

Doctoral Dissertation Research: Strategizing AIDS Prevention: The Exercise of Sexual Autonomy among Adolescent Girls in Rural Malawi

Section A: Introduction. The overall aim of the proposed research is to identify the factors and conditions that enable adolescent girls to develop and implement successful strategies of HIV prevention.

Background: It is well known that HIV is sexually transmitted, that sub-Saharan Africa (SSA) has the highest HIV prevalence in the world, and that the epidemic there is heterosexual. It is not surprising, then, that research and policy agendas often depict the sexual behavior of Africans as problematic. Social scientists frequently place gender inequality at the center of their research efforts, constructing men as dominant and women as vulnerable to infection and death because they are poorer and less powerful than men, and therefore dependent on the exchange of risky sex for basic survival needs (e.g., Stavrou and Kaufman, 2000). For unmarried young women without other means of earnings, the picture often painted is especially grim. It is indisputable that adolescent girls generally are poorer than their male sexual partners and that they value the benefits of engaging in sexual relationships for money and/or gifts. Nonetheless, the construction of young women as devoid of control or autonomy over their sexual lives diverts attention from other important considerations. For example, the majority of adolescent girls in SSA are not infected, even in rural Malawi, the country with the eighth highest HIV prevalence in the world, and one of the poorest countries in the world. Thus it is essential that researchers direct their attention to the ways in which young women and girls exercise autonomy and control over their sexual lives. We need to understand much more about the strategies young people use to avoid infection and the factors that contribute to their success. Such a research agenda raises many questions, including: What are the characteristics of girls who avoid risky sex? What are the aspects of their social and cultural context that encourage them to make safer sexual behavioral decisions, despite their poverty? And, what are the identifiable entry points that can be incorporated into effective interventions and strengthen their capacity to avoid risk? These unanswered questions provide the basis for the research proposed here.

The specific aims of the planned study are:

- 1) to describe these strategies as well as the social conditions in which they are developed and implemented;
- 2) to identify the points at which young females exercise autonomy in implementing these strategies;
- 3) to distinguish the individual and contextual factors that differentiate between those adolescent girls who are successful at preventing infection and those who are not;
- 4) to clarify the links between education and transactional sex (the exchange of money and/or gifts for sex) for boys and girls

The central premise guiding these aims is that adolescent girls are developing sensible strategies of HIV prevention. At several points during the process of sexual negotiation my observations indicate they have considerable autonomy, an autonomy that is assumed away both in the existing literature and by prevention programs. In addition, I expect that aspects of the social milieu in Malawi, such as the school environment, distinguish those who are likely to be successful at preventing infection from those who are not.

Addressing these specific aims requires collecting new information and using a multi-method approach to analyze new and existing data together. Although the centerpiece of my research will be ethnographic interviews that I plan to conduct in rural Malawi, my involvement with a unique, ongoing study in rural Malawi—where the overall adult HIV prevalence rate is 15% (UNAIDS and WHO 2002)—will easily facilitate a multi-layered analysis. This larger, longitudinal study (MDICP) conducted by the University of Pennsylvania and the Malawi College of Medicine in the summer and fall of 2004, will provide much needed new survey data on adolescents, including biomarkers of HIV and other STDs. The biomarkers are particularly unusual: most studies must infer likelihood of infection from self-reports of sexual behavior, although the validity of such self-reports is questionable (Mensch et al., 2001). Such an exceptional combination of data will permit me not only to distinguish those who are HIV positive from those who are not, but also to draw on a wide spectrum of explanatory variables, including both individual-level factors and more distally-related contextual influences.

To achieve the aims of the proposed project, I will:

1) Aims 1 and 2: Conduct in-depth interviews with approximately 80 unmarried young women and men selected from the MDICP survey sample stratified by region of the country, age and infection status. From these data I will be able to describe the development of strategies of prevention, the sexual autonomy exercised to implement these strategies in premarital relationships, and the contextual differences in both their development and implementation.

2) Aims 3 and 4: Analyze the MDICP survey data for approximately 1200 young men and women (age 15-24) in order to understand a) what characteristics distinguish those who have successfully avoided infection from those who have not, and b) which social conditions and situations young women are able to protect themselves from HIV and STI infection¹. Does, for example, education matter, and if so what are the channels through which it influences sexual behavior? What is the role of household wealth? Are adolescent girls from economically better-off families any different from poorer ones—or are both engaging in transactional sex, the poorer girls for survival and the wealthier ones for luxuries? What is the role of social networks?

Section B: Background and Significance. Throughout the world, while AIDS mortality rates rise after the mid-20s, nearly half of all new HIV infections are among young people between 15-24 years of age (and the long period between infection and death largely accounts for these differences). Both women and young people are considered at increased risk for STI and HIV infection; in SSA, the latest reports show that nearly 13 women are infected with HIV for every 10 men (UNAIDS 2002). In Malawi, recent demographic survey data indicate that 11% of women and 8% of men reported symptoms associated with an STI during the previous year, and in 2003, 58% of HIV infected cases (age 15-49 years) were women (Malawi Demographic and Health Survey, 2000; National AIDS Commission, 2004). Moreover, because the gender disparity in HIV infection rates is pronounced among those under 20, adolescent females are seen as particularly vulnerable (Glynn et al. 2001, Gregson et al. 2002; UNAIDS 2002). Thus for all of these reasons, more research and policy attention has been paid to women's greater vulnerability to infection.

The numbers cited above suggest a rather bleak situation for women and girls, yet it is important to note that in all countries the proportion of those not infected with HIV is much greater than those who are. In Malawi, approximately 15% of the adult population is infected with HIV, the 8th highest rate in the world. Yet despite an epidemic that began nearly two decades ago, the majority clearly are *not* infected, and despite much attention to vulnerable girls, we know little about the ways in which they *avoid* HIV infection. Research frequently focuses either on particularly high-risk adolescent girls (e.g. those in age-discrepant—"Sugar Daddy"—relationships), or on barriers to safe sex, such as the inability or unwillingness of women and girls to reduce risk by using condoms, despite the ravages the disease is causing (Feldman et al. 1997; Helizer-Allen 1994; MacPhail and Campbell 2001). Moreover, previous studies have several important flaws: they typically rely on information on risky sex based on potentially unreliable survey self-reports of sexual behavior; a reliance on survey data can obscure the significance of social context; and the investigations of transactional sex are usually reduced to an examination of gender inequities in power and resources (Nzyuko et al. 1997; for a review, see Luke and Kurz 2002). Collecting new ethnographic data and analysis of an unusually rich longitudinal survey that includes biomarkers of HIV and other STDs will address some of these flaws. Finally, this project will contribute, through a rigorous analysis of empirical findings, to new theoretical understandings about the role of social and cultural institutions and agency in the sexual lives of adolescent girls and boys in SSA.

Section C: Previous Research. In 2004, I supervised a pilot study of 20 in-depth interviews in two of three main regions of Malawi, the northern and the southern. My analyses of these data suggest that many aspects of adolescent sexual behavior are quite different from what is reported in much of the AIDS literature. In particular, I identified two broad but cohesive themes: 1) the nuances of transactional sex and 2) the links between education and autonomy. Regarding the first, transactional sex, the pilot respondents' anecdotes show that transactional sex is not confined to Sugar Daddy relationships, but exists among a variety of partnership types. Its pervasiveness suggests that poverty is not the sole motivating force underlying transactional sex, and thus indicates

¹Following the World Health Organization's categorization of adolescents and young people, I interchangeably use the terms 'adolescent girls (or boys)' and 'young women (or men)' but refer to the age group 15-24 years.

that these relations are more complex than had been understood on the basis of either survey data or qualitative data collected from special high-risk groups (Kelly et al. 2001; MDHS 2000). Rather surprisingly, for instance, stories of money and/or gift giving in the context of sexual partnerships were told by girls and boys involved in a range of partnership types, even in more emotionally-committed ones that had spanned some time, as if they were part and parcel of having a boyfriend or a girlfriend.

Regarding the second theme, the connection between schooling and risk avoidance, I found that school-going female respondents were less likely to be involved with a sexual partner than were those who had left school. Those who had left school were also more likely to have multiple partners. There was also some indication that longer duration of schooling played a role in successful strategies to prevent infection. While on the one hand these preliminary findings are not surprising given the corpus of social science research on the robust connection between education and contraceptive behavior, on the other hand they are contrary to contentions that young school girls in SSA must engage in risky sex in order to pay for school fees (therefore putting them at increased risk for infection). Lastly, there were notable differences between the stories told by girls (and boys) across the two regions, where the northern Tumbukas are patrilineal, more educated and Protestant, and the southern Yaos who are less educated, Muslim, and follow a matrilineal system of inheritance and matrilocal residence pattern following marriage. I will discuss later the importance of regional context and the place it has in the overall design of the study, but first I turn to a discussion of each of the aforementioned themes.

Theme #1: Nuances of transactional sex. The pilot data suggest that the process through which gifts and money are given in sexual partnerships is much more complex than a simple focus on poverty as the motivation for transactional sex or on structural gender inequities. Yet although few in number, recent inquiries have reconsidered this dominant perspective, and the pilot data showed that such explanations may very well be only a part of the whole story (Hunter 2002). Indeed, in settings outside of SSA and the sexual arena, new lines of research are providing interpretations of exchange that demonstrate how complex social interactions are. Wherry (2004), in conducting an investigation on the negotiation of the price of goods in Thailand and Costa Rica, found that the exchange that takes place between negotiators is as much a behavioral process as it is economic; the establishment of prices was found to be socially meaningful rather than purely instrumental. Findings from research on sexual transactions in Brazil showed that partners' expectations regarding modes of transactions are conditional on modes of partnerships, further implying that the transactions are shaped within the context of the partnership (Zelizer, 2003).

Similarly, the pilot data also indicated that the exchanges involved between male-female sexual partners are likely to be varied, to be determined by love and lust as well as money, and to occur within a specific set of social conditions and circumstances. For example, boys and girls noted that the giving and receiving of gifts were associated both with beginning and ending partnerships. Both boys and girls interpreted a gift prior to the beginning of the relationship as signifying the boy's "love", and its value signaled the extent of his interest, and subsequent gifts during the relationship were expected. Thus, girls who received less than they expected were within their rights to refuse a potential partner, or to end a partnership. Young women who reported being "in love" with a "boyfriend" did not seem to expect the same types of money or gifts as girls who did not refer to love or to their partner as a "boyfriend", but girls nonetheless expected some receipt of gifts for sex. In one interview in Rumphu, the Tumbuka female respondent ended the relationship after two months precisely because the boy kept asking for sex, even though he had given her small amounts of money over this period. Other specific elements emerged from the pilot data suggesting transactional sex is a complex social process, with social expectations that require further, in-depth research to understand. Respondents' narratives point to the possibility that money and love are not contradictory: the money given by young men was said to be given so that "she will know that I love her", and while the expectation of sex remained, the comment illustrates the need for more analysis. The proposed study will employ in-depth interviews requisite to capture these subtleties in the Malawian context and thus to understand how the intersections between gender, power, and sexuality contribute to the transmission of AIDS.

Theme #2: Education and Autonomy. The association between education and HIV infection rates is a somewhat ambiguous one. Early in the epidemic, more years of school completed was found to be positively associated with likelihood of infection (reasoned to be that because the more educated are

more mobile, they therefore are more likely to participate in sexual risk-taking) while many did not find a connection at all (Blanc 2000; Gregson, Waddell, and Chandiwana, 2001; Vandemortele and Delamonica 2000). More recently, reports have shown that the direction of the association may have changed (Fylkesnes 2001). In Uganda, de Walque (2004) found a significant negative relationship between educational attainment and infection rates, and that it remained robust net of the effects of religion, wealth, marital status, and village. Given the large number of research endeavors aimed at determining the nature of the ties between education and fertility, it is surprising that so few studies have rigorously sought to identify the mechanisms linking education and AIDS-related behavior. Following much of the traditional approaches to investigating the link between education and fertility, cognitive change models have underpinned the research design among those that have (eg., as addressed with the widely-used Knowledge, Attitudes, and Practices Surveys; Goody 1968; van de Walle 1992). Evaluations of numerous intervention programs aimed at disseminating information about HIV/AIDS, however, often show that over short periods of time, initial behavioral changes revert back to baseline, suggesting that the protective role of education works in ways other than changes in cognition (Walker et al. 2004). Indeed, many AIDS experts now recognize that cognitive change models are not effective and are thus calling for new angles to be used in future research (eg. Green 2004). The proposed study is thought to be such an endeavor.

Based on my analysis of the narratives of premarital relationships told by respondents in the pilot study, it appears as though the beneficial effects of education on reducing risk of HIV for adolescent girls might work through the following two mediating mechanisms. *First*, for many young women the perceived opportunities for the accumulation of human capital afforded them by schooling takes primacy over engaging in sexual partnerships has yet to be examined as a mediator (or at least as far as I could determine)². The pilot study suggests that girls in school are sometimes reluctant to have boyfriends, because it “takes away from getting good marks.” While love and money are not considered contradictory, love and schooling—preparation for “a bright future”—are understood to be at odds. Correspondingly, there was less mention of multiple partners among school-going girls than among girls who left school. The underlying logic of partner reduction is that if one partnership may interfere with studies, then more partners would be viewed as even more detrimental to school achievement.

The *second* proposed mechanism works indirectly via social networks. The literature on social networks suggests that differences in network structure have varying implications for similar outcomes (Granovetter 1973; Marsden 1987). For example, dense networks (networks in which the members know each other well) appear to be influential in changing behavior, whereas sparse networks (where the network partners are connected only to the ego) appear to facilitate the transmission of new information (Kohler, Behrman and Watkins 2001). My pilot data suggest that schoolgirls interact primarily with other schoolgirls, and thus that the density of school-based networks may be greater than the density of the networks of those girls who are not in school. The greater density of the school-based networks may thus be more influential in a collective formulation of strategies of HIV prevention, and in supporting the successful implementation of these strategies. Few studies have been conducted on the potential impact of social networks on AIDS-related behaviors. Yet investigations of social processes—such as networks—on other forms of behavior have been found to be more influential than individual-level explanations (Smith 2003; Watkins et al. 2003; Friedkin and Cook 1990). Moreover, fertility studies in Kenya have found that conversations about fertility and family planning are common among women and their network partners, suggesting that social networks may indeed influence health outcomes (Rutenberg and Watkins, 1997).

In sum, there is a need to investigate the relationship between education and AIDS-related behaviors in rural SSA, and to investigate the mechanisms through which education might protect young women from risk of infection. Themes garnered from the pilot data suggest that education does play a role in young women’s ability to exercise agency in an otherwise constraining setting, thereby managing risk. However, because the pilot data are from a small, unrepresentative sample, further research is needed to test these hypotheses. The plan to collect additional data and conduct other analyses was guided by the foregoing themes. Another important component of the proposed research includes a sociological examination of how individual behavior may be influenced by specific aspects of regional differences in Malawi.

² I suspect that individuals’ perceptions of opportunity costs may actually be a part of, as Swidler (1986) has argued, a “tool kit”, a repertoire of ideologies coupled with practices. While I plan to address this in the dissertation, further exploration of this issue in the current document is beyond the scope of this proposal.

Malawi's North and South. The northern and southern regions of Malawi are contrasted from each other in important social and cultural ways. The Yaos in the south are mostly Muslim, follow a matrilineal inheritance tradition and matrilineal pattern of residence following marriage. The Tumbukas in the north are Protestant, follow a patrilineal inheritance pattern and patrilineal marriage residence. These characteristics have provided the basis for numerous research projects seeking to explain women's power and autonomy in various domains. For instance, women's subordinate status relative to men in rural Tanzania was found to be largely attributed to women's restricted land rights in patrilineal communities Mascarenhas and Mbilinyi (1983). It is interesting to note that in the Balaka southern region the matrilineal and matrilineal Yao community—where women have seemingly greater autonomy on the basis of landholdings, the main economic resource in many African communities—is juxtaposed with Islam (Peters 1997). As a religion, Islam has been considered to be connected with lower autonomy than other religions, mainly because it is embedded in patriarchal values that are in turn linked with lack of contraception and restricted access to education (Caldwell 1986).

Levels of educational attainment are substantially higher among the northern Tumbukas than among the Yaos, and the difference is particularly large for women. In northern Rumphi, the locale of the proposed study's villages, women in the MDICP1 (1998) sample aged 15-49 have on average attended 7 years of school, while in the southern Balaka site women have attended considerably less, 1.5 years. Similarly, while 70% of Rumphi women in the MDICP sample can read and write, only 12% of Balaka can as well³.

Exploiting the contrasts between North and South thus promises to illuminate the ways in which dissimilar social environments—captured by Malawi's striking regional differences—shape the ability of young women to prevent infection of HIV. Indeed, the MDICP data show regional variation of sexual behavior. Seventy-two percent of women in Balaka reported retrospectively of having had sex by their 17th birthday, while 37% of Rumphi women reported the same. In addition, 94% of Balaka women reported having never used a condom during their first non-marital sexual partnership, while 64% of Rumphi women reported the same (see Bracher et al. 2004). Surveillance sites throughout the country of Malawi indicate that HIV rates also vary among communities. In the MDICP study sites, data from the antenatal clinic in Mblachanda, closest to the northern Rumphi site, estimate HIV prevalence in the area to be 14%. In Gawanani, where the antenatal surveillance site is closest to the MDICP southern Balaka site, the estimated rate is 17%. While these data are compelling, any conclusions drawn from them in regard to HIV must be tentative and cautious, because the information on sexual behavior and HIV status are not linked. The MDICP survey data I propose to analyze will enable this link to be addressed. Thus the regional differences, along with the apparent sexual and infection rate variations present a sociological puzzle: can the empirical variations be explained by concomitant differences in the social milieu?

The pilot study indicates that a regional effect on successful prevention strategies may exist; in general, girls in the south seem to be much more likely to have multiple partners for purposes of exchanging sex for benefits than are girls in the north. Girls in the north were less likely to have boyfriends, and when asked why, they attributed it to perceived opportunity costs as well as to peer group norms (eg. my friends use condoms and that is why I do too), and the pilot data suggest that in fact schooling and the value of education seem to play a prominent role in premarital relations in ways that other factors do not. Importantly, I will also examine the possibility that the influence of education on sexual autonomy may be conditioned by regional context. For instance, Yao school-going girls may have differing values and practices than do Tumbuka school-going girls in the north (for reasons not yet known), which in turn affect how they develop and implement strategies of prevention. However, this is only pilot data, and other explanations will need to be explored.

Indeed, while the pilot data suggest that schooling plays a prominent role in young female sexual autonomy, the religious differences across regions provide a unique opportunity to examine the influence of religion in the AIDS epidemic. It is surprising how little is known about religious influences on HIV, despite the nearly universal membership in faith-based institutions in Malawi as

³ While the education gap across the two regions is pronounced for both men and for women, it is more so for women. Thirty-eight percent of MDICP respondents in Balaka versus 96% of respondents in Rumphi reported having ever been to school. However, the gap for men is smaller than that for women: 93% of Tumbuka men can read and write compared to 51% of Yaos and Chewas in Balaka (in comparison with 70% of Rumphi women versus 12% of Balaka women). Historical reasons for these educational differences are rooted in Livingstonia Protestant missionary emphasis on schooling that missionary agendas elsewhere in the country lacked, including the dominant Catholic missionary in Malawi (see Vail in Posner, 2004).

well as throughout SSA (eg. Feierman 1985). Preliminary tabulations of HIV prevalence based on the 2004 round of the MDICP show that prevalence is higher in the South, which has a much higher proportion of Muslims than the other regions. Taking advantage of the ability to distinguish among religions as well as regions will provide a rare opportunity to examine religious institutions and young female sexuality in the context of AIDS.

Section D: Methods, Data, and Time-Table. *Overview.* The research proposed here will employ an interactive methodology by analyzing data from both in-depth interviews I plan to collect (Aims 1 and 2) and the MDICP survey (Aims 3 and 4). This multi-method approach has the advantage of being affiliated with the Malawi Diffusion and Ideational Change Project (MDICP), an ongoing, four-phase study in three regions of rural Malawi.⁴ The project's overarching goal is to investigate the role of social processes in modern family planning and HIV/AIDS and other STIs. In addition to the project's attentiveness to general issues of data quality, using the MDICP data will enhance the qualitative part of the study because of its four-fold, distinct characteristics: 1) its aim to assess young female sexual activity as accurately as possible, 2) its longitudinal design, 3) its inclusion of questions about social networks; and 4) the availability of STI and HIV biomarkers (see, for example, Watkins et al 2003; Bignami et al 2003).

Data from Round 3 of the MDIC project will be available in April 2005, and will be examined in light of the previously collected pilot data. Both the forthcoming survey data and the pilot interviews I conducted will shape the ethnographic guide I will use upon returning to the field in June 2005. However, while the proposed in-depth interviews are the cornerstone of the study, the range of objectives and questions that I described in Section A—which are central to an understanding of sexual autonomy—cannot be addressed entirely with qualitative methods. In fact, some objectives can best be addressed with the survey data, others with the qualitative data, and yet others with both. For example, one of the questions I ask is "Does education matter for successful protection against HIV?" Since the adolescents I plan to interview will not know their HIV status (or, if they do, may not disclose that information), this question can *only* be addressed using the biomarker data gathered from the survey. In contrast, a second objective, "to clarify the links between education and transactional sex for both boys and girls" cannot be adequately addressed with the use of the survey data alone. A more thorough understanding of the nuances of sexual partnerships as they may relate to schooling requires lengthy, informal interviews. Finally, the question, "What are the channels through which education influences sexual behavior?" can best be answered by employing both methods. Analysis of the survey data will show the predictive value of education on various aspects of sexual autonomy, but the qualitative data, however, will permit me to offer a more complete interpretation of any significant associations found (or lack thereof). In addition, the results of these analyses will influence the design of the questionnaire for round 4 of the MDICP (2006). In this wave, the same respondents will be re-interviewed, thus providing me with the opportunity to extend my research following the completion of my dissertation.

Sample. A sample of 80, unmarried adolescent boys and girls will be selected for in-depth interviews. While participants in the pilot study reside in MDICP districts, the forthcoming qualitative sample will come directly from the newly added MDICP 2004 sample of approximately 1,200 adolescents. The qualitative sample will be randomly selected from the list of adolescents in the survey sample in the following, three-step stratification process (aims 1 and 2). First, the sample will be drawn by region, so that 40 respondents come from the north of Malawi (in Rumphi) and 40 come from the southern region (in Balaka). Since the regional differences are thought to affect the degree of women's autonomy in various realms, they may influence the premarital sexual relations of adolescent girls (Palriwala and Risseuw 1996). Second, the qualitative sample will be stratified by sex; twenty girls and twenty boys will be drawn from the south and twenty girls and twenty boys will be drawn from the north. While the proposed research focuses on female autonomy, it is important to understand the sexual behaviors of boys in order to get a complete understanding of the how girls negotiate transactions of sex. It is also important to include boys in the sample since the proposed research is concerned with the ways in which boys negotiate transactional sex (aim 4). Finally, the

⁴ Principal investigators for the study are Susan Watkins, Jere Behrman, and Hans-Peter Kohler. Details can be found at www.ssc.upenn.edu/Social-Networks; a volume of articles resulting from this project is available at [#1](http://www.demographic-research.org/Special).

qualitative sample will be selected according to infection status in order to draw comparisons of characteristics associated with risky behavior (aim 3).

Qualitative methods. In-depth interviews will be the foundation of the qualitative data. An open-ended, semi-structured interview guide is being developed from the pilot study and will be refined once the survey data becomes available. The guide will focus on various aspects of boys' and girls' decision-making processes in the sexual realm, such as why partners are selected or rejected, and the negotiation of gift and money exchange as well as the use of contraception. Both boys and girls will be asked about their motivations behind the giving and receiving of sex, money, and/or gifts, as well as the expectations each sex has of their partner in these types of relationships. With the understanding that sexual transactions are complex interactions, the aim of the interviews will also be to determine what these partnerships mean to respondents. The interviews will be flexible and unobtrusive so that fuller responses are elicited and allowed to emerge spontaneously. The ordering of the questions will be left to the choice of the trained interviewer, so as to circumvent the problem of formality often associated with survey methodology. All interviews will be tape-recorded and transcribed with the consent of the respondent.

Experienced interviewers will be matched according to the sex, age, and ethnicity of the respondent, and will be re-trained by the author. Based on my experiences from the six months I recently spent in Malawi (in 2004), it is clear to me that because of the sensitivity of the subject matter and because of the context-embedded nature of the interview itself, interviews about sex are best conducted by trained local interviewers. To ensure the anonymity of participants, these interviewers will not be from the respondents' villages, but they will be from the same districts. My time in the field will be spent in close proximity to the interviewers in respondents' villages, and I will thus remain in close contact to both interviewers and participants throughout field work. Each semi-structured interview is expected to last approximately one and a half hours. The interviews are expected to take three months to conduct (June-August); the time will be spent divided equally between the two regions of the country in which the study takes place. Analyses and writing will take place over the course of the following academic year (September-May 2005/2006).

Research questions and variables to be used in quantitative analyses.

1. How does social context condition successful prevention strategies? (Aim 3)

The differing social milieu of Malawi's north and south is thought to influence both female sexual autonomy as well as the hypothesized impact of education on that autonomy. In order to assess this statement's accuracy, I will run a series of multiple regression models that will first test whether region is associated with autonomy. Next I will examine the predictive value of education on autonomy, and the possibility that this impact is tempered by Malawi's distinct regions.

Prior to using regression techniques, however, I will first gather basic statistics to describe the potential links between the explanatory variables and various measures of sexual autonomy. Examples of these include two-way tabulations of regional and gender differentials in HIV and STI status, number of partners, age of sexual debut, and ever used condoms. At this stage of the analysis I will also determine the distribution of schooling among the adolescent sample, as measured by both in-school versus out-of-school status as well as level of attainment achieved. This will be done in order to take into account the effects of age in all subsequent analyses. I will thus consider two possibilities. The first is to simply include age as a control. Carrying out the second will depend on the tabulated distribution of in-school versus out-of-school status. If it is the case that most 20-24 year olds in the sample are no longer in school, for example, and most 15-19 year olds are, I would then divide the sample into these two age groups and run each regression separately. This will enable me to examine whether the expected links between the right-hand-side variables and the dependent measures vary by these cohorts.

I expect to find that region will vary with sexual autonomy outcomes. If this is the case, I will then proceed to examine the predictive power of various explanatory variables on dependent measures through a number of linear regressions, with a fixed region effect for every model. In addition to the consideration of age effects, all regression models will be run separately for girls and boys, in order to determine whether any regional effects on outcome measures vary by gender⁵. The sole explanatory variable to be used in the baseline model will be a dichotomous measure of region (1=Balaka,

⁵Age effects will not, however, be considered in the baseline model.

0=Rumphi). The region coefficient will determine what the Balaka condom use rate is, for example, or the differential in age of sexual debut vis-a-vis Rumphi⁶.

The next two models will consider the potential predictive value of education. Education will be measured by number of years attended (eg. 7 years or 5 years), categorically (never been to school, completed primary, or completed secondary), and by current status (still in school versus out of school). To test for this, I will first add each of these two measures to the baseline model to establish whether education has a linear effect relative to region on the dependent variables. I will next consider the possibility of interaction effects; there is a potential for the salience of schooling to differ in terms of girls' sexual autonomy among the north and the south. Thus schooling measures will be computed with region. Measures of religious affiliation (*relig*) and ethnicity (*ethnc*) will be included to differentiate the relative weight of these explanatory variables with region in the baseline model. Age will be considered, as well as controls for measures of wealth to account for the presumed weight of economic resources on autonomy measures.

Thus the explanatory variables to be used in the regression equations are: region, measures of education, religious affiliation, ethnicity, and measures of social networks. The specific dependent variables of sexual autonomy to be used will be age at first intercourse, infection status, ever used condoms, the number of sexual partners, whether a gift/money was given/received during the respondent's last sexual encounter, and the reasons for beginning and ending partnerships. Regarding the first, age at first intercourse, some respondents are expected to report having never had sex. I will thus use an estimator that controls for right-censoring; this will estimate the expected age at which these respondents will first have sex. Regarding the last, a multinomial relationship best describes the possible response categories. For girls reported having ended a partnership, for instance, the following discrete outcomes are possible: 'lack of love', 'did not trust partner', 'partner would not get married', 'did not receive money/gifts', 'partner was unfaithful', 'was worried about partner's STD/HIV status', 'partner lived too far', 'work/migration' or 'other'. I will collapse these categories (if sensible) upon determining the distribution of responses. Each dependent variable listed was chosen precisely because it captures various points of possible prevention strategies. Autonomy may thus be exercised within the context of partnerships—for instance by negotiating safe sex—but it may also be mobilized on the “peripheries”—by ending partnerships risky.

Thus the full equation described will be estimated as such:

$$Y_i = \alpha_i + \beta_1 region_i + \beta_2 educ_i + \beta_3 educ_i * region_i + \beta_4 relig_i + \beta_5 ethnc_i + \beta_6 X_i + \varepsilon_i$$

Where Y_i is the outcome variable for individual ' i ', β_1 is the coefficient for region, β_2 is the coefficient for education, β_3 the coefficient to determine regional differences of education on the outcome variable, X is a vector of control variables thought to impact sexual autonomy, and ε is an independently distributed error term for individual i .

2. If education is found to have predictive power on sexual autonomy, then: What mechanisms can account for the association? (Aims 3 and 4).

As I noted earlier in Section C, Theme #2, evidence from the pilot data suggest that more educated girls appear to be more successful at avoiding risk because, in part, of perceived opportunity costs associated with premarital relations; they state that having a boyfriend or sex partner will threaten their chances of being successful in school. Measures of the value of education or of what it may bring in the future are not included in the survey, but will be addressed using the qualitative data. The second hypothesized mechanism, via social networks, will be tested using the survey data. I will be able to ascertain the relative influence of social networks by schooling measures. I hypothesize that the social networks of more educated, in-school girls frame social norms and practices that are conducive to preventing infection in ways that differ from less educated, out of school girls.

⁶ It is difficult to establish causal relationships without longitudinal data or instrumental variables (Winship and Morgan 1999). Since the newly added adolescent sample will be for only one point in time (data available in April 2005), only after the completion of the 2006 data collection will I be able to meaningfully attempt to difference out fixed effects and have an unbiased estimator necessary to infer causality. Preliminarily, however, I will use the qualitative data to begin assessing the direction of causality (see Short et al. 2002).

Building on social networks measures from the adult questionnaire, I designed the MDICP adolescent questionnaire so that knowledge about network partner characteristics could be gathered. In answering a question about whether they have talked with someone (outside the immediate family) about AIDS, respondents were asked to identify up to four network partners. Respondents were also asked about various characteristics of each partner named, including the relation of the partner to the respondent, level of education, current school status, whether the partner attends the same church or mosque as the respondent, and the level of intimacy between the respondent and each partner. The survey is also designed to establish the degree to which the partners know each other, and will thus enable me to determine the density of network partners, an important consideration if one is seeking to examine the level of social influence social networks have on one's outcome of interest. I will be able to compare the network partners of more educated versus less educated individuals, as well as examine trends found among networks as they relate to strategies of prevention employed by respondents. To do this, I will run separate regression equations by categories of schooling measures. For instance, I will divide the sample by school status (in vs. out) and examine networks as they are connected with outcomes of autonomy. Thus network measures (*netwrks*) will be added to the initial regression models but as they are separated by schooling measures, and will then be estimated as follows:

$$Y_i = \alpha_i + \beta_1 region_i + \beta_2 netwrks + \beta_3 relig + \beta_4 ethnc + \beta_5 X_i + \varepsilon_i$$

Where Y_i is the outcome variable for individual i , β_2 the coefficient for network variables for individual i , *netwrks* is an indicator of various network measures, including density, content of conversations, and partner characteristics, and ε is an independently distributed error term for individual i . As noted, this model will be used to compare schooling differentials. Thus it will be run separately for, example, individuals who completed primary school versus those who completed secondary school, or those who are still in school versus those who have left.

Section E. Analyses and Expected Results. Drawing the qualitative sample from the larger survey will enable me to conduct the requisite multi-method analyses for the proposed project. Using rigorous analyses of the in-depth interviews along with appropriate statistical models, I expect to find that Malawi's social context will have import on shaping the degree to which young women can exert autonomy in the sexual realm. I further expect that education will also be linked successful prevention strategies, and that this relationship will be conditioned by region. Social networks will be dynamically linked with education and autonomy, and transactional sex will be complex and intertwined with AIDS-related behavior and schooling in ways not known prior to the expected findings of the proposed project.

Specifically, based on findings from the pilot data, MDICP data, and my knowledge of DHS data, I expect to find regional differences in the statistical analyses to be calculated. By subsequently modeling for education both additively and interactionally, I also expect it to have predictive value on infection status, as well as on other AIDS-related behavioral outcomes, such as partner selection, and sexual and contraceptive behaviors. For instance, according to the model specified under research question #1, Section D I expect β_2 (the education coefficient) to be positively associated with outcome of interest Y (such as ever used condom). I also expect to find that longer exposure to schooling will be associated with greater network density which will in turn be associated with successful prevention strategies. It is thus expected that these analyses will provide new knowledge about the ways in which social context and education are connected with sexual and contraceptive behavior. In this regard, the study is expected to be of great value in understanding the HIV risk of young girls in Africa. But additionally and importantly, this information is also thought to inform the fertility literature. Thus while AIDS-related sexual behavior and fertility-related sexual behavior can be quite different (eg. a person may choose to wear a condom during intercourse to prevent pregnancy *or* to prevent HIV) the behaviors themselves—sexual and contraceptive behavior are the same. This study is therefore expected to be of value; while the connection between education and fertility-related behavior has been shown to be robust and sustainable over decades of research, the nature of the association remains unclear: the relationship is not always linear, its strength varies across social settings, and debates surrounding its linking mechanisms are unsettled (see Cleland and Kaufmann 1998).

The information garnered from the quantitative analyses will bring important knowledge about the effects of both individual and contextual factors on girls' ability to prevent HIV (specific aim #3). However, the qualitative data will be critical for accurately interpreting statistically significant

relationships. While it is expected that education will play a significant role in outcomes associated with sexual autonomy, it may be the case, as Johnson-Hanks (2003) found in Cameroon, that contraceptive behavior is not bound with one particular social institution more cohesively than others. Instead, such behavior is best understood as a product of a culmination of social and cultural practices, of one's social world. In using ethnographic findings to supplement survey data, she concludes that an attribution of one institution as carrying more weight over others in determining patterns of premarital fertility would be spurious.

I will systematically code all in-depth interview transcripts and from them create summary matrices. Rigorous examination of emergent themes and information-gathering of content, distribution and frequencies of perspectives expressed is expected to provide a nuanced understanding of premarital sexual relations. A qualitative software program, Nvivo, will be used to calculate the distributions of these themes. In addition to its value of interpreting the survey data, the in-depth interviews are expected to be the primary source of data for understanding other possible mediating factors accounting for the proposed link between education and AIDS-related behavior, such as the value of education (and hence perceived opportunity costs associated with having a boyfriend/girlfriend) often cited in the pilot data. It is also expected to shed light on social network findings from the quantitative data. For instance, if it is found that respondents' attribute as reasons for accepting a proposal from a sexual partner is because other friends had partners, then it would appear that network partners are influential in shaping AIDS-related behavior. (In Malawi, the normative approach for acquiring a girlfriend or sexual partner mandates that a boy "propose" a girl via a letter stating that, for instance, she is beautiful and he wants her to be his girlfriend, or via a messenger—usually a friend or sibling—who announces the boy's intention.)

Moreover, the intricacies of transactional sex employing ethnographic methods will permit clarification on the specifics of money and gifts used in transactions. Consistent with recent findings (as noted in section C, Theme #1) on exchange in other contexts, I expect to find that in this study, the characteristics of exchange will both vary across partnership types and be nuanced, all of which depend on many complex processes such as emotion and the socio-cultural context. The specifics of these exchanges are likely to have considerable consequences for girls' autonomy. While I expect to find that many of these transactions are driven by the girls' lack of resources to provide for their needs, I also expect to find that transactions do occur in more emotionally-committed relationships, and that education will have a place in determining patterns of sexuality. These themes gathered from the qualitative data will be considered in light of the findings from the quantitative analyses.

Section F. Summary. Findings from this study will increase our knowledge about the ways that young people (and especially girls) exercise agency in their sexual lives over the risks of STI and HIV infection. Rather surprisingly, little research has focused on youth who are *not* engaging in risk behavior in the sexual realm, yet they may be of critical importance in serving as the *avant garde*, as local examples for other youth. Quantitative analyses will permit identification of correlates of sexual behavior and characteristics of partnerships, but the crux of the proposed research, the qualitative data, will allow a deeper understanding of the patterns found. Thus, from the results of this project I hope to encourage researchers and policy makers interested in the sexual lives of adolescents to reconsider the social processes involved in risk-avoiding sexual behaviors. Despite consistent findings that education has beneficial effects on the lives of young women, we know surprisingly little about how it may reduce the likelihood that youth engage in risky sexual behavior.

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