A moveable feast?
AIDS-related uncertainty and the fertility preferences of young adults in a generalized epidemic

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ABSTRACT

This study asks about the role of uncertainty in shaping the fertility preferences of young adults in Sub-Saharan Africa (SSA). New data from Tsogolo la Thanzi, a study of 2500 young adults (15-24) in peri-urban Malawi, is used to assess the conditions under which respondents believe their preference will move, in which directions, and whether or not this move would be temporary (a tempo effect) or permanent (a quantum effect). We examine how concern about HIV predicts fertility desires as measured with the Coombs scale, a sensitive but rarely used tool. We draw upon a rich literature on uncertainty to theorize that heightened concern about HIV and the proximity of the threat of HIV translate into more malleable fertility preferences and a greater urgency to have children. Finally, we discuss what is - and what is not - unique about AIDS-related uncertainty in the Malawian context.

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Concerns about the vertical (mother-to-child) transmission of HIV in sub-Saharan Africa (SSA) have recently focused attention on the special needs of HIV positive women during their childbearing years. But even in a generalized epidemic where prevalence reaches as high as 25 percent among certain age groups, most adults – indeed 75 percent - are not infected. Some are certain of their status – they are infected and they know it, while others are confident that they do not have the virus. Populations experiencing generalized epidemics are not just characterized by high levels of HIV prevalence; they are also characterized by widespread anxiety about AIDS. A vast majority of adults are uncertain about their current status and about their imminent risk. Given the stochastic and supra-individual nature of risk - partner traits and community prevalence shape an individual's risk - such uncertainty is not just understandable but merited. Some people do not know their status because they are unable or unwilling to access testing facilities (Angotti et al. 2009). Some are afraid to know. Others know that they were negative when they were last tested, but worry that they could become infected at any time – whether because of their own sexual behavior or that of their partner(s). To illustrate, HIV prevalence among young people (aged 15-24) in Kenya is low (1 percent), but infections among this group are higher than any other. In other words, although relatively few young adults are infected, many are about to be, and this, rightly, worries them.

Uncertainty pervades life in SSA (Ashforth 2005; Johnson-Hanks 2004). While HIV/AIDS has contributed to the level of uncertainty, it has hardly introduced it. One need only dabble in the popular and scholarly portraits of SSA to emerge convinced that social life on the sub-continent is comprised of layer upon layer of uncertainty, ranging from food insecurity to political insecurity (e.g., civil war and corrupt states) to spiritual insecurity (e.g., witchcraft). The relatively recent AIDS epidemic represents one additional layer in an environment already characterized by sudden (and often inexplicable) mortality, natural disasters, and the more mundane hardships of daily life. In her work exploring the dual uncertainties of economic crisis and rapid social change characterizing Cameroon in the 1990s, Johnson-Hanks (2005) describes how many Africans respond to the unpredictability of their lives by pursuing strategies of "flexible opportunism" – diversifying risks, opportunities, and relationships. Uncertainty shapes how women both determine which goals are worth pursuing and decide upon the strategies that will facilitate the accomplishment of these goals.

In this paper, we build upon the work of Johnson-Hanks and a small collection of additional studies that address how uncertainty affects underlying aspirations and behavior to argue that, while important for public health research, the binary treatment of HIV status in the context of SSA is wrong-headed sociologically speaking. Categorizing people based on what we know from biomarker data about their sero-status has certain utility for estimating prevalence, determining the AIDS-related needs of populations, and making population projections. Using data from young adults in Southern Malawi, however,

we show that it is the very real experience of uncertainty with regard to infection – current and proximate – that shapes the aspirations and actions of people living in a generalized epidemic. Since the desire to have children is quasi-universal among young people in SSA, where fertility and desired fertility remain among the highest in the world, we focus here on the role of uncertainty in shaping fertility preferences. There are additional links between fertility and HIV: first, in a generalized epidemic, both infection and conception stem from unprotected heterosexual behavior. Second, childbearing is perceived both as a threat to health if one is infected (Yeatman 2009; Rutenberg, Biddlecom, and Kaona 2000) and evidence of health if one is not (Grieser et al. 2001).

Beyond our immediate interest in understanding how young Malawians construct their reproductive goals, we argue that uncertainty is a consequential and important analytical category that holds promise for sociological theorizing about decision-making more generally. Like the uncertainty brought about by rapidly expanding access to education for women in Cameroon (Johnson-Hanks 2004), AIDS represents a "new" type of uncertainty in SSA. In the context of generalized epidemic, most people know someone who has HIV or has died of AIDS, and infections -- while often patterned -- can also appear random. The consequence of this is not confined to the reproductive realm, but may also extend to distinct investment strategies (financial and educational) and religious commitments.

Thinking Sociologically about Uncertainty

Elsewhere in sociology, categories of uncertainty provide important insights into strategic actions for planning futures; these categories are particularly relevant for understanding family dynamics. Menjivar (2006) introduces the idea of "liminal legality" in her correction to thinking about legal status in the US as a black-and-white distinction between documented and undocumented persons. The concept of liminality comes from the work of Victor Turner (Turner 2002, 2004) and describes living on the threshold between two relatively fixed states. For Menjivar, liminal legality comes from policies granting temporary dispensations to individuals that may or may not be renewed at any time, leaving them in a state of heightened insecurity relative to individuals holding a status that can be understood concretely. The situation for Central Americans in particular means that many are legal – for now – but experience high levels of uncertainty about their future legal status. Their liminal status makes it impossible to make decisions about employment (e.g., starting a business), implement strategies for educating their children, and fully invest in their "American" lives (e.g., buying a house). Liminal legality also increases the chances that legal status is – or will become - discordant within families. Husbands and wives apply for renewals at different times, with different outcomes, leading to a situation where a vast majority of Central Americans (her empirical case) live in a kind of legal limbo – whether because of their own legal status or that of their family members. Menjivar argues that Central Americans are reconfiguring forms of the family, reimagining religious institutions, and transforming artistic expression in response to this type of uncertainty regarding their future legal status and location.

In a very different example, Goffman (2009) highlights another type of liminality in her analysis of the precarious legal status of many young Black men in Philadelphia. Neither "free" nor incarcerated, young men on probation, parole, or constant police surveillance in their communities occupy a semi-legal status. Their strategies for avoiding incarceration involve, for example, avoiding "dangerous" places (e.g., hospitals and places where police are present) and cultivating unpredictability in their schedules. Both strategies impede employment possibilities and foster relationship instability; a man who does not regularly sleep at his wife's house is at higher risk of divorce or separation than a man who can and does. For these men, the state of uncertainty within which they live dramatically shapes their lives and does so in unpredictable ways. Whereas being in jail or not fearing jail are realities that have clear defining characteristics and consequences, the uncertainty shrouding the in-between state creates conflict between goals and actions but is no less consequential.

While neither on the run from the law nor trapped in an endless bureaucracy, we argue that individuals in SSA who are uncertain of their HIV status and future risk of infection occupy a similar liminal space to the men and women Menjivar and Goffman describe. It is not the measurement of their status that concerns us here but the way in which the uncertainty they experience vis-à-vis their physical health and reproductive ability shapes their lives in a strongly pro-natalist society.

There is already a precedent in the demographic literature for acknowledging that uncertainty, generally speaking, is relevant for understanding fertility. First, work by Morgan (1982) showed that "don't know" is an analytically meaningful response to questions about fertility intentions. Several additional studies on this topic have moved this line of thinking forward substantially. "Don't know" is no longer treated as missing data but as a valid outcome that merits exploration, particularly in developing countries and areas where literacy is low – places where "traditional," "up to God," ideas about fertility persist. Cross-national comparisons by Riley and colleagues (1993) revealed that the proportion of non-numeric responses is greater in countries with higher desired family size; furthermore they used micro-data from Costa Rica to show that women who perceive less control over their fertility and those with less cognitive skill are more likely to give non-numeric responses (Riley et al. 1993). The reluctance to give a clear answer may not just be due to an inability to think concretely about abstract things or a failure to internalize biological understandings of conception and childbearing. Sandberg's more recent research with rural Nepalese women reveals that those who are nested in social networks where women experience infant morality are more likely to give non-numeric responses to questions about their fertility desires (Sandberg 2005). In other words, women who are exposed to the uncertainty about child survival are the most likely to say they do not know how many children they want and the most likely to say that it is up to God – and not within their control.

Studies of uncertainty have a) led to important discoveries about how liminal identities lead to distinct strategies of action and b) produced a growing consensus that, with regard to fertility, uncertainty is not "missing" or invalid data but a meaningful and analytically predictable response. In other words, reproductive uncertainty is now widely

recognized as an interesting and important outcome, but uncertainty is also a state that influences fertility outcomes – an important independent variable. Social scientists have not yet seriously considered the extent to which what individuals "know they don't know" (Donald Rumsfeld's famous "known unknowns") might be an important predictor of certain types of behavior, as well as the attitudes and preferences that accompany them. In the next section, we draw upon the fertility literature to theorize about why, and in what ways, HIV-related uncertainty in SSA may be particularly important for understanding the reproductive realm.

Quantum Changes

Theorizing about fertility transitions globally, John Caldwell (2004) argued that social upheaval could challenge cultural supports and quicken falls in fertility by increasing insecurity about the future. While Caldwell predominately used case studies of war or political crises, a similar argument has been used to explain the role of economic crisis in reducing both desired and actual fertility in Cameroon (Eloundou-Enyegue, Stokes, and Cornwell 2000). We extend this theory to the health, social, and economic upheaval that the AIDS epidemic has caused in sub-Saharan Africa. HIV/AIDS shifts cultural ideologies and in response culture "makes possible new strategies of action" (Swidler 1986:260). One of these strategies may be the re-evaluation of fertility preferences in response to the changing social realities that accompany the epidemic.

AIDS need not alter the fundamental motivations for childbearing in sub-Saharan Africa to affect preferences. It need only alter the relative importance of some of these factors to affect the childbearing calculus. A handful of studies have demonstrated that HIV positive women are more likely to express a desire to stop childbearing than their HIV negative counterparts (Heys et al. 2009; Taulo et al. 2009). Yeatman (2009b) is among the few studies to include men. She finds the effect of learning that you are HIV positive on the desire to stop childbearing is even greater for men than for women and that the motivations to alter childbearing strategies are highly gendered. She characterizes the fertility preferences of HIV positive women as ambivalent, as they struggle to live "normal" lives in spite of infection. For some women normal means continuing to have children as others in the community do, but for others, normal means preserving their health by ceasing childbearing. In contrast, the men in her study were less ambivalent and saw little utility in having children if the men themselves would not live much longer. None of these studies focused on young men and women, who have yet to begin or have only just being their childbearing, and whose fertility-related response to HIV could be highly variable from those of older men and women (Yeatman 2009b). Studies from urban communities with more experience with antiretroviral medicine have found that young infected men and women express a desire for normalcy characterized by resurgent desires to get married and have children (Cooper et al. 2007; Smith and Mbakwem 2006).

The studies cited above focus on individuals with confirmed HIV infections. But as discussed earlier, the majority of people living in SSA have concerns and uncertainty about their HIV status. Yeatman (Yeatman 2009a) examines how these perceptions about HIV

infection influence the desire to continue childbearing. Building upon ideas fostered in the sociological adage that "if men define situations as real, they are real in their consequences" (W.I. Thomas and D. Thomas 1929), she finds that rural Malawians who perceived they were HIV negative and were surprised to discover they were positive, reduced their fertility desires, while those who perceived they were positive but learned they were negative, increased their desires. These findings illustrate the environment of uncertainty surrounding potential HIV infection and the consequence of this uncertainty—fertility strategies were fundamentally based on *perceptions* of reality and subject to change upon the receipt of new information that changed these perceptions.

Tempo Changes

The timing and spacing of births is important analytically both because it is a predictor of completed family size and because it represents a commitment to a particular reproductive trajectory. In her work on the uncertainty of motherhood in Cameroon, Johnson-Hanks (2004) focuses on the interval between first and second births. In a context where childbearing is nearly universal and occurs early, she found that second-order births feature more variability than first-order births. Furthermore, since non-marital childbearing is common in Cameroon, where children are incorporated into the mother's lineage, second children represent a "true" transition to female adulthood. In other words, it is not the age at which childbearing begins but a distinctive pattern in the timing of second children that distinguishes the reproductive trajectories of educated Cameroonian women from their less-educated peers.

Other studies have emphasized the sensitivity of the tempo components of childbearing to perceptions of uncertainty. Studying the fertility trajectories of Nepalese women, Sandberg demonstrates how the timing of childbearing is sensitive to women's interpretation of child mortality in their proximate networks. He found that women who observe high levels of infant mortality among their friends and neighbors bear their children faster than those who observe low infant mortality among their social network (Sandberg 2006). Where network levels of infant mortality are highly variable, however, women speed up their childbearing, as the underlying risk of infant mortality is harder for them to accurately perceive. These micro-mechanisms reflecting macro-demographic patterns are likely largely sub-conscious yet lead to meaningful outcomes.

Uncertainty about HIV/AIDS

The uncertainty people in SSA feel about their own perceived infection and future risk is understandable. Epidemiologists have notoriously struggled to predict HIV prevalent infections in the diffuse generalized epidemics of the region. For example, Lopman and his colleagues (2008:89) conclude from their study in Zimbabwe:

> The proximate determinants did not explain the majority of
> new infections at the population level. This may be because we

have been unable to measure some risks, but identifying risk factors assumes that those acquiring infections are somehow different from others who do not acquire infections. That they are not suggests that in this generalized epidemic there is little difference in readily identifiable characteristics of the individual between those who acquire infection and those who do not.

That researchers have struggled to clearly identify risk factors in the SSA pandemic evidences the challenges facing those living in affected communities trying to assess their own risks of infection now and in the future.

Another feature of uncertainty is bound up with an amplified emphasis on HIV testing and counseling (HTC) for prevention. Westerners living outside a generalized epidemic might assert that Africans can simply address their uncertainty by getting tested and having their suspicions confirmed or disconfirmed with an objective test. While access to testing has expanded rapidly within the past four years, it remains unclear whether or not access to testing truly changes the calculus of risk perceptions. Testing for HIV also includes mandatory counseling by trained personnel. The UN-published manual to train counselors describes the window period for infection:

The window period lasts from the time a person is first infected until they develop enough antibodies to test positive on an HIV antibody test. This period is from 4-6 weeks for most people. For a few (less than 5% of the population) it may take as long as 12 weeks for enough antibodies to develop. This is very rare. During the window period, the HIV infected person can still pass the virus on to others (p.19).

While a relatively small proportion of new infections, trainers are taught to emphasize the window period possibility during counseling. Thus, individuals who test negative leave the testing center concerned about having been infected in the 12 weeks before testing and about becoming infected in the near future.

There are a few ways to prove your status in SSA. One is to get tested, but testing only gives you a 3-month old snapshot of infection, where one could still be in the window period with an underlying infection. Testing is also a largely private experience—while others may hear rumors, the actual test is only seen by the counselor and the person themselves. In contrast, having a healthy child who grows normally is seen as a public marker of one's own health. While biomedically this is a flawed strategy (mother to child transmission occurs in only approximately 1/3 of positive births without medication; the connection is even smaller for a male partner to child), this process is seen as a public demonstration of health (Grieser et al. 2001), and may be a strategy used by women and men to disconfirm their fears of infection.

The evidence we draw upon here points to two emerging research questions:
- How does uncertainty about HIV infection now – and in the future – influence reproductive desires?
- Are uncertain individuals more similar in their fertility preferences to people who

are certain they are positive? Certain they are negative? Or is uncertainty itself a distinctly liminal state?

DATA

The data for the study come from Tsogolo la Thanzi (TLT), a longitudinal study in Balaka, Malawi designed to examine how young people navigate reproduction in an AIDS epidemic. The first wave of data collection, which we use for the present analysis, took place between May and August 2009. Fifteen hundred female and six hundred male respondents were randomly selected from a sampling frame of 15 to 24 year olds living in census enumeration areas within 7 kilometers of Balaka, Malawi. The catchment area includes a mix of rural and peri-urban communities around Balaka, a growing town one and a half hours from the southern city of Blantyre. In addition to the core sample of randomly-selected women and men, TLT used respondent driven sampling (RDS) to enroll the romantic partners of our female survey respondent into the study, and successfully enrolled approximately 450 partners.

One unique feature of TLT is the use of a centrally located research center for conducting interviews. Respondents were first contacted in their homes and asked to set up a time for an interview. On their assigned day (or more accurately close to it), respondents came to the research center and were interviewed in a private room where their responses could not be overheard by family members or neighbors. The survey took approximately one and a half hours to complete. Refusal at the time of making an appointment and passive refusal by not showing up at the research center were relatively rare (95% of recruited respondents were successfully interviewed).

Our analyses also include the 1406 women with valid responses on all the variables used here, 408 male partners who enrolled in the study through RDS, and a random sample of 533 men who were selected for participation in exactly the same way the women's sample was drawn.

Uncertainty
To examine how uncertainty about HIV shapes ideal family size, timing of childbearing, and the malleability of fertility preferences, we examine several distinct configurations of uncertainty, treating it as a dynamic phenomenon. Our measures are based on an interactive probabilistic measure of likelihood of infection now and at different points in the future (Delavande and Kohler 2009). Respondents were given 10 beans and asked to shift the number of beans to represent the likelihood of certain things happening. The interviewers introduce this method by starting with straightforward questions about the likelihood of going to the market and moving slowly to questions about more sensitive issues. Here, we examine the respondents' answers to the prompt: Pick the number of beans that reflects how likely it is that: a) you are infected with HIV/AIDS right now, b) you will become infected with HIV during the next 12 months, c) you will become infected with HIV during your lifetime. We first make a binary distinction between certain and uncertain individuals: respondents placing between 1 and 9 beans are uncertain, while those placing 0 or 10 are certain. Second, we differentiate between types of certainty, placing those who are sure they are negative in one group and those who are certain they are positive in

another. To examine variation in levels of uncertainty over time, we further split uncertain respondents into three groups based on the interquartile range (<25 percentile, between 25-75 percentile, and 75 percentile and above), creating a five-category measure of uncertainty about current HIV status. We replicate this approach for proximate (within the next year) and lifetime infection.[1] For ease in interpretation, we focus on the 3-pronged measure of uncertainty in our bivariate models; we use the five-category uncertainty measures in our regression models in order to examine variation within the uncertain group.

Quantum: Coombs Scale
TLT measured total desired fertility using the Coombs scale. Rather than using a measure of the number of children a respondent reports as his or her ideal, the Coombs scale value represents each respondent's position on a continuum, distinguishing between respondents who report the same ideal family size but whose actual desired preferences have subtle distinctions. Respondents' position on the scale is determined based on their second and third choices in addition to the first articulated ideal family size.
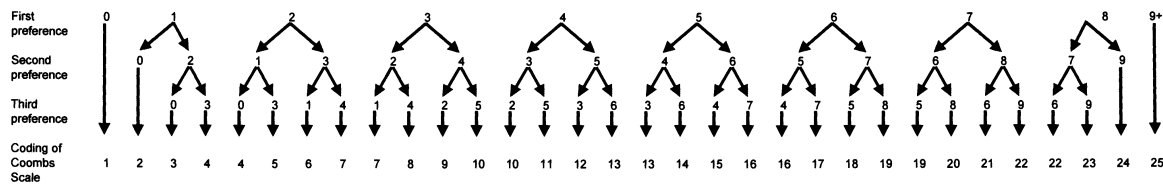
Figure 1: Coombs Scale

FIGURE 1. Response alternatives and coding scheme for Coombs Scale family size preference measure.

Tempo: Timing of Next Child
The timing of childbearing is an important for understanding how fertility preferences are manifest. We measure timing to next birth with the following question asked of all respondents: "How long would you like to wait before having your first/next child?" Responses ranged from: "As soon as possible" (0) to "Five or more years," (5).

Flexibility of Preferences
After the administration of the Coombs scale, each respondent was asked a set of 18 items to tap the malleability of their fertility preferences. In other words, faced with significant

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[1] For an experimental component of this study, one-third of the sample was tested for HIV after completing their regular interview. Of the 25 respondents who indicated they were certain of their infection (10 beans), 9 were tested. The correlation with our HIV biomarker data was alpha=.77 for this group. Of the 1492 who reported knowing they were negative, 624 were tested for HIV and 9 tested positive: alpha=.18. The accuracy of self-assessments are irrelevant to our argument that perceptions are more important than actual HIV status for decision-making; however, it is clear that those who indicate certainty of being positive are mostly right about their status.

events that commonly occur in Malawi (e.g., food shortage, death of a parent, relationship instability), would their preference for number of children increase, decrease or stay constant? [2]In order to differentiate tempo from absolute changes, we also asked about whether or not such events would alter the timing of their childbearing.

Socio-Demographic Factors & Controls
We control for key socio-demographic factors that the previous literature has established as associated with ideal family size: gender, age, sibship size, marital status, and parity (number of living children). We measure education in years of schooling completed. To measure socio-economic status, we created an index of household goods that ranges from 0 to 11.[3]

Because testing for HIV is an obvious response to uncertainty about HIV, we additionally examine a) whether or not a respondent has ever been tested for HIV and received the results from that test and b) time since last test using CMC format; the value for respondents who have never been tested is equal to June of their birth year.

Analytic Strategy

We explore the role of uncertainty in the reproductive goals of young adults in Malawi using a four/five-stage approach. We begin with a brief empirical discussion of five ways to conceptualize AIDS-related uncertainty in this context. Second, we provide an overview of our sample characteristics by uncertainty, including our key outcomes of interest: Coombs Scale score and timing of next birth. Third, we present an in-depth descriptive overview of a unique feature of our data that allow us to assess the role of AIDS-related uncertainty on fertility preferences relative to other types of uncertainty common in the context. We then move to multivariate models to examine the relationship between AIDS uncertainty and quantum and tempo differences in fertility preferences.

RESULTS

Figure 2 provides a nuanced overview of AIDS-related uncertainty in Malawi and how it changes over time. Approximately 36 percent of our sample is uncertain of their current HIV status – placing between 1 and 9 beans. Just over one percent of respondents (N=25) indicated with 10 beans that they were certain of their infection, and the remaining 63 percent were certain of their lack of infection. When considering uncertainty about infection within the next year, the distribution shifts dramatically. About 40 percent of respondents indicate certainty they will remain negative during the next year, and just under 60 percent fall within the uncertain range. We split uncertain responses into thirds: low probability of infection (under the 25th percentile), the interquartile range, and high probability of infection (the 75th percentile and above.) Certainty in avoiding infection (0 beans) falls to 17 percent when respondents are asked about lifetime infection, with 40 percent of respondents situating themselves within the interquartile range of uncertainty,

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[2] Table 3 presents the questions in detail.

and 7 percent of respondents indicating they are certain they will be infected in their lifetime. As a starting point for characterizing AIDS-related uncertainty in Malawi, three observations are evident: 1) a sizable proportion of this population is currently uncertain about their HIV status; 2) uncertainty is dynamic phenomenon – it expands as individuals think about their futures over longer periods of time; 3) there is considerable variation in likelihood of infection within the uncertain group.

Table 1 provides a descriptive overview of the sample characteristics by <u>current</u> certainty status and further serves to highlight the study's setting. The average age for the TLT sample is 20 years old, the average respondent has 1 living child of his/her own, but comes from a family of 5.3 children. Educational attainment in this sample is low: respondents have, on average, 7.8 years of education – over 60 percent have not completed primary school though some are still enrolled. Their households possess fewer than 3 of the 8 items in the household index, the most common of which are radio (77%), phone (63%), and bicycle (57%). Socio-demographically, uncertain individuals are indistinguishable from those who are confident they are negative, while those who know they are positive are older, have more children, and are socio-economically disadvantaged in terms of household goods and education.

On average, respondents report 3.3 children as their ideal family size, a number that is slightly higher for men than for women. The distribution by gender (see Figure 3) also shows that more men than women (3 percentage points) report wanting 4 children, while an ideal of 2 children is more common among women. The average Coombs scale score is 8.77. A position of 8 on the Coombs scale is assigned to a respondent who indicates 3 children as the ideal number, moves down to 2 when forced to choose between 2 and 4, but then moves back up to 4 when forced to choose between a 1 or a 4 child family. A 9 is assigned to respondents who first indicate 3, move up to 4 and then back down to 2 when choosing between 2 and 5 children (see Figure 1). At the bivariate level, ideal family size is comparable for these three groups, but they differ in their reported time to next birth, with those certain they are positive reporting a desire to wait the shortest amount of time for their next child (2.6 years), those who are certain they are negative wanting to wait longer (3.6), and the uncertain almost exactly in-between.

The bivariate statistics displayed in Table 1 provide no evidence that testing for HIV abates uncertainty: uncertain individuals are just as likely to have been tested for HIV as those who are certain they are negative, though HIV positive individuals are more likely to have been tested. To further examine the relationship between testing and uncertainty, we run a logistic regression model predicting uncertainty (vs. certain negative). After controlling for socio-demographic characteristics, neither having ever had an HIV test nor time since last test predict uncertainty about one's HIV status.

Table 3 presents the diversity of conditions under which respondents indicated whether or not they would adjust their fertility preferences. The conditions are listed in the order of least to most susceptible to change. While we list all of the responses here, we focus our discussion on the conditions to which more than half report some change. More than 70 percent of our sample reports no quantum or tempo change for the first 11 conditions, which include all of the economic conditions (e.g., winning the lottery, new

policies to make the education of children more affordable) and most conditions related to family crises such as the illness or death of a parent and the illness of a young child. Our data provide no evidence of strong sex preferences for, though 20 percent of respondents clearly express their desires for a mixed sex household by saying they would have more children if they had only boy or only girl children (these two measures are highly correlated at .86). On average, respondents indicated movement in fertility preferences on 6 of the 18 conditions presented to them. While 11 percent of young people in Balaka report no movement in their preferences in any of the conditions, 3 percent reported some change for every one of the conditions presented to them (not shown).

Of the conditions that elicit quantum changes in preferences for the majority of our sample, four of the five are AIDS-related. Fostering nieces and nephews, hearing rumors of a partner's unfaithfulness, and self or partner losing weight (suspicion of AIDS) are associated with a shift towards fewer children for the majority of young people in Balaka. The only non-AIDS-related condition that strongly influences preferences is having a partner who wants fewer children. Young people in Balaka are more likely to believe their partners' desires could decrease their family size than increase it, revealing what we consider to be a consensus around the "lowest common denominator" as a solution to discordant fertility preferences within couples.[4]

In examining how conditions would alter the tempo of childbearing, we see very similar patterns as we do for quantum preferences but with some notable exceptions. Most respondents report no change in the timing of their families; only the AIDS-related conditions elicit changes in the timing of children from a majority of respondents. Nearly 40 percent report that they would accelerate their childbearing if they suspected that either they or their partner was infected, and 31 percent report that they would have children sooner if they suspected their spouse of infidelity. The latter result may suggest that childbearing is seen as a strategy for maintaining a family in this context. 55 percent of those who report wanting fewer for this reason (unfaithful partner) say would have them sooner: assuming their health is currently intact, they perceive themselves at high risk of infection and anticipate declines in health that will compromise childbearing. Figures 4 and 5 illustrate the quantum and tempo flexibility, respectively, of preferences by age across three types of conditions: economic changes, family changes, and AIDS-related issues. The figures both clearly show that our respondents anticipate their preferences being far more influenced by AIDS-related concerns than by other common experiences and worries.

In Table 4 we examine the relationship between uncertainty around HIV infection and fertility preferences using a series of linear regression models. First, we examine quantum differences via the Coombs Scale, and second we examine variation in tempo of childbearing using our years to next child measure. The socio-demographic patterns are in line with the wide literature on fertility preferences and are stable across these models.

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[4] Across conditions, the preferences of women are less fixed than those of men; however for all the conditions we asked about the general pattern was the same, and we find high levels of consistency in the ordering of these conditions by men and women.

Model 1 reveals patterns in ideal family size that are largely consistent with the substantial literature on fertility preferences in the developing world: net of the number of living children, women desire fewer children then men, sibship size is associated with a preference for larger families, while education and SES are negatively associated with the Coombs Scale score. In examining the role of current uncertainty about HIV status, we find no strong relationship. The story changes, however, when we examine the certainty of HIV status within the coming year: we find a curvilinear relationship, with uncertain individuals desiring larger families than those who are certain in either direction; those in the interquartile range of uncertainty want the largest families, and those who express certainty they are negative tend to desire slightly smaller families.

Model 3 shifts the focus from the number of children young people want to their timing preferences. Women and younger adults want to have their next child sooner, while respondents who have never been married, already have children, are of higher SES and education want to delay their next birth. Individuals who know they are infected right now are no different from those who are certain they are not infected; however, individuals in all three levels of current uncertainty plan to have children sooner. Again, we see a slight curvilinear relationship here, with individuals in the "middle uncertainty" category (2-6 beans) having the strongest acceleration desires. When we consider respondents' certainty about their HIV status 1 year from now, we see a slightly different threshold effect, where individuals in the low category of uncertainty look much like those who know they are uncertain. On the other hand, those who experience middle to high levels of uncertainty in the proximate future want to speed their fertility up but are indistinguishable from those who are certain they will be positive 1 year from now.

DISCUSSION

Life in SSA is characterized by uncertainty. In this paper, we examine the prevalence and nature of AIDS-related uncertainty – and argue that this phenomenon is crucial for understanding the reproductive goals of young adults who are entering their childbearing years. Responses about the conditions under which fertility preferences might change clearly demonstrate that young Malawians think of AIDS as a distinct type of uncertainty: one that has more influence over their reproductive goals than the other types of uncertainty they regularly experience. Its relationship to the body and to sex make HIV especially salient for reproductive matters, though it certainly has implications for other dimensions of life. We argue that it is not HIV status per se, but AIDS-related uncertainty that brings about distinctive forms of decision-making. These findings have important policy implications and offer crucial insights into the role of uncertainty in everyday life.

Among our first observations is that ideal family size is fairly homogenous among young people in this rural Malawian context. The ideal family size for these adults is heavily concentrated between 2 and 4 children (5-10 on the Coombs scale), which doesn't allow for a lot of movement: in life or in our quantum models. Contrary to a handful of studies that have concluded that HIV positive individuals are less likely to want – and have - additional children, we find no relationship between perceived current infection and ideal family size.

Those who are certain they are or will become infected are no different from those who are confident they will not. The differences exist for those who are uncertain about what the future holds and perceive themselves to be at some risk for infection over the near term; among this group, we observe a higher ideal family size. Our sample of young adults has largely just begun their childbearing and may use expressions of ideal family size to hedge their bets about what the future holds.

Preferences in the timing of fertility are very clearly influenced by uncertainty around HIV infection. While individuals who are certain they are HIV positive look much like those who are certain they are negative, those experiencing uncertainty about their current and proximate HIV status express desires to accelerate their childbearing plans relative to their certain peers. We interpret these findings to mean that individuals who acknowledge uncertainty about current and future HIV infection (as in: "I'm healthy now but might not be soon") accelerate their childbearing in order to 1) maximize their (limited) window of good health requisite for healthy childbearing; and 2) demonstrate to themselves and their community that they are healthy, and therefore likely HIV negative.

Since our analyses take a cross-sectional approach, it is possible that the identified relationships work in the opposite direction. For example, individuals who want their next child more quickly could interpret this preference as increasing their risk for acquiring HIV. While this certainly may be true from an epidemiological perspective, we think it is unlikely that the causal order is operating in this direction. In the conditionalities section, we ask our respondents about a possible future and how they would react to that future; they indicate that AIDS-related phenomena are the most salient for their reproductive plans. Our models reveal that these patterns hold true – though they are stronger for tempo than quantum changes. We suspect that the particularly close alignment between our tempo findings and the aggregate responses from our conditionalities questions reflect the fact that both the timing of childbearing and perception of future infection are proximate events, while ideal family size is a more global in scope – reflecting a "destination" in the more distant future.

Tempo differences are key for understanding how women and men who fear AIDS navigate their reproductive lives. Young Malawians who know they have, who think they might have, and who believe they're likely to get HIV - do not cease to want children. On the contrary, they approach childbearing with a sense of great urgency. This process likely operates sub-consciously: Malawian men and women may or may not be sitting with their friends and talking explicitly about how they need to hurry up their childbearing because their partners have started losing weight. Subconscious or conscience, the tendency for uncertain and positive individuals to accelerate their childbearing represents the primacy of local knowledge about reproduction over public health recommendations: there are no campaigns offering such advice to young, HIV positive (or at-risk) men and women.

There are at least three reasons why this new knowledge about uncertainty and childbearing is important for those designing and implementing public health interventions. First, HIV positive persons currently receive counseling that focuses on

effective methods of contraception to avoid childbearing altogether.[5] Among this age group, however, it is clear that most HIV positive individuals will still want children, and most will do everything they can to have their children sooner – while they are relatively healthy. Advice on how to safely achieve that goal would almost certainly be more effective than recommendations on how to avoid having children – which young women (even HIV positive ones) are wont to ignore completely. Second, to date, efforts to integrate HIV prevention with family planning have moved almost exclusively in a single direction: mandating testing for pregnant women (in ante-natal clinics), and making medicine to prevent the vertical transmission of HIV accessible to pregnant, HIV positive women. Some family planning clinics (in Malawi, particularly non-profit clinics) also provide some information about HIV to women who are seeking contraception. Since concerns about childbearing and HIV go hand in hand in this context, integrating discussions about family planning into established HTC programs would well-serve those who are concerned about their current status and prospects for future infection. Third, while ante-natal and family planning clinics only target women, HTC facilities are accessed by women and men almost equally. The current strategies sideline men, but men have fertility preferences and intentions too (Frost and Dodoo 2009). A move towards integrating family planning services into HTC would also dramatically expand the reach of integrated FP/HIV programs in a nearly effortless way - simply by including men, and addressing their reproductive goals and plans.

Apart from individuals' own HIV status – and perceptions thereof – AIDS-related shocks in the community may also shape fertility preferences and play a critical role in the childbearing calculus of young Malawians. Aggregate responses from the conditionalities questions indicate that caregiving and fostering responsibilities factor into the fertility preferences of young people – both through quantum and tempo mechanisms. This will be a key area for future research on AIDS and childbearing, as researchers increasingly recognize that HIV is truly a supra-individual concern and design studies that take this into account in meaningful ways. Focusing on how extended family responsibilities, including caregiving, providing economic assistance, and rearing non-biological children, shape reproductive goals is a clear next-step in this direction.

Importantly, one of the mainstays of HIV prevention and mitigation efforts – HTC – does not mitigate uncertainty for young adults living amidst a generalized epidemic. This is only partially because of the dreaded "window period" qualifications that accompany any negative diagnosis. In our models, current status and certainty have less predictive power than anticipated status in the near future. AIDS-related uncertainty is fundamentally about the future - not the present. Worry about what will happen in the coming weeks and months weighs heavy on young people's minds – especially as this relates their reproductive goals and plans. Even in the current context of expanding access to testing and ARVs, their lives will only become increasingly uncertain with regard to HIV. Unprotected sex – is a requirement for conception, thus an inevitability for the 94 percent of young adults in our study who want to have children within the next 5 years. We caution

here that the utility of testing for HIV not be overstated. It is, of course, an essential tool for researchers and clinicians, and an important service to people living in a generalized epidemic – particularly for those who receive a positive diagnosis. For those who do not get a positive diagnosis, however, HTC does not offer any certainty – either about the present or the future. Retooling the counseling portion of HTC is unlikely to change the landscape of AIDS-related uncertainty: people experience uncertainty about AIDS because it is a profoundly stochastic thing.

In the context of a generalized epidemic, treating HIV status as a binary category ignores the reality of between 40 – 75 percent of the population: those who understand their status to be an uncertain one and make important decisions about their daily lives from within this liminal state. Here we examine solely how uncertainty factors into decisions within the reproductive realm, but we also believe that such uncertainty may lead to distinct strategies in other domains of life. Examinations of the religious beliefs and practices of uncertain individuals may reveal, for example, high levels of religious coping and distinctive beliefs about the nature of the physical and spiritual world. Similarly, uncertainty may lead to different strategies for pursuing educational and occupational goals, not to mention the raw economic questions of how habits of saving and investing are different for people who are highly uncertain about what the future will bring. Studies of uncertainty have the potential to reveal crucial insights into how knowledge is held and prioritized and how decisions are made - both at the individual and collective levels.

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TABLE 1: Overview of TLT W1 Sample by Certainty Status				
	Certain Negative	Uncertain	Certain Postive	Total
TOTAL	63.49	35.45	1.07	
Ideal Number of Children (0-10)	3.25	3.35	3.12	3.29
Coombs Scale Score (0-25)	8.68	8.92	8.40	8.77
Time to Next Birth (0-5)	3.36	3.03	2.60	3.24
Female**	66.95	32.41	0.64	0.60
Male	61.17	37.48	1.35	
Age (13-56)	20.44	20.54	24.00	20.50
Parity (0-13)	0.74	0.82	1.60	0.76
Sibship Size (0-23)	5.30	5.38	5.08	5.33
Years of Education (0-15)	7.98	7.60	7.12	7.81
Household Goods Index (0-8)	2.69	2.52	1.88	2.64
Ever tested for HIV	0.56	0.55	0.84	0.56
Date of last test (CMC)	24109.47	24108.55	24113.10	24109.21
N=2347				

TABLE 2: Adjusted Odds Ratios Predicting Uncertain HIV Status[a]

Female	1.25	*
	(0.13)	
Age	1.00	
	(0.02)	
Marital Status (vs. Married)		
Separated/Divorced	1.33	
	(0.31)	
Never Married	0.77	*
	(0.10)	
Parity	0.97	
	(0.06)	
Years of Education	0.98	
	(0.02)	
Household Goods	0.98	
	(0.03)	
Ever Received Results from an HIV Test	1.21	
	(0.42)	
Time Since Last Test	1.00	
	(0.00)	
Pseudo R2	.01	
Log Likelihood	-1500.12	
LR Chi2	25.78	**
N[b]	2315[+]	

[a] Uncertain vs. Certain Negative (Zero Beans)

[b] excludes 25 cases where respondents know they are HIV positive; and 6 cases missing data on HTC

TABLE 3: Flexibility of Fertility Preferences and Timing of Childbearing							
	NUMBER				TIMING		
	More	Fewer	No Change		Sooner	Later	No Change
Ill Mother(in-law)	1.24	9.96	88.80		4.55	15.24	80.22
Free Secondary School	5.83	7.22	86.95		4.71	15.93	79.36
Primary Uniforms Materials	4.91	8.26	86.83		4.11	16.53	79.35
Mother(in-law) Passes Away	1.83	12.28	85.89		6.55	13.82	79.63
Win Lottery	6.02	9.97	84.01		5.71	18.16	76.13
(Man) Steady Job	8.73	9.13	82.14		4.75	20.59	74.66
(Woman) Steady Job	7.54	10.81	81.65		5.55	19.23	75.22
Ill Youngest Child	4.87	16.73	78.40		7.22	20.87	71.91
Anticipating Maize Shortage	0.24	27.97	71.79		16.27	17.71	66.03
Only Girl Children	20.43	8.14	71.43		6.23	23.56	70.21
Only Boy Children	20.26	8.57	71.17		5.90	24.37	69.72
Partner Wants More	24.59	9.34	66.07		7.56	27.39	65.05
(Male) Partner to RSA	2.27	35.32	62.41		13.20	31.11	55.68
3 Sister(in-law) 's Children	2.87	49.08	48.05		20.41	28.11	51.58
Rumors Partner Unfaithful	0.56	52.14	47.30		31.10	23.34	45.56
Partner Wants Fewer	1.72	56.92	41.36		19.81	27.48	52.72
Partner Losing Weight	0.20	61.39	38.41		38.80	21.04	40.16
Losing Weight AIDS	0.16	62.08	37.76		38.79	21.95	39.27
N=2464							

	Coombs Scale				Time to Next Birth			
	Model 1		Model 2		Model 3		Model 4	
Female	-0.47	***	-0.49	***	-0.34	***	-0.33	***
	(0.14)		(0.14)		(0.06)		(0.06)	
Age	-0.04		-0.04		-0.18	***	-0.18	***
	(0.02)		(0.02)		(0.01)		(0.01)	
Divorced/Widowed (vs. Married)	-0.77	*	-0.82	*	0.21		0.25	
	(0.34)		(0.34)		(0.17)		(0.17)	
Never Married (vs. Married)	-0.37	*	-0.35	+	1.12	***	1.10	***
	(0.18)		(0.18)		(0.08)		(0.08)	
Parity	0.65	***	0.65	***	0.40	***	0.40	***
	(0.09)		(0.09)		(0.04)		(0.04)	
Sibship Size	0.08	***	0.08	***	-0.03	*	-0.03	*
	(0.02)		(0.02)		(0.01)		(0.01)	
Years of Education	-0.13	***	-0.13	***	0.06	***	0.05	***
	(0.02)		(0.02)		(0.01)		(0.01)	
Household Goods	-0.13	**	-0.13	**	0.05	*	0.05	**
	(0.04)		(0.04)		(0.02)		(0.02)	
Current Certainty Status (vs. Certain Negative)								
Uncertain Low	0.22				-0.14	*		
	(0.15)				(0.07)			
Uncertain IQR	0.14				-0.58	***		
	(0.27)				(0.12)			
Uncertain Hi	-0.18				-0.29	**		
	(0.24)				(0.11)			
Certain Positive	-0.82				0.02			
	(0.60)				(0.33)			
Proximate Certainty Status (vs.Certain Negative in 1 Year)								
Uncertain Low			0.40	**			-0.03	
			(0.15)				(0.07)	
Uncertain IQR			0.49	*			-0.38	***
			(0.19)				(0.08)	
Uncertain Hi			0.37	*			-0.37	***
			(0.19)				(0.08)	
Certain Positive			0.06				-0.35	+
			(0.42)				(0.20)	
Constant	10.40	***	10.18	***	5.77	***	5.80	***
	(0.53)		(0.54)		(0.23)		(0.24)	
Log Likelihood	-5873.50		-5870.64		-3625.76		-3622.43	
R2	.11		.12		.37		.38	
N	2347		2347		2170		2170	

FIGURE 2: Operationalizing Uncertainty

Binary Distinction

35% 65%

certain   uncertain

HIV Status

1% 35% 63%

Certain -   Uncertain Status   Certain +

Uncertainty as a Range

Current

7% 1%
5%
23%
63%

Proximate

2%
15%
14%
40%
29%

Lifetime

7% 17%
15%
21%
40%

Certain -   Uncertain Lo   Uncertain IQR
Uncertain Hi   Certain +
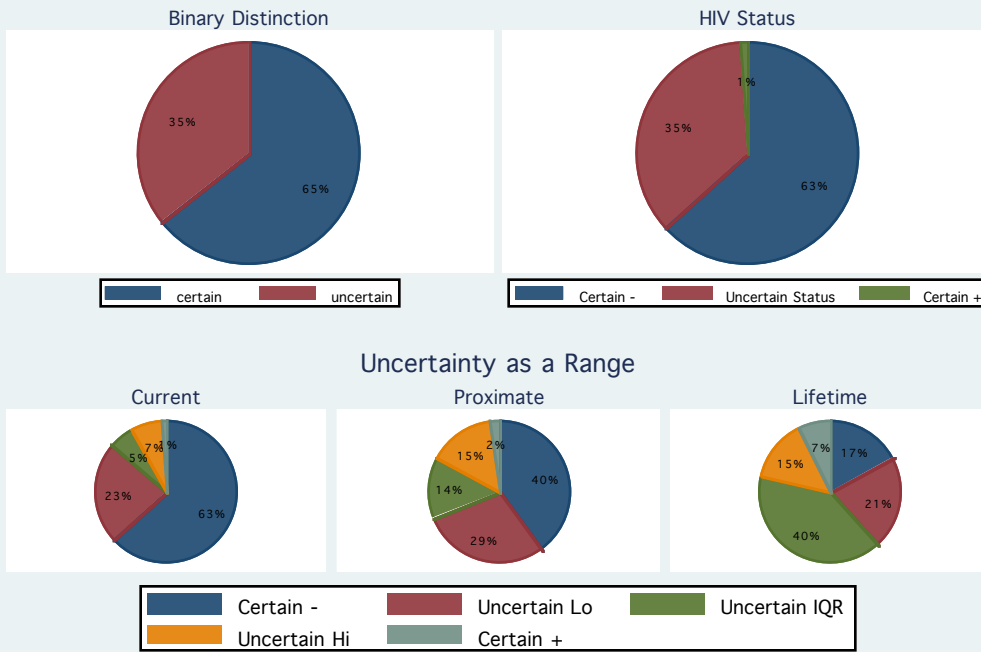
FIGURE 3:
Ideal Number of Children by Gender

Men   Women
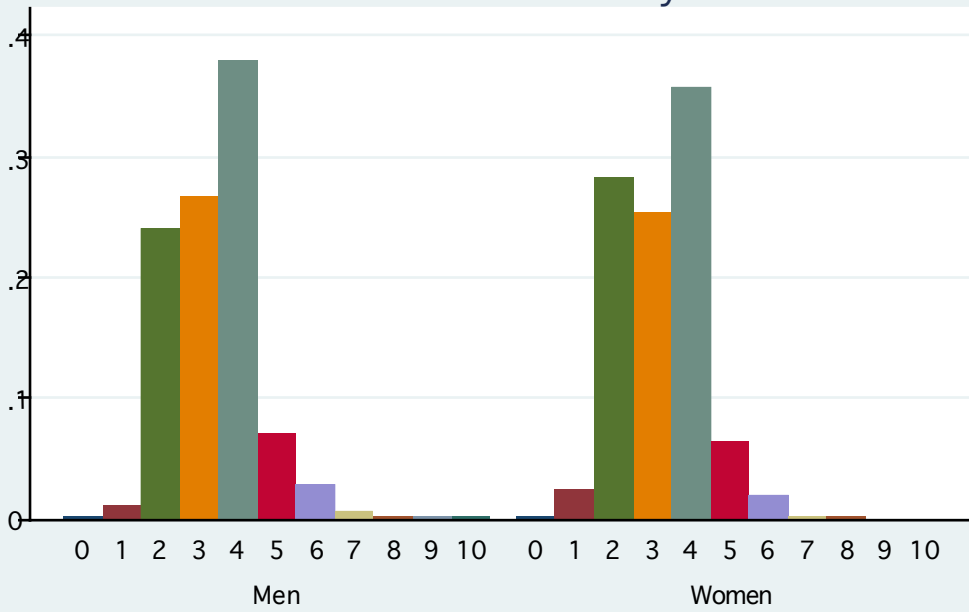
Source: TLT, W1, 2009

FIGURE 4:
Quantum Flexibility of Fertility Preferences By Condition and Age

ECONOMIC REASONS   FAMILY REASONS   AIDS-RELATED REASONS
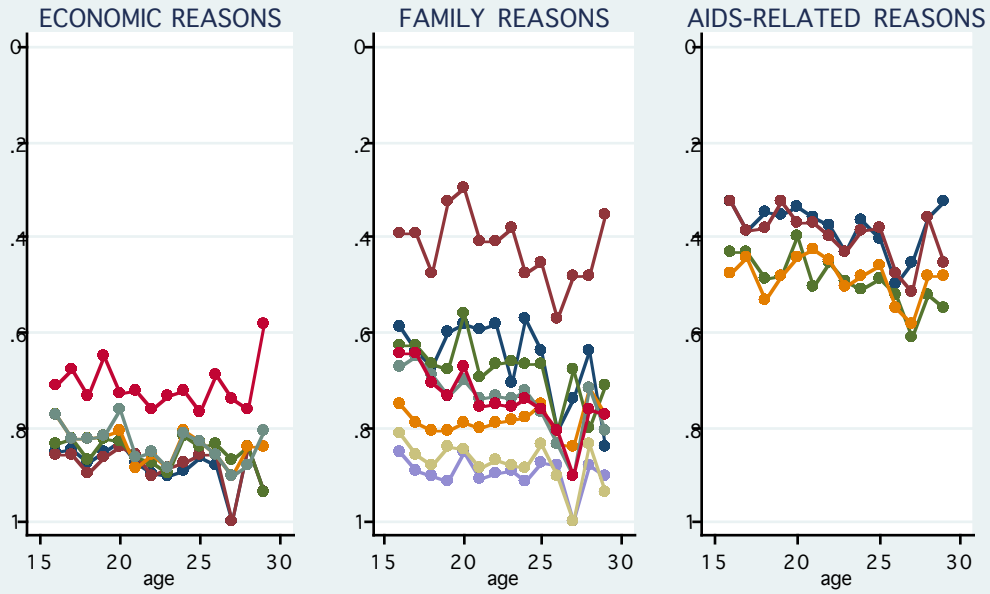
SOURCE: TLT, W1, 2009

FIGURE 5:
Tempo Flexibility of Fertility Preferences By Condition and Age

ECONOMIC REASONS   FAMILY REASONS   AIDS-RELATED REASONS

SOURCE: TLT, W1, 2009