Shocks, Family Transfers and Youth-Transitions in Rural Malawi

Iliana V. Kohler* Hans-Peter Kohler† Linda Kalilani-Phiri‡ Jere R. Behrman§

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Abstract

We investigate how the occurrence of multiple economic and health shocks within families affects the transition to adulthood of adolescent men and women aged 15 to 20 years in rural Malawi, one of the poorest countries in sub-Saharan Africa (SSA) with among the world's highest HIV prevalence rates of 12%. Specifically, by drawing on longitudinal data for 2006 and 2008 (and 2010 in our final analyses) we study how frequent shocks alter important aspects of adolescent transitions such as changes in health status, transition into marriage, leaving the parental household or leaving school within this two-year period. A key innovation of this analysis is that we evaluate the extent to which the effect of shocks on adolescent outcomes is modified—or potentially buffered—by transfers within extended families, and in particular by the net transfers given to the mothers of these adolescent children. Our analysis suggests that the experience of demographic and/or economic shocks affect adolescents in their transition to adulthood, but that transfers given to the mothers of the adolescents possibly play an important mediating factor that can ameliorate the impact of family-level shocks on adolescent outcomes. For instance, mothers who receive net transfers from their parents and/or other adult children are able to buffer the extent to which shocks affect their adolescent children's health. Our results are consistent with the interpretation that financial transfers within families represent an important mechanism to absorb shocks and buffer their effects on multiple aspects of adolescents' lives.

For the final version of the paper, we will extent the analyses included in this *preliminary abstract* and we will include data from 2010, the most current data collection of the Malawi Longitudinal Study of Families and Health (MLSFH). The additional round of observations will substantially increase the statistical power of our analyses, and it will allow us to explore fixed effect and related analyses that can possibly control for the selectivity of experiencing shocks and/or the provision/receipt of transfers. In addition, while in the current preliminary version we focus only on transfers given to mothers of adolescent children, we will expand this analysis and include the "fathers' perspective". In particular, we will compare how patterns of adolescent transitions differ depending on shocks and transfers given to mothers versus shocks and transfers reported by the fathers of adolescents in rural Malawi. The inclusion of the 2010 MLSFH data will therefore allow us to extend the scope of the paper and further explore intergenerational gender links, specifically because shocks perceived by fathers may have more salience for adolescent men and shocks perceived by mothers may have more salience for adolescent women.

*University Research Associate, Associate Director, Population Aging Research Center (PARC), 3718 Locust Walk, University of Pennsylvania, Philadelphia, PA 19104, USA; *Email:* iliana@pop.upenn.edu;

†Frederick J. Warren Professor of Demography, Professor in Sociology, 3718 Locust Walk, University of Pennsylvania, Philadelphia, PA 19104, USA; *Email:* hpkohler@pop.upenn.edu, *Homepage:* http://www.ssc.upenn.edu/∼hpkohler

‡Deputy Director, Research Support Centre, College of Medicine, University of Malawi, Private Bag 360, Blantyre 3, Malawi, *Email:* lkalilani@medcol.mw

§William R. Kenan Jr. Professor of Economics and Professor in Sociology, 3718 Locust Walk, University of Pennsylvania, Philadelphia, PA 19104, USA; *Email:* jbehrman@econ.upenn.edu;

1 Introduction

Young people in sub-Saharan Africa (SSA) make the transition from adolescence to adulthood in challenging and risky socioeconomic and health environments, with substantial exposure to aggregate and idiosyncratic shocks. The SSA context is characterized by poverty levels that are among the highest in the world, frequent exposure to social, economic and environmental shocks, and high risk disease environment including the world's highest HIV/AIDS prevalence rates (Benson and Clay 1994; Fruchart et al. 2011; Jamison et al. 2006; Mkandawire and Aguda 2009; World Bank 2005). In recent decades, moreover, this environment deteriorated secularly rather than improved as in most other less-developed regions, though the recent relatively high economic growth may have reversed this pattern (Lloyd 2005; Lloyd et al. 2006). The relevance of these conditions for the transition to adulthood in SSA is heightened by the very limited formal insurance and institutionalized protection systems that can buffer the consequences of shocks occurring on individual and/or family level, or that can provide support for adolescent individuals during the critical period of human development, when the trajectories for their future as adults are shaped (Lloyd et al. 2006).

In the SSA context, the family represents the central institution through which shocks are mitigated and investments in the adolescents' human and social capital are secured (Ben-Porath 1980; Frankenberg et al. 2002; Pollak 1985; Pörtner 2001). In the face of exposure to repeated numerous shocks, the role of the family for sustaining the well-being of generations, including adolescents, is currently particularly relevant in the sub-Saharan African context because of the demographic, socioeconomic and health consequences of the HIV/AIDS epidemic. AIDS-related morbidity and mortality affects predominantly adults at primary ages in the peak of their economic productivity and is currently the leading cause of prime-age adult mortality (Blacker 2004; Bradshaw et al. 2003; Bradshow et al. 2004; Crampin et al. 2002; Heuveline 2003, 2004; Palloni 1996; Porter and Zaba 2004). The consequences of the epidemic are not only direct for the HIV+ individuals, but the levels and age patterns of HIV/AIDS have indirect implications for household structure and household organization, residential patterns, kin relationships, intergenerational transfers in monetary terms and in-kind and overall well-being of family members, including those family members who themselves are not directly infected (Adhvaryu and Beegle 2009; Beegle et al. 2010; Heuveline 2003, 2004; Merli and Palloni 2006; Palloni and Lee 1992). The magnitude and the disruptive consequences of the HIV/AIDS epidemic make the family also more vulnerable to other aggregate and individual and/or family-level shocks such as drought, change in prices of important goods, lost of crops, and illness or death in the household (Beegle et al. 2008; Bray 2009; Merli and Palloni 2006). As a result of the multiple pressures on families, the roles and responsibilities of family members and generations in providing support and insurance to each other have been changing and shifting (Beegle et al. 2007; Beegle 2008; Bray 2009; Floyd et al. 2007; Hosegood and Timaeus 2006; Knodel et al. 2003; Merli and Palloni 2006; Mtika 2001; Naidu and Harris 2005; Nyasani et al. 2009; Peters et al. 2008; Zimmer 2009).

An important aspect of families in sub-Saharan Africa and other underdeveloped regions is the ability of families to pool and re-distribute resources to ensure family members against different types of risk including health and socioeconomic risks. Young individuals may be among the most affected in this context because of their position in the household, that is being not neces-

sarily dependent on contributions from their parents, but also being in the (physical) position to make contributions to the household and family. When a household is affected by an economic or health shock, adolescent individuals may be under pressure to take upon higher responsibilities for sustaining the household's well-being, which may result in greater monetary and non-monetary transfers flowing from adolescent individuals to their parents, younger siblings and the household in general. Increased obligations to contribute to the well-being of the family, may speed-up certain adolescent transitions such as the transition to work, or marriage. Because of their unique position in the family—being in the process of transitioning to adulthood—parents may invest less in adolescent children, when the household is experiencing a shock since adolescent men and women do not necessarily represent the most frail family members in contrast to younger children or elderly individuals. As a result, less transfer services may be provided from parents to adolescent children, which itself can result in adverse adolescent outcomes such as poor health or a faster transition to independence as an adult.

The implications of this context characterized by the presence of frequent shocks and the pressure to sustain the well-being of families on the transition of young people to adulthood are currently only poorly understood and documented, despite the fact that there is a considerable need for this research both for understanding the current determinants of important transitions that young people undergo, and also for designing improved policies targeting young individuals in sub-Saharan Africa. Since the outbreak of the HIV/AIDS epidemic, studies have paid most attention to the direct risk of HIV/AIDS for adolescents, and in particular on sexual initiation and adolescent reproductive behavior (Biddlecom et al. 2008; Blanc and Way 1998; Eaton et al. 2003; Mensch et al. 2006). Sexual behavior and reproductive health represent however only one aspect of the multiple transitions to adulthood that young people undergo, and a systematic assessment of how individual-level and aggregate contexts influence adolescent outcomes such as the transition from school to work, marriage, health status, or changing roles and responsibilities of adolescents within the family is still lacking. Even fewer studies have investigated how the family context and specifically family-level shocks influence adolescent transitions in the era of HIV/AIDS, and much less evidence exists on whether transfer services within extended family networks such as monetary and in-kind support provided directly to the adolescents or their parents may buffer the impacts of these shocks on adolescents. The analysis of this latter aspect is of particular relevance given the importance of the family in sub-Saharan Africa and the extent to which family structures, relationships, responsibilities and roles of family members have been affected by the HIV/AIDS epidemic.

In this analysis we investigate how family-level factors affect adolescent men and women aged 15 to 20 years in rural Malawi, one of the poorest countries in SSA with among the world's highest HIV prevalence rates of 12% (Malawi DHS 2004). Specifically, we analyze whether family-level economic and health shocks—such as poor crop yields, loss of income sources, breakup of a household, death or serious illness of an adult family member, or just the frequent occurrence and accumulation of different types of shocks—affect young individuals during their transition to adulthood in terms of their health, co-residence with parents, schooling and marriage. To investigate this link between the family context and the transition to adulthood, we employ unique longitudinal data collected in 2006 and 2008 that include detailed information on idiosyncratic and aggregate shocks and exchange of transfers services within extended families. Specifically, we investigate the association of shocks with adolescents' outcomes observed in 2008 such as health and marital status, co-residency with the mother, level of formal education; we refer to these outcomes as *adolescents' current status*. In addition, we analyze whether family-level shocks experienced

between 2006 and 2008 predict changes in these outcomes; we refer to the latter as *adolescents' transitions*. A key innovation of this research is that we evaluate the extent to which the effect of shocks on adolescent outcomes and the changes in these outcomes is modified—or potentially buffered—by transfers occurring within extended families and specifically net financial transfers provided to the mothers of these adolescent men and women. This analysis of the impacts and mechanisms for coping with idiosyncratic shocks will be informative regarding the value of new programs for dealing with such shocks, as well as for considering the consequences of more aggregate shocks for which the traditional informal mechanisms built on transfer networks are likely to be less effective.

The remainder of this paper is organized as follows. In the next section, we describe the Malawi Longitudinal Study of Families and Health (MLSFH) with a particular focus on how information on household shocks and transfers among household members was collected. In section 3 we present discuss the results based on longitudinal data for 2006 and 2008, the data collections with the most comprehensive information on financial transfers within families.[1] In the last section 4 we summarize and discuss our findings.

2 Data

2.1 The Malawi Longitudinal Study of Families and Health (MLSFH)

Data used in this analysis comes from the Malawi Longitudinal Study of Families and Health (MLSFH; formerly, Malawi Diffusion and Ideational Change Project), a longitudinal panel survey with survey waves in 1998, 2001, 2004, 2006, 2008 and 2010[2] that is implemented in three sites in rural Malawi: Rumphi (in the northern region), Mchinji (in the central region), and Balaka (in the southern region). The primary goals of the MLSFH are to study the role of social interactions on attitudes related to sexual behavior in a high risk HIV/AIDS environment, contraceptive use and family planning, and to identify mechanisms used by Malawian households in rural areas to cope with multiple shocks such as HIV/AIDS infections or mortality.

In 1998, when the project started data collection, a sample of 1,541 ever-married women aged 15-49 and 1,065 of their spouses were interviewed. In 2001, respondents were re-interviewed, along with any new spouses since 1998. In 2004, the study added two new components to the data collection: an additional sample of approximately 1,500 adolescents, and free HIV testing and voluntary counseling for the HIV test results to all respondents. The MLSFH returned for a fourth wave of survey data collection and a second round of HIV testing in 2006, and it followed-up in 2008 with a fifth round of extensive survey data, including the collection of the extensive transfer data that are used in the present analysis, and a 3rd round of HIV testing and counseling. In 2006 and 2008 about 4,000 individuals were interviewed by the MLSFH.

Since we are interested in whether financial transfers between family members alter the effects of shocks on demographic and socioeconomic outcomes among adolescents, we use data from the 2006 and 2008 MLSFH waves because they include currently the most detailed information on

[1] Similarly comprehensive information on financial transfers within extended families was collected also in 2010. In the final version of the paper, we will include also these data in the analysis).

[2] The 2010 data collection was completed in August 2010. The linkage between respondents and their children as well as the extraction of the family and transfer information based on the household rosters requires very extensive and time-consuming computational process and was completed while conducting the analysis for this preliminary version of the paper. In the final version of the paper, we will also include the family and transfers information from this last data collection in Malawi.

financial and in-kind transfers between the respondents and living children age 15 and above as well as the respondents' elderly parents. The key innovation of the 2006 and 2008 data collection enabling the present analysis has been the expansion of the family and transfer information. The 2006 and 2008 household and family rosters include not only all individuals who currently live in the household, as frequently is the case in other household data sets, but also information about all parents and children independent of their survival and resident status, including demographic, socioeconomic characteristics and transfers given and received from the respondents' perspective. [3] Specifically, respondents were asked to list all household and family members, including parents and children ever born. For all individuals listed on these household and family rosters, respondents also reported the relationship to the respondent and key socioeconomic information. For example, for each person listed on the household roster (including adolescents), the respondent reported the marital status, the subjective health and health relative to others, schooling and main occupation. In total, 3,850 fathers (1,570 of whom were alive), 3,830 mothers (2,150 of whom were alive), and 22,000 children (16,050 of whom are alive) were listed in the approximately 3,900 household/family rosters that were collected in 2008.

The present analysis selects a sample based on female respondents who listed children age 15-20 in their household rosters in 2008.[4] These children have been longitudinally linked based on matching of names and demographic variables (Castro et al. 2010), and combined with the extensive information on transfers and shocks, our analysis can draw on a rare data set that includes longitudinal information on adolescent's health, marriage, schooling and co-residence along with data on transfers and socioeconomic and health shocks affecting families.

2.2 Family Roster and Transfer Questions in the MLSFH

As part of the 2008 MLSFH survey, as noted, respondents were asked to list all household and family members independent of their residence and survival status, including parents and children ever born. For all listed individuals, respondents also provided background characteristics. In total, 3,850 fathers (1,570 of whom were alive), 3,830 mothers (2,150 of whom were alive), and 22,000 children (16,050 of whom are alive) were listed in the approximately 3,900 household/family rosters that were collected in 2008.

Specifically, for each listed parent or child, MLSFH respondents were asked a set of questions, including: "***What is [name's] relationship to you?***", with our analyses focusing on the respondent's children. "***Is [name] alive?***"For all living parents/children, respondents were asked: (*i*) "***How old is [name]?***"; (*ii*) "***Where does [name] usually live?***", where we classify parents/children living in the same household or compound as the respondent as *co-resident*; (*iii*) "***How would you rate [name's] health in general?***", with response categories including excellent, very good, good, poor, very poor. Because few respondents used poor or very poor to describe the health of their children or parents, similar to the response pattern for the respondent themselves (see Table 1), these categories were further collapsed in our analyses into *excellent health*, *good health*, and *very poor, poor or good health*; and (*iv*) "***What is the highest level of schooling [name] has attended?***", from which we establish whether respondents have completed less than primary schooling, primary schooling, or secondary schooling or more.

[3] In addition, approximately 800 parents of respondents already in the MLSFH sample were added. Detailed description of the MLSFH data and sample is presented in (Watkins et al. 2003), and Anglewicz et al. (2009) provide detailed assessment of MLSFH data quality for the 2004-2006 waves.

[4] Data on transfers between parents and children under 15 were not collected.

For all alive parents and children above age 15, MLSFH respondents were further asked a set of questions about financial and non-financial assistance, including: (*i*) "***In the past two years, have you given [name] any money or financial assistance?***", with responses ranging from: 0 = no; 1 = yes, a little; 2 = yes, some; and 3 = yes, a lot; (*ii*) "***In the past two years, have you given [name] any non-financial help? This could include help that takes time like collecting firewood, cooking, taking care of people, or helping with farming.***", with responses ranging from 0 = no; 1 = yes, once; 2 = yes, several times a year; 3 = yes, at least once a month; 4 = yes, at least once a week; and 5 = Yes, daily; (*iii*) "***In the past two years, has [name] given you any money or financial assistance?***", with responses ranging from: 0 = no; 1 = yes, a little; 2 = yes, some; and 3 = yes, a lot; and (*iv*) "***In the past two years, has [name] given you any non-financial help? This could include help that takes time like collecting firewood, cooking, taking care of people, or helping with farming.***", with responses ranging from 0 = no; 1 = yes, once; 2 = yes, several times per year; 3 = yes, at least once a month; and 4 = yes, at least once per week.

For each of the above questions about financial/non-financial transfers among respondents and their parents or children, a further binary variable was created that indicates whether a respondent has given or has received a ***substantial amount*** of transfers, defined as either "2 = yes, some and 3 = yes, a lot" for financial transfers and "3 = yes, at least once a month; and 4 = yes, at least once per week" for non-financial transfers.

In addition to measuring the actual transfers occurring among family members, the MLSFH questionnaire elicited a list of up to twelve individuals of "potential transfer partners" to whom a respondent could turn to for assistance in periods of need,[5] along with a set of key characteristics of these potential transfer partners such as the relationship to the respondent, the place of residence and occupation, the relative wealth and some other characteristics.

2.3 Linkage of children across household rosters

To allow for longitudinal analyses of the information elicited in the above household and transfer rosters, the data on the respondent's children listed in the 2006 and 2008 MLSFH family and transfer rosters were linked using names, ages, sex, and birth order. Because not all data were available in every wave, and because the spelling of names is not always exactly identical across waves, the matching was not undertaken with a computerized algorithm, but was done case-by-case instead. Two processes were undertaken simultaneously. First, names were designated the principal matching variable; so to be consider matched, a minimum similarity in spelling was required. Second, a quality indicator for the quality of the match was assigned to each matched child, with the match being *low quality*, if no other data than the spelling itself was available to establish the match, and the spelling itself was not sufficiently similar across waves, *medium quality*, if any other variable was available (age, sex, birth order) to establish the match or, if no other data was available but the spelling matched very closely, and *high quality*, if two or more variables were available to establish the match. Only children of medium and high quality of match are included for the analyses of this paper, which represent about 90% of the total matched cases. In total, over five thousand three hundred children were matched between the 2006 and 2008 waves, of which 790 are in the 15-20 age range on which we focus in this paper.

[5]The wording of this section of the questionnaire was as follows: "People in your community occasionally experience various crises, such as famine, health problems, or other events that may lead to economic shortages in your household. If you were to experience such a crisis, who would you ask for assistance. List the names of up to 12 individuals whom you would contact in the case of a crisis, starting with the most reliable source of assistance."

2.4 The Economic Shocks Questions in the MLSFH

Starting in 2006, the survey has collected in each wave detailed information about economic shocks experienced by the household of the survey respondent. In particular, the survey asked the question: "***Over the past five years, was your household severely affected negatively by any of the following unexpected events or crises?***", where the unexpected events/shocks were: (*i*) Death or serious illness of an adult member or someone who provides support for yourself or your family; (*ii*) Poor crop yields, loss of crops due to disease or pests, or loss of livestock due to theft or disease, etc.; (*iii*) Loss of source of income—such as loss employment, business failure, someone who had been assisting the household stopped their support; (*iv*) Big change in price of grain (either increase or decrease); (*v*) Breakup of household, such as divorce; (*vi*) Damage to house due to fire, flood, or other unexpected event; (*vii*) Other, specify.

If several shocks were experienced by the household, respondents were asked to rank among them the three most significant income shocks for the household and answer the following additional questions: (*i*) ***Did this shock cause a reduction in household income, assets, both, or none?***, where the response options were income loss, assets loss, loss of both, or neither; (*ii*) ***Besides your household, who did this shock affect?***, with response options as following: own household only, other households as well, most households in the community, and all households in the community; (*iii*) respondents were asked about the ***year when this shock occurred*** and ***What did you do in response to this shock to try to deal with this shock?***; (*iv*) finally, respondents were asked ***How much money did your household spent to deal with this shock?***, where respondents had to name the amount in Kwatcha, the Malawi currency;

In addition, as part of the roster on potential transfer partners, respondents were asked to list up to 12 individuals whom they would ask for assistance in the occurrence of such shock, including the relationship of these listed individuals to the respondent, their age, frequency of contacts, economic status and what is the respective person's main way of earning money. In the present analysis, we focus on "recent shocks", that is shocks that occurred between 2006-08.

2.5 Methods

The data on economic shocks experienced by households that we use in this study are obtained from the reports of the female respondents, where we focus on shocks experienced between 2006–08 ("recent shocks"). Information about the health, schooling, residence and marital status of adolescents aged 15–20 is obtained from the family rosters in 2006 and 2008 (based on reports by the respondents) and this information is used to calculate transitions in these outcomes that adolescents experience within the two-year period.

To investigate whether the association of shocks experienced by the household with adolescent outcomes is possibly mediated by financial transfers between family members, we computed a simple indicator of net financial transfers received by the respondent (= adolescent's mother). This measure is obtained by calculating the net transfer that the female respondent receives from each of the elderly parents and each child above age 20, and then summing up across parents and adult children. Since the quantitative measurement of transfers in contexts such as Malawi is inherently difficult, the MLSFH did not attempt to monetize the financial and non-financial transfers between respondents and their parents/children. Instead, as described in above, the survey asked respondents to classify the transfers during the two years preceding the survey in terms of the categories "a little", "some" and "a lot" for money or financial assistance, and in terms of the categories "once", "several times per year", "at least once a month" and "at least

once per week" for non-financial help. In earlier analysis, we have combined the respective highest two categories into variables indicating a *substantial amount* of financial/non-financial transfers (Kohler et al. 2011). Under the assumptions that the categorical description "a substantial amount of financial assistance" reflects an approximately equal amount of transfers when a respondent describes the transfers given and received from one particular parent, we can use the categorical description to approximate the net transfers between the respondent and a particular parent/child. For this purpose, we construct a variable *net transfer from mother* (or *father* or each *child* aged 20+ years), that: equals -1 if the respondent has given a substantial amount of financial assistance to his/her mother (father/child) and received from her no or only a little financial assistance in the last two years; equals zero if the respondent has given a substantial amount of financial assistance to his/her mother (father/child) and has also received a substantial amount of financial assistance from his/her mother (father/child); and equals one if the respondent has given no or only a little financial assistance to his/her mother (father), but has received a substantial amount of financial assistance from his/her mother (father/child). Moreover, to reflect the net resource flows unconditional on the respondent's mother's/father's/child's survival, we assign the net transfer variable a value of zero if the respondent's mother/father/child has diseased (or if a respondent has no adult children).

2.6 The Adolescent Children and Their Mothers—Sample Description

2.6.1 The female respondents

The study population for our analyses includes all female respondents who (*i*) were interviewed in 2006 and 2008 and completed the household and transfer rosters, (*ii*) have at least one adolescent child aged 15–20 in 2008 listed on the household roster, and (*iii*) at least one of the adolescent children listed in the household roster has been successfully linked between the 2006 and 2008 MLSFH rounds. Table 1 shows descriptive statistics for these respondents, along with a comparison to other female respondents who were not included in the analyses because they either did not have adolescent children aged 15–20 or because the adolescent children could not be linked across the 2006 and 2008 MLSFH rounds. These comparisons are important since they allow us to assess the quality of the linkage procedure and data.

We begin our description with a comparison between the female respondents with adolescent children. We have successfully linked the information on children for 525 respondents, and only for 68 respondents we could not link the information longitudinally. That is, conditional on having at least one linked adolescent child, 94% of the adolescent children of women were successfully linked to the household rosters. With few exceptions, the first two groups—respondents with at least one linked adolescent child (group 1) versus respondents with unlinked children (group 2)—are very similar in terms of their sociodemographic characteristics. The women are on average 43 years old, and a slightly higher proportion of women with linked children is married (85% versus 76%). On average women with linked children report about 6 alive children, while women with unlinked children report 5.4 alive children. Among these children, the first group reports 1.65 alive adolescent children, and women with adolescent children who were not linked to the rosters report 1.24 adolescent children age 15-20. The mean age of linked and unlinked adolescent children in the 15–20 age range is 17 years, and the mean age of the adult children age 20+ in 2008 is about 26 years for respondents in group 1 and 28 years for respondents in group 2.

The most noticeable differences between the two groups are in the schooling and the regional distributions, HIV positive status, wealth quintiles and the net transfers provided from adult chil-

Table 1: Respondent characteristics

	Female respondents interviewed in both 2006 and 2008							
	With children aged 15–20 (in 2008)							
	At least one child linked in HH rosters		No youth child linked in HH rosters		**No youth child aged 15–20 (in 2008)**		**Total**	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**
# of respondents	**525**		68		828		1421	
Respondent characteristics in 2008								
Age	**42.93**	**(8.57)**	43.34	(10.73)	31.34	(12.52)	36.19	(12.53)
Married	**0.85**	**(0.36)**	0.76	(0.43)	0.85	(0.36)	0.85	(0.36)
# of alive children	**5.86**	**(1.76)**	5.41	(2.04)	2.79	(1.70)	4.05	(2.29)
Highest attended schooling level								
no schooling	**0.35**	**(0.48)**	0.54	(0.50)	0.21	(0.41)	0.28	(0.45)
primary school	**0.62**	**(0.49)**	0.43	(0.50)	0.66	(0.47)	0.64	(0.48)
secondary school	**0.03**	**(0.18)**	0.03	(0.17)	0.12	(0.33)	0.09	(0.28)
Years of completed schooling	**6.80**	**(4.56)**	6.78	(4.44)	8.02	(4.25)	7.65	(4.37)
Region								
North	**0.38**	**(0.49)**	0.19	(0.40)	0.30	(0.46)	0.33	(0.47)
Central	**0.31**	**(0.46)**	0.18	(0.38)	0.34	(0.47)	0.32	(0.47)
South	**0.31**	**(0.46)**	0.63	(0.49)	0.36	(0.48)	0.35	(0.48)
Wealth quintile (1 to 5)	**3.24**	**(1.41)**	2.86	(1.45)	3.09	(1.41)	3.13	(1.41)
SF12 subjective health score	**51.77**	**(9.46)**	50.84	(7.87)	52.81	(5.98)	52.33	(7.57)
HIV positive	**0.07**	**(0.26)**	0.16	(0.37)	0.06	(0.24)	0.07	(0.25)
Youth children (alive and aged 15-20 in 2008)								
# of youth children	**1.65**	**(0.75)**	1.24	(0.52)	–	–	1.61	(0.73)
mean age of youth children	**17.37**	**(1.26)**	17.05	(1.54)	–	–	17.33	(1.30)
Proportion linked in HH roster	**0.94**	**(0.16)**	–	–	–	–	0.83	(0.34)
Adult children (alive and aged 20+ in 2008)								
At least one adult child	**0.63**	**(0.48)**	0.57	(0.50)	0.16	(0.37)	0.35	(0.48)
# of adult children	**1.72**	**(1.77)**	1.63	(2.03)	0.45	(1.24)	0.97	(1.62)
mean age of adult children	**25.75**	**(5.31)**	28.05	(8.01)	29.73	(9.44)	26.96	(7.04)
Net transfers to respondent from parents and adult children								
from parents	**-0.21**	**(0.62)**	-0.19	(0.61)	-0.04	(0.82)	-0.11	(0.75)
from adult children	**0.21**	**(1.05)**	0.31	(1.10)	0.12	(0.66)	0.16	(0.85)
from parents and adult children	**-0.02**	**(1.21)**	0.10	(1.27)	0.08	(1.03)	0.04	(1.12)

Table 2: Transfer characteristics

	mean	sd	N
Respondent: Financial transfers with mother during 2006–08			
Mother is alive	0.586	0.493	515
Given a substantial amount to mother	0.431	0.496	299
Received a substantial amount from mother	0.141	0.349	297
Net financial transfer from mother	-0.169	0.447	510
Respondent: Financial transfers with father			
Father is alive	0.347	0.476	522
Given a substantial amount to father	0.315	0.466	178
Received a substantial amount from father	0.192	0.395	177
Net financial transfer from father	-0.043	0.350	517
Net financial transfer from parents	-0.210	0.617	504
Respondent: Financial transfers with adult children			
# children to whom R has given substantial transfers	1.695	1.752	525
# children from whom R has received substantial transfers	1.688	1.753	525
Net financial transfer from adult children	0.206	1.052	525

dren and elderly parents. Specifically, a lower proportion of women with at least one linked child (35%) has no formal schooling, whereas among women with unlinked adolescent children 54% fall into this category. In contrast, a higher proportion of women with linked children has completed primary school (62% versus 43%), and only 3% of women in both groups have secondary schooling. Respondents with at least one successfully linked child are almost equally distributed among the three regions included in the MLSFH, while respondents with unlinked children are concentrated in the South region (63%). Women with at least one linked adolescent child are also on average wealthier compared to those with unlinked children. Only 7% of the respondents with linked children are HIV+, while 16% of the respondents with unlinked children fall into this category. Female respondents in both groups are less likely to receive net financial transfers from their elderly parents, which means that they are the net providers of transfers to parents. In contrast, in both groups female respondents are net receivers of financial transfers from adult children, however the respondents with unlinked adolescent children receive higher net transfers. As a result from the difference in the net transfer flows from parents and adult children to the respondents, the total net transfers to women with linked children is negative suggesting that these women are the providers of transfers, and positive for women with unlinked children suggesting that they are the net receivers of financial transfers.

Female respondents interviewed in 2006 and 2008 who do not report having a adolescent child in 2008 are an average younger than the two former groups, have lower numbers of live children, are better educated and have smaller numbers of adult children. In terms of the net transfer flow of financial resources, these women are less likely to receive net transfers from their elderly parents, but the negative balance is lower compared to the women with adolescent children. When the financial net flows from adult children are included in the net equation, the balance in net transfers is positive suggesting that these women are net receivers of financial transfers.

Table 2 focuses only on the respondents whose adolescent children were successfully linked and are the focus of our analysis. The table shows a more detailed description of the transfer patterns between these women (the adolescent children's mothers) and their elderly parents and adult children age 20+. The report of the transfers with parents are, respectively, conditional on having an alive mother and father. About 59% of the respondents have alive mothers and 35% have alive fathers. 43% of the female respondents have given substantial amounts of financial

Table 3: Shock characteristics

	Female respondents interviewed in both 2006 and 2008							
	With children aged 15–20 (in 2008)							
	At least one child linked in HH rosters		No youth child linked in HH rosters		No youth child aged 15–20 (in 2008)		Total	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**
# of respondents	**525**		68		823		1416	
Respondent characteristics in 2008								
Recent death/illness of adult family member	**0.29**	**(0.46)**	0.35	(0.48)	0.30	(0.46)	0.30	(0.46)
Recent crop loss	**0.58**	**(0.49)**	0.62	(0.49)	0.55	(0.50)	0.57	(0.50)
Recent loss of income source	**0.22**	**(0.41)**	0.25	(0.44)	0.22	(0.42)	0.22	(0.42)
# of recent significant shocks	**1.71**	**(0.94)**	1.82	(1.04)	1.72	(1.00)	1.72	(0.98)
# of recent significant shocks resulting in income losses	**1.43**	**(0.95)**	1.51	(1.01)	1.43	(0.99)	1.43	(0.97)
# of recent significant shocks resulting in asset losses	**0.76**	**(0.82)**	0.94	(0.94)	0.72	(0.85)	0.75	(0.85)

help to their mothers, if alive, but only 14% of them have received substantial financial help from the mothers; 32% have provided substantial financial help to their fathers, if alive, and 19% of them have received financial help from the fathers. The net financial transfers from both elderly mothers and fathers to the female respondents are negative, which means that the latter are the net providers of financial transfers to parents rather than the receivers. On average, respondents have given substantial amounts of financial help to less than 2 adult children (1.7 children), and an equal proportion of adult children has provided substantial financial help to them. The net financial transfer between the respondents and their adult children is slightly positive, which is a result of the fact that adult children provide more financial help to their mothers (i.e., the respondents) than they receive.

Table 3 shows summary statistics for the shocks experienced by female respondents interviewed in 2006 and 2008. We compare again the three groups—respondents with at least one linked adolescent child, those whose adolescent children were not linked, and respondents without a adolescent child in 2008. The three groups experience very similar shocks with similar consequences. The most noticeable differences are that the proportion of a recent death/illness of adult family member is highest among women with no adolescent child linked to the household rosters (35%), whereas only 30% of the women with linked adolescent children or women without adolescent children experience this type of shock. Similarly, women with unlinked adolescent children experience a higher number of recent shocks resulting in income losses or asset losses.

2.6.2 The adolescent children

Table 4 compares the linked and unlinked adolescent children in household rosters between 2006 and 2008. The female respondents have listed in the household rosters 952 children age 15-20, of whom we were able to link 788 (83%) longitudinally, and 164 children (17%) could not be linked across the 2006 and 2008 household rosters.[6] Both groups, linked and unlinked children, are very

[6]The main reasons for the failure to link include a misreporting of children and/or their names or other essential information in either the 2006 or the 2008 household roster; because for linked children the essential information was consistently reported in two rounds we expect the data quality for these children to be fairly high.

Table 4: Descriptive Statistics about linkage of children in household rosters between 2006 and 2008

	Youth child linked in HH roster		Youth not linked in HH roster		Total	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**
N	**788**		164		952	
Youth characteristic in 2008						
Age	**17.43**	**(1.68)**	17.38	(1.80)	17.43	(1.70)
Female	**0.51**	**(0.50)**	0.49	(0.50)	0.51	(0.50)
Currently married	**0.23**	**(0.42)**	0.23	(0.42)	0.23	(0.42)
Coresident with parents†	**0.65**	**(0.48)**	0.60	(0.49)	0.64	(0.48)
Enrolled in school	**0.58**	**(0.49)**	0.52	(0.50)	0.57	(0.49)
Years of completed schooling	**5.96**	**(2.71)**	5.04	(2.88)	5.80	(2.76)
Subjective health (assessed by mother)						
excellent	**0.41**	**(0.49)**	0.43	(0.50)	0.41	(0.49)
very good	**0.39**	**(0.49)**	0.36	(0.48)	0.39	(0.49)
good/poor/very poor	**0.19**	**(0.40)**	0.21	(0.41)	0.20	(0.40)
Subjective health score‡	**2.22**	**(0.75)**	2.22	(0.77)	2.22	(0.75)

Notes:
†: coresidence = residence in same household or compound
‡: subjective health score: 1 = good/poor/very poor; 2 = very good; 3 = excellent

similar in terms of their sociodemographic characteristics. Adolescent children are on average 17 years old, and 23% of them are married in 2008. A high proportion (65% of the linked and 60% of the unlinked children) are co-residing with their mothers. More than half of the adolescent children is enrolled in school, however linked children have on average one more grade of schooling compared to the unlinked children. According to the mothers' reports, over 40% of the adolescent children are in excellent health, about 40% in very good and 20% are in good/poor/very poor health.

Table 5 summarizes the main adolescent children's outcomes that are the focus of our subsequent investigation. Our sample comprises 788 linked children age 15-20 in 2008, of whom 386 (41%) are male and 402 (51%) are female. Their mean age is slightly over 17 years. About 40% of the female adolescents are married in 2008, and 22% of them transition into marriage between 2006 and 2008. Male adolescents are in contrast substantially less likely to be married: only 8% are married in 2008 and 5% transition into marriage. However, a higher proportion of male adolescents is co-residing with their mothers (76%) and only 15% of male children move out of their mothers' households during the two-year period. Among female children, 55% are co-resident with their mothers, and 25% moved out of the household in 2006-08. Male adolescents are on average better educated, more likely to be enrolled in school, and less likely to discontinue school enrollment in 2006-08 compared to female adolescents. There are no large differences in terms of subjective health status as reported by the mothers, and the health of about equal proportions for male and female children worsens during the two-year period. Half of the children have received substantial amounts of financial help from their mothers, but a slightly higher proportion (16%) of the female children has given substantial amounts of financial help to the mothers compared to 13% of the male adolescents. The net balance of financial transfers from the mothers is somewhat higher for male children.

Table 5: Child outcomes

	Male		Female		Total	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**
N	386		402		788	
Age (in 2008)	17.37	(1.69)	17.49	(1.68)	17.43	(1.68)
Currenty married (in 2008)	0.08	(0.26)	0.38	(0.49)	0.23	(0.42)
Married during 2006–08§	0.05	(0.23)	0.22	(0.42)	0.14	(0.35)
Coresident with parents (in 2008)†	0.76	(0.43)	0.55	(0.50)	0.65	(0.48)
Moved during 2006–08¶	0.15	(0.36)	0.25	(0.43)	0.20	(0.40)
Enrolled in school (in 2008)	0.71	(0.45)	0.46	(0.50)	0.58	(0.49)
Years of completed schooling (in 2008)	6.19	(2.56)	5.74	(2.83)	5.96	(2.71)
Discontinued school enrollment during 2006-08$	0.19	(0.39)	0.34	(0.48)	0.26	(0.44)
Subjective health (assessed by mother) in 2008						
excellent	0.43	(0.50)	0.39	(0.49)	0.41	(0.49)
very good	0.40	(0.49)	0.39	(0.49)	0.39	(0.49)
good/poor/very poor	0.17	(0.37)	0.22	(0.41)	0.19	(0.40)
Subjective health score (in 2008)‡	2.27	(0.73)	2.17	(0.76)	2.22	(0.75)
Health got worse during 2006–08#	0.35	(0.48)	0.32	(0.47)	0.33	(0.47)
Financial transfers with mother (=resp) during 2006-08						
Received a substantial amount from mother (=resp)	0.54	(0.50)	0.52	(0.50)	0.53	(0.50)
Given a substantial amount to mother (=resp)	0.13	(0.33)	0.16	(0.37)	0.14	(0.35)
Net financial transfer from mother (=resp) during 2006–08	0.41	(0.63)	0.36	(0.64)	0.38	(0.64)

Notes:
§: among youth who were not married in 2006
†: coresidence = same household or compound
¶: moved = no longer coresiding with parents in 2008, among coresident youth in 2006
$: among children who were enrolled in 2006
‡: subjective health score: 1 = good/poor/very poor; 2 = very good; 3 = excellent
#: decline in subjective health rating (assessed by mother) on scale 5 = excellent, 4 = very good, . . . , 1 = very poor

3 Results

In this section, we investigate the associations of shocks with adolescent outcomes described above. Specifically, we focus on two types of shocks: *a)*, the total number of recent shocks that the respondent's (i.e., the adolescent's mother's) household has experienced in the two-year period between 2006-08, and *b)*, the occurrence of a recent death/illness of an adult household member during 2006-08.[7] The total number of shocks includes different types of economic, health and demographic shocks such as the recent death or serious illness of an adult household member who provides support for the respondent's family, poor crop yields or loss of crop, loss of source of income, changes in price of grains, breakup of the household such as divorce, damage to the house due to fire, flood or other unexpected event.[8]

We analyze the adolescent outcomes from two different perspectives: first, we investigate how the occurrence of shocks affects current outcomes observed among adolescent men and women in 2008. Specifically, we analyze how current self-reported health status, being ill in the past 12 months, current marital status, current co-residency with the mother and current level of schooling are associated with the total number of shocks or the occurrence of a recent death/illness in the mother's household. Second, we investigate whether shocks predict adolescents' transitions occurring during the two-year period of investigation, i.e. negative changes (decline) in health status, transition to marriage, leaving the mother's household, and discontinuing formal education.

An innovative aspect of the present analysis is that we investigate whether support from the extended family as measured by the net financial transfers given to the adolescents' mothers mediates or even buffers completely the effects of shocks on adolescent outcomes.

The regression analyses summarized below are conditional on adolescent children 15 to 20 years old in 2008 who have been successfully linked longitudinally to the household rosters of their mothers (i.e., the respondents) and for whom longitudinal information on their health and sociodemographic status is available. The key findings about the correlates of adolescent outcomes are summarized below and discussed by type of adolescent outcome.

3.1 Shocks, Transfers and Adolescents' Health

Table 6 shows the relationship between different measures of adolescent's health status and the exposure to shocks occurring in their mother's household. The upper panel A of the table reveals that female adolescents are more likely to report worse subjective health status. However, self-reported health status is not associated with the total number of recent shocks. Similarly, net financial transfers provided to the adolescents' mothers do not predict self-reported health status, and the interaction between the number of shocks and the net financial transfers provided is also not statistically significant.

The middle panel B in Table 6 reports the odds ratios from a logistic regression estimating the associations of shocks and transfers with an indicator of whether the adolescent child was sick in the past 12 months. With the exception of females who have 36-37% higher odds of being sick in the past compared to males, we do not find any statistically significant associations between the

[7] We report the results for recent death/illness only for the outcomes for which we find statistically significant associations.

[8] In our exploratory analyses we investigated how each specific shock is associated with the adolescent outcomes. We did not find a consistent and significant patterns for most individual shocks, and thus we do not report these results here.

dependent and the explanatory variables. Nevertheless, the direction of the odds ratios is noteworthy: higher numbers of recent shocks as well as higher net transfers provided to the mother are associated with about 15% higher odds for the adolescent to have been sick in the past 12 months. Although not statistically significant, the interaction term suggests net transfers reduce the effect of shocks by about 9%.

In the bottom panel in Table 6 we investigate whether shocks predict transitions in health status. We find that adolescents living in households experiencing larger number of shocks are under higher risk of worsening health and the odds for negative health transitions between 2006-2008 increase by 32-35%.

Model 3 in panel C shows that adolescents whose mothers received net transfers during 2006-08 have about 35% higher risk of experiencing worsening in health compared to adolescents whose mothers do not receive net transfers, probably reflecting the fact that the transfers recipients are mothers in need. The interaction term between transfers and shocks, however, reveals that the receipt of transfers by the adolescents' mothers reduces the effect of number of shocks on negative changes in health status by 15%.

3.2 Shocks, Transfers and the Transition to Marriage

In Table 7 we investigate whether the occurrence of shocks in the mothers' households predicts the marital status and the transition into marriage of the adolescent children. The upper panel A shows that female adolescent children 15-20 years old are substantially more likely to be married compared to male adolescents. The high odds ratios reflect the fact that among adolescent males less than 8% (29 cases) are married, while among girls more than 38% are married in 2008. Age is also a strong predictor of being married and one year increase in age is associated with 85-87% higher odds to be married. The total number of shocks is also strongly associated with marital status, and the occurrence of an additional shock increases the odds for adolescents to be married by 25-27%. The estimates for net transfers provided to the mother as well as the interaction term between transfers and shocks are not statistically significant, however the direction of the odds ratios suggests that net transfers are associated with higher odds for the adolescents to be married, but the provision of net transfers reduces the effect of shocks on the probability to be married by about 10%.

In Table 7 Panel B we focus on the transition into marriage of the adolescent children between 2006-08. Again, the results suggest that girls have substantially higher odds to get married in the two-year period compared to boys, and the odds of transitioning into marriage increase with about 44% with each additional year of age. Similarly to the results for currently being married, the occurrence of shocks is strongly associated with the change in marital status and the experience of an additional household shock increases the odds for the adolescents to get married by 27% in all three models. Net transfers provided to the mothers are statistically significant only in model 2 and are also associated with higher odds for the adolescent children to transition into marriage. The interaction term between shocks and net transfers is not statistically significant and there is no clear evidence that net transfers to the adolescent's mother modify the association between the number of shocks experienced by the household and the marital status in 2008 and/or the transition into marriage during 2006–08.

Table 8 shows the relationship between adolescent's marital status and the experience of a recent death/illness in the mother's household during 2006-08.[9] Similar to the results discussed

[9]We found a significant association of recent death/illness in the household with marriage and co-residency of the

Table 6: Relationship between adolescent children's health and the total number of shocks 2006-08

Panel A: Subjective health (coefficients of linear regression)	(1)	(2)	(3)
Gender: female	-0.092^{+}	-0.097^{+}	-0.094^{+}
	(0.053)	(0.054)	(0.054)
Age	-0.005	-0.006	-0.006
	(0.014)	(0.015)	(0.015)
# of recent shocks	0.001	0.008	0.006
	(0.035)	(0.036)	(0.036)
Net transfers to mother's HH		0.008	0.081
		(0.025)	(0.057)
Net transfers to HH x # of recent shocks			-0.045
			(0.031)
Constant	1.352**	1.358**	1.356**
	(0.263)	(0.272)	(0.272)
Observations	784	748	748
Panel B: Sick in the past (odds ratio of logistic regression)	**(1)**	**(2)**	**(3)**
Gender: female	1.362*	1.369*	1.379*
	(0.206)	(0.212)	(0.214)
Age	0.980	0.976	0.976
	(0.041)	(0.042)	(0.042)
# of recent shocks	1.153	1.160	1.155
	(0.106)	(0.109)	(0.109)
Net transfers to mother's HH		0.992	1.157
		(0.073)	(0.177)
Net transfers to HH x # of recent shocks			0.910
			(0.079)
Observations	777	741	741
Panel C: Health got worse between 2006-08 (odds ratio of logistic regression)	**(1)**	**(2)**	**(3)**
Gender: female	0.880	0.888	0.897
	(0.136)	(0.140)	(0.142)
Age	0.995	0.999	0.999
	(0.043)	(0.044)	(0.044)
# of recent shocks	1.325**	1.354**	1.350**
	(0.127)	(0.132)	(0.132)
Net transfers to mother's HH		1.025	1.348^{+}
		(0.075)	(0.209)
Net transfers to HH x shock indicator			0.850^{+}
			(0.073)
Observations	777	742	742

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 7: Relationship between adolescent children's marital status and the total number of shocks 2006-08

Panel A: Married in 2008 (odds ratios of logistic regression)			
	(1)	(2)	(3)
Gender: female	9.897**	11.397**	11.653**
	(2.422)	(2.872)	(2.982)
Age	1.850**	1.874**	1.885**
	(0.121)	(0.132)	(0.133)
# of recent shocks	1.258+	1.276+	1.277+
	(0.152)	(0.164)	(0.163)
Net transfers to mother's HH		1.119	1.337
		(0.099)	(0.237)
Net transfers to HH x # of recent shocks			0.899
			(0.094)
Observations	784	748	748
Panel B: Got married between 2006–08 (odds ratios of logistic regression)			
	(1)	(2)	(3)
Gender: female	5.128**	6.049**	6.012**
	(1.445)	(1.851)	(1.840)
Age	1.437**	1.439**	1.437**
	(0.096)	(0.102)	(0.102)
# of recent shocks	1.278*	1.271+	1.265+
	(0.157)	(0.167)	(0.168)
Net transfers to mother's HH		1.217*	1.122
		(0.111)	(0.205)
Net transfers to HH x # of recent shocks			1.048
			(0.099)
Observations	706	675	675

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 8: Relationship between adolescent children's marital status and the experience of recent death/illness in the HH 2006-08

Panel A: Married in 2008 (odds ratios of logistic regression)			
	(1)	(2)	(3)
Gender: female	9.796**	11.289**	11.475**
	(2.395)	(2.837)	(2.909)
Age	1.845**	1.866**	1.878**
	(0.119)	(0.130)	(0.131)
Recent death/illness	1.640*	1.733*	1.732*
	(0.380)	(0.417)	(0.414)
Net transfers to mother's HH		1.128	1.226*
		(0.098)	(0.120)
Net transfers to HH x recent death/illness			0.744
			(0.154)
Observations	784	748	748
Panel B: Got married between 2006–08 (odds ratios of logistic regression)			
	(1)	(2)	(3)
Gender: female	5.046**	5.973**	5.971**
	(1.410)	(1.826)	(1.827)
Age	1.433**	1.432**	1.430**
	(0.095)	(0.102)	(0.101)
Recent death/illness	1.475	1.567+	1.551+
	(0.350)	(0.384)	(0.388)
Net transfers to mother's HH		1.227*	1.199+
		(0.113)	(0.123)
Net transfers to HH x recent death/illness			1.083
			(0.233)
Observations	706	675	675

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

before, female sex and age of the adolescent child are strongly associated with being married or transitioning into marriage. The experience of a recent death or illness of a household member represents a shock that has a substantial effect on the probability of being married or getting married for adolescents in rural Malawi. In particular, adolescents in households that experience this type of shock have 64-73% higher odds to be married in 2006-08, and 47-57% higher odds to transition into married during this period. The provision of net transfers to the mothers is also associated with higher odds to have married adolescent children. The interaction terms of net transfers and the experience of recent death/illness are not statistically significant, but the magnitude and direction of the odds ratios suggest that the provision of transfers reduces the association between this type of shock with the adolescent's marital status in 2008, while transfers don't seem to modify the association of a recent death/illness with the transition into marriage during 2006–08.

3.3 Shocks, Transfers and Co-Residence

The results summarized in Tables 9 and 10 show the relationships between number of shocks and experience of recent death/illness in the mothers' household with the co-residence status and its changes observed among adolescent children. Generally, girls are about 63-66% less likely to be co-residing with their mothers compared to boys. The experience of an additional shock in the household increases the odds for the adolescent children to move out of the mother's household by 25-31% (table 10), and adolescents in households that experience a recent death of an adult or serious illness have 39-44% higher odds to leave the mother's household as opposed to adolescents in household that are not exposed to this shock experience. The coefficients for financial net transfers provided by the extended family to the mothers of the adolescent children are not statistically significant for the co-residency status and the transition out of the mother's household, but their direction suggest that transfers may somewhat ameliorate the effect of shocks on this adolescent outcome. An exception is model 3 in table 9, where the provision of larger net transfers to the mothers reduces the odds for the adolescent to move out of the household by about 30%, and the interaction with total number of shocks suggest that the transfers reduce the association of shocks with leaving the mother's household.

3.4 Shocks, Transfers and Schooling

Table 11 summarizes the relationship between number of shocks and adolescents' schooling outcomes. In Panel A we show coefficients of linear regression models where the dependent variable is the adolescent's grades completed of formal schooling in 2008. The negative coefficients indicate that females have fewer grades of formal schooling compared to boys, while—as one would expect—grades of completed schooling are higher for older children. Shocks are strongly associated with grades of schooling and the experience of a higher number of recent shocks reduces the grades of schooling that the adolescents have completed as of 2008. Net transfers to the mother are also negatively associated with the outcome variable in Model 2, and the interaction between transfers and the number of recent shocks does not suggest that the association between shocks and grades of schooling is modified by transfers.

Panel B in table 11 investigates whether the experience of shocks predicts the discontinuation of formal schooling, that is whether adolescents' leave school in the period 2006-08. Female ado-

adolescents, and thus we report the results only for these two outcomes. This particular type of shock does not predict health status and schooling as well as their changes.

Table 9: Relationship between adolescent children's co-residency status and the total number of shocks 2006-08

Currently co-resident with mother (odds ratios of logistic regression)			
	(1)	(2)	(3)
Gender: female	0.370**	0.341**	0.338**
	(0.064)	(0.061)	(0.060)
Age	0.719**	0.706**	0.705**
	(0.035)	(0.036)	(0.036)
# of recent shocks	0.856+	0.842+	0.844+
	(0.079)	(0.082)	(0.082)
Net transfers to mother's HH		0.960	0.824
		(0.071)	(0.143)
Net transfers to HH x # of recent shocks			1.098
			(0.100)
Observations	787	751	751
Moved out of HH (odds ratios of logistic regression)			
	(1)	(2)	(3)
Gender: female	1.862**	2.004**	1.980**
	(0.360)	(0.397)	(0.393)
Age	1.156**	1.153**	1.149*
	(0.061)	(0.063)	(0.063)
# of recent shocks	1.253*	1.290*	1.315*
	(0.134)	(0.144)	(0.150)
Net transfers to mother's HH		0.958	0.698*
		(0.078)	(0.119)
Net transfers to HH x # of recent shocks			1.199*
			(0.107)
Observations	781	746	746

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 10: Relationship between adolescent children's co-residency status and recent death/illness in the HH 2006-08

Currently co-resident with mother (odds ratios of logistic regression)	(1)	(2)	(3)
Gender: female	0.372**	0.344**	0.343**
	(0.064)	(0.061)	(0.061)
Age	0.720**	0.707**	0.707**
	(0.035)	(0.036)	(0.035)
Recent death/illness	0.777	0.785	0.787
	(0.139)	(0.147)	(0.146)
Net transfers to mother's HH		0.956	0.930
		(0.070)	(0.078)
Net transfers to HH x recent death/illness			1.122
			(0.185)
Observations	787	751	751
Moved out of HH (odds ratios of logistic regression)	(1)	(2)	(3)
Gender: female	1.849**	1.987**	1.988**
	(0.358)	(0.393)	(0.394)
Age	1.156**	1.151**	1.152**
	(0.061)	(0.062)	(0.062)
Recent death/illness	1.389+	1.437+	1.435+
	(0.275)	(0.293)	(0.292)
Net transfers to mother's HH		0.965	0.970
		(0.079)	(0.097)
Net transfers to HH x recent death/illness			0.980
			(0.171)
Observations	781	746	746

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 11: Relationship between adolescents' schooling and the total number of shocks 2006-08

Panel A: Years of formal education (coefficients of linear regression)			
	(1)	(2)	(3)
Gender: female	-0.508**	-0.515**	-0.518**
	(0.187)	(0.188)	(0.187)
Age	0.307**	0.317**	0.317**
	(0.051)	(0.052)	(0.052)
# of recent shocks	-0.408**	-0.402**	-0.400**
	(0.120)	(0.117)	(0.118)
Net transfers to mother's HH		-0.186*	-0.254
		(0.091)	(0.205)
Net transfers to HH x # of recent shocks			0.042
			(0.111)
Constant	1.564+	1.412	1.415
	(0.897)	(0.926)	(0.927)
Observations	787	751	751
Panel B: Stopped school in 2008 (odds ratios of logistic regression)			
	(1)	(2)	(3)
Gender: female	2.753**	3.088**	3.101**
	(0.591)	(0.689)	(0.691)
Age	1.659**	1.669**	1.672**
	(0.105)	(0.112)	(0.111)
# of recent shocks	0.992	0.978	0.978
	(0.112)	(0.114)	(0.114)
Net transfers to mother's HH		1.143	1.220
		(0.105)	(0.215)
Net transfers to HH x # of recent shocks			0.959
			(0.097)
Observations	560	539	539

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 12: Relationship between financial transfers to adolescent children and their mothers with different types of shocks 2006-08

Panel A: Youth received lots of transfers from mother ((odds ratios of logistic regression)				
	(1)	(2)	(3)	(4)
Gender: Female	0.959	0.962	0.962	0.967
	(0.146)	(0.146)	(0.146)	(0.147)
Age	0.850**	0.850**	0.850**	0.849**
	(0.036)	(0.036)	(0.035)	(0.035)
# of recent shocks	0.918			
	(0.083)			
# of shocks with income loss		0.972		
		(0.087)		
# of shocks with asset loss			0.976	
			(0.100)	
# recent deaths/illness				1.190
				(0.222)
Observations	757	757	757	757
Panel B: Net grant transfers given to youth's mother (coefficients of linear regression)				
	(1)	(2)	(3)	(4)
Age	1.028**	1.028**	1.028**	1.028**
	(0.007)	(0.007)	(0.007)	(0.007)
# of recent shocks	1.041			
	(0.053)			
# of shocks with income loss		1.068		
		(0.057)		
# of shocks with asset loss			1.007	
			(0.058)	
# of recent deaths/illness				0.995
				(0.109)
Observations	504	504	504	504

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

lescents aged 15-20 are about 3 times more likely to discontinue formal schooling compared to male adolescents. Age is also strongly associated with the discontinuation of school enrollment, and each additional year of age increases the odds to stop schooling by about 70%. In contrast to Panel A, which shows a strong negative relationship of shocks with the absolute level of formal schooling, the experience of multiple shocks in the household does not predict whether the adolescent will discontinue school or not. Similarly, the odds ratios estimated for the net financial transfers provided to the mothers are not statistically significant, but their direction suggests that the children of mothers who receive higher net transfers are more likely to stop schooling. The interaction term between the number of shocks and net transfers is also not statistically significant, however the direction of the odds ratio indicates that transfer may slightly reduce the effects of shocks on the probability of discontinuing school.

3.5 Do shocks predict transfers given to the adolescents and their mothers?

A question related to our analysis presented in the above sections is whether shocks determine the transfers given to the adolescents and their mothers. Table 12 shows the results from simple regression analyses investigating this issues. In particular, the upper panel A shows odds ratios from logistic regressions where the dependent variable is whether the respondent has given lots of financial net transfers to the adolescent child. The explanatory variables are different measures of

shocks, such as the total number of shocks experienced by the mother's household, the occurrence of shocks with income loss, the occurrence of shocks with asset loss, and recent death or serious illness of an adult household member. The results in all models show that non of the listed shocks is associated with the amount of transfers that mothers provide to their adolescent children. In the bottom panel B we show the coefficients of linear regression models in which we investigate whether different types of shocks predict the net financial transfers given to the youth's mother. Similarly to the results for the adolescents, we do not find any statistically significant association of shocks with the outcome of interest (net financial transfers given to the respondent). In summary, the patterns shown in Table 12 suggest that the transfer patterns and the amount of net financial transfers are not clearly associated with the occurrence of unexpected shocks and "neediness" for financial help is not necessarily a result from these shocks.

4 Summary and Discussion

In very poor societies such as the ones in sub-Saharan Africa, adolescents are subject to considerable and frequent shocks, primarily occurring in and affecting directly their parental households. Although adolescents usually are not the most vulnerable members of their families, they are at particularly high risk to be affect by the socioeconomic shocks because of their unique position in the family, i.e., being not necessarily dependent on parental support, but being in the physical and social position to make important monetary and non-monetary contributions to the well-being of other family members and the parental household. Because of this constellation, the exposure of adolescents to shocks is critical since they may alter important aspects of the adolescents' transitions to adulthood such as faster transition to independence from the parents, discontinuation of formal schooling and transition into work or marriage. In this context, support and financial resources provided within networks of extended family members may play an important role to buffer the effects of shocks and thus may have important implications for the extent to which such shocks affect adolescents during the transition to adulthood. The MLSFH provides a unique longitudinal dataset to investigate these issues in the context of sub-Saharan Africa.

In the present analysis, we investigate how the occurrence of multiple socioeconomic and health shocks within families affects the transition to adulthood of adolescent men and women aged 15 to 20 years in rural Malawi. The availability of longitudinal data for 2006 and 2008 allows us to go beyond the analysis of how shocks affect current adolescent outcomes to also investigate whether the occurrence of shocks determines the pace of the adolescent transitions into adulthood. We investigate several dimensions of adolescent outcomes, from changes in health status to changes in marital status, disruption in schooling or the probability to leave the parental household as well as the current status of these adolescents. A key innovation of this analysis is that we evaluate the extent to which the effect of shocks on adolescent outcomes is modified—or potentially buffered completely—by the provision of financial transfers within extended families, and in particular by the net transfers given to the mothers of these adolescent children.

Regressions of adolescent outcomes on indicators that the mother's household has experienced frequent and important socioeconomic shocks clearly show that adolescent children in rural Malawi are affected by these shocks. Exploratory analysis (results are not reported here) showed that the frequent occurrence and accumulation of multiple shocks is more important for adolescent outcomes compared to single, more idiosyncratic type of shocks. Among the more specific types of shocks, only the occurrence of a recent death/serious illness of an adult household member is

strongly associated with variety of adolescent outcomes.

The common finding across many specifications of the adolescent outcomes is that the occurrence of shocks is associated with poorer health, a higher probability of being married or transition into marriage at a relatively young age (i.e., marriage below age 20). A high number of shocks and occurrence of a recent death or serious illness in the household are also associated with higher probabilities of the adolescent children leaving their mothers' households or interrupting their schooling. More important for this paper, however, is that our analysis points to an important role of transfers when a family experiences shocks. In most model specifications, we find that higher net transfers from other family members to the mother's households are associated with more adverse adolescent outcomes. This reflects most likely the fact that mothers exposed to frequent shocks are more likely to receive support from their extended families because their resources are more strained and thus other family member reallocate resources to these mothers, possibly in response to the experience of a shock. The interactions between shocks and net transfers however revealed that the effects of the shocks on adolescent outcomes are attenuated and thus the analysis points to the important role of transfers in mediating the extent to which adolescents are affected by these shocks. In summary, our analysis suggests that the experience of demographic and/or economic shocks affect adolescents in their transition to adulthood, but that transfers given to the mothers of the adolescents possibly play an important mediating role that can ameliorate the impact of family-level shocks on adolescent outcomes. Our results are consistent with the interpretation that financial transfers within families represent an important mechanism to absorb shocks and buffer their effects on multiple aspects of adolescents' lives.

The present analysis looks at the relationship between shocks, transfers to mothers and adolescent outcomes. A logical expansion of this work, which we will conduct for the final revised version of this paper, is to further explore intergenerational gender links, and investigate how shocks experienced by fathers and transfers given to them relate to adolescent outcomes. This is an important aspect for future work since shocks perceived by fathers may have more salience for adolescent males and shocks perceived by mothers may have more salience for adolescent females.

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