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# Women's Autonomy and Subjective Well-Being in India

## How Village Norms Shape the Impact of Self-Help Groups<sup>1</sup>

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## **Abstract**

This paper presents quasi-experimental impact estimates of women self-help groups on subjective well-being in Orissa, India. We find that, on average, self-help group membership does not affect subjective well-being. However, our results at the same time reveal that subjective well-being sharply declines for those members whose newly gained autonomy meets with relatively conservative social gender norms among non-members. We interpret this finding as evidence for heterogeneous losses of feelings of identity for self-help group members. Identity losses loom larger when women's enhanced autonomy implies a stronger violation of social gender norms at the community level. Social sanctioning mechanisms play an important role in the heterogeneous negative impact on subjective well-being, as evidenced by qualitative accounts of women's empowerment trajectories in the research area.

**Keywords:** Autonomy, Subjective Well-Being, Impact Evaluation, Identity, Sanctioning, India

**JEL Codes:** I38, O12, D03

## 1. Introduction

Self-help groups (SHGs) are nowadays the most popular strategy for empowering women in India (Jakimow and Kilby, 2006). SHGs are groups of 10 to 20 women<sup>i</sup> initiated by a development agency, which are usually involved in savings and credit programs and/or advancing group members' claims or rights (Thorp, Stewart and Heyer, 2005). Previous studies suggest that SHG programs have had a positive impact on consumption and asset levels at the household and community level in India (Deininger and Liu, 2009a and Bali Swain and Varghese, 2009). Evidence on the impact of SHGs on empowerment is more mixed. Bali Swain and Walentin (2009) and Deininger and Liu (2009b) find positive impacts of SHGs on a latent variable of women empowerment composed of female attitudes, and an index of women's autonomy and political participation, respectively.<sup>ii</sup> In addition, Holvoet (2005) finds suggestive evidence for positive impacts of SHGs on investments in girls' healthcare in southern India. Garikipati (2008), however, argues that a non-patriarchal hold on productive assets is a necessary but unfulfilled condition for positive impacts of SHGs on empowerment in India.

To our best knowledge, the current study is the first to turn its attention to the impact of SHGs on subjective well-being (SWB), using data from a survey we administered in 2008 in the districts of Bolangir and Puri in the Indian state of Orissa. Empowerment is generally defined as the "expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them" (Kabeer, 1999, p. 437). Perceptions of freedom and control over choices are conceptually related to this definition of empowerment, and were found to predict SWB better than any other known factor, also in India (Verme, 2009). SHGs could thus have a positive impact on SWB through the channel of empowerment, which consists of a resources, agency and achievements dimension. Agency can be defined as the

individual ability to define goals and act upon them (Kabeer, 1999). This paper mainly focuses on the link between a key component of agency, i.e., autonomy, and SWB.

Although SHG membership could have a positive impact on SWB through the channel of empowerment, the latter often requires the transgression of social gender norms. Conservative social gender norms, reflected in the view of women as being shy, not assertive and subordinating their life to their husband (Agarwal, 2007), are clearly visible in Orissa. Its violation, in the sense that individual abilities to act upon goals are not accepted in the wider community, could result in decreases in SWB by the loss of feelings of identity (Akerlof and Kranton, 2000). To comprehend this relationship, we have to take into account gender relationships outside the household (Agarwal, 1997). Starting from these notions and the well-known identity model of Akerlof and Kranton (2000) we formalize the argument that SHG membership could have heterogeneous impacts on SWB, which are more likely to be negative if social gender norms at the village level are relatively conservative.

Applying propensity score matching we fail to find significant average treatment effects on the treated (ATT) of SHG membership regarding SWB. However, the analysis provides strong evidence for negative impacts of SHG membership on SWB in villages with relatively conservative social gender norms. The heterogeneous impacts on SWB are likely driven by members' enhanced autonomy, which we show is strongly correlated with SHG membership. A triangulation of findings from propensity score matching, instrumental variable regression analysis and qualitative research suggests that this relation is a causal one.

The evidence is consistent with our identity-based interpretation of the link between SHG membership and SWB. This interpretation is further supported by in-depth interviews showing that transgressions of social gender norms through autonomy are often accompanied by social sanctioning by other community members. Finally, the heterogeneous impact of

SHG membership on SWB is robust to a wide range of specification tests and the inclusion of relatively large magnitudes of unobserved heterogeneity.

The remainder of this paper is structured as follows. First, we describe the context of our study and our analytical framework. Subsequently, we present our survey data, including the operationalisation and descriptive statistics of our key variables. This is followed by the econometric specification and the results presenting impacts of SHG membership on women's autonomy and SWB. Finally, we present our conclusions.

## **2. Context and analytical framework**

### *2.1 Context*

Our study takes place in the state of Orissa, which is one of the least-developed states in India featuring the highest income poverty rate in the country (Government of Orissa, 2004). For our survey, we selected the two districts of Bolangir and Puri, to capture some of the intra-regional variation in Orissa. Although poverty is higher in Bolangir than in Puri, the male-female ratio, which is 109 in Puri and 103 in Bolangir, suggests that gender-inequality is worse in Puri than in Bolangir.<sup>iii</sup> The share of non-adult married women is, however, four times as high in Bolangir (0.58) as in Puri (0.14), which casts some doubt on the stronger position of women in Bolangir (Government of Orissa, 2004).

To gain a better understanding on the manifestations of empowerment in the context of Orissa, in-depth interviews with self-help group members and non-members were undertaken alongside the survey in March 2007 (in 4 villages in Bolangir and 5 villages in Puri) and from January-March in 2008 (in 5 villages in Puri). The interviews were not undertaken in a representative sample of villages. Instead, the interviews should be seen as a way to uncover underlying processes, i.e., to provide insight into how an intervention works (Bamberger et al., 2010). The interviews indicate that social gender norms restricting women's autonomy clearly exist in both Puri and Bolangir. A woman going out in public is

likely to meet disapproval, as illustrated by the following excerpt from an interview in one of the communities in our sample;

“Interviewer: Are women getting enough respect from men?”

Respondent: No, there are many conflicts between men and women.

Interviewer: What kind of conflicts?

Respondent: In and outside the families, men scold at women.

Interviewer: Outside the family?

Respondent: In the community, men scold.

Interviewer: They also scold at you?

Respondent: Yes

Interviewer: What are they saying then?

Respondent: They yell at me and say: ‘why are you going outside the house? Why are you going to meetings? You should stay in’.”

Violators of social gender norms are not merely subject to ‘external’ social sanctioning by other community members. Increases in emotional distress could also result from anxieties and tensions arising with newly adopted non-traditional roles (Ahmed, Chowdhury and Bhuiya, 2001) that are related to internalized psychological rules about sex-typed standards (Akerlof and Kranton, 2000 and Wood et al, 1997). We will label the transgression of internalized psychological rules as ‘internal’ sanctioning in this paper. Recent experimental research has shown that nonmonetary sanctions, in the form of expression of disapproval, can help to sustain social norms (Dugar, 2009), which could obviously also be the case in our setting. Both internal and external social sanctioning could act as barriers to increased empowerment.

Through group lending schemes and the organization of supplementary trainings, which may range from meetings imparting business skills to camps aimed at increasing

awareness of women's legal rights, both NGO-supported and government-supported SHGs stimulate the challenging of social gender norms in Orissa. In-depth interviews among SHG members suggest that SHGs primarily focus on generating income for SHG members, although NGO-supported SHGs put a somewhat stronger emphasis on meetings about social issues than government supported SHGs.

Participation in SHGs could change attitudes towards gender roles, either because of increased income earning capabilities (Khandker, 2005) or because of meetings of SHGs, in which women are exposed to new ideas and become more aware of their subordinate social position (Jakimow and Kilby, 2006). Our interviews suggest that SHG members have a greater autonomy in public space than in the past as illustrated by the following quote by a respondent; "Before we were inside the house and had not seen anything, not a bank, not an office, a police station, a court and so on. We had no experiences. But the bird escaped from cage and moved from one tree to another. With the group we have come to see new things and have seen new places and we have been lucky to see police station, bank courts, offices etc."

Based on this information, we would expect a positive relationship between SHG membership and autonomy. SHG membership could also influence other components of agency, such as attitudes towards male control over women and domestic violence. The enhanced freedom that an improvement in agency brings should exert a positive effect on SWB for SHG members. However, it is unclear whether the possible increases in SWB would outweigh the decreases potentially resulting from sanctions after the violation of social gender norms. In our subsequent analytical framework we will elaborate further on the relationship between SHG membership, agency and SWB. In our estimation strategy, we will also pay attention to the difficulties associated with demonstrating causal relationships between SHG membership, agency and SWB in the presence of self-selection into SHGs.



## 2.2 Analytical Framework

As explained in the previous section, agency and SWB could be related in different ways. Arguably, the positive effect of empowerment on SWB, through the channel of agency, will only dominate the negative effect of social sanctioning on SWB, if the social costs of violating prevailing gender norms are relatively low. To illustrate this mechanism, we follow the economic model of identity as discussed by Akerlof and Kranton (2000).

$$U_j = U_j(a_j, a_{-j}, I_j) \quad (1)$$

$$I_j = I_j(a_j, a_{-j}, c_j, \varepsilon_j, P) \quad (2)$$

Equation 1 derives utility  $U$  of person  $j$ , which depends on identity  $I_j$ , actions  $a_j$  and others' actions  $a_{-j}$ .  $j$ 's actions also determine  $j$ 's consumption of goods and services, which guarantees that standard economic factors are incorporated in the model (Akerlof and Kranton, 2000). Equation 2 derives  $j$ 's identity  $I$ , which depends amongst others on  $j$ 's assigned social category  $c$ . The social status of this category is given by the function  $I_j(\cdot)$  and a person assigned a social category with higher social status may enjoy an enhanced identity. The extent to which  $j$ 's own characteristics match the ideal of the social category, as indicated by the prescription  $P$ , is captured by  $\varepsilon_j$ . Feelings of identity depend on the extent to which  $j$ 's own and others' actions correspond to prescribed behavior indicated by  $P$ . Gains or losses in identity are depicted by increases or decreases in utility that derive from  $I_j(\cdot)$  (Akerlof and Kranton, 2000).

In our context, departures from the idealized social gender norm through enhanced agency are represented in changes in actions, which have two effects in an empowerment process without second-order effects.<sup>iv</sup> First, agency could result in utility gains through gains in freedom. These utility gains could be realized directly but also through actions, such as the setting up of small businesses. Second, agency results in actions that do not correspond to prescribed behavior according to the idealized social gender norm, which could result in

social costs through identity losses. These social costs can be further subdivided in internal and external sanctioning costs.

In our analytical framework, we interpret social gender norms as exogenously determined context characteristics. We believe that SHGs can only transform social gender norms in the long run, after a dynamic process, just like fertility programs in Bangladesh were only able to transform social norms about fertility in the very long run (Munshi and Myaux, 2006). This does, however, not prevent SHGs from stimulating individuals to challenge social gender norms in the short run. For this reason, the exercising of agency by individuals is most likely dependent on the individuals' belief about the likelihood and strength of sanctioning after empowerment. Beliefs about social sanctioning could be related to SHG membership, if the SHG serves as a form of social legitimization of behavior that challenges the social gender norm, as discussed in Ray (1998, p. 323) or if SHG members challenge the social gender norm more often than non-members prior to joining the SHG. If this is the case, we would expect SHG members to have more optimistic beliefs about social sanctioning than non-members, in the sense that sanctions are believed to be few and mild, because of microfinance, meetings about social issues or self-selection. Individuals will only choose to depart from the idealized social gender norm when they believe that the expected benefits of challenging social gender norms outweigh the expected costs. If SHG members have more optimistic beliefs about sanctioning, we would expect a positive correlation between SHG membership and agency, as hinted at in our earlier discussed qualitative data. Moreover, we would expect a causal impact of SHG membership on agency, if SHG members become more optimistic after the legitimization of behavior that challenges the social gender norm by the SHG.

Individual beliefs about the likelihood and strength of social sanctioning not necessarily have to be correct. Other modeling exercises related to social sanctioning of the

violation of social gender norms have, amongst others, tried to explain the fertility transition in Bangladesh (Munshi and Myaux, 2006). A model was derived in which a woman that chooses modern reproductive behavior gets sanctioned if she meets a conformist woman, i.e., a woman with a conservative social gender norm. The proportion of women with conservative social gender norms in the village is uncertain, such that the chance to be sanctioned is ex-ante unknown for the women in the model. In our analytical framework, SHG members are more likely to be overoptimistic in villages with relatively conservative social gender norms if the likelihood and/or strength of social sanctioning are dependent on the conservativeness of the social gender norm. Therefore, we would expect increases in utility for SHG members if the social gender norm is sufficiently liberal, while we would expect decreases in utility for SHG members if the social gender norm is sufficiently conservative, assuming that the social legitimization of the exercising of agency by SHGs works similarly in villages with relatively conservative (liberal) social gender norms. Our analytical framework thus predicts heterogeneous impacts of SHG membership on utility, which depend on the conservativeness of the social gender norm.

More formally we could define the change in expected payoffs from challenging social gender norms for SHG members as in equation 3. The change in expected payoffs after SHG membership depends on gains in agency represented in changes in actions  $a_j$ , losses in identity  $I_j$  resulting from internal sanctioning, which depend on changes in actions  $a_j$ , and losses in identity  $I_j$  resulting from external sanctioning, which depend on actions of others  $a_{-j}$  (sanctions).  $\beta_j$  is a parameter that defines the positive change in utility after gains in agency for woman  $j$ , represented in changes in actions  $a_j$ , as a result of SHG membership.  $\gamma_j$  is a parameter defining the negative change in utility from identity losses after internal social sanctioning for woman  $j$ .  $Pr_i$  is the probability of external social sanctioning after the

challenging of social gender norms in village  $i$ , and is positively related to the conservativeness of the social gender norm  $S$  in village  $i$ .  $\mu_j$  is a parameter indicating the negative change in utility after identity losses from external social sanctioning for woman  $j$ .

$$E\left[\frac{\partial U_j}{\partial SHG_j}\right] = E\left[\beta_j\left(\frac{\partial a_j}{\partial SHG_j}\right) + \tau_j\left(\frac{\partial I_j(\partial a_j)}{\partial SHG_j}\right) + \Pr_i(S_i)\mu_j\left(\frac{\partial I_j(\partial a_{-j})}{\partial SHG_j}\right)\right] \quad (3)$$

Admittedly, we should be careful to draw general conclusions from our model, because it describes a static picture without second-order effects. Individuals could shift their belief about social sanctioning back to their belief before the social legitimization of the violation of social gender norms, when they would be disappointed with utility losses resulting from social sanctioning. There exists some experimental evidence for such a mechanism (Van Kempen, 2009). Explicit use of sanctioning has, however, also been shown to result in stronger violations of social norms among the punished (Fehr and Rockenbach, 2003 and Fehr and List, 2004). These violations are consistent with psychological game theory, as developed by behavioral economists (Rabin, 1993), in which strongly reciprocal individuals respond kindly towards actions that are perceived to be kind and hostile to actions that are perceived to be hostile, such as sanctioning. Therefore, it remains unclear whether disappointment with utility losses for SHG members would result in a return to their level of agency before the legitimization of the violation of the social gender norm.

SHG members could also legitimize the transgression of social gender norms for non-members if social networks result in a dynamic diffusion of beliefs from SHG members to non-members. Under this condition, the cost of sanctioning for the sanctioners could in the long run become too high, if too many women break the social gender norm. In this case, cultural adjustment through breaking social gender norms would be in the long-term interest of SHG members (Kuran, 2004) and there would not be any trade-off between agency and social sanctioning. Deininger and Liu (2009a) and Janssens (2010) provide suggestive

evidence on the presence of empowerment externalities from SHGs, demonstrating that levels of empowerment are higher for non-SHG members in villages with SHGs than for women in villages without SHGs.

A model accounting for such dynamic equilibria is beyond the scope of this paper (Munshi and Myaux (2006) discuss such a model), because our cross-section data would not allow us to analyze the dynamic relationships between SHG membership, agency and SWB. It is nonetheless important to realize that relationships between SHG membership, agency and SWB could also be interpreted taking into account these dynamic relationships. In our multivariate data analyses in section 4, we will test whether SHG members experienced an improvement in autonomy, one of the components of agency. In addition, we will estimate the impact of SHG membership on SWB as a proxy for utility, taking into account the possible heterogeneous impacts in villages with relatively conservative (liberal) social gender norms. However, we will not be able to demonstrate possible shifts to the dynamic low-empowerment equilibrium level, nor the potential stronger violation of social gender norms after social sanctioning or empowerment spillovers to non-members. In the interpretation of the results, we will nevertheless take into account the possible dynamic relationships between SHG membership, agency and SWB.

### **3. The Survey Data**

#### *3.1 Sampling Design*

For our survey we selected households from 19 villages, of which 9 are situated in Puri and 10 in Bolangir. In each village 20 households were interviewed; 12 or 13 households with SHG members and 7 or 8 households without SHG members.<sup>v</sup> The survey consists of 9 sections that related to all household members; a household roster, employment and income, migration, transfers, consumption and production, credit, housing, education and health. Besides, in each household with SHG members the SHG member and his/her spouse were

individually interviewed about issues related to social capital and empowerment, just like the household head and his/her spouse in each household without SHG members. Each village in our survey contains at least one government-supported or NGO-supported SHG. Discussions with coordinating NGO and government officials and a number of field visits suggested that it would not be possible to select comparable villages where no SHGs were active in either Puri or Bolangir.

Participation in government-supported SHGs is only possible for below-poverty-line households. To assure comparability between government-supported SHG members, NGO-supported SHG members and non-members, only below-poverty-line households were interviewed.<sup>vi</sup> Besides, within this category relatively poor households were selected by restricting the sample to those with monthly SHG saving rates of no more than 30 Rupees. Very poor households might be excluded from SHG membership due to limited saving capabilities. The threshold of 30 Rupees was set to assure comparability between possibly excluded non-member households and households with SHG members. Apart from these criteria, both households with and without SHG members were randomly selected. In total 400 households were interviewed; 124 households had at least 1 household member that participated in an NGO-supported SHG, 129 households had at least 1 household member that participated in a government-supported SHG and 147 households had no SHG members.

In the remainder of this paper, women in households without female SHG members will be used as a comparison group for female SHG members. Men, however, also participate in SHGs in certain villages of our sample. Of the 19 villages in our sample, 13 villages (9 in Bolangir and 4 in Puri) contain SHGs with male members. We will focus on the impact of female membership in SHGs. Whenever necessary, we will control for male membership in SHGs in our empirical specifications.

### *3.2 Empowerment profile of the sample*

In this section we focus on indicators for empowerment of SHG members and non-members. These indicators will give us approximations of the conservativeness of the social gender norm of non-SHG members and the magnitude of the deviation from the social gender norm by SHG members. Fehr and Gächter (2000) define a social norm as “1) a behavioral regularity that is 2) based on a socially shared belief of how one ought to behave, which triggers 3) the enforcement of the prescribed behavior by informal social sanctions.” The mean level of empowerment of non-SHG members at the village level, which is a proxy for the level of empowerment of SHG members in the absence of SHGs, could be seen as the traditionally shared belief among women in the village of how women ought to behave. Deviations of SHG members from this social norm could trigger external social sanctions of non-SHG members. Therefore, we would expect stronger utility losses for SHG members in villages with relatively conservative social gender norms, but only if SHG members deviate from the social gender norm of non-SHG members considerably, i.e., if there are significant differences in empowerment between SHG members and non-members.

Although we mainly focus on women’s agency, we also discuss a number of ‘resources’ in our descriptive statistics. Besides, we also discuss indicators related to male tolerance of women’s agency, because male attitudes could be indirectly influenced by SHG membership of their wives. The first part of table 1 clearly shows that households with SHG members have more economic resources in the form of savings, loans and assets than non-members. Savings and loans in SHGs are significantly higher for households with SHG members, as well as the level of loans from family and friends. The saving level in non-SHG saving groups is significantly lower for SHG members, which suggests that there has been substitution of savings away from saving groups to SHGs. Households with SHG members also have more assets available in their household. They are significantly more likely to own

livestock. In addition, the estimated size of their land is significantly higher than the estimated size of the land of households without SHG members and women have a significantly higher chance to own land. Arguably, the pre-condition of economic resources for empowerment is fulfilled to a greater extent for SHG members. Economic resources in the form of savings, loans and assets are only one of the ways in which SHG members can achieve agency, as we discussed in Section 2. Disentangling the impacts of increased income earning capabilities and meetings of SHGs is, however, beyond the scope of this paper.

With regard to agency, we focus on autonomy, male control over women and domestic violence. Concrete autonomy indicators in our survey relate to the degree of freedom women have to leave the house without permission. Both men and women were asked for their agreement with statements related to the freedom of women to go to the market and visit a doctor without male permission. Men were also asked for their agreement with the statement “Women should be able to go to community meetings on their own”. Comparable empowerment indicators were used in a recent impact evaluation of an SHG program in Andhra Pradesh in India. In this study, economic empowerment of women was based on “whether a woman can set aside money for her own use, go to the market, to the clinic or the community center, visit friends, or work on fields outside the village, without asking permission from her husband or other males from the family” (Deininger and Liu, 2009a). In more abstract terms, respondents in our survey were also asked for their agreement with the statement “I have control over my own life” on a Likert scale from 1-5. The statement serves to see whether concrete conceptualizations of autonomy are actually related to perceptions about control.

The exact wording of the statements and descriptive statistics are reported in the second part of table 1. The table shows some differences in autonomy between SHG members and non-members. SHG members show a significantly higher agreement with the statements



“I have control over my own life and “I am able to go to the market without asking a man”.

However, we find no significant differences in the women’s autonomy to visit a doctor. We also encounter some significant differences in male attitudes towards women’s autonomy. Spouses of SHG members show a significantly higher agreement with the statements “Women should be able to go to community meetings on their own” and “Women should be able to go to the market without male permission”. We find no significant differences in male tolerance of women seeing a doctor without requesting permission from them first. The differences are not necessarily related to impacts of SHG membership. Spouses of SHG members also show a significantly higher agreement with the statement “I have control over my own life”, which indicates that characteristics of spouses could play an important role in self-selection into SHGs. However, even if the significant differences in autonomy are not related to SHG membership, our results still show that SHG members deviate considerably from the social gender norms of non-members. Our data on autonomy also indicate that there are considerable differences in social gender norms across villages (the mean percentage of non-SHG members that have the freedom to go to the market runs from 0 to 62% across villages). This gives us the statistical power to estimate heterogeneous impacts of SHG membership on SWB in villages with relatively conservative (liberal) social gender norms in later stages of this paper.

Data about attitudes towards male control over women and domestic violence were collected, by asking both men and women for their level of agreement with the statements “Men are entitled to command their women” and “Men are entitled to beat their women on certain occasions” on a 5-point Likert scale. A comparable indicator related to domestic violence was used in a different study on India, relating the introduction of cable TV to attitudes towards domestic violence. In this study, women were asked whether it is acceptable for a husband to beat his wife (Jensen and Oster, 2009). Descriptive statistics about statements

related to male control over women and domestic violence are reported in table 1. There are only slight differences between attitudes of SHG members and non-members. Spouses of SHG members, however, show a lower degree of agreement with the statement “Men are entitled to beat their women”. The relatively small differences suggest that SHG members do not deviate considerably from the social gender norms of non-members in the area of male control over and domestic violence against women. Because it is unclear whether SHG members violate social gender norms in these areas and because domestic violence is intrinsically linked to sanctioning at the household and not at the village level we will focus on autonomy in the remainder of this paper.<sup>vii</sup>

### *3.3 Subjective well-being and social gender norms*

Let us also discuss some descriptive statistics regarding SWB. Survey questions related to happiness or SWB have become fairly standardized in the economics literature and have been increasingly used as a proxy for experienced utility (Di Tella and MacCulloch, 2006). Admittedly, SWB does not measure “true utility”. However, SWB has been shown to correlate strongly with other variables that we can plausibly claim to be associated with “true utility”, such as unemployment, but also with left frontal brain activity and Duchenne smiles, a type of smiling that involves a muscle near the eye (Ibid.). In addition, research in developing countries has shown that correlates with happiness are remarkably consistent around the world (Graham, 2009). Based on these findings, we argue that SWB measures utility with some noise, but that the variable is valid to use in empirical applications in developing countries. The way we measure SWB is in accordance with the economics literature (for an extensive review see Frey and Stutzer, 2002). Both the household head and his/her spouse were asked to answer the question “How happy are you with your life in general” on a scale from 1 to 5 to quantify SWB. Descriptive statistics are reported in table 1.

The results indicate that, on average, there are no significant differences in levels of SWB between SHG members and non-members. Our theoretical model, however, discusses the possibility that differences in SWB between SHG members and non-members could be positive (negative) in villages with relatively liberal (conservative) social gender norms.

To analyze these possible heterogeneous effects, we construct a proxy for the conservativeness of the social gender norm. Our setting, in which SHG membership could serve as a form of social legitimization to violate social norms, provides us with an excellent opportunity to analyze the effect of variations in normative expectations of non-SHG members on SWB of SHG members. A proxy for the conservativeness of the social gender norm was constructed by using the mean of the indicated level of autonomy to go to the market and the doctor of female non-SHG members at the village level (Mean=0.35, S.E.=0.16). We especially focus on levels of autonomy, because the violation of this specific social gender norm was frequently related to social sanctioning in in-depth interviews with SHG members and because our descriptive statistics showed a clear significant difference between SHG members and non-members for these variables. When we compare SWB between SHG members and non-members for women living in villages with a mean level of the proxy variable below and above 0.35, respectively, we find indicative evidence for heterogeneous impacts of SHG membership on SWB. SHG members in villages with a relatively conservative social gender norm have a significantly lower SWB than non-members ( $t=-2.07$ ,  $P=0.02$ ), while the difference in SWB between SHG members and non-members is positive and marginally significant in villages with relatively liberal social gender norms ( $t=1.68$ ,  $P=0.09$ ). However, we should be careful in interpreting these results since we have not yet accounted for other factors. The next section elaborates further on the (heterogeneous) relationships between SHG membership, autonomy and SWB.

*Insert Table 1*

## 4. Econometric Specification and Results

In this section we will test the theoretical predictions from our model. First, we will use propensity score matching (PSM) and instrumental variable (IV) regression analyses to derive the impact of SHG membership on autonomy. Second, we will estimate the impact of SHG membership on SWB by using propensity score matching, to elaborate further on equation 3 of our theoretical model.

### *4.1 Estimation Strategy*

Our descriptive statistics have already shown evidence for a strong correlation between SHG membership and autonomy. It is nonetheless uncertain whether the differences in social gender norms between SHG members and non-members are causally linked to the presence of SHGs. To estimate the causal impact of SHG membership on autonomy, we present PSM and IV regression analysis. Both PSM and IV regression analysis suffer from methodological shortcomings and using both methods will minimize the problems associated with the different empirical procedures.

The basic idea of PSM is to find a group of non-participants that are similar in observed characteristics to a group of participants (Caliendo and Kopeinig, 2008). By estimating a probit model with SHG membership as the dependent variable, we are able to estimate the so-called propensity score for female participation in SHGs. The predicted propensity for participation from the probit model can be seen as the relevant summary statistic to be balanced between participants and non-participants in SHGs. The region of the probabilities for which a valid comparison group can be formed is termed the region of common support, and only observations in this region are used to estimate the impact of the SHG program (Rosenbaum and Rubin, 1983). Several matching algorithms are available for PSM. Following the advice of Caliendo and Kopeinig (2008), we try two different approaches; 1) nearest neighbor matching with replacement and 2) kernel matching. In nearest

neighbor matching the individual from the control group is chosen as a matching partner for a treated individual that is closest in terms of propensity score. Allowing for replacement could decrease bias, but the variance of our estimates could also increase. Because there are only a limited number of control observations in our relatively small sample, matching with replacement seems a practical choice. Kernel matching uses weighted averages of all individuals in the comparison group. More information is used in this procedure, which reduces the amount of variance in our estimates. The danger of this procedure is, however, that bad matches are chosen (Caliendo and Kopeinig, 2008). Using both nearest neighbor matching with replacement and kernel matching provides us with a natural robustness check, to guard us against the disadvantages of the two matching algorithms. There are several reasons to prefer PSM over regression analysis. First, because of its non-parametric nature PSM does not need assumptions about functional forms of relationships (Ibid.). Second, it is unclear whether there are valid instrumental variables in our sample that could account for bias resulting from reversed causality or measurement error. However, PSM is no adequate solution to estimate the causal impact of SHG membership, if reversed causality and/or measurement error influence the results.

There is some indication for bias resulting from reversed causality. In-depth interviews in Puri indicate, for example, that women with husbands and/or family-in-law with relatively conservative values face more constraints to enter SHGs compared to women with relatively liberal family members. The relationship between SHG membership and agency could thus be spuriously driven by reversed causality, if agency and male attitudes towards women's agency are correlated at the household level. However, reversed causality not necessarily results in an upward bias in our impact estimates. SHGs could also be formed with less empowered women (Holvoet, 2005). In addition, data derived from answers to questions related to beliefs or attitudes, such as our data related to autonomy, could suffer from measurement error in the

form of cognitive bias (Bertrand and Mullainathan, 2001), which could bias the PSM impact estimates towards zero.

The IV method provides a solution to reversed causality and measurement error problems, if instruments can be found that are strongly correlated with the explanatory variables but not with the dependent variable. By estimating presumably exogenous variation in SHG membership in a first stage, and use the predicted value of SHG membership as a regressor in a second stage, we should be able to derive consistent impact estimates of the effect of SHG membership on autonomy (Wooldridge, 2002, p. 82). Although it is unclear whether transaction costs of SHG formation fulfill this condition perfectly, Garikapati (2010) makes use of such an instrument to estimate the impact of SHG membership on empowerment. Therefore, taking into account the different methodological shortcomings of PSM, we will also estimate the impact of SHG membership on autonomy using the percentage of household heads in the village that is of the same caste as the female respondent (Samecaste) as an instrument for SHG membership, assuming that transaction costs of group formation are lower for same-caste than for mixed-caste communities. Garikapati (2010) used a dummy variable that is 1 if the caste of the SHG member is the dominant caste in a village as an instrument for SHG membership. We use Samecaste, however, to prevent losing information and because this variable is highly significantly correlated with SHG membership ( $\beta=0.2260$ ,  $P=0.00$ ). Samecaste could also be related to autonomy through membership in other organizations. Therefore, we will control for membership in other organizations in our IV regression analyses to estimate the impact of SHG membership on autonomy. As such, we will estimate a model, as specified in equation 4, in which  $FA_i$  is the level of autonomy for woman  $i$ ,  $SHG_i$  is a variable indicating the participation in an SHG by woman  $i$ ,  $X_i$  is a matrix of control variables,  $\varepsilon_i$  is the residual value, and  $\beta_1$  is the estimate of the magnitude of the impact of SHG membership on autonomy.

$$FA_i = \alpha + \beta_1 * SHG_i + \beta_2 * X_i + \varepsilon_i \quad (4)$$

It has to be acknowledged that our results from PSM and IV regression analyses will most likely be conservative estimates of the impact of SHG membership on autonomy. As discussed in our analytical framework, comparing participants and non-participants in SHGs in the same village will underestimate the impact of SHG membership on empowerment in the presence of empowerment externalities. The presentation of the impact estimates nonetheless serves to verify the impact of SHG membership on autonomy in Orissa, which in turn allows for comprehending the differences in social gender norms between SHG members and non-members.

To estimate the impact of SHG membership on SWB, we will only use PSM. There are several arguments to refrain from IV regression analyses in the estimation of the impact of SHG membership on SWB. First, bias from unobservables through reversed causality is less likely to pose a problem in the hypothesis we test for this relationship. Second, it is unclear whether Samecaste is related to SWB through the number of friends of our respondents, raising doubts about the validity of Samecaste as an instrument to estimate the impact of SHG membership on SWB. Third, and most important, it is not valid to estimate the impacts of SHG membership on SWB using IV regression analyses in the presence of heterogeneous impacts for villages with conservative (liberal) social gender norms, because IV estimates only represent the change in SWB for those most affected by the instrument (Chen, 2010). Samecaste is only sufficiently correlated with SHG membership in villages with relatively liberal social gender norms, i.e., villages with a mean of the indicated level of autonomy to go to the market and see a doctor for female non-SHG members at the village level equal to or higher than 0.35. Using Samecaste as an instrument to estimate the impact of SHG membership on SWB, will thus result in weak-instrument bias in villages with relatively liberal social gender norms. For this reason, we should also be careful in extrapolating the IV

impact estimates on autonomy to the complete survey population. However, for the impact estimates on this variable we have not explicitly hypothesized heterogeneous impacts, raising fewer doubts about the validity of Samecaste as an instrumental variable.

Admittedly, we should incorporate bias from unobservable characteristics in our impact estimate of SHG membership on SWB. In the absence of suitable instruments, we will estimate the sensitivity of our heterogeneous impact estimates to bias from unobservables using Rosenbaum bounds. This is an indirect check for the robustness of the estimates to heterogeneity from unobservables, by asking the question how large the effect of these unobservables needs to be in order to reverse the results found (Becker and Caliendo, 2007). In this way, we estimate the degree of endogeneity that is needed to change our results, an approach proposed by Connely et al (2010) in the absence of suitable instruments.

#### *4.2 Propensity Score Matching to Estimate the Impact on Women's Autonomy*

In our logit model for estimating the propensity score we control for a number of presumably exogenous socio-economic characteristics (household size, the size of land holdings, a dummy for house ownership and a number of dummy variables indicating housing characteristics), personal characteristics (age, dummy variables for caste, level of education, language used in daily life and religion), individual trust levels (the level of agreement with the statement “Most people can be trusted” on a 5-point Likert scale), the number of working days the respondent missed as a result of illness to control for personal health status and a dummy for male SHG membership. In addition, we control for the maximum level of education of adult men in the household. We also include a number of village level characteristics in our model; the mean level of general trust for men and women, and the mean level of trust in women for both men and women, measured by the level of agreement with the 5-point Likert-scale statements “Most people can be trusted” and “Women can be



trusted”, respectively. Low levels of trust could be an indication for the implementation of sanctioning threats (Fehr and Falk, 2002 and Fehr and List, 2004). Sanctioning of social gender norm violations could thus be stronger in villages with low levels of trust; especially in villages with low trust in women. Observations outside the common support are eliminated from our model, by imposing a common support condition and by eliminating the 5% of the treatment observations at which the propensity density of the control observations is the lowest.

Table 2 presents the probit model we use to estimate the propensity score. Our estimated propensity increases significantly with Samecaste, age, trust and living in a house made of permanent material, and is significantly lower for respondents whose age is further away from the median age of women at the village level. Besides, male membership in SHGs within the same household as the respondent strongly and significantly decreases the propensity to participate in an SHG for women. A balancing score reveals that significant differences in observables between SHG members and non-members are no longer significant after matching, which suggests that the balancing condition for PSM has been fulfilled. We find no evidence for positive causal impacts of SHG membership on concrete autonomy, using PSM. Our PSM impact estimates indicate that the significant differences between SHG members and non-members in concrete autonomy cannot be causally linked to SHG membership. We also find no causal link between SHG membership and female perceptions of the degree of control over their own life.

The earlier discussed positive significant differences in our descriptive statistics are thus not necessarily causally linked to SHG membership. Possibly, individuals that challenge social gender norms self-select into SHGs. However, we should be careful in interpreting the conservative impact estimates from PSM. As discussed earlier, PSM suffers from a number of methodological shortcomings. Let us, therefore, also estimate the impact of SHG

membership on autonomy using IV regression analyses, to get a complete picture of the impact of SHG membership on autonomy.

#### *4.3 Instrumental Variable Analysis to Estimate the Impact on Women's Autonomy*

In our IV regression analyses we control for a number of presumably exogenous variables, like in our PSM procedure. However, degree of freedom concerns prevent us from controlling for all the variables that were used in our PSM procedure. We control for socio-economic characteristics (household size, the size of land holdings, a dummy for house ownership and a number of dummy variables indicating housing characteristics), personal characteristics (age, dummy variables for caste and level of education), individual trust levels (the level of agreement with the statement “Most people can be trusted” on a 5-point Likert scale) and a dummy for male SHG membership. In addition, we control for a variable indicating the number of memberships in other organizations of the respondent, to account for the earlier discussed concern about a possible correlation between Samecaste and empowerment through membership in other organizations. We adjust standard errors for heteroskedasticity and clustering at the village level, by using the generalized method of moments (GMM) procedure for IV regression analyses.<sup>viii</sup> Results are reported in table 3. We refrain from presenting probit models for the binary dependent variables for ease of tractability, but instrumental variable probit models lead to the same qualitative interpretation of our results.

In contrast to our findings from PSM, women's autonomy seems to be strongly affected by female SHG membership. The autonomy to go to the market and doctor are significantly affected by SHG membership at the 95% level. In comparison with non-members, women who participate in an SHG have an 82%-point higher chance to be able to go to the market without their husband's permission according to our IV regression analyses. However, female perceptions of the degree of control over their own life do not seem to be

causally linked to SHG membership, which indicates that concrete autonomy indicators are not necessarily related to abstract measures of autonomy.

We believe that it is unlikely that Samecaste is related to the empowerment variables other than through SHG membership or membership of other organizations. Controlling for the percentage of scheduled caste and tribe members in the village does also not give rise to qualitatively different results, indicating that the findings are not driven by differences in social gender norms across castes. However, a number of different assumptions are needed to validate this argument. Attitudes towards women's autonomy should, for example, not be related to transaction costs of SHG formation. Inclusion of more than one instrumental variable provides us with the opportunity to test the validity of the instrumental variable, conditional on the validity of the second instrument. Let us, therefore, present some indicative evidence on the validity of Samecaste as an instrument to estimate the impact of SHG membership on autonomy, by discussing the estimated impact of SHG membership on autonomy with two instruments.

Because a second instrument, which is unrelated to Samecaste, is not readily available in our dataset, we use an interaction between Samecaste and another exogenous source of transaction costs of SHG formation as a second instrumental variable. To construct this variable, we exploit the fact that SHGs are mainly formed among people of the same age that are members of the same caste. The correlation between Samecaste and SHG membership is higher for women for whom the difference between their age and the median age of female respondents of their own caste at the village level is smaller than or equal to 10 years ( $\beta=0.2511$ ,  $P=0.00$ ). We take advantage of this relationship by using an interaction between Samecaste and a dummy, which is 1 when the difference between the respondent's age and the median age of female respondents of their own caste at the village level is smaller than 10 years (Samecasteage), as a second instrument for SHG membership. Unreported IV regression

results with two IVs suggest that the IV results are robust to the inclusion of a second IV. In addition, Hansen J tests suggest that Samecaste is a valid instrument (or more precisely a valid instrument conditional on the validity of Samecasteage as a second instrument) for identifying the impact of SHG membership on the autonomy to go to the market ( $J=0.461$ ,  $P=0.50$ ) and the doctor ( $J=2.239$ ,  $P=0.13$ ) as well as for female perceptions of the degree of control over their own life ( $J=0.13$ ,  $P=0.72$ ).

As stated earlier, we should be careful to extrapolate the findings from IV regression analyses to our complete sample population. Impacts on autonomy are more convincingly demonstrated for government-supported than for NGO-supported SHG members, because Samecaste is only significantly correlated with SHG membership in villages with government-supported SHG members. We find significant impacts on the autonomy to go to the market ( $\beta=1.34$ ;  $P=0.00$ ) and the doctor ( $\beta=1.68$ ;  $P=0.00$ ) for a subsample of villages with government-supported SHGs. Unfortunately, first-stage F-statistics for a sub-sample of villages with NGO-supported SHGs are too low to reliably estimate the impact of SHG membership for this subgroup. Our IV regression analyses nonetheless point at a positive impact of SHG membership on autonomy.

By triangulating the findings from PSM and IV regression analyses, we find evidence that is mildly supportive for our hypothesis that SHG membership is causally linked to autonomy. Our earlier discussed qualitative evidence is consistent with this idea. Taking into account the conservativeness of our impact estimates, we believe that these findings are indicative for a positive causal impact of SHG membership on autonomy. The results fit the idea that SHGs legitimize the transgression of social gender norms, as hypothesized in our analytical framework. However, even if the differences in social gender norms between SHG members and non-members cannot be causally linked to SHG membership, which requires some statistical assumptions, our PSM procedure to estimate the heterogeneous impact of

SHG membership on SWB would still produce reliable evidence on the utility gains and losses of breaking social gender norms.

*Insert Table 3*

#### *4.4 The impact of SHG membership on SWB*

Using the same specifications as in our PSM procedure to estimate the impact of SHG membership on autonomy, we find no evidence for a significant ATT of SHG membership on SWB, neither for kernel matching (ATT=-0.19, S.E.=0.20) nor for nearest-neighbor matching with replacement (ATT=-0.32, S.E.=0.27). On average, there do not seem to be large differences between utility gains and losses following autonomy, as we described them in equation 3 of our theoretical model. We predicted, however, that utility losses for autonomous women would be more likely in villages with relatively conservative social gender norms. Impact estimates could thus be positive (negative) in villages with relatively liberal (conservative) social gender norms. Our descriptive statistics already provided some indicative evidence for this heterogeneous relationship.

##### *4.4.1 Heterogeneous impacts of SHG membership on subjective well-being*

To test whether identity losses are higher for SHG members in villages with relatively conservative social gender norms, we divide our sample in two groups; a group of women in villages with relatively high and relatively low levels of autonomy for female non-SHG members. We present probit models to estimate the propensity for sub-samples of women in villages with conservative and liberal social gender norms in column 1 and 2 of table 4, respectively. In our PSM procedure, we follow the advice of Dehejia (2005) to estimate different models for each treatment group-comparison group combination, to ensure that the balancing condition will be fulfilled in every sub-sample.<sup>ix</sup> Admittedly somewhat arbitrary, we define a village with a conservative social gender norm as a village in which the mean of

the autonomy to go to the market and the autonomy to go to the doctor of female non-SHG members at the village level is lower than 0.35.

Our results show that SHG membership has a strong and significant negative impact on SWB in villages with relatively conservative social gender norms, while the impact is far from significant in villages with relatively liberal social gender norms. Both nearest neighbor and kernel matching in villages with relatively conservative social gender norms result in significant negative effects at the 99% significance level. The size of the negative impact is remarkably large, consistent across specifications and robust to different threshold values for conservative social gender norms. This finding provide strong indicative evidence for equation 3 of our theoretical model, which predicts relatively high levels of agency and relatively low levels of SWB for SHG members in villages with relatively conservative social gender norms. Using a dynamic analytical framework, the result could also be interpreted as an unstable equilibrium with reciprocal altruism, resulting in increasing agency and decreasing SWB for SHG members in villages with strong sanctioning mechanisms and with few or no empowerment spillovers to non-SHG members.

Using a male-based proxy for conservativeness of social gender norms does not result in qualitatively different findings. We construct this male-based proxy by estimating the mean level of tolerance regarding women's autonomy of husbands of non-SHG members at the village level. Both Nearest neighbor (ATT=-0.53, S.E.=0.29) and kernel (ATT=-0.52, S.E.=0.30) matching result in significant negative impact estimates of SHG membership on SWB at the 95% significance level in villages where the mean level of male attitudes towards women's autonomy at the village level is lower than 0.45. In villages with mean levels above this threshold, we find positive but non-significant effects of SHG membership on SWB.

#### *4.4.2 Robustness Checks*

This section serves to check the robustness of the heterogeneous impact of SHG membership on SWB to the assumptions of the empirical model. First, the negative heterogeneous impact on SWB could be biased as a result of the cherry picking of the “right threshold” for the conservativeness of the social gender norm. However, we find strong evidence for heterogeneous impacts of SHG membership on SWB using a linear propensity adjusted regression model. The discussed regression model includes a dummy for SHG membership, the mean of the indicated level of autonomy to go to the market and the doctor of female non-SHG members at the village level, an interaction between a dummy for SHG membership and the mean of the indicated level of autonomy of female non-SHG members at the village level and the estimated propensity from the full model as explanatory variables of SWB and excludes the observations outside the common support. As presented in figure 1, the estimated marginal effect of SHG membership on SWB is negative and strongly significant in villages with relatively conservative social gender norms and increases with the liberalness of the social gender norm, eventually resulting in positive significant impacts in villages with very liberal social gender norms.

Second, the heterogeneous impact could be biased by a reflection problem, in the sense that the attitudes of non-SHG members reflect the attitudes of SHG members themselves. This argument can be countered by including the mean of the indicated level of autonomy of female SHG members at the village level and its interaction with a dummy for SHG membership in the previously discussed propensity adjusted regression model. Although levels of autonomy of SHG members and non-members are correlated with each other, the impact of SHG membership on SWB only increases significantly with the level of autonomy of non-members, which suggests that the possible reflection problem does not bias our results.

As discussed in our estimation strategy, women with husbands with relatively conservative attitudes face more constraints to enter SHGs than women with husbands with relatively liberal attitudes. So far, we did not include indicators related to male tolerance of women's autonomy as control variables in our matching equation, because they are potentially endogeneous. However, if women with husbands with relatively liberal values face fewer constraints to enter SHGs, the results of the PSM model could be biased as a result of the omission of indicators related to male tolerance of women's autonomy. To account for this possible bias, we include male tolerance of women's autonomy to go to the market, visit the doctor and visit community meetings in our logit model for estimating the propensity score. Including these indicators in the matching equation should result in conservative impact estimates, because of the potential endogeneity of the variables. After controlling for male tolerance of women's autonomy, both nearest neighbor (ATT=-0.58, S.E.=0.48) and kernel matching (ATT=-0.58, S.E.=0.36) estimates are no longer significant in villages with relatively conservative social gender norms. However, this has to do with a loss of statistical power as a result of twelve missing values for male tolerance of women's autonomy. In villages with an indicated level of autonomy of non-SHG members below 0.45 both nearest neighbor (ATT=-0.66, S.E.=0.438) and kernel matching (ATT=-0.45, S.E.=0.33) result in negative significant impacts of SHG membership on SWB at the 95% level when we include indicators of male tolerance of women's autonomy to the model, because of an increase in sample size compared to the sample in villages with an indicated level of autonomy of non-SHG members below 0.35. In villages with an indicated level of autonomy of non-SHG members above 0.45, the estimated impact of SHG membership on SWB is positive but non-significant. Controlling for male attitudes does not result in qualitatively different findings, despite the potential conservatism in the impact estimates.



As discussed earlier, the results of our estimation strategy could also be sensitive to the inclusion of other forms of unobserved heterogeneity. Therefore, we estimate the sensitivity of the heterogeneous negative impact on SWB in villages with a mean of the indicated level of freedom to go to the market/doctor of female non-SHG members below 0.35 to unobserved heterogeneity with help of the earlier discussed Rosenbaum bounds. The significantly lower SWB for SHG members in these villages is quite robust to the inclusion of unobserved heterogeneity for the small sample we use.<sup>x</sup> The difference between SHG members and non-members remains significant at the 90% level for effects that would increase the odds of being treated with 1.13. In addition, unobserved heterogeneous characteristics should have very different effects in villages with relatively conservative than in villages with relatively liberal social gender norms to explain our research findings. Although we cannot rule out this possibility, alternative explanations of a link between SHG membership and SWB are either consistent with positive or with negative correlations between SHG membership and SWB. First, economic benefits of SHG membership could explain the positive relationship between SHG membership and SWB in villages with very liberal social gender norms, but not the negative relationship between SHG membership and SWB in villages with relatively conservative social gender norms. Second, overoptimistic expectations regarding economic benefits for SHG members are consistent with negative impacts in villages with relatively conservative social gender norms, but not with positive impacts in villages with relatively liberal social gender norms.

The results are mildly robust to the use of a different proxy for the social gender norm. Equation 3 of our theoretical model predicts a larger loss of feelings of identity for SHG members in villages with relatively strong sanctioning mechanisms. Therefore, we perform a sensitivity analysis, using a variable that has been shown to be related to sanctioning in previous studies. As discussed earlier, external sanctioning of violators of social gender norms

is most likely when women are perceived as untrustworthy by non-SHG members (Fehr and Falk, 2002 and Fehr and List, 2004). Therefore, we use trust of non-SHG members in women at the village level as a proxy for the likelihood that autonomous women are sanctioned by other community members. We define as threshold below which women are generally perceived as untrustworthy an average level of trust in women of non-SHG members at the village level smaller than 3.5. Heterogeneous impacts are derived by performing PSM analyses in villages with perceived (un)trustworthy women. In first instance, the results do not point at negative impacts of SHG membership on SWB in villages with relatively low trust in women. The impact estimates do not come close to conventional significance levels for nearest neighbor (ATT=-0.22, S.E. =0.37) nor for kernel matching (ATT=0.01, S.E. =0.39) in villages with relatively low trust in women. The impact in villages with relatively high trust in women is also far from significant. However, there is some evidence that the impact of SHG membership on SWB is negative in villages with relatively low trust of men in women. When the average level of trust of male non-SHG members in women at the village level is smaller than 3.8, kernel matching impact estimates on SWB are negative and significant at the 90% level (ATT=-0.37, S.E. =0.28), while nearest neighbor impact estimates are significant at the 95% significance level (ATT=-0.60, S.E.=0.37). This result is in line with our qualitative research finding that social sanctioning mechanisms are mainly (but not exclusively) executed by men.

## **5. Conclusion**

This paper contributes to the literature on empowerment, identity and subjective well-being by presenting impact estimates of SHG membership on women's autonomy and SWB in Orissa, India. We relied on attitudinal statements to measure women's autonomy and SWB. Our descriptive statistics showed strong evidence for a positive significant relationship between SHG membership and women's autonomy. Using a triangulation of in-depth

interviews, propensity score matching and instrumental variable regression analyses, we provided suggestive evidence on a positive causal impact of SHG membership on women's autonomy.

On average, SHG membership in Orissa has no significant impact on SWB. Our results indicate that there is a significant negative impact on SWB in villages with relatively conservative social gender norms. These results are consistent with a model that predicts that identity losses following the transgression of social gender norms will be higher in villages with conservative social gender norms. The identity-based interpretation of our results is robust to a wide range of specification tests and supported by qualitative findings, thus underlining the importance of a triangulation of research methods. Our results match with other studies on the effect of social norms on SWB in different contexts, such as the finding that stronger social norms to work result in higher losses in subjective well-being for the unemployed (Stutzer and Lalive, 2004) and experimental results indicating that sanctioning results in lower subjective well-being for the sanctioned (Brandts and Fernanda Rivas, 2009).

Enhanced autonomy is, arguably, no sufficient condition for increases in women's SWB in the medium run. The utility loss that failing to conform to the dominant social gender norm entails can be so large that agency results in declines in SWB, especially if social gender norms are conservative. In order to assure that improvements in agency coincide with improvements in SWB, village level investments to change social gender norms could be more effective than investments at the level of the SHG. It could, therefore, be valuable to integrate SHG programs with gender programs implemented at the village level, such as the reservation of seats for women in the village council, which has been shown to weaken stereotypes about gender roles (Beaman et al, 2009).

In the long run, the unstable equilibrium with low levels of SWB and high levels of agency could also transform the social gender norm. Cultural adjustment typically generates

frustration, resentment and social costs. Future research could, therefore, focus on the dynamics of social gender norms. In addition, future research could also concentrate on the estimation of heterogeneous impact of SHG membership on SWB in different contexts and/or through randomized evaluations, to minimize the assumptions needed for the impact evaluation.

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**Table 1: Descriptive statistics**

## 1a) Resources

Variable	(1) Mean Members	(2) Mean Non-Members	(3) t-test/ Chi <sup>2</sup> test <sup>a</sup>
(1)SHG Savings	257.71 (193.11)	90.20 (137.35)	10.14*** <sup>b</sup> (0.00)
(2)Savings in saving group	17.25 (88.88)	40.13 (153.19)	-1.73* <sup>b</sup> (0.08)
(3)Other Formal Savings	379.88 (3063.67)	183.26 (1177.85)	0.89 <sup>b</sup> (0.37)
(4)Informal Savings	165.87 (959.34)	69.53 (726.98)	1.14 <sup>b</sup> (0.25)
(5)SHG and saving group loans	337.57 (559.62)	58.97 (186.61)	7.07*** <sup>b</sup> (0.00)
(6)Informal loans	346.73 (776.54)	226.46 (655.39)	1.67 <sup>b</sup> (0.09)*
(7)Money lender loans	11.78 (112.54)	24.87 (183.48)	-0.82 <sup>b</sup> (0.41)
(8)Bank loans	99.00 (927.74)	85.30 (645.57)	0.17 <sup>b</sup> (0.86)
(9)Other formal loans	232.25 (746.99)	285.49 (850.34)	-0.65 <sup>b</sup> (0.86)
(10)Any Livestock	0.71 (0.45)	0.61 (0.49)	4.56*** <sup>c</sup> (0.03)
(11)Land Size in Acres	2.01 (7.08)	0.96 (1.84)	2.16** <sup>b</sup> (0.03)
(12)Female Land Ownership	0.06 (0.24)	0.02 (0.15)	4.01*** <sup>c</sup> (0.05)

1b) Agency

Question/Statement	Women			Question/Statement	Men		
	(4) Mean Members	(5) Mean Non- Members	(6)t -test/ Chi <sup>2</sup> test <sup>a</sup>		(7) Mean Members	(8) Mean Non- Members	(9) t-test/ Chi <sup>2</sup> test <sup>a</sup>
Autonomy				Autonomy			
(1) I have control over my own life	3.84 (1.33)	3.60 (1.25)	1.85* <sup>b</sup> (0.07)	(1) I have control over my own life	3.56 (1.36)	3.27 (1.31)	2.22** <sup>b</sup> (0.03)
(2) not applicable	not applicable	not applicable	not applicable	(2) Women should be able to go to community meetings on their own.	0.92 (0.27)	0.80 (0.40)	10.75*** <sup>c</sup> (0.00)
(3) I am able to go to a doctor without asking a man	0.52 (0.50)	0.47 (0.50)	0.65 <sup>c</sup> (0.42)	(3) Women should be able to go to the doctor without a male escort.	0.60 (0.49)	0.55 (0.50)	1.03 <sup>c</sup> (0.31)
(4) I am able to go to the market without asking a man	0.33 (0.47)	0.21 (0.41)	6.36*** <sup>c</sup> (0.01)	(4) Women should be able to go to the market without male permission	0.41 (0.49)	0.28 (0.45)	7.26*** <sup>c</sup> (0.01)
Domestic Violence and Male Control				Domestic Violence and Male Control			
(5) Men are entitled to command their women	3.65 (1.40)	3.57 (1.43)	0.51 <sup>b</sup> (0.61)	(5) Men are entitled to command their women	3.46 (1.45)	3.66 (1.39)	-1.41 <sup>b</sup> (0.16)
(6) Men are entitled to beat their women in certain occasions	2.60 (1.44)	2.73 (1.37)	-0.96 <sup>b</sup> (0.34)	(6) Men are entitled to beat their women in certain occasions	2.50 (1.38)	3.10 (1.42)	-4.22*** <sup>b</sup> (0.00)
Happiness				Happiness			
(7) How happy are you with your life in general?	3.52 (1.21)	3.58 (1.11)	-0.53 <sup>b</sup> (0.60)	(7) How happy are you with your life in general?	3.32 (1.26)	3.29 (1.25)	0.20 <sup>b</sup> (0.84)

$p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . a) T-values or Chi<sup>2</sup>-values are reported in these columns, depending on the applicable test. b) t-value reported  
c) Pearson Chi<sup>2</sup> reported

Notes: Standard errors in parentheses in column 1-2, 4-5 and 7-8. P-value in parentheses in column 3, 6 and 9.

Answer category for statement 1, 5 and 6

- 1=Strongly Disagree
- 2=Disagree
- 3=Neither Agree nor Disagree
- 4=Agree
- 5=Strongly Agree

Answer category for question 2

- 1=Yes
- 0= No

Answer category for question 3 and 4

- 1=Agree
- 2=Disagree

Answer category for question 7.

- 1=Very Unhappy
- 2=Unhappy
- 3=Neither Unhappy nor Happy
- 4=Happy
- 5=Very Happy

**Table 2: Propensity Score Matching To Explain Female Autonomy**

(1) Logit Model for Participation in SHG

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Bolangir <sup>b</sup>	-0.053 (0.346)
Samecaste <sup>b</sup>	1.358*** (0.359)
Difference with median age in village	-0.032*** (0.011)
Land size <sup>a</sup>	0.036 (0.026)
Ownership house <sup>b</sup>	0.162 (0.346)
Pucca <sup>b, c</sup>	0.575* (0.348)
Semi-pucca <sup>b, d</sup>	-0.289 (0.245)
Pucca weak-sector housing <sup>b, e</sup>	0.090 (0.264)
Household size	0.011 (0.043)
Age	0.022*** (0.008)
Hindu <sup>b</sup>	0.363 (0.437)
Oriya <sup>b</sup>	-0.087 (0.548)
Scheduled caste <sup>b</sup>	-0.247 (0.363)
Scheduled tribe <sup>b</sup>	-0.653 (0.449)
Backward caste <sup>b</sup>	-0.140

	(0.319)
Illiterate <sup>b</sup>	-0.190
	(0.390)
No primary schooling <sup>b</sup>	-0.011
	(0.410)
Primary schooling <sup>b</sup>	0.144
	(0.369)
Middle schooling <sup>b</sup>	0.469
	(0.386)
Illiterate men <sup>b</sup>	-0.111
	(0.370)
No primary schooling men <sup>b</sup>	0.003
	(0.337)
Primary schooling men <sup>b</sup>	-0.022
	(0.260)
Middle schooling men <sup>b</sup>	0.062
	(0.242)
Number missed days	0.014
	(0.027)
Trust	0.173**
	(0.073)
Trust men	-0.468
	(0.459)
Trust women	0.225
	(0.454)
Trust men in women	0.276
	(0.291)
Trust women in women	-0.135
	(0.418)
Happiness man	-0.087
	(0.073)
Perceived control man	0.099

		(0.071)
Male membership <sup>b</sup>		-2.186 <sup>***</sup>
		(0.451)
Constant		-2.238
		(2.177)
Pseudo R <sup>2</sup>		0.299
N		366
Common Support		359
Matching Algorithm	N.N.	Kernel
ATT Autonomy Market	0.042	0.071
	(0.091)	(0.077)
ATT Autonomy Doctor	-0.014	-0.050
	(0.111)	(0.079)
ATT Control Over Own Life	0.000	0.049
	(0.235)	(0.186)

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . a) Size in acres. b) Dummy Variables c) Pucca house (made of permanent material) d) Semi-pucca house (either wall or roof made out of permanent material e) Pucca house (made of permanent material) in weak-sector housing scheme.

Notes: N.N.=Nearest Neighbor Matching Algorithm. Standard errors in parentheses and bootstrapped with 100 replications for the ATT. Significance levels based on Bias-Corrected confidence intervals

**Table 3: GMM Instrumental Variable Regression Analysis to Explain Women Empowerment**

	Concrete Female Autonomy		Abstract Female Autonomy
	Autonomy to go to the market	Autonomy to go to the doctor	Control over own life
Female Member <sup>b</sup>	0.823*** (0.255)	0.917** (0.411)	-0.188 (0.711)
Bolangir <sup>b</sup>	-0.045 (0.066)	0.248*** (0.064)	-1.104*** (0.137)
Land size <sup>b</sup>	0.0003 (0.005)	0.003 (0.003)	-0.004 (0.008)
Owner of house <sup>b</sup>	-0.047 (0.160)	-0.085 (0.182)	-0.125 (0.170)
Household Size	-0.022 (0.015)	-0.009 (0.016)	-0.030 (0.027)
Age	-0.003 (0.004)	-0.002 (0.004)	0.009 (0.007)
Scheduled Caste <sup>b</sup>	-0.086 (0.083)	-0.135 (0.101)	0.007 (0.299)
Scheduled Tribe <sup>b</sup>	-0.061 (0.090)	-0.086 (0.184)	0.109 (0.289)
Backward Caste <sup>b</sup>	-0.008 (0.038)	-0.068 (0.068)	-0.079 (0.259)
Illiterate <sup>b</sup>	-0.057 (0.131)	-0.058 (0.124)	-0.325 (0.209)
No primary schooling <sup>b</sup>	-0.222** (0.106)	-0.023 (0.114)	-0.06 (0.230)
Primary Schooling <sup>b</sup>	-0.054 (0.105)	-0.142 (0.097)	-0.175 (0.247)
Middle Schooling <sup>b</sup>	-0.155 (0.126)	-0.090 (0.118)	-0.190 (0.244)

Trust	-0.023 (0.034)	-0.053 (0.030)	-0.026 (0.064)
Number of other organizations	0.011 (0.047)	-0.024 (0.069)	-0.075 (0.114)
Male Member <sup>b</sup>	0.423 <sup>***</sup> (0.095)	0.466 <sup>***</sup> (0.159)	-0.180 (0.291)
Endogeneity test for endogenous regressors	5.830 <sup>**</sup> (0.02)	3.723 <sup>*</sup> (0.05)	0.067 (0.80)
First-stage F-statistic	18.81 <sup>***</sup>	17.72 <sup>***</sup>	14.43 <sup>***</sup>
N	387	388	385

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$  a) Size in acres. b) Dummy Variables

Notes: Constant and dummy variables for Hindu, pucca (made of permanent material), pucca in weak-sector housing-scheme and semi-pucca (either wall or roof made of permanent material) structure of house were partialled out of the analyses. Female membership instrumented by Samecaste. Standard errors in parentheses and robust to heteroskedasticity and clustering at the village level. P-Value of Chi-squared in parentheses for endogeneity test

**Table 4: Propensity Score Matching To Explain Female Subjective Well-Being**

	(1) Logit Model for Conservative Social	(2) Logit Model for Liberal Social
	Gender Norm	Gender Norm
Bolangir <sup>b</sup>	-0.062 (0.439)	0.654 (1.589)
Samecaste <sup>b</sup>	1.556 <sup>**</sup> (0.607)	1.563 (1.367)
Difference with median age in village	-0.030 <sup>**</sup> (0.015)	-0.041 <sup>*</sup> (0.023)
Land size <sup>a</sup>	0.023 (0.024)	0.069 (0.061)
Ownership house <sup>b</sup>	0.733 (0.501)	0.427 (0.783)
Pucca <sup>b, c</sup>	-0.115 (0.560)	1.573 <sup>**</sup> (0.749)
Semi-pucca <sup>b, d</sup>	-0.552 (0.341)	-0.286 (0.501)
Pucca weak-sector housing <sup>b, e</sup>	0.397	-0.353

	(0.341)	(0.576)
Household size	-0.011	0.179*
	(0.052)	(0.101)
Age	0.017	0.027*
	(0.012)	(0.015)
Hindu <sup>b</sup>		-0.264
	Non-Hindus Outside Common Support	(0.929)
Oriya <sup>b</sup>	Collinear	1.576
		(1.229)
Scheduled caste <sup>b</sup>	-0.487	-0.946
	(0.474)	(1.131)
Scheduled tribe <sup>b</sup>	-0.956*	-3.554**
	(0.554)	(1.509)
Backward caste <sup>b</sup>	-0.240	-0.118
	(0.432)	(0.770)
Illiterate <sup>b</sup>	0.597	-0.932
	(0.621)	(0.768)
No primary schooling <sup>b</sup>	0.490	-0.699
	(0.648)	(0.730)
Primary schooling <sup>b</sup>	0.690	-0.103
	(0.609)	(0.668)
Middle schooling <sup>b</sup>	1.036*	-0.366
	(0.621)	(0.800)
Illiterate men <sup>b</sup>	-0.550	3.016***
	(0.490)	(1.130)
No primary schooling men <sup>b</sup>	0.163	-0.557
	(0.443)	(0.705)
Primary schooling men <sup>b</sup>	0.166	-0.490
	(0.352)	(0.532)
Middle schooling men <sup>b</sup>	0.014	0.093
	(0.323)	(0.513)
Number missed days	0.053	-0.211**
	(0.036)	(0.085)
Trust	0.072	0.625***

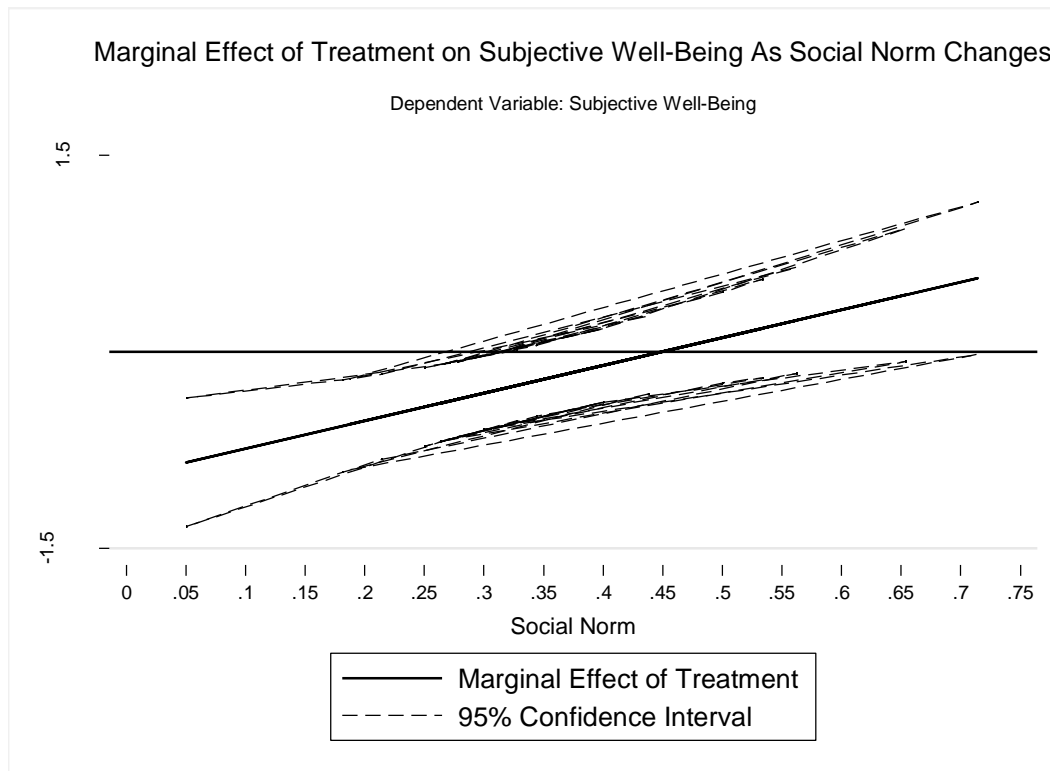


		(0.099)		(0.180)
Trust men		-0.335		-2.296
		(0.601)		(3.109)
Trust women		0.366		-1.193
		(0.594)		(4.707)
Trust men in women		0.268		2.482
		(0.425)		(1.819)
Trust women in women		-0.124		-0.508
		(0.838)		(1.281)
Happiness man		-0.141		-0.061
		(0.101)		(0.142)
Perceived control man		0.094		0.249
		(0.093)		(0.158)
Male membership <sup>b</sup>		-2.268 <sup>***</sup>		Outside Common Support
		(0.489)		
Constant		-2.865		-3.826
		(3.098)		(10.900)
Pseudo R <sup>2</sup>		0.323		0.368
N		233		134
Common Support		226		116
Matching Algorithm	N.N.	Kernel	N.N.	Kernel
ATT	-0.852 <sup>***</sup>	-0.671 <sup>***</sup>	0.220	0.031
	(0.269)	(0.287)	(0.456)	(0.629)

<sup>\*</sup>  $p < 0.1$ , <sup>\*\*</sup>  $p < 0.05$ , <sup>\*\*\*</sup>  $p < 0.01$ . a) Size in acres. b) Dummy Variables c) Pucca house (made of permanent material) d) Semi-pucca house (either wall or roof made out of permanent material) e) Pucca house (made of permanent material) in weak-sector housing scheme.

Notes: N.N.=Nearest Neighbor Matching Algorithm. Standard errors in parentheses and bootstrapped with 100 replications for the ATT. Significance levels based on Bias-Corrected confidence intervals

# Figure 1



Notes: Significance levels based on bootstrapped standard errors with 100 replications.

<sup>i</sup> Men also participate in SHGs in certain villages of our sample. We will discuss the participation of men in SHGs in the presentation of our data.

<sup>ii</sup> Unless otherwise stated, the concepts of empowerment, agency, autonomy, utility, SHG membership, political participation and subjective well-being refer to female-related characteristics.

<sup>iii</sup> We report male-female ratios in the age group of 0-6 years.

<sup>iv</sup> Admittedly, empowerment is no process without second-order effects. However, in our analytical framework we abstain from modeling dynamic empowerment processes for reasons of simplicity and because we are not able to analyze possible dynamic relationships with our cross-section data. We will take into account the possible dynamic relationships between SHG membership, empowerment and SWB after the presentation of our static model and in the interpretation of our results.

<sup>v</sup> In one particularly large village we interviewed 40 households in 2 hamlets that were clearly separated from each other.

<sup>vi</sup> Below-poverty-line households were identified by asking households for a so-called below-poverty-line (BPL) card before the start of the interview. This card is distributed by the Indian government and serves as a threshold to identify poor households.

<sup>vii</sup> For reasons of space, we will not present impact estimates of SHG membership on male tolerance of women's autonomy.

<sup>viii</sup> Within this procedure we partial the constant and dummy variables for Hindus, a *pucca* house (made of permanent material), a *pucca* house in weaker sector housing schemes, and a *semi-pucca* house (either wall or roof made of permanent material) out of our IV regression analyses, because the number of clusters is insufficient to calculate the optimal weighing matrix for GMM estimation. The coefficients corresponding to these regressors are not calculated, but by the Frisch-Waugh-Lever theorem, in two-step GMM estimation the coefficients for the remaining regressors are the same (Baum, Schaffer and Stillman, 2007).

<sup>ix</sup> Balancing scores suggest that balancing score conditions are fulfilled for each of the discussed PSM models in the rest of this paper.

<sup>x</sup> In this specification we do not control for indicators regarding male tolerance of women's autonomy, because of the earlier discussed missing values for these variables.