Effects of Social Norms on Multiple Partnerships: Evidence from Young Adults in the Metropolitan Communities of Cape Town, South Africa

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Abstract

Even though antiretroviral treatment is becoming more efficient and available, new HIV infections still occur. This is particularly the case in sub-Saharan Africa. Sexual transmission of HIV is still the main mode of transmission in sub-Saharan Africa, and multiple sex partners have been shown to be crucial for the spread of the epidemic. It is therefore problematic that sexual risk-taking, in terms of multiple sex partners, persists in spite of HIV awareness and knowledge. This study examines the role of social norms on multiple partnerships using longitudinal data on young adults residing in the metropolitan communities of Cape Town, in South Africa. Overall, our results show that social norms, proxied by the average number of sex partners in the community, have a positive and significant influence on young adults' choice of number of sex partners. This effect appears to be stronger amongst male young adults, than female young adults.

Keywords: Social interaction, HIV/AIDS, Social norms, Multiple partnerships

1 Introduction

Despite increased availability and efficiency of anti-retroviral treatment, the HIV/AIDS epidemic remains a worldwide emergency (UNAIDS, 2011). How-

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ever, the characteristics of the epidemic differ widely between different regions in the world. Thus, in order to combat the spread of the disease, it is important to acknowledge these differences. In the sub-Saharan Africa region, the main mode of transmission of HIV is heterosexual sex (UNAIDS 2009; Wilson and Halperin 2008; WHO 2008; Mah and Halperin 2010a). Indeed, relatively recent HIV/AIDS statistics show that 80% of new infections occurred through sexual intercourse (UNAIDS 2010a). Epidemiological research suggests that having multiple and concurrent sexual partners significantly increases the risk of transmitting the virus[1]. However, sexual risk taking, in terms of multiple sexual partnerships is still common in the region.

Recent anecdotal and qualitative studies suggest that the presence of social norms, whereby masculinity is associated with having many sex partners and having concurrent sexual partnerships, along with the social pressure to comply with these norms, are important driving mechanisms behind persistent sexual risk-taking in the region (e.g. Ragnarsson *et al.* 2009; Selikow *et al.* 2009; Ragnarsson *et al.* 2010). This suggests that social norms that support and maintain multiple partnerships may constitute important obstacles for the achievement of the '*Zero new infection*' vision promoted by UNAIDS[2]. It is therefore important to analyse to what extent social norms affect the choice of number of sex partners.

In this study, we use longitudinal data on young adults in Cape Town, South Africa. Like elsewhere in sub-Saharan Africa, South Africa's young adults are the most vulnerable population to new HIV infections and risky sexual behaviours are notably the main ingredients. A recent report by Human Science Research Council (HSRC) shows that HIV prevalence and incidence are highest amongst young adults. It is unsurprising, therefore, that young adults practise the most risky sexual behaviours such as having many sex partners (Shisana *et al.*, 2014). Further, it has been shown that young adults' choices are particularly susceptible to social influence, most notably in education (e.g. Fletcher, 2009; Giorgi, 2010) and health (e.g. Trogdon *et al*, 2008; Lundborg, 2006) outcomes. Unfortunately, quantitative studies in sub-Saharan Africa to date have not associated sexual behaviour in general and number of sex partners in specific with social influence. This is quite surprising, given that the cultural characteristics of close-knit social kinship and ties in the sub-Saharan Africa region make it more likely that human choices will be socially influenced. To tie this loose end, we make a quantitative assessment into the role of social norms in multiple partnerships.

In our assessment, the main outcome variable is number of sex partners (in

[1] It should be noted that there is an on-going debate regarding the role played by multiple partnerships in HIV transmission, which has most notably been captured in the articles of Mah and Halperin (2010a, 2010b); Lurie and Rosenthal (2010a, 2010b); Morris (2010) and Epstein (2010).

[2] It is increasingly recognised that for the UNAIDS vision '*Zero New HIV Infection*' to be realised there needs to be a revolution in sexual behaviour (UNAIDS 2011). In sub-Saharan Africa this implies a decrease in multiple partnerships, since it is the dominant sexual behaviour associated with the risk of HIV/AIDS.

the last year)[3]. As an alternative, we use a binary number of sex partners (one if the young adult reported more than one partner and zero otherwise) to eliminate measurement error associated with self-reporting of sexual partners. Our main regressor is the prevailing social norms in the community. To capture this, we follow the main body of the current literature and use the mean number of sex partners within the community excluding the reference observation. In this case, the community is the sub-place level used as the primary sampling units, i.e. enumeration area, for census purposes. To address potential bias from simultaneity, sorting and unobservables, we use the two-stage instrumental variable fixed-effects panel methodology. We use several instruments from previous studies which include social norms leads; and one-year, two-year and three-year lags. Lastly, we perform a series of robustness tests. First, we replace the social norms with placebo social norms (norms from other communities) on the premise that this is unlikely to influence sexual decisions. Second, a falsification test using residential status is executed, the essential assumption here being that permanent residents are more likely to follow norms than temporary or non-residents. Third, we consider a subjective (self-reported) norm related to sexual debut, and test whether the results are similar to our objective social norm measure. The aforementioned tests produce satisfactory results. Overall our results suggest that social norms prevailing in the communities affect sexual choices (i.e. choice of number of sex partners) of the community members, and the impact appears to be larger among young men than women.

There is at least one contribution of the current study: According to our literature review, our study is the first to give a quantitative estimate of the relationship between social norms and multiple sexual partnerships. Although a range of anecdotal and qualitative studies suggest that such a link exists in sub-Saharan Africa[4], these studies cannot establish the extent to which these patterns are present in the general population. In this regard, our analysis may provide policy makers with important information for policy formulation in settings where multiple sexual partnerships are prevalent. Such policies, we suggest, may consider targeting the prevailing social norms if the 'Zero new HIV infection' vision promoted by UNAIDS is to be achieved. The remainder of this paper is structured as follows: The subsequent section provides a brief literature review on the link between social norms and multiple sexual partnerships. In section 3, we define our main variables, thereafter we describe the empirical model and our identification strategy. This is followed by detailing

[3]Note that our measure (number of sex partners) cannot distinguish whether these sexual relationships are multiple concurrent partnerships or serial partnerships, where the former explains sexual relationships with more than one partner at the same time, while the latter defines sexual relationships with no overlap in time with subsequent partners.

[4]Researchers agree that African AIDS is sustained through a complex interaction of social and cultural processes (Takyi 2003: p. 1223). ...in SSA, sexual activity appears to be driven by socio-cultural beliefs and practices...the ability of individuals to sustain safer sexual behaviours may largely depend upon societal sexual norms and practices (Akwara *et al.* 2003: p. 386). Culture plays a vital role ...particularly in Africa, where values of extended family and community significantly influence individual behaviour (Airhihenbuwa and Webster 2004: p. 4).

the estimation results in section 4. Finally, section 5 concludes.

2 Social norms and sexual risk taking

The role of social norms in economic behaviour has a relatively long history in economics (e.g. Akerlof, 1980; Lindbeck, 1995, 1997; Lindbeck *et al.* 1999). However, previous literature concerning norms can be traced back to the social-psychological discipline of social influence and human behaviour in the early 1900s (Cialdini and Trost, 1998). Although the definition of social norms remains elusive, narrowly defined, social norms are informal rules that shape human behaviour through interactions[5]. Conformity to social norms is driven by various motivates, such as, the desire to build or maintain relationships; to be accepted; for esteem, prestige or even popularity (Bernheim, 1994; Cialdini and Trost, 1998). Surprisingly, conforming has been observed even in cases where the prevailing social norms clash with personal norms. This is because while conformity to the norm is either met by appraisal or just acceptance, deviation from the norm is usually associated with some social sanction. Hence to avoid social sanctions individuals may engage in seemingly irrational behaviour by following the prevailing social norms (Fisher, 1988; Cialdini and Trost, 1998).

To date, a rapidly growing body of economic studies have tested social norms in various aspects of human behaviour[6]. The current studies are however skewed in favour of theory over empirical works. Related to the current study, Fisher (1988), in a review of literature, links social norms related to condom use to risky sexual decisions amongst college students. The review reveals that male and female students feared rejections (sanctions) from non-conformity to group expectation (the desirable group expectation in this case is unprotected sex). Hence students chose to have unprotected intercourse over discussing condom

[5] At its core, the social-psychological literature offers the following description of social norms: Rules and standards that are understood by members of a group that guide and/or constrain social behaviour without the force of laws. These norms emerge out of interactions with others. They may or may not be stated explicitly and any sanctions for deviating from them come from social networks, not the legal systems. Social norms can include societal expectations for our behaviour; the expectations of valued others for our behaviour (e.g. subjective norms); our own expectations for our behaviour (e.g. personal norms); and standards that develop out of our observations of others' behaviour (e.g. descriptive norms) (Cialdini and Trost, 1998: p. 152).

[6] Labour economics (e.g. Moffit, 2001; Vendrik, 2001; Akerlof *et al.*, 2005; Grodner *et al.*, 2006), psychology (e.g. Bamberg *et al.*, 2007), education (e.g. Fletcher, 2009; Giorgi *et al.*, 2010), environment (e.g. Elster, 1989), crime and juvenile behaviour (e.g. Evans *et al.*, 1992; Gaviria *et al.*, 2001; Lundborg, 2006), entrepreneurship (e.g. Meek *et al.*, 2009), health, obesity and fertility (e.g. Manski, 2000; Munshi *et al.*, 2006; Etile, 2007; Trogdon *et al.*, 2008). Etile (2007), for example, measures social norms as the average weight in the reference group and shows how this affects weight outcomes. Along similar lines Trogdon *et al.*, (2007) uses the average weight of peers to measure how they affect weights of students. Giorgi *et al.*, (2010) follows the trend and adopts the average subject chosen by classmates, while Munshi *et al.*, (2006) proxy the norm with the average contraceptive usage in the community. In Gaviria *et al.*, (2001) and Fletcher (2009)'s work the average number of students who smoke measures the norm of cigarette smoking, while Lundborg (2006) measured group effects using average number of students who participated in binge drinking.

use and HIV prevention with their sex partners, as this acceptable behaviour would guarantee rewards (acceptance) by their sex partners for conforming as opposed to sanctions for non-conformity. In addition to this, Fisher (1988)'s review also offers valuable insights on culturally driven norms in minority groups with high rates of HIV infection. In these particular settings the desirable cultural behaviour prohibits the discussion of sexual related matters and HIV prevention between sex partners. Hence deviating from such culturally specific accepted norms, and having pre-sex discussion on HIV prevention, could lead to sanctions. Further, Fisher (1988) reveals the 'free sex' norms in the 1970 and 1980s amongst the gay community. During this time it was difficult to discuss or even initiate safe sex with a sex partner, as the 'free sex' norm encouraged unprotected sexual behaviour.

Further, and as earlier mentioned, more recent qualitative studies (e.g. Ragnarsson *et al.*, 2009; Selikow *et al.*, 2009; Ragnarsson *et al.*, 2010) suggest that social norms promoting certain gender roles and the social pressure arising out of these norms may hold important explanatory power regarding the persistence of multiple partnerships[7]. For example, Ragnarsson *et al.*, (2009) observe a real man identity within young male groups in South Africa. A real man is one who has several sexual partners that include one official partner; secondary partners and casual weekend partners. This behaviour is known and supported by the social group, and if a man deviates from this norm he is emasculated and viewed as a lesser man and even faces being ostracised from the social group. These findings are important for the fight against HIV/AIDS in Sub-Saharan Africa, where, as mentioned in the introduction, heterosexual sex is still the main mode of HIV transmission (Wilson and Halperin 2008; Horton and Pam 2008; UNAIDS 2009, 2010a; Lurie and Rosenthal 2010a). For this reason, the current study measures whether young adults' choice of number of sex partners is directed by social norms (i.e. prevalence of number of sex partners) in the community[8]

Social norms, from a social-psychological perspective, are informal rules that govern, and influence, behaviour within a community (Cialdini and Trost, 1998). According to Manski, (1993) social norm is synonymous to the endogenous effects hypothesis. Economics, have long been interested in endogenous effects (see Manski, 1993 for an elaborate discussion), e.g., individual's demand for a particular good depends on price, which is also dependent on aggregate demand for the good in the market. In the current paper we assume that the social norms are informal rules that guide the sexual choices, in specific number of sex

[7] We provide the following verbatim findings from some of these studies: "I will take a lot of pressure from the boys. They will tease and make funny jokes and tell me that having one girlfriend is the same as having no one at all. . . ..Other people will think that you do not have a game (if not having multiple girlfriends), you do not know how to treat the girls" (Ragnarsson *et al.*, 2010, p.3). "There are those who discourage you when you have one girlfriend, because they say if one leaves you; you will be 'uzakusokola esisihumane' (struggling bachelor), you will struggle since you do not have a girlfriend; such names" (Selikow *et al.*, 2009: p.109).

[8] Although the analysis and literature is mainly based on sub-Saharan Africa, some of the trends in multiple sexual partnerships have also been observed elsewhere (see, e.g., Choi and Catania,1996; Gorbach *et al.*, 2002; Le Pon *et al.*, 2003; Yingying *et al.*, 2011).

partners, of young adults in the community. Accordingly, we assume that each young adult chooses the number of sex partners to maximise utility. In this case, the utility function is assumed to be additively separable and made up of both a private utility and a social utility component. The former is referred to as the private utility as it only captures the young adult choices, while the latter comprises of the influence from choices or behaviour of young adults in the community.

3 Empirical Framework

This section describes our estimation strategy. We first provide a description of the data and then describe the main variables. The section then ends with a description of our econometric modelling strategy

3.1 Sources of Data and Variable Specification

The data utilised stems from the Cape Area Panel Study (CAPS). CAPS is a longitudinal study which follows young adults (and their households) undergoing transition from adolescence to adulthood in metropolitan Cape Town, South Africa. The study collects information on young adults' schooling, family formation, participation in the labour market, political attitudes, sexual and reproductive health. There are a total of five waves. The first wave was conducted in 2002, while the most recent wave occurred in 2009. In specific, in 2002, wave 1 interviewed approximately 5,000 randomly selected young adults (black, coloured and white population group) between 14 and 22 years. In 2003, wave 2a re-interviewed a third of the sample. In 2004, wave 2b re-interviewed two-thirds of the sample interviewed in 2002. In 2005 (wave 3) and 2006 (wave 4) the full sample was re-interviewed. Finally in 2009, wave 5 re-interviewed young adults from 2002, 2005 or 2006 (Lam *et al.*, 2012). In the current study we use wave 1 (2002), wave 3 (2005), wave 4 (2006) and wave 5 (2009). We do not include wave 2 (2003) as it lacks some information on sexual behaviour. The final sample used in the current analysis consist of 856 young adults who were sexually active (i.e. indicated that they had had sex – full penetration) in 2002 and have complete and matched information in wave 1, 3, 4 and 5. We note that attrition is likely to be a problem in our study. The response rate in CAPS wave 2, 3, 4 and 5 was 83%, 74%, 72% and 71% respectively. Further, like all surveys in South Africa, the response rate in CAPS was lowest amongst the White population in comparison to African and Coloured population (see Lam *et al.*, 2012).

Ideally an outcome variable that captures multiple concurrent partnerships in line with the qualitative literature is needed. However, the only variable common and available in all the waves is number of sex partners in the last year. This variable does not distinguish whether this is multiple concurrent partnership or serial partnership[9]. Admittedly, this variable is not without

[9] Concurrent partnerships are sexual relationships with more than one person. This is

flaws: There is likely to be recall bias, given that it is easier for a monogamous young adult to remember the number of partners they have had in the last year, than for a young adult who has been in serial or concurrent relationships, hence creating a bias towards those who are monogamous. In addition, it has been shown that men in sub-Saharan Africa over report their number of sex partners while women under report (Dinkelman *et al.*, 2007; Wellings *et al.*, 2006). Hence, the variable is likely to suffer from this bias. To overcome these biases we collapse the number of sex partners into a binary variable represented by one if the young adult had more than one partner and zero otherwise. A third kind of bias which is rarely addressed in the literature is the bias brought about by age and experience. That is, the older youths are more likely to have more sex partners in comparison to younger youths (Bezabih *et al.*, 2010). To address this flaw we normalise number of sex partners by dividing the variable by the age of the young adult and use this as an alternative outcome.

In order to estimate the socially prescribed behaviour, we follow a line of research (e.g. Etile, 2007; Trogdon *et al.* 2007; Giorgi *et al.* 2010; Munshi and Myaux, 2006; Gaviria and Raphael, 2001; Fletcher, 2009; Lundborg, 2006) and use the average behaviour (i.e. average number of sex partners) in the community as a measure for the social norm. We use the community (sub-place level) as the social space[10] for two key reasons. First, the geographic boundary is clearer and unambiguous in comparison to other non-geographical boundaries (e.g. social groups based on socio-economic characteristics). Second, in South Africa, students are expected to enrol in schools that coincide with their place of residence. Hence using community will more likely capture the interaction that occurs during and after schooling hours amongst young adults who are still in school. However, we are aware that modern technology has somewhat diminished the role of physical geography (i.e. physical proximity) in social interaction and this is likely to weaken the social influence within communities[11]. Although

contrasted with sequential or serial partnerships whereby an individual engages in a sexual relationship with only one partner, with no overlap in time with subsequent partners (Mah and Halperin 2010a; p. 12).

[10] Social interaction occurs when individuals are close together within an abstract social space (Akerlof, 1997; Etile, 2007; Durlauf and Ioannides, 2010). It is this social space that in turn influences decision making process (Akerlof, 1997; Conley and Topa, 2002; Grodner *et al.*, 2006; Etile, 2007; Durlauf and Ioannides, 2010). From a sociological perspective: "The social space is constructed in such a way that the closer the agents, groups, institutions which are situated within this space, the more common properties they have and the more distant the fewer (Bourdie 1987: p16). It is this social proximity between individuals that is likely to lead to social interaction. For example Case *et al.*, (1991) uses city blocks, while Conley and Topa (2002) construct a social space based on physical geography, ethnicity and socioeconomic similarity. Grodner and Kniesner (2005) use individuals who are similar in age, family structure and location. Munshi *et al.*, (2006) uses religion. On the other hand Fletcher (2009) and Giorgi *et al.*, (2010) use classmates, while Etile (2007) and Grodner (2006) use individuals of the same occupation, gender and age as the group characteristics.

[11] Indeed some sociologists are of the opinion that physical geography is not a prerequisite in today's social interaction needs (Conley and Topa 2002). This sociological view is now supported by a large body of literature. For example, Manski (2000) notes that advancement in modern telecommunication technology such as cell phones, internet and social networks has drastically diminish the role of physical geography in social interaction. Likewise, Urry (2003)

social interaction may be weakened by this advancement (mainly through social media, which is common amongst young adults) it is unlikely, however, to be eradicated, hence using a community as a social space is likely to hold. Finally, we also include covariates that are standard in sexual behaviour literature: educational attainment and knowledge of HIV/AIDS.

3.2 Econometric Approach

Consistent with the literature the empirical model for estimating the effect of social norms on the number of sex partners is a simple linear equation as depicted in equation (1). Where y_{ict} is the normalised sex partners belonging to individual i a member of community (sub-place level) c in time t, $\bar{Y}_{ct}$ is the social norm (average number of sex partners) in community c in time t, $\mathbf{X}_{ict}$ are the individual-level characteristics and u_{ict} the error term.

$$y_{ict} = \beta_1 + \beta_2 \bar{Y}_{ct} + \beta_2 \mathbf{X}_{ict} + u_{ict} \tag{1}$$

Our main interest is to measure the extent to which the social norm ($\bar{Y}_{ct}$), which captures the average number of sex partners within the community, influences young adults' choice of number of sex partners (y_{ict}). There are several potential endogeneity issues with our estimation. One likely channel of endogeneity is simultaneity between social norms and the outcome. Another potential channel is family sorting into communities. A further possible channel is the influence of unobservables. We employ the two-stage fixed-effects model (FE2SLS) to address these issues. An instrumental variable (IV) must be correlated with the endogenous regressor but be uncorrelated with the error term, that is, redundant in the main equation. We use lead social norms as the IV. This is because although future social norms ($\bar{Y}_{ct+1}$) will be correlated with current social norms ($\bar{Y}_{ct}$), future social norms are unlikely to affect current choice of number of sex partners (y_{ict}) hence correctly excluded from the model.

4 Estimation Results

4.1 *Descriptive Statistics*

Table 1 describes the characteristics of our sample. Lastly, the statistics show that more than half of the young adults know someone who has HIV/AIDS or someone who has died of AIDS. On average, the young adults have two sex partners, with 20 being the maximum number of sex partners reported by the young adults and 0 the minimum. As previously stated, we use two outcome variables in our analysis. The first is the normalised number of sex partners (divided by age), and the second is a binary sex partners outcome,

notes that the average distance (physical geography) between people in their social networks has drastically increased as a result of motorisation, urbanisation, airline deregulation, advancement in internet and telecommunication. On similar lines, Xu *et al.*, (2010) notes that social networks have expanded due to increases in migration.

taking the value of one if the young adult reported more than one partner, and zero otherwise.

4.2 *Regression Results*

Table 2 presents the results of our estimations. Column 1 shows estimates for the full sample of young adults, while Columns 2 and 3 report the estimates for males and females separately and respectively. Panel B (Columns 4–6) mirrors Panel A (Columns 1–3), in that we re-estimate the regressions using a binary outcome variable (1 if more than one sex partner and 0 otherwise), while in Panel A we use the normalised number of sex partners to control for age bias. In essence, Panel B explores the robustness of Panel A after accommodating for misreporting error in number of sex partners. Important to note is the fact that regardless of the structure of the outcome variable (cardinal or ordinal), we estimate the models in Panel A and B using FE2SLS following Angrist and Pischhke (2008) who established that similar estimates are produced under linear models even when the outcome is a limited dependent variable (LDV).

Overall, we observe that the prevailing social norms in the communities' influences number of sex partners, as shown by the social norms coefficient which is positive and significant in Column (1). This significance remains, and further, the coefficient becomes larger when we consider young adult males (Column 2), however, when we move to Column (3), amongst the young female adults, the significance decreases somewhat and so does the size of the coefficient. In Panel B we obtain qualitatively similar results, with the only exception being that social norms coefficient is insignificant amongst the young female adults. The results also show that knowing someone with HIV/AIDS decreases the number of sex partners. This significance, of knowing someone with HIV/AIDS coefficient, remains among the male young adults (Column 2) but disappears among the female youth (Column 3) and when we use the binary outcome variable (Column 5 and 6). The age of the young adult is positive and concave to number of sex partners. In general, these results are consistent with current literature, where several anecdotes and qualitative work have suggested that social norms influence multiple partnerships. See Latkin *et al.*, (2005); Ragnarsson *et al.*, (2009); Selikow *et al.*, (2009) and Ragnarsson *et al.*, (2010).

Unsurprisingly, the strength of association differs by gender (Columns 2 and 5 vs. Columns 3 and 6). We observe, in specific, that the relationship between social norms and number of sex partners is weaker (coefficients are smaller, although significant) for females than it is for male young adults. Further, while social norms coefficient is significant at 1% amongst males it is only significant at 10% within the female young adults and this significance disappears when we use the binary outcome variable. This gender difference finding is also consistent with existing qualitative studies (e.g. Ragnarsson *et al.*, 2009; Selikow *et al.*, 2009; Ragnarsson *et al.*, 2010). In specific, the current qualitative studies show that although social norms related to multiple partnership are dominant amongst, and influence, male young adult in general (Wellings *et al.*, 2006; Selikow *et al.*, 2009; Ragnarsson *et al.*, 2010). This trend is however

gaining popularity amongst female young adults as well (Selikow *et al.*, 2009; Mah, 2010).

4.3 *Robustness Tests*

In the previous section we showed the robustness of our results to different specifications of the outcome variable, in this section we perform additional robustness tests. First, we use an alternative IV strategy, and investigate whether our estimates will be affected by different instruments. Second, we use alternative specifications of the social norms. These include placebo social norms and subjective (self-reported) social norms which differ from the objective social norms used in the previous section. Third, we test how multiple partnerships will respond to social norms if we consider the type of residence in the community (i.e. permanent, temporary and non-resident).

Alternative IV Strategy

This section repeats the previous analysis using lagged values as instruments. The lagged values IV uses the fear of sanctions hypothesis and assumes that although past social norms in the community are likely to be correlated with present social norms, the fear of sanctions hypothesis dictates that it is only the prevailing norm in the community that will influence the behaviour (multiple partnership) of the young adult. Hence the past norm is correctly excluded from the main equation. For more literature on norms and fear of sanctions see Fisher (1988); Bernheim (1994); Akerlof (1997); Cialdini and Trost (1998). For example Cialdini and Trost (1998) state that: We conform to others when perceived or real pressure from them causes us to act differently from how we would act if alone (Cialdini and Trost 1998: p. 152).

However, CAPS does not contain any information that can allow us to directly measure whether perceived or real pressure does indeed exist in the current setting. Hence we look for alternative information that can provide an indirect indication as to whether pressure to conform does exist amongst the young adults. In wave 5, CAPS asked the following question: "if things you do upset people, it is their problem not yours", the responses included "strongly agree", "agree", "neither", "disagree" and "strongly disagree". We notice that the majority (54.3%) disagreed with this statement and 20.8% were indifferent. This in essence suggests that the opinions of others influence the young adult's decision in this particular setting, providing an indication that fear of sanctions somewhat exist in the communities, thus supporting our earlier hypothesis. Further, as earlier mentioned, the literature also states that young adults are, in general, susceptible to social influence (e.g. Lundborg, 2006; Trogdon *et al*, 2008; Fletcher, 2009).

However, the main problem with lagged values IV is that it is reasonable to assume that the previous year's community norm is likely to affect current multiple partnership through slow learning or sluggish adoption of the prevailing norms by (some) young adults in the community. In such cases, lagged values are likely to be correlated with the error term, producing invalid instruments. Thus the challenge becomes knowing or assuming the suitable lag length (Murray,

2006). Accordingly, to tease out this influence, we use one-year, two-year and three-year lagged values of social norms as IVs. In this approach, we assume that using a longer lag is likely to eliminate the correlation between the error term and the instrument, and thus provide a somewhat more credible instrument. On the other hand however, a problem that arises is that using more distant lags may cause the instrument to lose its correlation with the endogenous regressors, hence producing weak instruments (Murray, 2006). We find the correlation coefficient between the current social norms and the past one-year, two-year and three-year lags to be 0.3508* (0.000), 0.0399 (0.0985) and -0.0253 respectively. Hence the association becomes weaker, as we use longer lags. Table 3 replicates the regressions in Table 2 using this assortment of lagged instrumental variables.

The regression in Column 1 of Table 3 shows the results using one-year lagged instrument, in Column 2 we use two-year lagged values, and finally, Column 3 uses three-year lag as instruments. In Panel B we change the outcome variable to a binary measure. We also observe that the size of the coefficient increases with increases in lag length (as we move from one-year to three-year lag), however this increase in size of coefficient is accompanied by a decrease in level of significance. That is, while the one-year lag is significant at 5% the three-year lag is significant at 10%. Comparing the estimates between Table 2 and Table 3 we find qualitative similar results in our coefficient of interest, which somewhat reinforces our findings of social norms effects on individual behaviour.

Placebo social norm test

Here we continue with the robustness test and turn to a falsification test using placebo social norms. This placebo test is implemented in the spirit of Lavy and Schlosser, (2007). A similar approach was adopted by Fletcher (2009) and Giorgi *et al.* (2010). Giorgi *et al.* (2010), for example, assessed peer effects and course selection. For the falsification test Giorgi *et al.* (2010) randomly and artificially allocated students to hypothetical classes and found no evidence of peer effects using the placebo classes as per the authors' expectations. Similarly, a paper by Fletcher (2009) analysed the influence of classmates' smoking behaviour on individual smoking decisions. For the placebo test Fletcher (2009) replaced classmates with students from lower or higher classes. The author found no evidence of peer effects when lower or higher grades were used.

In the current study, the social norm from another community offers a good placebo social norms and falsification test. For example, the social norms (average number of sex partners) from the Khayelitsha community is assigned amongst youth who reside in Malmesbury[12]. Based on this contention, our expectation is that placebo social norms (i.e. social norms from a different com-

[12] Please note that we use the sub-place as the level of analysis. For example, while Khayelitsha is a larger area at the main-place level, we use the sub-level which includes Khayelitsha-G Mxenge, Khayelitsha-Graceland, Khayelitsha-Green Point, Khayelitsha-H Gwala, Khayelitsha-Harari, Khayelitsha-Ilitha Park, Khayelitsha-Ireland, Khayelitsha-Macassar, Khayelitsha-Section A, Khayelitsha-Section C, Khayelitsha-Section E, Khayelitsha-Section G, Khayelitsha-Section J, Khayelitsha-Site B, Khayelitsha-Site C, Khayelitsha-T Vilakazi, and Khayelitsha-Town2. Hence in the social norm placebo test we replace the norm in Khayelitsha-T Vilakazi with Malmesbury NU (i.e., a sub-place area of within Malmesbury).

munity) should not affect the young adult's choice of number of sex partners. If a significant relationship does however exist between the placebo social norms and number of sex partners, this would suggest that the social norms measure is correlated with unobservable community characteristics, which then invalidates our measure as a good proxy for social norms. Table 4 replicates Table 2 using the placebo social norms. As is evident from the table, the placebo social norms coefficient is now insignificant, indicating that the placebo social norms do not have any effect on multiple partnerships. This insignificance persists even after restricting the estimation to male only (Columns 2 and 5) or female only (Columns 3 and 6) young adults. This somewhat confirms that our findings in Table 2 are not spurious, but are picking up the effects of social norms.

Social norm falsification test

The response to social norms by residential status provides another good falsification test for our social norm measure. To perform this falsification test we exploit the following questions present in wave 3 (2005) and 4 (2006): "Have you moved since last interview?" and "Number of moves since last interview". Using this information we define three types of residential status. We consider a young adult a *permanent* resident of a community if they have not moved since the last interview. We define someone as a *temporary* resident if they have moved only once since the last interview, and finally we consider someone a *non-resident* if they have moved two times or more since the last interview. Generally, we would expect young adults who are *permanent* residents to follow the existing norms in comparison to other young adults who are *temporary* or *non-residents*. If this condition holds then it would suggest that our proxy is a good measure of social norms related to number of sex partners in the community. Table 5 reports the results of regressing social norms on number of sex partners partitioned by residential status. Here we use cross-sectional analysis because of the small sample among the *non-residents*. Consequently, the regressions are based on OLS estimates. Panel A shows results from wave 3, where Column 1 shows the results of *permanent* residents, Column 2 restricts the sample to those who are *temporary* residents while Column 3 shows *non-residents*. Columns 4–6 repeat the preceding regressions using wave 4.

As the table shows, the social norm coefficient is positive and statistically significant amongst those who are *permanent* residents. In sharp contrast, this significance disappears when we consider *temporary* or *non-residents*. The similarity of the coefficients in panels A and B (representing wave 3 and 4 respectively) supports our falsification test, suggesting that our proxy captures the prevailing norms in the community. However, the OLS coefficient in Table 5 is likely to be biased and inconsistent due to endogeneity. Because of the small sample size among the *non-residents,* we are unable to use either lags or leads as instruments. Nevertheless, although we cannot separate the true social norms effects, the result is consistent with our expectations.

Alternative Social Norm Measure

As a further robustness check, here we experiment with an alternative measure of social norms. Specifically, wave 3 has information on sexual debut for the young adults and their friends. Whether the young adults' friends have had

sex is a somewhat subjective measure of social norms related to sexual debut[13]. Further, if we assume that friends are likely to live in close proximity to one another, this provides a good subjective measure of social norms related to sexual debut in the community. This is not an unreasonable assumption to make and follows the current literature on social interaction and physical proximity. Although we do take note that advancement in modern technology, such as social media, has made it possible for interaction to occur without close physical proximity (see Manski 2000; Conley and Topa 2002). Nonetheless, our expectation is that this subjective social norms (i.e. whether the friends have sexually debuted) is likely to predict whether the young adult reports sexual debut.

In doing so we use the following two sexual debut questions: "Have you ever had sex?" where the response options include 'yes' or 'no', and the second question is "How many of your friends have had sex?" where the response options were "most of them", "some of them", "few of them", and "none of them". As mentioned earlier, our expectation is that there is likely to be a strong positive correlation between the information from these two questions. That is, whether the young adult reports sexual debut is likely to be correlated with whether the young adult's friends have had sex. Table 6 depicts the correlation of the above scenario. As can be seen and as per our expectation, the correlation between whether the young adult has had sex (1) and whether their friends have had sex is quite high at 0.695. Further, the p-value shows failure to accept the null hypothesis of independence between the two variables. Table 7 follows from Table 6, where we regress the proportion of friends who have had sex with whether the young adult has had sex and other covariates. We observe that the probability of sexual debut increases with the increment in the number of friends who have made their sexual debut (i.e. "most of them"). In general, this suggests that whether friends have had sex matters for the sexual debut decisions of these young adults. However, as in Table 5, the results in this table (Table 7) are far from definitive. This is because of the probably endogeneity. Unfortunately, we are not able to use lags or leads as instrument because the sexual debut information on close friends is only available in wave 3. Additionally, we do not have any credible instruments at our disposal. Nonetheless, even though the true social effects cannot be separated, the results are consistent with our expectations.

Repeated game experiment

A large body of literature on repeated game experiments and group norms (see, e.g., Fischbacher *et al.*, 2000; Fehr *et al.*, 2004; Gachter *et al.*, 2009; Brick *et al.*, 2010) indicate that being below the group norm often leads to a revision upwards towards the norm, while being above the norm is associated with a revision downwards to the group norm. In this section we mimic a repeated game experiment by taking advantage of the panel structure of our data in order to determine how young adults who are below and above the norm will adjust their number of sex partners in the subsequent years. In Table 8 we

[13] This differs from our objective measure of social norm related to multiple partnerships, which is calculated as the average number of sex partners in the community following current literature.

show the regression results using change in the number of sex partners as the outcome and absolute positive deviation that is, those who are above the social norm and negative deviation for those who are below the norm. As expected we see a negative coefficient on the positive deviation regressor, indicative of a decrease in the number of sex partners towards the norm, for young adults above the norm. In addition, we observe a positive coefficient, on the negative deviation regressor, suggesting an increase in the number of partners for those who are below the norm.

5 Conclusion

To reiterate, this paper examines whether social norms (measured by the average number of sex partners in the community) affect young adults' number of sex partners (multiple partners). We use a panel (2002–2009) of young adults who reside in the metropolitan area of Cape Town in South Africa. We use two outcomes: normalised number of sex partners to overcome age bias and binary sex partners to overcome reporting bias. We use a two-stage fixed-effects model and an assortment of instruments to accommodate simultaneity, sorting and unobservables. Further, we perform various robustness tests to support our model identification. First, we test various instruments. Second, we construct placebo social norms where we substitute the norm with that of another community. Third, we apply a residential status falsification test on the premise that *permanent* residents are more likely to follow the existing community social norms than *temporary* or *non-residents.* Last, we augment the objective social norm measure with a subjective (self-reported) norm related to sexual debut. All the aforementioned tests yielded satisfactory results.

It is apparent that there is persistent practice of multiple (serial/concurrent) partnerships in sub-Saharan Africa, which is quite surprising, given that 80% of new HIV infection, in the region, occur through heterosexual transmission (UNAIDS 2010a). A question that has persisted over time is what drives multiple partnerships in sub-Saharan Africa. The study explores the possibility of social norms. Our findings, to a large extent, support this possibility. From a policy perspective, this has important implications for the '*Zero new HIV infection*' vision promoted by UNAIDS. Targeting the prevailing social norms that relate to multiple partnerships is arguably a priority, if this vision is to be achieved.

Also important, the results show that the magnitude of social norms differs by gender, which suggests that male and female young adults respond differently to the prevailing social norms. This certainly requires further probing. What is it about young women that make them more resilient to the prevailing social norms in the community? Some qualitative studies have pointed to the influence of 'real man' identity where young males face pressure from their friends to conform (see Ragnarsson *et al.* 2010). Other studies have suggested that women in sub-Saharan Africa are expected to be submissive and passive on sexual matters (see Akwara *et al.*, 2003; Wellings *et al.*, 2006; Benefo *et al.*, 2008). Future research could investigate this gender difference among young

adults. Another interesting and related question is what drives this adoption of the prevailing social norms in the community, is it social pressure or merely imitation? We attempt to address this in a forthcoming paper.

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Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Multiple partners (Number of sex partners in the past year)	1.6069	1.5728	0	20
Normalised multiple partners (by age)	0.0728	0.074523	0	1.0588
Binary multiple partners (0/1)	0.256149	0.43657	0	1
Age	22.6236	3.2439	14	33
Sex	0.5749	0.4944	0	1
Education years	10.0716	1.9948	3	16
Knowledge of someone died of AIDS	0.5867	0.4925	0	1
Knowledge of someone with of HIV/AIDS	0.6555	0.4753	0	1
Social norm	1.4930	0.4977	0.3333	5.6667

Table 2: Two-stage fixed-effects model for the effects of social norm on multiple partnerships

Outcome:	Panel A Normalised multiple partners			Panel B Binary multiple partnership (0/1)		
	(1) All	(2) Males	(3) Females	(4) All	(5) Males	(6) Females
Social norms	**0.964*** **	**1.661*** **	**0.294***	**0.391*** **	**0.689*** **	**0.0529**
	(0.192)	**(0.373)**	**(0.151)**	**(0.120)**	**(0.197)**	**(0.141)**
Age	0.259***	0.360*	0.129**	0.115**	0.129	0.0814
	(0.0863)	(0.186)	(0.0652)	(0.0539)	(0.0985)	(0.0608)
Age^2	-0.00702***	-0.00999**	-0.00336**	-0.00348***	-0.00411*	-0.00236*
	(0.00200)	(0.00425)	(0.00152)	(0.00125)	(0.00225)	(0.00142)
Education years	-0.0158	-0.0257	-0.00778	-0.0155	-0.0116	-0.0171
	(0.0249)	(0.0534)	(0.0188)	(0.0156)	(0.0283)	(0.0176)
Knowledge of someone died of AIDS	0.000117	-0.0474	0.0224	0.0138	-0.0287	0.0392
	(0.0413)	(0.0955)	(0.0295)	(0.0258)	(0.0505)	(0.0276)
Knowledge of someone with of HIV/AIDS	-0.106**	-0.211**	-0.0427	-0.0545**	-0.0855	-0.0400
	(0.0428)	(0.100)	(0.0303)	(0.0267)	(0.0532)	(0.0283)
Constant	-2.101**	-2.925	-0.910	-0.649	-0.660	-0.373
	(0.828)	(1.792)	(0.624)	(0.517)	(0.948)	(0.582)
Observations	2,375	990	1,385	2,375	990	1,385
Number of young adults	857	366	493	857	366	493

● Standard errors in parentheses ● *** p<0.01, ** p<0.05, * p<0.1 ● Instrumented for social norms. Excluded instruments: lead social norms

Table 3: Two-stage fixed-effects model for the effects of social norm on multiple partnerships

Outcome:	Panel A Normalised multiple partners			Panel B Binary multiple partnership (0/1)		
	(1)	(2)	(3)	(4)	(5)	(6)
Instrument:	One-year lag IV	Two-years lag IV	Three-years lag IV	One-year lag IV	Two-years lag IV	Three-years lag IV
Social norms	0.945**	1.407***	1.902*	0.0101	0.0482**	0.0642*
	(0.419)	(0.431)	(1.010)	(0.0226)	(0.0202)	(0.0375)
Age	6.269***	6.180***	-9.588**	0.0702	-0.0782	-0.177
	(1.075)	(1.842)	(4.503)	(0.0581)	(0.0865)	(0.167)
Age^2	-0.131***	-0.141***	0.166*	-0.00121	0.000480	0.00311
	(0.0201)	(0.0336)	(0.0873)	(0.00109)	(0.00158)	(0.00324)
Education years	0.0282	-0.00590	-0.0228	0.00227	0.000576	-0.00117
	(0.0783)	(0.137)	(0.0962)	(0.00423)	(0.00641)	(0.00357)
Knowledge of someone died of AIDS	0.413	0.829	0.857	-0.00155	0.0189	-0.0285
	(0.487)	(0.808)	(1.289)	(0.0263)	(0.0380)	(0.0479)
Knowledge of someone with of HIV/AIDS	-1.226**	-1.677*	-0.840	-0.0528*	-0.0223	-0.0175
	(0.538)	(0.870)	(1.436)	(0.0290)	(0.0409)	(0.0533)
Constant	-74.08***	-66.44**	131.3**	-0.742	1.759	2.506
	(15.83)	(25.96)	(59.39)	(0.855)	(1.219)	(2.206)
Observations	2,395	1,653	840	2,395	1,653	840
Number of young adults	858	858		858	858	

Recall that our analysis is based on CAPS wave 1, 3, 4 and 5. We do not include wave 2 because of lack of information on sexual behaviour. The models in Column 1 and 4 are based on one-year lag IV. In Column 2 and 5, we use two-year lag IV. Lastly, in Column 3 and 6, we use three-year lag IV, hence here we use two-stage least squares.

● Standard errors in parentheses ● *** p<0.01, ** p<0.05, * p<0.1 ● Instrumented for social norms. Excluded instruments: lag social norms

Table 4: Two-stage fixed-effects model for the effects of social norm on multiple partnerships - Placebo test

Outcome:	Panel A Normalised multiple partners			Panel B Binary multiple Partnership (0/1)		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	Males	Females	All	Males	Females
Placebo social norms	**-1.475**	**-2.115**	**-0.182**	**-1.015**	**-2.798**	**-0.427**
	(1.019)	**(1.374)**	**(0.814)**	**(0.656)**	**(2.070)**	**(0.793)**
Age	0.346**	0.664**	0.118	0.185**	0.537	0.0950
	(0.135)	(0.300)	(0.0738)	(0.0869)	(0.358)	(0.0719)
Age^2	-0.00701***	-0.0136**	-0.00273*	-0.00389**	-0.0100	-0.00229
	(0.00262)	(0.00596)	(0.00153)	(0.00169)	(0.00640)	(0.00149)
Education years	0.0112	-0.0161	0.00344	-0.00591	-0.0510	-0.0111
	(0.0298)	(0.0693)	(0.0205)	(0.0192)	(0.0706)	(0.0199)
Knowledge of someone died of AIDS	-0.0398	-0.0765	0.0153	-0.0147	-0.103	0.0278
	(0.0589)	(0.122)	(0.0368)	(0.0379)	(0.118)	(0.0359)
Knowledge of someone with of HIV/AIDS	-0.0499	-0.192	-0.0325	-0.0156	-0.0482	-0.0192
	(0.0657)	(0.122)	(0.0500)	(0.0423)	(0.107)	(0.0487)
Constant	-2.871**	-5.648**	-0.803	-1.264	-4.251	-0.495
	(1.255)	(2.772)	(0.700)	(0.808)	(3.220)	(0.682)
Observations	2,375	990	1,385	2,375	990	1,385
Number of young adults	857	366	493	857	366	493

● Standard errors in parentheses ● *** p<0.01, ** p<0.05, * p<0.1 ● Instrumented for social norms. Excluded instruments: lead social norms

Table 5: OLS model for the effects of social norm on multiple partnerships: permanent vs. temporary vs. non-resident

	Wave 3			Wave 4		
Outcome: Normalised multiple partnership	(1) Permanent resident	(2) Temporary resident	(3) Non-resident	(4) Permanent resident	(5) Temporary resident	(6) Non-resident
Social norms	**0.466*** **	**0.781***	**1.041**	**0.682*** **	**0.118**	**0.0858**
	(0.120)	**(0.463)**	**(0.605)**	**(0.170)**	**(0.134)**	**(0.443)**
Age	-1.153***	-1.081***	-4.080	-2.339***	-0.0716***	2.604
	(0.208)	(0.377)	(3.487)	(0.467)	(0.0117)	(2.252)
Age^2	0.0242***	0.0221***	0.0874	0.0477***	-0.000798	-0.0567
	(0.00459)	(0.00816)	(0.0756)	(0.00993)	(0.000774)	(0.0482)
Education years	0.00119	0.00246	-0.0551	-0.0252**	-0.0324*	0.0379
	(0.00442)	(0.00765)	(0.0859)	(0.0118)	(0.0194)	(0.0460)
Knowledge of someone died of AIDS	0.0216	0.0267	-0.717*	-0.0402	-0.0721	-0.362
	(0.0209)	(0.0447)	(0.331)	(0.0589)	(0.110)	(0.392)
Knowledge of someone with of HIV/AIDS	-0.0551*	-0.0882**	0.795**	0.0310	-0.0139	0.384
	(0.0290)	(0.0426)	(0.355)	(0.0632)	(0.105)	(0.433)
Constant	13.77***	13.09***	47.95	28.70***	2.923***	-29.80
	(2.335)	(4.393)	(39.44)	(5.421)	(0.414)	(26.66)
Observations	1,013	157	18	1,051	183	26
R-squared	0.298	0.531	0.518	0.295	0.242	0.228

● Robust standard errors in parentheses ● *** p<0.01, ** p<0.05, * p<0.1

Table 6: Tetrachoric Correlation[1]

		Has had sex
• Has had sex	Tetrachoric correlation	1.000
	Standard error	0.000
• Friends have had sex (response from young adult)	Tetrachoric correlation	**0.695**
	Standard error	0.021
	2-sided exact P[2]	0.000

[1] Tetrachoric correlation is specifically designed for measuring correlation between binary variables. We therefore converted the responses from "How many of you friends have had sex?" to binary representing "none of my friends" and "some of my friends". Tetrachoric correlation is the only one applicable to our data which is mostly categorical in nature.

[2] The p-value is based on the null hypothesis that variables are independent (2-sided exact P)

Table 7: The effects of proportion of friends who have had sex on whether youth has had sex

Outcome: Ever had sex	(1) OLS	(2) PROBIT
No. of friends who have had sex: few of them	**0.310*** **	**0.970*** **
	(0.0270)	**(0.125)**
No. of friends who have had sex: some of them	**0.445*** **	**1.376*** **
	(0.0260)	**(0.123)**
No. of friends who have had sex: most of them	**0.565*** **	**2.080*** **
	(0.0250)	**(0.124)**
Gender dummy	0.0199	0.138*
	(0.0132)	(0.0719)
Age	0.402***	1.172***
	(0.0454)	(0.279)
Age^2	-0.00853***	-0.0223***
	(0.00108)	(0.00681)
Education years	-0.0232***	-0.129***
	(0.00344)	(0.0199)
Household income	1.89e-06	8.68e-06
	(3.26e-06)	(1.53e-05)
Population group, coloured	-0.118***	-0.678***
	(0.0149)	(0.0848)
Population group, white	-0.293**	-1.093*
	(0.135)	(0.646)
Knowledge of someone with HIV/AIDS	-0.00537	-0.0340
	(0.0154)	(0.0900)
Constant	-3.973***	-13.29***
	(0.463)	(2.780)
Observations	2,545	2,545
R-squared	0.392	

● Robust standard errors in parentheses ● *** p<0.01, ** p<0.05, * p<0.1 ● gender reference - male, population group reference - black

Table 8: The effects of proportion of friends who have had sex on whether youth has had sex

Outcome: Change in number of sex partners	(1) All	(2) Males	(3) Females
Positive deviation[1]	-0.166***	-0.146***	-0.193***
	(0.00912)	(0.0116)	(0.00991)
Negative deviation[2]	0.00335***	0.00429***	0.00294***
	(0.000491)	(0.000990)	(0.000395)
Constant	-0.0361***	-0.0501***	-0.0295***
	(0.0114)	(0.0187)	(0.00964)
Observations	2,375	990	1,385
R-squared	0.787	0.755	0.841
Number of personid	857	366	493

*** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses
[1] Difference between norm and no. of partners (normalised) if above norm (absolute value)
[2] Difference between norm and no. of partners (normalised) if below norm