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Can social capital be intentionally generated? A randomized trial from rural South Africa[☆]

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ABSTRACT

While much descriptive research has documented positive associations between social capital and a range of economic, social and health outcomes, there have been few intervention studies to assess whether social capital can be intentionally generated. We conducted an intervention in rural South Africa that combined group-based microfinance with participatory gender and HIV training in an attempt to catalyze changes in solidarity, reciprocity and social group membership as a means to reduce women's vulnerability to intimate partner violence and HIV. A cluster randomized trial was used to assess intervention effects among eight study villages. In this paper, we examined effects on structural and cognitive social capital among 845 participants and age and wealth matched women from households in comparison villages. This was supported by a diverse portfolio of qualitative research.

After two years, adjusted effect estimates indicated higher levels of structural and cognitive social capital in the intervention group than the comparison group, although confidence intervals were wide. Qualitative research illustrated the ways in which economic and social gains enhanced participation in social groups, and the positive and negative dynamics that emerged within the program. There were numerous instances where individuals and village loan centres worked to address community concerns, both working through existing social networks, and through the establishment of new partnerships with local leadership structures, police, the health sector and NGOs. This is among the first experimental trials suggesting that social capital can be exogenously strengthened. The implications for community interventions in public health are further explored.

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Ubuntu - 'I am because you are' (South Africa)

Among the first references to the term social capital was by Hanifan in 1916 when highlighting the importance of community involvement in a successful schooling system (Hanifan, 1916). Over the course of the 20th century, the concept has been further invigorated by the likes of Durkheim, Bourdieu, and Coleman (Baron, Field, & Schuller, 2000; Portes, 1998), and recently by Putnam whose reintroduction of the term into public and academic debate has stimulated an explosion of research on social capital and its effects (Kawachi & Berkman, 2000; Putnam, Leonardi, & Nanetti, 1993).

Social capital broadly refers to the system of networks, norms, and trust relationships that enable communities to address common concerns (Coleman, 1988; Putnam et al., 1993; Woolcock & Narayan, 2000). Research has suggested the potential benefits of social capital in a wide variety of fields including its potential to enhance income attainment (Maluccio, Haddad, & May 2001; Narayan & Pritchett, 1997), economic development (Knack & Keefer, 1997; Wickrama & Mulford, 1996; Woolcock & Narayan, 2000), child development (Hagan, Merkens, & Boehnke, 1995), education (Coleman, 1988), and good governance (Evans, 1997).

There is also a growing literature linking social capital to better health at a population level - from longitudinal studies documenting associations with lower mortality rates (Berkman & Syme, 1979; Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997), improvements in child health (Drukker, Buka, Kaplan, McKenzie, & Van Os, 2005), mental health (De Silva et al., 2004a), and higher levels of selfreported health (Miller, Scheffler, Lam, Rosenberg, & Rupp, 2006). Greater stocks of social capital have been associated with lower levels of sexually-transmitted infections (Holtgrave & Crosby, 2003), alcohol abuse (Weitzman & Chen, 2005), and rates of crime and violence (Galea, Karpati, & Kennedy, 2002). There have also been studies examining social capital at the individual level - examining whether an individuals' investment in social capital carries potential health returns. While studies at this level are more limited, positive associations with better mental health (Veenstra, 2000, 2002) and lower rates of smoking (Lundborg, 2005) have been observed. In Zimbabwe, membership in some social groups and not others has been associated with lower HIV risk (Gregson, Terceira, Mushati, Nyamukapa, & Campbell, 2004). Detailed reviews of this literature are well presented elsewhere (Bolin, Lindgren, Lindstrom, & Nystedt, 2003; Field, 2003; Macinko & Starfield, 2001; Szreter & Woolcock, 2004).

Despite this emerging body of evidence, the discourse on social capital and health has major limitations. Many assessments of social capital have employed diverse and unstandardized measurement tools, and have tended to rely upon purely cross-sectional study designs. While highlighting potentially important relationships between social capital and health, their ability to draw causal inferences have been limited (De Silva et al., 2004a; Macinko & Starfield, 2001). As a theoretical construct, social capital has also been criticized for lacking sufficient clarity and depth (Muntaner Lynch, & Smith, 2001). A recent review also suggests that the application of social capital within public

health has focused too strongly on communitarian notions of trust and reciprocity, while leaving social networks and their implications for access to resources unexamined (Moore, Shiell, Hawe, & Haines, 2005). Others suggest that the concept runs the risk of being used so widely and diversely that its ability to contribute meaningfully to academic and policy discourse is limited (Fine, 2001). Finally, there remains a dearth of research from developing countries, and studies have uncommonly employed complementary qualitative research to add depth to statistical observations.

While associations from cross-sectional studies generate important insights on potential relationships between social capital and health, it is unclear how such observations might translate into community-level interventions. Indeed, a natural extension of previous work would be to ask whether and in what settings might interventions act to strengthen social capital, and whether this results in better health (Harpham, Grant, & Thomas, 2002; Kawachi & Berkman, 2000; Thomson et al., 2004). Better understanding how to work effectively with communities around public health concerns has the potential to strengthen the relevance and application of social capital to public health policy and program development (Hawe & Shiell, 2000).

We recently conducted the Intervention with Microfinance for AIDS & Gender Equity (IMAGE Study), a cluster randomized trial that explored the effects of a combined microfinance and training intervention on levels of HIV and intimate partner violence (IPV), both perceived to be major priority issues in rural South Africa (Pronyk et al., 2006). Over a two year period, levels of physical and sexual violence were reduced by half (Kim et al., 2007), and there were positive shifts in HIV risk behaviour among younger program participants (Pronyk et al., 2008).

One explicit hypothesis of the study was that the IMAGE intervention had the potential to generate changes in social capital – through stimulating participation in social networks, enhancing solidarity, and mobilizing communities around priority concerns including gender and HIV. Social capital was felt to be important both as a secondary outcome, as well as being a pathway variable with the potential to mediate intervention effects (RADAR, 2002a).

A previous analysis of the trial suggested positive shifts in a number of indicators of social capital (Pronyk et al., 2006). The aim of this paper is to review these findings alongside a complementary portfolio of qualitative research, and examine the changes in social capital in response to a microfinance-based community intervention in a rural South African context - asking 'can social capital be intentionally generated?' First, we examine the magnitude of intervention effects on solidarity and reciprocity referred to henceforth as cognitive social capital, as well as network-related structural social capital (De Silva et al., 2004b; Harpham et al., 2002). Second, using qualitative methods we further explore the nature of bonding and bridging social capital within villages receiving the intervention - the former referring to the strength of connections within groups, while the latter referring to connections between more heterogeneous groups (Putnam, 2000). Finally, as this work is housed within a larger

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public health trial, we also draw upon Social Network Theory (Berkman & Glass, 2001) to assess potential mechanisms through which social capital might underpin solidarity and reciprocity, influence the flow of social and material support, and contribute to better health.

Methods

Setting

This study was conducted between June 2001 and March 2005 in South Africa's rural Limpopo Province. The area is densely settled and adjacent to a platinum mining belt. Study villages were between two and 20 km from a main trading centre. Poverty remains widespread (Rose & Charlton, 2003) with high levels of labour migration (Collinson, Tollman, Kahn, Clark, & Garenne, 2005). Few households have land or livestock sufficient to support livelihoods and the major source of income is government grants including pensions and child-support.

The IMAGE intervention

The Intervention with Microfinance for AIDS and Gender Equity (IMAGE) combined a microfinance program (Small Enterprise Foundation, SEF, Tzaneen, South Africa) with a gender and HIV training curriculum (Kim et al., 2007; RADAR, 2002b). The intervention was introduced in communities with no prior access to microfinance services. A participatory wealth ranking process identified the poorest half of households in target villages. These households were offered access to credit through group-based microfinance services for income-generating activities. The intervention used a Grameen Bank model of microfinance delivery and employed standard microfinance best-practice in all respects (Yunus, 1999). Businesses were run by individual women, with loan groups of five guaranteeing each others' loans and repaying together to receive additional credit. Approximately 40 women (eight groups of five) comprised one loan centre which met every 2 weeks to repay loans and discuss their businesses.

Based upon participatory learning and action principles (Freire, 1994), a 12 month training curriculum called 'Sisters-for-Life' (SFL) was implemented during fortnightly loan centre meetings to microfinance participants. The program included two phases: Phase One consisted of 10 one-hour training sessions covering topics such as gender roles, cultural beliefs, relationships, communication, IPV and HIV. Training sessions aimed to strengthen communication skills, critical thinking and leadership. Since groupbased learning can foster solidarity and collective action (Friedman & O'Reilly, 1997), Phase Two encouraged wider community mobilization to engage both youth and men in the intervention communities. Key intervention participants were nominated by centre members for further leadership training, and subsequently worked with their centres to mobilize the wider community around priority issues including HIV and IPV. Each loan centre identified a priority issue (or series of issues over time) and worked together to formulate a village level action plan. Areas to be addressed were at the discretion of loan centres and varied

widely. While SFL trainers helped facilitate group discussion, any individual or group-level activities were led by loan recipients themselves.

Ethical review

The study design was approved by ethical review committees at the University of the Witwatersrand (South Africa) and the London School of Hygiene and Tropical Medicine (UK). The intervention was administered in comparison communities upon study completion.

Quantitative evaluation

A cluster randomized trial was used to assess intervention effects. The study protocol, methodology and study profile have been presented in detail elsewhere (Hargreaves et al., 2004; Pronyk et al., 2006). Briefly, participatory wealth ranking (PWR) was conducted in eight study villages at the outset. Villages were pair-matched by size and accessibility, with one from each pair randomly allocated to receive the microfinance and training intervention, and the other to receive it at the end of the trial period. Quantitative data were collected using face-to-face interviews by female interviewers, who had received 4 weeks of intensive training, including technical, ethical, and safety considerations. The team evaluating the project was separate from those delivering the intervention. As 15 months was required for full cohort enrolment, there was an approximately two-year follow-up period for quantitative

Surveys assessed levels of social capital at baseline and at the end of two years, comparing intervention participants with women of the same age and poverty status selected at random from comparison villages. All study outcomes were defined prior to analysis. Evaluation was done on an intention-to-treat basis and included both active participants as well as drop-outs. The study protocol underwent peerreview at the Lancet (03/PRT/24) and was registered with the National Institutes of Health (NCT00242957).

The number of villages was determined by the operational feasibility of delivering the intervention over a wide geographic area; time required for cohort recruitment and follow up; the need to enroll all eligible households in a village before expanding; and, ethical concerns about withholding participation from comparison villages for an extended period.

Measuring social capital

Measurement instruments were based on the World Bank's Social Capital Assessment Tool and related literature for assessing social capital in developing countries (Grootaert, Narayan, Jones, & Woolcock, 2003; Harpham, Grant, & Thomas, 2002; Krishna & Shrader, 1999). A number of potential measures of social capital were field-tested based on this previous research. Final interview questions were selected to ensure aspects of both structural and cognitive social capital were well captured, alongside the local relevance of potential indicators. Questions and response codes were modified as needed to ensure they were well

understood by both interviewers and respondents. As we were examining the effects of an intervention on access to social capital among recipients, and as a potential mediator of individual health effects, we chose to assess social capital at the individual level. All indicators were pre-defined prior to statistical analysis.

Structural social capital

Structural social capital (SSC) was measured by nature and intensity of participation in community organizations as follows:

Group membership and the level or intensity of membership

$$SSC = \beta(g1) + \beta(g2) + \beta(g3) + \cdots$$

where β is the multiplier for intensity of group membership (1 = member/occasional attender, 2 = active/regular attender, 3 = group leader) and gx is the specific social group (derived from a pre-coded list of 18 potential groups). For SSC, a binary variable was constructed to reflect households below and above median values.

Cognitive social capital

Three variables were constructed for cognitive social capital (CSC) (Table 1):

- Perceived levels of reciprocity and community support (three binary items)
- Perceived solidarity in response to a crisis event (four binary items)
- Taken part in collective action (independent of the intervention itself) (two binary items)

Cronbach's alpha was used to assess internal reliability and the potential to combine responses from several survey questions into single numerical values (Bland & Altman, 1997). Reliability coefficients were: 0.55 for community support, 0.6 for solidarity, and 0.7 for collective action. The values obtained reflect a fair level of internal consistency given the small number of items per scale and the binary response for each item.

Statistical methods

First the socio-demographic characteristics of study households and the profile of social networks at baseline were calculated. Binary indicators were then generated for each CSC variable as outlined in Table 1. SSC was made binary based on whether the score fell above or below the median value. Sensitivity analysis was conducted with social network score as a continuous variable, and the pattern of results remained the same (data not shown).

Because the intervention was randomized at the community level, the assessment of intervention effects on social capital used data aggregated at the village level. A cluster-level analysis was performed by entering the log of village level summaries into an analysis of variance model including terms for the intervention and village pair. This allowed crude measures of effect with 95% confidence intervals to be calculated (prevalence or risk ratios, identified as RR)

Adjusted measures of effect (aRR) were calculated by generating standardized village level summaries. These summaries were calculated as the ratio of observed to expected values with the latter being predicted by fitting a logistic regression model on individual level data

Table 1Outcome variables

Social capital outcome	Question
Structural	
Social network score (score	List of 18 potential community groups
derived from group	Intensity of membership: member (1), active member (2), group leader (3)
$member \times intensity \ multiplier)$	Binary variable: those above/below the median value
Cognitive	
Perceived reciprocity and community support (positive response: yes to any or all)	If a community project does not directly benefit your neighbor but has benefits for others in the village/
	neighborhood, do you think your neighbor would contribute time for this project? Yes or no
	If a community project does not directly benefit your neighbor but has benefits for others in the village/ neighborhood, would your neighbor contribute money (say about 10R/\$1.5) for this project? Yes or no
	If there were a problem that affected the entire village/neighborhood, for instance lack of water or electricity or
	a major flood, which scenario do you think would best describe who would work together to deal with the situation?
	Yes if the entire village would work together to solve the problem
Perceived solidarity in a crisis (positive response:	If your house has been destroyed by fire who could you turn to for shelter for 2 weeks? Yes if you could turn to people you do not know at all
yes to any or all)	If your house has been destroyed by fire who could you turn to for (money) R50 (\$7US) to help you buy clothes after the fire?
	Yes if you could turn to people you do not know at all
	How confident are you that you alone could raise enough money to feed your family for 4 weeks? – this could be for
	example by working, selling things that you own, or by borrowing money from people you know or from a bank or
	money lender? Yes if very confident
	Would you say that your household's ability to survive this kind of crisis is better, the same or worse as it was two years ago? Better or worse/same
Taken part in collective action (positive response: yes to	In the past two years, have you participated in a meeting, march, rally or gathering around HIV/AIDS awareness? Yes or no
one or both)	Have you ever been involved in the organization of such a meeting or gathering? Yes or no

(Donner & Klar, 2000; Grosskurth, Mosha, & Todd, 1995). Baseline data were incorporated as covariates into the analysis to adjust for differences at baseline and to maximize the statistical power of the study (Snedecor, Cochran, & Cox, 1989). The standardized village level summaries were then entered into an analysis of variance model as above, generating risk ratios adjusted for baseline values, marital status and village-level clustering. Inclusion of other variables such as education and unemployment in the model made little difference to the findings and are not presented.

Qualitative evaluation

Qualitative data were collected by two anthropologists and a research assistant over a three year observation period. A variety of different methods were employed, including: non-participant observation of loan centre meetings (n = 4 centres); focus group discussions (FGD) with loan groups purposively selected by age (young, old, mixed) and success of microfinance involvement (good and poor performers) (n = 8 groups followed over 2–3 loan disbursement rounds); key informant (KI) interviews (eight women followed over three years); interviews with program drop-outs (n = 8); and Participatory Learning and Action (PLA) exercises with young people in the wider community (eight groups over multiple sessions). In addition, training facilitators kept diaries for each loan centre (n = 12) describing the specific challenges associated with the training, the response of centre participants, and actions undertaken individually and collectively around priority issues. All qualitative data was translated, transcribed and thematically coded in Nud*ist database (Qualitative Solutions & Research v.6).

Results

Intervention participation and baseline characteristics

Four hundred and thirty women enrolled in the loan program during the 15-month recruitment period, which was in line with program targets of approximately 20% of eligible households based on poverty criteria. Approximately 1750 loans were disbursed over the first three years of program operation, valued at over US \$290,000. Loans were most often used to support retail businesses selling fruit and vegetables, new/second-hand clothes or tailoring businesses. Repayment rates were above 99.7%. The drop-out rate in IMAGE loan centres, where clients repay but do not apply for new loans, was 8% over three years - 50% below the institutional average. Among women successfully followed up, 78% had taken out three or more loans and most were still members of the program. Some 65% attended more than seven training sessions. There were no significant differences in baseline characteristics between those retained in the program and those who left.

Table 2 presents baseline socio-demographic characteristics of study participants. Eight hundred and forty five women from intervention and comparison villages were successfully interviewed at baseline with a response rate of

98%. Baseline characteristics were similar between groups. The mean age of respondents was 42 years. Forty three percent of women were married and nearly 2/3 had a primary school education or less. Respondents were generally long-term residents of the community who reside locally for more than 11 months of the year. Average household size was seven people, formal employment was uncommon, and there were lower levels of unemployment among women participating in the intervention.

Respondents reported membership of religious organizations as most common among 18 social groups in our assessment of social networks, particularly churches (81%) and prayer groups (16%). Burial society membership was widespread (78%), with one third of respondents admitting to being involved in two or more. Savings groups (*stokvels*) were the next most common (18%), followed by membership in political organizations (6%).

Quantitative effects on social capital

Data on intervention effects were derived from 426 loan recipients and 419 matched comparison women. Two-year follow up rates were 90% in the intervention arm and 84% in the comparison arm.

Some baseline differences in social capital were observed, including women enrolled in the intervention being more likely to be members of social groups (p = 0.01) and more likely to believe that community members would support one another in working together towards common goals (p = 0.06).

Table 3 presents changes in social capital after two years of follow-up. After adjusting for baseline imbalances, estimates for all indicators of social capital changed in a positive direction with large effect estimates for most indicators.

Women in the intervention group were more likely to report higher levels of SSC based on increased participation in social groups, and higher levels of CSC reflected by higher levels of perceived community solidarity in a time of crisis and higher levels of collective action. There were more modest shifts in perceptions regarding whether community members would support one another in working towards common goals.

Qualitative effects on social capital

A thematic content analysis of 105 qualitative transcripts pertaining to social capital was undertaken for this study. We present changes in structural and cognitive social capital separately. A distinction between bonding and bridging social capital is highlighted in the analysis (Putnam, 2000, 2004). The former pertained to the nature and strength of relationships within organizations, in this case IMAGE loan groups and centres. The latter captured connections between groups that were more heterogeneous, such as relationships formed between IMAGE-affiliated groupings and organizations in the wider community. Changes in cognitive social capital in relation to bonding 'intra-group' dynamics were further guided by Social Network Theory (Berkman & Glass, 2001) to facilitate a systematic exploration of social capital in relation to

Table 2Baseline characteristics of villages, households and individuals interviewed at baseline

	Intervention group	Comparison group	Chi-squared p-value
Villages			
Number enrolled	4	4	
Mains electricity	3 (75%)	3 (75%)	-
Number of households (mean, range)	1310 (845-2256)	1147 (567-1512)	-
Distance to the main road (mean, range)	9.1 km (0-20)	8 km (0-15.7)	-
Adult unemployment rate (mean, range)*	57% (55-59%)	54% (51-60%)	-
Population sleeping away from home (mean, range)	29% (22-37%)	25% (21-32%)	-
Household access to water from a tap (mean, range)	53% (20-93%)	75% (39–90%)	-
SF households			
Number interviewed at baseline	408	425	
Household size (mean, range)	7 (1–15)	7 (1–19)	0.595**
Household density (people per room) (median, IQR)	0.64 (0.43-0.90)	0.63 (0.43-1.0)	0.938**
Household dependency ratio (<15 or >60 year-olds:	0.67 (0.40-1.0)	0.75 (0.50-1.0)	0.258**
15-60-year-olds) (median, IQR)			
Female headed household	206 (50%)	232 (55%)	0.222
Maximum level of schooling in household is above primary	363 (89%)	380 (89%)	0.838
At least one member of household unemployed*	314 (77%)	370 (87%)	< 0.001
>50% of household (working aged and non-students) are employed/self-employed	143 (37%)	80 (21%)	<0.001
At least one member of household sleeping away from home	206 (50%)	225 (53%)	0.479
Both important incomes are work-related	130 (32%)	67 (16%)	< 0.001
At least one important income is from self-employment/	288 (71%)	141 (34%)	<0.001
Very poor (participatory wealth ranking score <23.9)	239 (59%)	249 (59%)	0.998
Walls made of block or face bricks with cement	120 (30%)	135 (32%)	0.448
Have a toilet facility	323 (80%)	300 (71%)	0.006
Senior females			
Number interviewed at baseline	426	417	
Age (median, IQ range)	41 (34–49)	42 (33-49)	0.946**
Never married	104 (24%)	135 (32%)	0.029
Currently married	187 (44%)	172 (41%)	
Divorced, separated, widowed	135 (32%)	110 (26%)	
Had to beg for food or money in the past year	302 (71%)	305 (73%)	0.501
Level of schooling is above primary	162 (38%)	141 (34%)	0.193
Unemployed (if not a student and aged 15–60 years)	104 (25%)	263 (63%)	<0.001

^{*}Unemployment measured as a proportion of all non-students aged 15–60 years who were unemployed or in irregular work over the past 12 months.

changes in social support (emotional, instrumental/material, appraisal, information) and social influence (norms).

Changes in structural social capital

A woman's choice to take part in the IMAGE program included a commitment to join a 'new' social network. In effect, the introduction of the IMAGE intervention changed the landscape of locally available social groups in a context where group membership was seen an important form of social insurance. The solidarity, trust, and in some cases economic benefits of participation in these provided security for poor households during crisis events.

Participation in other non-IMAGE related community groups was also explored. In some instances, participants said the additional responsibilities associated with the intervention were limiting as they became so busy with their businesses that they were unable to engage in 'regular' social functions or attend to family problems.

However, in most instances involvement in IMAGE served to enhance social network participation. In

some cases, the financial benefits of IMAGE facilitated membership of other organizations that required payment of monthly fees (such as burial societies or *stokvels*, *which* are rotating credit and savings groups).

"SEF [Small Enterprise Foundation] money is not enough to weather family crises. We do society – stokvels and other community help projects for these reasons. There are many societies that do different services. So it is important to join almost every one of them." (FGD)

For others, there was evidence of gradual improvements in self confidence and self esteem, which also encouraged women to increase the frequency and quality of participation in social networks.

"[If I had not gone through the training] I would talk to you facing down, avoiding any form of eye contact with you. I would be very scared to look at you or any other person I was not used to." (KI)

"We do mokgodishwano and stokvels (savings groups) more than before. I think it is because that I see my life differently. I am now more active than before SEF." (FGD)

^{**}Wilcoxon equality of medians test.

Table 3Estimates of the IMAGE intervention effect on social capital

	Baseline			Follow up			
	Intervention, n/N (%)	Comparison. n/N (%)	p-Value	Intervention, n/N (%)	Comparison, n/N (%)	Unadjusted RR (95% CI)	Adjusted RR* (95% CI)
Structural social capital							
More participation in social groups	112/422 (26.6)	53/416 (12.7)	0.01	275/386 (71.2)	133/363 (36.6)	1.96 (1.02-3.78)	1.85 (0.95–3.61)
Cognitive social capital							
Belief in community support towards common goals	242/426 (56.8)	171/419 (40.8)	0.06	232/387 (60.0)	184/362 (50.8)	1.14 (0.39–3.36)	1.11 (0.38–3.24)
Greater perception of community	300/419 (71.6)	264/414 (63.8)	0.35	306/387 (79.1)	179/363 (49.3)	1.68 (0.83-3.39)	1.65 (0.81-3.37)
solidarity in a time of crisis Taken part in collective action	167/407 (41.0)	146/403 (36.2)	0.18	290/383 (75.7)	124/361 (34.4)	2.22 (1.05–4.70)	2.06 (0.92-4.49)

^{*}Adjusted RRs calculated on the basis of expected number of events from a logistic regression model on individual data with independent variables including age, village pair, marital status, and baseline measure. Denominators may vary due to missing data for some indicators.

Changes in cognitive social capital

This section considers dynamics within IMAGE loan groups and centres, and highlights the role of bonding social capital experienced through participation in the intervention.

Bonding - Social support

As the poor have little material collateral, the group lending model works on the premise of shared solidarity to guarantee loan repayments. In nearly all cases, prior trust relationships were emphasized. Thus, women joining loan groups were generally familiar with each other as members of the same church, *stokvel* or burial society. A pervasive theme throughout the qualitative assessment was the fundamental role of trust and solidarity in shaping experience and success within the program.

"I am happy because to work as a group has been a good idea. They say – kopano ke maatla – unity is strength and I tend to agree with it. I do not think we would have made it working as individuals." (FGD).

When noting the types of support provided, nearly all groups cited financial and business advice as important benefits of group membership. However, emotional support was also commonly identified, manifested through assistance between loan group members in dealing with family matters such as illness, problems with children, or abusive partners. One participant remarked "if one member has a problem, the sun will never go down without us knowing it" (FGD).

Participants also noted a number of factors that had the potential to undermine this solidarity including loan repayment problems; a lack of attendance at fortnightly loan centre meetings; leadership problems, particularly if there was evidence of corrupt practice or financial mismanagement; and malicious gossip. These occurred among only a small number of groups and centres.

Bonding – Social influence

Participants recognized that shared norms evolved within loan groups over the course of the intervention, shaped partly through witnessing the success (or failure) of other participants.

Having particularly strong or vocal leaders played an important role in the development of group identity,

serving as inspiration for other members. One member noted of her group leader: "let me tell you that since we joined MM we are living up to our group's name (Itumiseng, "those with pride"). We are doing well under the leadership of MM. We are completely different" (FGD). Several groups cited the importance of a strong centre chairperson as 'setting the tone' – "she should be exemplary" remarked one participant (KI).

While strong leaders were identified an important source of social influence, the role of regular day-to-day interactions with other poor women who did not necessarily stand out from the group, seemed to be equally important to the response of IMAGE participants.

"From rubbing shoulders with hard workers like LM and FM, I have learnt a lot. ...I have met a lot of different people. I have learnt how to bargain for a good price. I feel I am wiser." (FGD)

Bridging social capital

Broadening horizons. Over the course of the intervention, participants described a number of ways in which interactions between IMAGE participants and the wider community took place. For many women, establishing a small business provided an important first opportunity to expand their social horizons – to 'see outside worlds' and 'meet different people'.

"It is important because we see things we did not know, places we did not know. We learn more in seeing different places, like Durban [to purchase stock for a clothes re-selling business]. We now know what the sea looks like...places that we never knew we would reach." (FGD)

Household effects. Evidence from the qualitative data suggests that for many, the content of the training sessions was both challenging and influential. New insights and understandings were first and foremost shared with children and partners. Some noted that "Each time I attend the centre meeting my children will be patiently waiting for me for more news." (FGD)

Furthermore, they noted that prior to the intervention, such openness was unusual.

"These things were secret (sepiri). I never used to talk to my daughter about using condoms or prevention. I am grateful of health talks because they have helped me. My children are listening to me. Such knowledge makes any parent to be brave in facing their children" (FGD).

Participation in collective action. Bringing together the economic and social dimensions of the intervention was an attempt to foster synergy, providing participants with both the means (income/empowerment) and the knowledge to address priority concerns. Some participants chose to work as individuals or small groups to engage wider community structures. For others, loan centres were the locus of mobilizing to address common problems. Examples of each will be presented below. The 'success' of these efforts was difficult to gauge, and the process of community mobilization was inevitably fluid, rarely straightforward and highly unpredictable. Notably, not all centres or individuals engaged in such activities and the qualitative data suggest that for many, it was sometimes easier to engage in the 'public domain' than take steps to engage the 'private domain' at home.

There were a number of strategies employed by IMAGE participants to disseminate new insights and perspectives. Most chose to work through existing social networks in their communities. In some instances, centres targeted their churches and burial societies for gender and HIV/AIDS awareness raising initiatives and reported back at loan centre meetings. In other cases, women were individually tasked with visiting local clinics, hospitals and police stations to find out what services were available for victims of domestic violence. Others approached soccer clubs or primary schools as entry points for engaging young people.

Perhaps the most common form of action taken by IMAGE participants was as mediators in local conflicts. Participants described being asked to intervene in relationships and family crises. Most often, this took the form of marriage or relationship counselling, although in some instances, the interventions made by participants were quite dramatic such as actively preventing two young girls from being raped by a family member in one case, and in another, acting to address a situation where an older woman was being raped by her grandson. One IMAGE participant brought a civic leader to a fellow villager's home to assist in resolving a situation of parental neglect and abuse of a six year old daughter.

"Some women of the community have come to us for help. Remember the time when some woman asked us to help her with alcoholic sister who used to leave her child everywhere when drunk? Do you remember what we did? This is what being SEF member means to me." (FGD)

Events in which an entire loan centre took part to address a common concern presented the most visible manifestations of bridging social capital. Some centres identified problems that were clearly linked to gender and HIV, while others chose to focus on broader issues such as water supply, or disputes between leadership structures in the village. The data also suggest that a pre-condition for wider collective action was a well-functioning microfinance program. Among centres struggling with loan

repayment problems, leadership challenges or lack of trust between members, community mobilization activities were much more limited.

There are numerous examples of collective action and 'bridging effects' between loan centres and the wider community. It is important to note that within the context of the IMAGE intervention, these efforts were driven by participants themselves and not by the training team. While not an exhaustive list, loan centres organized at least 40 village workshops, 16 meetings with leadership structures, five civic marches, two partnerships with local institutions, and formed two new village committees to address common concerns.

Specific examples include:

- Bringing a men's group from Johannesburg to conduct a workshop for men and boys in their rural community.
- Forming relationships with a local home-based care group, where they worked together on referrals and exchanging information.
- A civil protest at a local police station after a centre member was raped. The favourable and supportive response of the police resulted in the formation of a Village Rape Committee that brought loan centres together with representatives from the police, traditional leadership structures and teachers.
- After a meeting with a local chief to discuss community safety issues, a new community group called Women Against Crime was formed. This group identified alcohol as a key driver of violence and HIV, and succeeded in establishing an early curfew at local liquor store, and in stopping the sale of alcohol to minors.
- Two loan centres worked together to organize a civic protests in support of the 16 days of activism for no violence against women.
- After many attempts to chart a conciliatory resolution with a local clinic around the quality of services, loan centres held a sit-in in the office of a local hospital manager. They received a sympathetic hearing, and the meeting resulted in the children of loan centre members becoming volunteers at their local clinics.

"Some community members used to think that they (the centre) were crazy when they started mobilizing for the hospital issue. They used to think that the women would never succeed. Some even said that the police would shoot at the women if they do what they wanted to do. But now that things have changed for the better those people are also benefiting." (KI)

Discussion

This study suggests that an intervention combining group-based microfinance with gender and HIV training has the potential to catalyze shifts in multiple dimensions of social capital among participating households relative to a matched comparison group over a two year period.

Effects on structural social capital appeared large, with evidence of expanded social group membership. In this area of rural South Africa, involvement in religious organizations, financial savings organizations, and political parties were the major social groupings identified. There was also evidence to suggest effects on cognitive social capital associated with participation in the IMAGE intervention, particularly solidarity and collective action.

We used a randomized, controlled design with multiple intervention and comparison communities to generate unbiased estimates of effect. Baseline differences were observed for some indicators, such as women who had been previously employed (including in the informal sector) and more likely to participate in social groups. While the study design and analysis allowed us to adjust for these differences, this unevenness highlights a form of selection bias among 'early adopters' of the intervention that is common to evaluations of microfinance programs (Armendariz de Aghion & Morduch, 2005). The design also accounted for secular changes associated with South Africa's rapid pace of social and economic transformation. This was evidenced by shifts in some outcome measures noted in the comparison group during the study period, including structural social capital. In our case, this likely reflected an increased access to government grants in the study site, including pensions and child-support grants - which increased capital required for membership in some social groupings. The use of comparison groups and accounting for the effects of secular change represent a substantial advance over previous research on both social capital and microfinance where experimental evaluations have been virtually absent (Armendariz de Aghion & Morduch, 2005; Macinko & Starfield, 2001; Pronyk, Hargreaves, & Morduch, 2007).

As the logistical and ethical challenges cited above constrained our ability to simultaneously enroll large numbers of villages, our study is limited by wide confidence intervals unlikely to exclude unity for many indicators. Thus the interpretation of our findings is based on the size, consistency and congruency of changes in pre-defined study outcomes, alongside concurrent changes observed through an extensive portfolio of qualitative research (Habicht, Victoria, & Vaughn, 1999). An additional limitation is that this study does not make any assertion regarding the differential effects of each intervention component. Rather, it examines the IMAGE package of microfinance and health training vs nothing. Finally, it is important to note that as the intervention targeted the poorest half households in villages, the generalizability of the approach may be limited.

While statistical measures assessed the presence or absence of changes in social capital, qualitative methods present a far more complex picture of diverse responses to the intervention. With respect to social networks, while there was some evidence that additional responsibilities associated with IMAGE impeded further group membership, more commonly the reverse was the case. The combination of microfinance and training generated additional financial resources for participants, while simultaneously enhancing self-confidence and self-esteem. The positive effects of the intervention on numerous dimensions of empowerment have been highlighted elsewhere

(Kim et al., 2007). Taken together, this expansion of financial and social resources seemed to improve both the quantity of social network membership as well as the quality of participation in these groups.

Qualitative research also drew attention to the bonding and bridging dimensions of social capital. Trust relationships within loan groups were viewed as central to establishing successful businesses, a factor noted in previous research on social capital from the microfinance sector (Karlan, 2001). Loan groups and centres provided opportunities for the exchange of emotional and financial resources, allowed mentorship and role-modelling to take place, and generated a strong sense of group identity and common purpose among participants. Findings also depict how these processes could be easily undermined by poor financial performance and loan repayment problems, a lack of attendance at meetings, corruption, and malicious gossip within centres.

While quantitative effects on collective action were rather narrowly defined, qualitative data provide much more detailed and nuanced picture of social engagement, drawing attention to forms of 'bridging social capital' where participants worked individually and collectively to define and address priority issues in the wider community. Women made changes close to home, through engaging children and partners in sensitive discussions, and then began to be drawn in to mediate what were sometimes quite serious and challenging household crises among neighbors. Many participants also utilized existing social groups, such as churches and burial societies, as entry points for disseminating their new knowledge and perspectives gained from the training program within their villages. Finally, there were numerous instances where loan centres worked collectively to address priority concerns - establishing effective partnerships with village leadership structures, the police, the health sector and local NGOs. However, our data caution that the potential for such bridging opportunities are limited in the presence of a poorly functioning microfinance program - findings echoed in experience elsewhere (Barr, 1998; Huda, Rahman, & Guirguis, 2005).

This work represents one of the few longitudinal studies to provide encouraging evidence that social capital can be intentionally generated in relatively short programmatic time frames. This is in contrast to Putnam's proposal that the accumulation of social capital takes place only very slowly (Putnam et al., 1993). In their review, Kawachi and Berkman (2000) note that we have a far better understanding of forces that undermine social capital, as opposed to examples of interventions that strengthen it. However, others suggest that social capital may not be quite so historically fixed, and that it might be possible to build up social capital within relatively short spans of time (Schneider, Teske, Marschall, Mintrom, & Roch, 1997). Furthermore, it has been suggested that social capital gains might be accelerated through creative institutional partnerships, and by working at many levels simultaneously (Evans, 1997). IMAGE brought together health and development components to an intervention which may have produced synergistic effects on the generation of social capital.

There has been debate as to whether social capital constitutes a positive social resource in settings where material deprivation is quite marked (UNESCO, 2002).

Some put forth that the entire discourse risks overly romanticizing community life, drawing attention away from pressing debates on poverty and inequality (Muntaner et al., 2001; Navarro, 2004; Ziersch et al., 2005). This study supports previous experience from South Africa suggesting that in the absence of other forms of capital, social capital does have the potential to play a critical role in supporting livelihoods and generally buttressing social and economic vulnerabilities (Gilbert & Walker, 2002). Our work also resonates with research from the development sector suggesting that communities endowed with rich and diverse social networks may be in a stronger position to confront poverty and vulnerability (Moser, 1996), share beneficial information (Isham, 1999) and resolve disputes (Schafft & Brown, 2000). Indeed, wide social networks have been deemed quite useful in catalyzing the success of development projects (Isham, Narayan, & Pritchett, 1995).

Perspectives and lessons learnt about social capital from this study have important implications for public health, with particular application to the design and implementation of community interventions. These interventions attempt to influence the risk of a disease in individuals by addressing the conditions that contribute to and sustain vulnerabilities at the population-level (Sorenson, Emmons, Hunt, & Johnston, 1998). The success of community interventions often lies in their ability to engage and strengthen social capital. They are grounded in the notion that healthy behaviour is better shaped by influencing social norms and negotiating collective identities, rather than through providing individuals with factual information (Stockdale, 1995). Ideally, interventions are designed through community consultation and involvement, and their implementation capitalizes on existing social networks (Sorenson et al., 1998). 'Process' is as important as outcome, and notions of 'community competence' (Israel, Checkoway, Schultz, & Zimmerman, 1994) and 'community empowerment' (Wallerstein & Bernstein, 1994) feature prominently.

Over the past two decades, trials have been conducted in schools, workplaces and entire communities to reduce the risk of a variety of conditions such as heart disease, cancer, substance abuse and HIV infection. Interventions have varied from intensive screening and risk-factor management, to awareness raising and social marketing, to policy-level interventions such as increasing taxation on cigarettes. Their effects on chronic disease in industrialized countries have thus far been mixed (Susser, 1995). However, a recent cluster randomized trial of a facilitated learning intervention with women's groups in Nepal demonstrated dramatic reductions in neonatal and maternal mortality (Manandhar et al., 2004). It is possible that in developing countries, where health challenges and the space to improve remain great, and where the reach of secular change to comparison communities may be slower, the design and testing of such interventions could hold much promise. We hope this work stimulates further research in this regard.

Conclusion

There remains much to learn about interventions to strengthen social capital, the process of community mobilization, and techniques to foster sustainable community participation in health. In the IMAGE Study, a multi-level intervention that provided economic, social and educational inputs resulted in reductions in levels of violence and HIV risk behaviour. While the data presented here suggest plausible shifts social capital may have taken place in the context of the intervention, they may not explain the whole story. Further analysis of the relative contribution of the various inputs to observed health benefits is currently underway – in an attempt to 'unpack the black box' (Wight & Obasi, 2003).

Nonetheless, we suggest that applying a social capital framework to address major public health challenges in Africa was important and useful. It allowed for a rigorous and theory-driven assessment of both process and outcomes, alongside a deeper understanding of how to work effectively in communities where new insights and opportunities to further gains in health and development are urgently required.

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