed through strong ties (Table 10). The findings align with the previously discussed theory that vulnerable people tend to distrust and be suspicious of creating and strengthening ties among family and friends for fear of manipulation and disruption of household patterns (Ross, Mirowsky, and Pribesh 2001). In addition, as the literature suggests, it requires more time to expand families and create friendships than to get to know acquaintances. As program interventions were for two years, it is understandable that they did not significantly impact the creation of new social capital through family and friends.

### 6.2.4. Social capital formation when accessed through weak ties

Our findings indicate that there is a significant impact of program intervention on creating social capital through weak ties among both groups of active-age program participants (Table 11). The impact is significant among all dimensions of social capital. If we compare the size of the effect on different social capital indicators measured through weak ties, we can see that the quality

**Table 9.** Measurement of treatment effect.

Social Capital indicators	Group 1		Group 2		Group 3	
	B (St Error)	Std. Beta	B (St Error)	Std. Beta	B (St Error)	Std. Beta
Network volume	84.435 (50.281)*	0.190	114.661 (20.310)***	0.220	69.989 (20.164)***	0.133
Upper range	2.192 (3.732)	0.072	3.406 (1.379)**	0.107	2.420 (1.306)**	0.075
Range	4.229 (4.203)	0.123	3.983 (1.543)***	0.110	3.042 (1.563)*	0.082
Composite measure	0.247 (0.224)	0.134	0.309 (0.082)***	0.155	0.209 (0.083)***	0.103

Source: Authors' calculation.

Note: \*\*\*, \*\*, \* denote significance at the 1 per cent, 5 per cent, and 10 per cent levels, respectively; cluster robust standard error in parentheses.

**Table 10.** Measurement of treatment effect (through strong ties only).

	Strong ties					
	Group 1		Group 2		Group 3	
	Beta (St. Error)	St. Beta	Beta (St. Error)	St. Beta	Beta (St. Error)	St. Beta
Social capital indicators						
Network volume	8.176 (18.098)	0.047	10.494 (10.077)	0.039	-2.241 (13.269)	-0.007
Upper reachability	1.886 (6.130)	-0.038	-0.522 (2.240)	-0.009	-0.106 (2.319)	-0.001
Range	-3.467 (4.958)	-0.086	-0.434 (1.72)	-0.010	-0.013 (2.000)	-0.0002
Composite social capital indicator	-0.061 (0.197)	-0.037	0.012 (0.076)	0.006	-0.007 (0.090)	-0.003

Source: Authors' calculation.

Note: \*\*\*, \*\*, \* denote significance at the 1 per cent, 5 per cent, and 10 per cent levels, respectively; cluster robust standard error in parentheses.

**Table 11.** Measurement of treatment effect (through weak ties only).

	Week ties					
	Group 1		Group 2		Group 3	
	Beta (St. Error)	St. Beta	Beta (St. Error)	St. Beta	Beta (St. Error)	St. Beta
Social capital indicators						
Network volume	76.259 (52.491)	0.177	104.167 (18.861)***	0.217	72.229 (18.634)***	0.149
Upper reachability	1.484 (4.565)	0.037	6.915 (1.910)***	0.158	4.916 (1.961)***	0.107
Range	5.281 (5.419)	0.111	7.768 (2.128)***	0.161	5.404 (2.067)***	0.108
Composite social capital indicator	0.221 (0.220)	0.117	0.394 (0.085)***	0.195	0.275 (0.086)***	0.131

Source: Authors' calculation.

Note: \*\*\*, \*\*, \* denote significance at the 1 per cent, 5 per cent, and 10 per cent levels, respectively; cluster robust standard error in parentheses.

measure effects are much larger, thus reinforcing the general theory, which suggests that to get to the upper reach and diversified social capital, one has to rely on a network that consists of more acquaintances who are not part of family and friends (Granovetter 1973).

As discussed in the literature review section, different structural alteration interventions, forming a local community group, and creating vertical linkage with local elites might play an influential role in creating weak ties. Although it is difficult to precisely outline the exact mechanism by which specific interventions contribute to the creation of social capital, we can highlight how these interventions may contribute to its development.

We argue that formation of village solidarity committees and creating linkages with local service providers enables the extremely poor women to connect with local elites and higher-prestige job holders, facilitating heterophilious interaction. Access to different job positions through social ties data (Table 7) reveals that treatment groups have higher access to upper white-collar (treatment: 48 per cent; control: 40 per cent) and lower white-collar (treatment: 22 per cent; control: 16 per cent) job positions, which primarily involve service providers and elites from the villages and higher social strata. Equally, we find, all such job positions are predominantly accessed through acquaintances (upper white-collar: 83 per cent; lower white-collar: 77 per cent), indicating most of these interactions result in formation of weak ties. This supports the second working theory, outlined in the literature section, that with careful planning and management, creating vertical linkage with upper segments of the society can be an effective way to create social capital for extreme poor women.

## 7. Conclusion

Given the multidimensional nature of extreme poverty and social capital, using quasi-experimental data, we test whether a set of interrelated interventions can create social capital among extremely poor women. We find that BRAC's UPG program interventions have had a significant impact on creating both quantity and quality of social capital among the actively aged extremely poor women participants in the treatment group. However, program interventions appear to have had the most impact on creating the volume of social capital. Furthermore, we find that extremely poor women in the treatment group made more heterophilious interactions and created weaker ties resulting in different dimensions of social capital.

Furthermore, we find program interventions have been successful in creating social capital but only through weak ties. Recognising that implementing a multifaceted or integrated set of interventions comes with challenges, as these types of interventions are resource-intensive and complex to implement, it is vital to consider cost implications and implementer capacity. Considering this aspect, one policy suggestion is therefore to focus on creating opportunities to develop weak ties for extremely poor women, that enable, for example, further connections with other individuals in different professions and higher positions in society. However, in a men-dominated society, most job positions are held by men, and as such, creating these weak ties might involve creating social networks with men who are not family members or friends/neighbours. Due to social and gender norms, women are usually reluctant to maintain these relationships. Even though the program intervention can create an initial network, there is a chance that this social network might not be sustainable. As a result, reinforcement is necessary, which will ensure regular contact, at least for an initial period, to help continue the network in future.

Last, as Bangladesh is a largely homogeneous country in terms of social structure and norms, replicating the interventions on a large scale might be possible without much customisation. BRAC has been implementing these interventions on a large scale across Bangladesh for the last 15 years. However, replicating those in an international context will require more in-depth analysis and understanding of the context and may require special consideration and customisation, prevailing on community structure and gender norms.

## Notes

1. Group 2 participants own a maximum productive asset value of BDT 5,000 (USD 45) and maximum of five decimals of land. Group 3 participants own a maximum productive asset value of BDT 10,000 (USD 90) and a maximum of 30 decimals of land.
2. Service providers include doctors in sub-district hospitals, community health workers, agricultural extension officers, members of local union councils, agricultural traders, and veterinary officers.
3. To program-match the savings of participants by depositing same amount of money in the participant's account as a grant.
4. Uddin and Lawson (2024) outlines robustness checks associated with the PSM technique applied in this paper.
5. NN is a matching technique that uses a certain tolerance level (calliper) to decide which control unit is closest to each treated unit and match those (Greifer 2022).
6. The active-age group is defined by the program as people who are between 16 and 50 years of age.
7. The older age group is defined by the program as participants aged above 50 years
8. 25.92 per cent of the active-age women were engaged in the labour market in comparison to 14.31 per cent of older aged women (BBS 2018).

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