The Influence of Female Headship on Adolescent Transitions to Adulthood in Rural Malawi

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***CONTEXT*:** This paper explores differences by gender of household head in adolescent transitions to adulthood. Female headship, generally equivalent to single motherhood, has been observed to have a harmful effect on children in many parts of the world. In sub-Saharan Africa however, female headship has been shown to be positively associated with a variety of children's outcomes.

***METHODS*:** Using longitudinal data on 877 boys and 861 girls from the Malawi Schooling and Adolescent Survey (2007-2011), we estimate Cox proportional hazards models with lagged time varying covariates in order to investigate the influence of living in a female-headed household at baseline on school dropout, first marriage and first birth during the survey period.

***RESULTS*:** For girls, living in female-headed households at baseline is associated with lower hazards of school leaving, marriage and pregnancy relative to comparable adolescents in male-headed households. For boys, the findings are mixed; female headship is associated with lower dropout and marriage risk but not with first birth.

***CONCLUSIONS*:** The findings suggest that female-headed households, despite significantly lower socioeconomic status may be able to slow adolescent transitions to adulthood, particularly for girls.

Female headship, which often accompanies single motherhood, has been observed to have a detrimental influence on child development in many parts of the world (Guo and Harris 2000; Pong, Dronkers, and Hampden-Thompson 2003). The negative effect is generally attributed to reduced economic circumstances among households headed by women (Guo and Harris 2000; Pong et al. 2003). As single parent households face greater financial and time constraints than two parent households, social policies that minimize the resource differentials between families have been shown to reduce the negative effect of female headship on child academic achievement (Pong et al. 2003). In addition, the economic and psychosocial pressures of single parenthood are stressful for both mothers (Guo and Harris 2000) and children (Sandefur and Wells 1999); single mothers are less likely to promote learning and provide a general sense of wellbeing. In multiple sub-Saharan African countries, however, studies have found a surprising beneficial relationship between female headship and a variety of children's outcomes: school enrollment and dropout (Lloyd and Blanc 1996; Sibanda 2004), nutrition (Pfeiffer, Gloyd and Li 2000; Kennedy and Peters 1992), and health (Buvinić and Gupta 1996; Castle 1995).

The contrary finding regarding female headship in Africa is remarkable because female-headed households in this region, as in others, have significantly fewer economic resources than those headed by men (Kennedy and Peters 1992; Lloyd and Gage-Brandon 1993; Mberu 2007). Kennedy and Peters (1992) theorize that poor female household heads are better able to compensate for their lack of resources than male heads. They argue that it is not female headship per se that improves children's outcomes but rather the intersection of gender and household headship at very low levels of income. Findings from Fuller and Liang (1999) linking

father absence to lower dropout risk for girls suggests that the advantage from female household heads may be the result of increased autonomy that arises when a resident male decision-maker is absent. In addition, when women in sub-Saharan Africa have greater bargaining power and control more resources, their households spend significantly more of their budget on child-related expenditures (Doss 2005; Duflo and Udry 2004; Quisumbing and Maluccio 1999). A third explanation for the positive influence of female headship is that female household heads in sub-Saharan Africa can access additional resources to compensate for their socio-economic disadvantage relative to male-headed households. Studies show that female-headed households in this region are able to supplement the household's own resources: female-headed households are more likely to receive remittances than male-headed ones (Lloyd and Gage-Brandon 1993) and to have higher per capita expenditures than comparable male-headed households when they receive remittance income (Kennedy and Peters 1992). They also have access to social resources that can alleviate the stress of female headship: social support from extended family networks significantly improves the welfare of female-headed households and provides a buffer to protect against negative shocks (Cross 1999; Lloyd and Gage-Brandon 1993; Mberu 2007).

To date, the research on female headship and child outcomes has focused on the earlier part of the life course. There is relatively little on the influence of female headship during adolescence and young adulthood. If residence in female-headed households has a significant positive effect on health and schooling during childhood, then it is likely that this influence may extend to adolescence as well. Using longitudinal data from two districts in rural Malawi, the purpose of this paper is to explore whether there are differences by gender of household head

in the timing of adolescent transitions including school leaving, marriage and first birth. Based on prior findings regarding the effect of female-headed households in sub-Saharan Africa, we hypothesize that female headship has a positive influence on school enrollment and helps deter early marriage and childbearing. We also expect that the effect of female headship will be greater for girls because they are observed to receive greater benefits in households where women control more resources (Quisumbing and Maluccio 1999; Fuller and Liang 1999; Townsend et al. 2002).

Pathways linking Female Headship and Adolescent Transitions

The primary pathway through which female-headed households may influence transitions to marriage and parenthood would be via the aforementioned effect on schooling. Of greater interest are the less tangible ways that female-headed households may affect adolescent transitions to adulthood by influencing adolescent attitudes and behavior. It would be worthwhile to determine if in addition to mediating effects, female-headed households directly influence sexual and health behaviors. For instance, if adolescents in female-headed household are encouraged to concentrate on their schooling and long-term opportunities, such focus could manifest in later transitions to marriage and parenthood. In addition, female-headed households receive significant social support from extended family networks (Lloyd and Gage-Brandon 1993; Mberu 2007), allowing adolescents to have access to adult mentors.

One of the questions about female headship is whether there is heterogeneity among female household heads in sub-Saharan Africa that can explain their positive influence on child outcomes. In developed countries, the negative association between female headship and

education outcomes is usually attributed to their being single parent households (Guo and Harris 2000; Pong et al. 2003). In sub-Saharan Africa, female headship may not necessarily be the same as single parenthood as a substantial proportion of the female household heads are married (Lloyd and Gage-Brandon 1993). This suggests that the selection process into female headship in sub-Saharan Africa differs from industrialized countries where divorce represents the primary cause of single motherhood with out of wedlock childbearing a distant second (Pong et al. 2003). If so, the marital status of female household heads in this region represents an important difference because the economic status of female household heads with a non-resident spouse is likely to be more similar to the status of two-couple households than to households with single mothers.

Conventional measures of household resources also likely underestimate the resources female-headed households have available to invest in children's schooling. For instance, female-headed households in Ghana are two to three times more likely to receive remittances than male-headed ones (Lloyd and Gage-Brandon 1993). Remittances make up an important part of household resources and help consumption smoothing in many sub-Saharan African countries (Adams, Cuecuecha and Page 2008; Azam and Gubert 2006; Quartey 2006) while making an important contribution to child education expenditures (Lu and Treiman 2007; Sibanda 2004). Excluding migrant household members' remittances from household income would inflate socio-economic differences between male- and female-headed households. In addition to economic resources, households transfer intangible and equally important resources, such as ambition and motivation, to children that positively influence educational outcomes; neglecting to consider the nonmaterial contribution of households will thus

underestimate the influence of family characteristics on academic outcomes. For instance, female household heads are more likely to invest in intangible resources such as time and emotional support that positively affect education outcomes (Lloyd and Gage-Brandon 1996). Accounting for these other resources may mean that female-headed households have comparable resources available for children than male-headed ones.

DATA

Our data come from the Malawi Schooling and Adolescent Study (MSAS), a longitudinal survey conducted from 2007 to 2011 by the Population Council that interviewed adolescents from Balaka and Machinga, two rural districts in the southern region of Malawi. The baseline sample was 14 to 17 years in 2007. 1,764 in-school adolescents drawn from the school rosters of 59 randomly selected schools and 886 out-of-school adolescents drawn from the catchment area of the selected schools make up the baseline sample. The survey first interviewed adolescents between May and July of 2007 and has re-interviewed adolescents annually through 2011 with follow-up rates of 91% in 2008, 90% in 2009, 88% in 2010, and 88% in 2011 of the original sample. The survey collected extensive information on adolescent characteristics using face to face interviews; information on sensitive issues, such as sexual behavior and history, was collected using Audio Computer Assisted Self Interviews (ACASI). In this paper we focus on the sample of in-school adolescents – 877 boys and 861 girls (98.7% and 98.4% respectively of the original sample) who were unmarried and had not had a first birth at baseline. We also exclude six respondents who were not re-interviewed after the first round.

Measures

Dependent Variables

School Leaving: We determine timing of school leaving as the first round in which an adolescent is not enrolled in school if he/she does not report being enrolled in subsequent rounds.

First Marriage: We determine timing of first marriage as the first round in which adolescents report ever being married.

First Birth: We determine timing of first birth as the first round in which girls report ever given birth and for boys as the first round in which they report that to their knowledge a girl had given birth to their child.

Independent Variables

Female Headship: The gender of the head of household was collected in a household roster at baseline.

Household Socioeconomic Status (SES): The analyses control for SES because female-headed households typically have fewer economic resources. We measure SES using total household assets from reports of household ownership of the following items: mattress, sofa, table, chairs, paraffin lamp, TV, radio, cell phone, books, mosquito net, electricity, a car, motorcycle, bicycle and a boat/canoe.

Education: We control for adolescent literacy with a dummy variable indicating whether the respondent can read two simple sentences in English aloud. In the analyses of marriage and first birth we also control for school enrollment status in the previous round.

Other Adolescent Characteristics: The models control for age as probability of experiencing any outcome increases with age. Dummy variables are included that indicate parent-headed household, grandparent-headed household, resident father, ethnicity and orphanhood as these characteristics differ by gender of household head. We use parental education as control for family background. We also control for whether adolescents changed households after the first round. As the purpose of this analysis is to investigate the effect of female headed households, we do not include an exhaustive set of covariates that potentially determine the outcomes in these models.

Data Analysis

To determine if there are differences in adolescent transitions to adulthood between adolescents in female-headed households and those in male-headed households, we use event history analyses to predict the probability that adolescents experience certain transitions in the period between the first and fifth rounds. We use Cox proportional hazard models to analyze the influence of female headship on the hazard of our outcomes of interest – (1) school dropout, (2) first marriage, and (3) first birth, controlling for the other variables listed previously. With adolescents at risk between the five rounds, we have four time points (between rounds 1 and 2; 2 and 3 and so on) to observe whether they experience each outcome or not. We run a series of nested models – first a bivariate model estimating the correlation between female headship and the dependent variable, then a second model that adds education variables to observe the influence of education controls on the female headship hazard ratio and finally the full model with all controls included. Explanatory variables are time

varying covariates lagged from the previous round apart from female headship, ethnicity and parental education.

Time constant covariates (measured at baseline): female headship, Yao, Chewa mother has no education, father has no education.

Time varying covariates: school dropout, first marriage, first birth, age, orphan, father resident in household, school enrollment, literacy, moved since baseline parent-headed household,, grandparent-headed household, household assets.

RESULTS

Descriptive Statistics

[Table 1a and 1b]

Tables 1a and 1b summarize the characteristics of the baseline sample. The most notable difference between female- and male-headed households is in socio-economic status, consistent with findings from other settings. For both boys and girls, female household heads average almost 1.5 fewer household assets and are almost twice as likely to have no education. They are also significantly less likely to be married. About 20% of female household heads are married with 6% to 9% living with a resident spouse meaning that a fifth of female households are not single mother households as well. Adolescents living in female-headed households are significantly less likely to be living with a resident father and significantly more likely to have lost at least one parent. For girls but not boys, female-headed households are less likely to be headed by a biological parent. Girls are also slightly more likely to be living in female-headed households (32% compared to 28% for boys) but the difference is not statistically significant.

[Figures 1a to 1c]

Figures 1a to 3a show the proportions by round for each of the dependent variables. For girls, we see similar rates of school leaving and marriage within the study period for male and female headed households. By the fifth round, 27% of girls are still enrolled for both groups. 37% of girls living in male-headed households at baseline were still unmarried compared to 36% from female-headed households. For first birth, there is slower transition for girls in female-headed households as 8% more report never giving birth by round 5; this difference is mainly due to a slower transition between rounds 4 and 5 for girls in female headed households compared to girls in male-headed households.

From the descriptive statistics, we see that adolescents in female-headed households had significantly fewer household assets yet we observe similar rates of school leaving and marriage and slower transitions to first birth for girls in the sample compared to those in male-headed households. This suggests female-headed households in the aggregate are able to maintain comparable outcomes relative to male-headed households despite fewer economic resources i.e. girls in female headed households do not experience transitions earlier than their peers in male headed households, despite the fact that female headed households are poorer.

[Figures 2a to 2c]

Figures 2a to 2c show transitions for boys for our main outcomes. From the table 1b, we see that boys in female-headed households are almost a year older than those in male-headed households so we would expect boys in this group to be more likely to experience transitions faster. This is true for schooling as there is a slightly faster rate of school dropout for those in female-headed households. For transitions to marriage and first birth, both groups follow

similar paths. However a lower proportion of boys in female-headed households are married by round 5 while a greater proportion reports a first birth.

Multivariate Analyses

[Table 2a and 2b]

Tables 3a and 3b present hazard ratios and z-scores for the models predicting school leaving. The bivariate models indicate that girls in female-headed households at baseline had a similar risk of leaving school during the study period compared to those in male-headed households. Adding a control for literacy has a negligible effect on the size of the coefficient. The full model however reveals that girls in female-headed households had a significantly lower hazard (20%) of leaving schooling by round 5. The change in the magnitude and significance of the female headship coefficient is driven in large part by the controls for socioeconomic status.

This finding from the multivariate models is consistent with the finding from the descriptive analysis that there is little difference in transitions by gender of household head despite differences in SES. Once the models control for SES, positive correlations with female headship emerge. For boys, we see substantial positive correlation (14% to 18% greater hazard) between female headship and schooling leaving in the first two models. In the full model, the hazard ratio for female headship is negative but not significant indicating a 6% lower hazard of leaving school for boys living in female-headed households at baseline. The finding indicating a positive association between female headship and schooling as well as the larger effect for girls relative to boys is consistent with the existing literature.

[Table 3a and 3b]

The next set of tables present the results of the event history analysis for first marriage where we also see positive correlations with female headship. In all models, the hazard ratio for female headship is negative but not significant. Adding education controls to the bivariate model leads to a decline in the size of the female headship hazard ratio; the decrease is much larger for boys. In the full model, female headship is associated with a 7% lower hazard for girls and a 12% for boys.

[Table 4a and 4b]

The final regressions estimate transitions to first birth. There are significant negative effects of female headship for girls in all three models and a 25% lower hazard in the full model. The effect is opposite for boys where female headship is associated with much higher likelihood of reporting a first birth – 20% higher in the bivariate and 34% in the full model.

The results from these models, which indicate positive associations with female headship for all three outcomes for girls, and for schooling and marriage for boys, provide some support for the hypothesis that female headship influences adolescent transitions to adulthood. Moreover, the results are consistent with the findings from the literature that female headship is more important for girls than for boys. .

Supplementary Analyses

[Table 5a and 5b]

As noted above, female-headed households differ by marital status. Some female household heads are unmarried; others are married with a non resident spouse and still others have a resident spouse. In order to determine whether the three types of female headed-

households differ in their influence on adolescents, we re-run the analysis controlling for marital status and co-residence with spouse of household heads. Marital status can represent a proxy for both autonomy and resources. We can assume a female head of household with a spouse has less autonomy than a head without a spouse because of the absence of a male decision-maker. We can also assume that married female household heads would have comparable resources to two parent households. Thus, we would expect that female household heads with a non-resident spouse would have the most benefit for adolescents as they have both the autonomy to make decisions on resource allocation and have additional economic resources available from their absent spouse.

Tables 6a and 6b presents analyses by type of female heads household; the results provide limited support for this theory. For school leaving and marriage, the largest effects for girls are in female-headed households where there is a non-resident spouse; however, the same is not true for first births. For boys, school dropout has the strongest correlation with female household head with a non-resident spouse. For marriage; female household heads who are not married provide the strongest benefits. These findings suggest that the absence of a male decision-maker in the household plays a role in determining the influence of female-headed households. The limitation of this analysis however is that a number of female household heads with a resident spouse in the sample is quite small (N= 66 at baseline).

CONCLUSIONS

This paper explores differences by the gender of the household head gender in adolescent school leaving, timing of first marriage and timing of first birth using longitudinal

data from the Malawi Schooling and Adolescent Survey (MSAS). Living in a female-headed household at baseline is correlated with significantly lower risk of schooling, lower risk of marriage and significantly lower risk of first birth for girls. Living in a female-headed household at baseline is associated with lower risk of schooling and marriage but not first birth for boys although none of the effects are significant. The findings suggest that the strength of female-headed households is their ability to produce comparable outcomes to male-headed households with higher SES levels. The positive effects of female headship remain after controlling for education indicating that the influence works through other pathways besides schooling. These results suggest that residence in female-headed households may slow transitions to adulthood, particularly for girls.

The findings are consistent with the main hypothesis that female-headed households have a positive association with adolescent outcomes, and with the secondary hypotheses that the effect is stronger for girls. For boys, residence in female-headed households is probably not as relevant because the timing of marriage and childbearing is later for boys than for girls in sub-Saharan Africa. By the time boys make these transitions in later adulthood, residence in a female-headed household during adolescence may be of little import. It is also likely that the presence and counsel of a strong female role model, in the form of the female household head, may be an important influence on the behavior and decision-making of young girls but have little effect on that of boys. The lack of adult male influences in their daily lives may even be a disadvantage for some boys.

The positive association between female-headed households and child outcomes in sub-Saharan Africa, in spite of their perceived socio-economic disadvantages, underscores the

importance of promoting female empowerment in developing countries. It would appear that the "success" of female-headed households stems from the absence of a male head of household decision-maker, suggesting that the autonomy of women to control the allocation of resources is important for children. Studies have found evidence of gender differences in the way income is allocated within the household (Pfeiffer et al. 2000; Quisumbing and Maluccio 1999) – households where women have greater bargaining power and have the autonomy to control a greater share of resources have greater expenditures for education and other child-related investments (Doss 2005; Hindin 2006). Some studies suggest that women in sub-Saharan Africa may be better able than males to manage resources, a valuable asset in a region with limited economic resources. For these reasons, it remains important in resource-constrained settings to promote female empowerment in general and within male-headed households in particular.

It is also important to continue to investigate the ways in which women can improve the outcomes of children and adolescents. This analysis used data from a four-year span; it would be informative to study girls over a longer period to determine whether residence in a female-headed household during adolescence has enduring effects.. It would also be useful to incorporate more data on the characteristics of the head of household to study the pathways linking female headship and adolescent behavior.

These results also have important programmatic implications. The ability of female household heads to positively influence the wellbeing of children and adolescents, despite their lower socio-economic status, can provide insight into the ways in which policy-makers in sub-

Saharan Africa can improve the health and educational outcomes of other disadvantaged groups.

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TABLES

Table 1a

Summary of Descriptive Statistics for Adolescent Girls, at Baseline

Characteristic	Gender of Head of Household: Male	Female	
Adolescent			
Age	15.62	15.19	
Orphan	0.10	0.35	**
Yao	0.37	0.42	
Chewa	0.21	0.17	
Proficient English Literacy	0.72	0.75	
Math Operations Score	6.06	6.07	
Resident Father	0.67	0.08	**
Mother Has No Education	0.38	0.33	
Father Has No Education	0.18	0.14	
Household			
Household Assets	6.07	4.55	**
Parent-Headed Household	0.67	0.62	ł
Grandparent-Headed Household	0.07	0.23	**
Head of Household Has no Education	0.22	0.41	**
Head of Household Has some Primary Education	0.35	0.34	
Head of Household Married (Resident Spouse)	0.97	0.19	**
Head of Household Married (Non-Resident Spouse)	0.00	0.09	**
N	588	273	
Percent of Sample	68.3%	31.7%	

ł Significant difference by household gender at 10%; * Significant difference at 5%; ** Significant difference at 1%

Table 1b

Summary of Descriptive Statistics for Adolescent Boys, at Baseline

Characteristic	Gender of Head of Household: Male	Female	
Adolescent			
Age	15.73	16.51	
Orphan	0.10	0.36	**
Yao	0.38	0.41	
Chewa	0.21	0.17	
Proficient English Literacy	0.65	0.69	
Math Operations Score	6.12	5.98	
Resident Father	0.65	0.02	**
Mother Has No Education	0.40	0.41	
Father Has No Education	0.17	0.17	
Household			
Household Assets	6.01	4.47	**
Parent-Headed Household	0.65	0.66	
Grandparent-Headed Household	0.08	0.24	**
Head of Household Has No Education	0.20	0.48	**
Head of Household Has Some Primary Education	0.39	0.30	*
Head of Household Married (Resident Spouse)	0.95	0.06	**
Head of Household Married (Non-Resident Spouse)	0.01	0.13	**
N	629	250	
Percent of Sample	71.6%	28.4%	

ł Significant difference by household gender at 10%; * Significant difference at 5%; ** Significant difference at 1%

Table 2a

Results of Cox Proportional Hazard Models Predicting School Leaving for Girls,
Z-Scores in Italics. Subjects = 861; Failures = 575; Time at Risk = 3147

	1a		1b			1c		
Variable	Hazard Ratio	Z-Score	Hazard Ratio		Z-Score	Hazard Ratio		Z-Score
Female Headed Household	1.021	*0.23*	1.064		*0.69*	0.802	*	*-2.30*
Proficient English Literacy			0.645	**	*-4.18*	0.623	**	*-4.97*
Age						1.007	ł	*1.80*
Orphan						0.849		*-0.64*
Chewa						1.093	ł	*0.76*
Yao						1.214	ł	*2.03*
Changed Households						1.265	*	*2.53*
Household Assets						0.918	**	*-6.08*
Mother has No Education						1.210	*	*2.02*
Father has No Education						0.903		*-0.84*
Parent-Headed Household						0.672	**	*-3.53*
Grandparent-Headed Household						0.550	**	*-3.52*
Resident Father						0.554	**	*-4.35*
LR Chi^2	0.85		50.61	**		203.12	**	

ł Significant at 10%; * Significant at 5%; ** Significant at 1%

Table 2b

Results of Cox Proportional Hazard Models Predicting School Leaving for Boys,
Z-Scores in Italics. Subjects = 877; Failures = 342; Time at Risk = 3721

	1a		1b			1c		
Variable	Hazard Ratio	Z-Score	Hazard Ratio		Z-Score	Hazard Ratio		Z-Score
Female Headed Household	1.146	*1.16*	1.182		*1.42*	0.941		*-0.46*
Proficient English Literacy			0.375	**	*-8.27*	0.405	**	*-7.49*
Age						1.001		*0.19*
Orphan						1.748	*	*2.32*
Chewa						1.124		*0.78*
Yao						1.095		*0.74*
Changed Households						1.311	*	*2.25*
Household Assets						0.891	**	*-5.89*
Mother has No Education						1.232	†	*1.78*
Father has No Education						1.299	†	*1.87*
Parent-Headed Household						0.846		*-1.16*
Grandparent-Headed Household						0.907		*-0.46*
Resident Father						0.784		*-1.55*
LR Chi^2	1.32		60.90	**		137.20	**	

Table 3a

Results of Cox Proportional Hazard Models Predicting First Marriage for Girls,
Z-Scores in Italics. Subjects = 861; Failures = 527; Time at Risk = 3147

	1a		1b			1c		
Variable	Hazard Ratio	Z-Score	Hazard Ratio		Z-Score	Hazard Ratio		Z-Score
Female Headed Household	0.949	*-0.56*	0.925		*-0.83*	0.926		*-0.78*
Enrolled in School			0.003	**	*-11.48*	0.004	**	*-11.11*
Proficient English Literacy			0.980		*-0.21*	1.099		*0.98*
Age						0.996		*-0.75*
Orphan						0.923		*-0.35*
Chewa						0.909		*-0.75*
Yao						1.211	†	*1.93*
Changed Households						1.545	**	*4.45*
Household Assets						0.949	**	*-3.48*
Mother has No Education						1.174		*1.66*
Father has No Education						1.115		*0.87*
Parent-Headed Household						0.255	**	*-10.24*
Grandparent-Headed Household						0.292	**	*-5.47*
Resident Father						1.517	**	*2.73*
LR Chi^2	0.32		1190.18			1454.20		

Table 3b

Results of Cox Proportional Hazard Models Predicting First Marriage for Boys,
Z-Scores in Italics. Subjects = 877; Failures = 99; Time at Risk = 3721

	1a		1b			1c		
Variable	Hazard Ratio	Z-Score	Hazard Ratio		Z-Score	Hazard Ratio		Z-Score
Female Headed Household	0.934	*-0.30*	0.835		*-0.80*	0.880		*-0.53*
Enrolled in School			0.018	**	*-7.74*	0.025	**	*-7.06*
Proficient English Literacy			1.020		*0.09*	0.824		*-0.85*
Age						0.984		*-0.83*
Orphan						0.426		*-1.16*
Chewa						0.588	†	*-1.72*
Yao						0.786		*-1.08*
Changed Households						1.725	**	*2.28*
Household Assets						0.863	**	*-3.99*
Mother has No Education						0.784		*-1.09*
Father has No Education						1.419		*1.34*
Parent-Headed Household						0.221	**	*-4.32*
Grandparent-Headed Household						0.245	**	*-2.67*
Resident Father						1.857	†	*1.67*
LR Chi^2	0.09		184.71	**		260.32	**	

Table 4a

Results of Cox Proportional Hazard Models Predicting First Births for Girls,
Z-Scores in Italics. Subjects = 861; Failures = 465; Time at Risk = 3147

	1a		1b		1c	
Variable	Hazard Ratio	Z-Score	Hazard Ratio	Z-Score	Hazard Ratio	Z-Score
Female Headed Household	0.829 †	*-1.83*	0.801 *	*-2.15*	0.753 **	*-2.63*
Enrolled in School			0.028 **	*-14.79*	0.060 **	*-10.70*
Proficient English Literacy			1.085	*0.80*	1.136	*1.23*
Age					1.000	*-0.09*
Orphan					1.656 *	*2.32*
Chewa					0.829	*-1.41*
Yao					1.075	*0.68*
Changed Households					0.855	*-1.49*
Household Assets					0.985	*-0.87*
Mother has No Education					0.885	*-1.16*
Father has No Education					1.064	*0.47*
Parent-Headed Household					0.987	*-0.09*
Grandparent-Headed Household					1.116	*0.50*
Resident Father					0.776	*-1.57*
Married					2.750 **	*7.22*
LR Chi^2	3.44 †		637.35 **		733.72 **	

Table 4b

Results of Cox Proportional Hazard Models Predicting First Birth for Boys,
Z-Scores in Italics. Subjects = 877; Failures = 86; Time at Risk = 3721

	1a		1b			1c		
Variable	Hazard Ratio	Z-Score	Hazard Ratio		Z-Score	Hazard Ratio		Z-Score
Female Headed Household	1.207	*0.82*	1.120		*0.49*	1.343		*1.20*
Enrolled in School			0.141	**	*-7.65*	0.571	**	*-1.54*
Proficient English Literacy			1.464		*1.39*	1.300		*0.93*
Age						1.010		*0.74*
Orphan						1.784		*0.96*
Chewa						0.950		*-0.16*
Yao						0.914		*-0.37*
Changed Households						0.887		*-0.44*
Household Assets						1.019	*	*0.68*
Mother has No Education						0.932		*-0.29*
Father has No Education						1.307		*0.94*
Parent-Headed Household						0.676		*-1.10*
Grandparent-Headed Household						0.320		*-1.54*
Resident Father						1.215		*0.53*
Married						35.109	**	*10.50*
LR Chi^2	0.65		68.08	**		97.78	**	

Table 5a

Results of Cox Proportional Hazard Models Predicting Transitions to Adulthood for Girls,

Variable	Dependent Variable: School Leaving		First Marriage		First Birth	
	Hazard Ratio	Z-Score	Hazard Ratio	Z-Score	Hazard Ratio	Z-Score
Female Head of Household:						
Not Married	0.812 †	*-1.84*	0.918	*-0.72*	0.766 *	*-2.08*
Married with Resident Spouse	0.897	*-0.61*	0.966	*-0.20*	0.629 *	*-2.22*
Married with Non-Resident Spouse	0.628 †	*-1.74*	0.758	*-0.97*	0.847	*-0.51*
LR Chi^2	209.48 **		1440.09 **		740.76 **	
Subjects	861		861		861	
Failures	575		527		465	

Table 5b

Results of Cox Proportional Hazard Models Predicting Transitions to Adulthood for Boys,

Variable	Dependent Variable: School Leaving		First Marriage		First Birth	
	Hazard Ratio	Z-Score	Hazard Ratio	Z-Score	Hazard Ratio	Z-Score
Female Head of Household:						
Not Married	0.931	*-0.49*	0.836	*-0.68*	1.191	*0.63*
Married with Resident Spouse	0.907	*-0.21*	1.142	*0.18*	1.450	*0.51*
Married with Non-Resident Spouse	0.743	*-0.86*	1.235	*0.35*	1.210	*0.31*
LR Chi^2	143.18 **		263.21 **		98.22 **	
Subjects	877		877		877	
Failures	342		99		86	

FIGURES

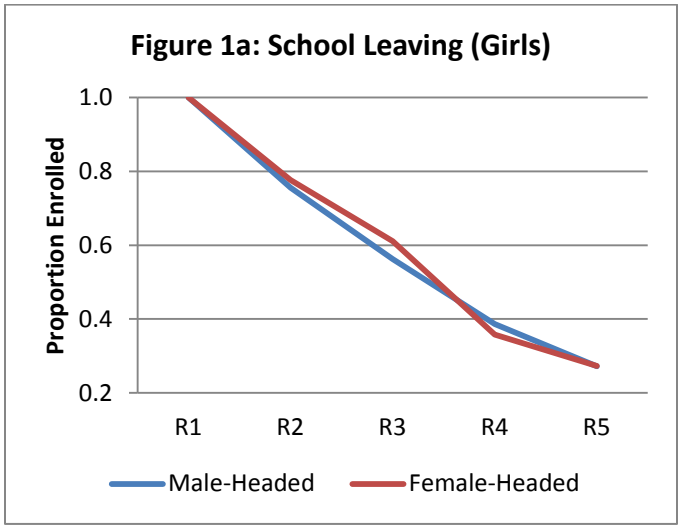
Figure 1a: School Leaving (Girls)
Proportion Enrolled
1.0
0.8
0.6
0.4
0.2
R1
R2
R3
R4
R5
Male-Headed
Female-Headed

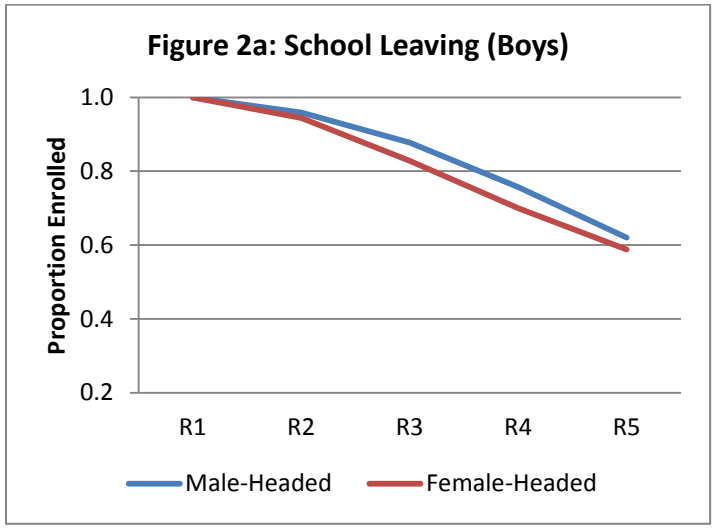
Figure 2a: School Leaving (Boys)
Proportion Enrolled
1.0
0.8
0.6
0.4
0.2
R1
R2
R3
R4
R5
Male-Headed
Female-Headed

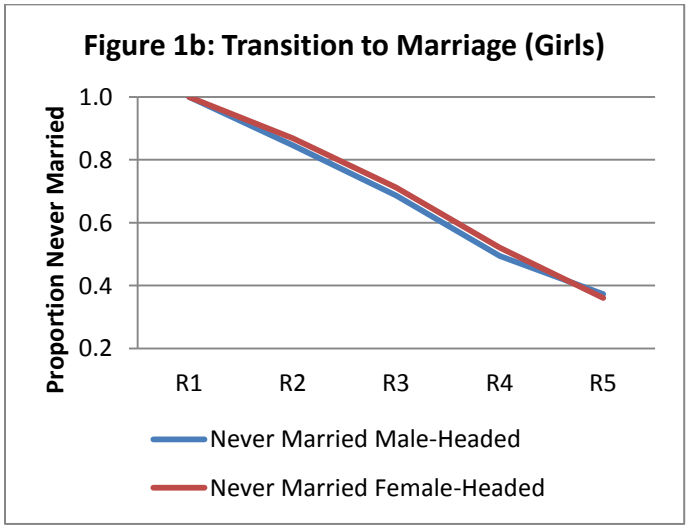
Figure 1b: Transition to Marriage (Girls)
Proportion Never Married
1.0
0.8
0.6
0.4
0.2
R1
R2
R3
R4
R5
Never Married Male-Headed
Never Married Female-Headed

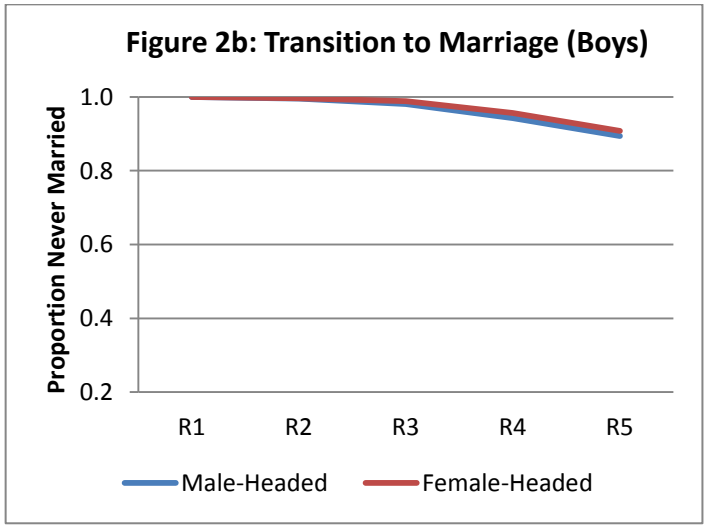
Figure 2b: Transition to Marriage (Boys)
Proportion Never Married
1.0
0.8
0.6
0.4
0.2
R1
R2
R3
R4
R5
Male-Headed
Female-Headed

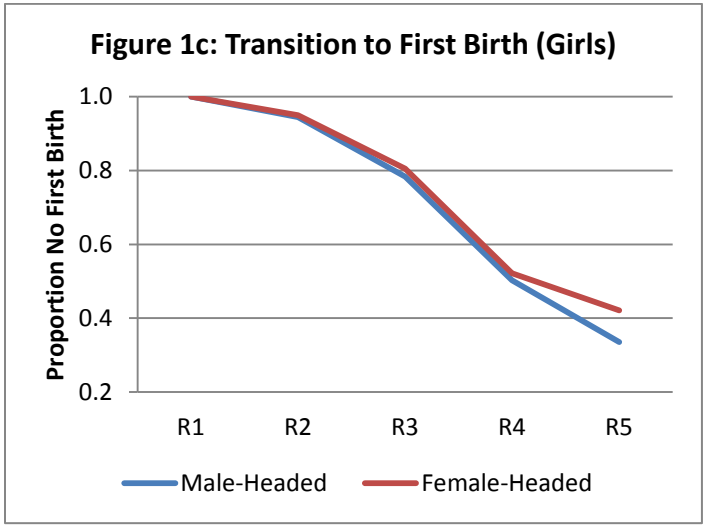
Figure 1c: Transition to First Birth (Girls)
Proportion No First Birth
1.0
0.8
0.6
0.4
0.2
R1
R2
R3
R4
R5
Male-Headed
Female-Headed

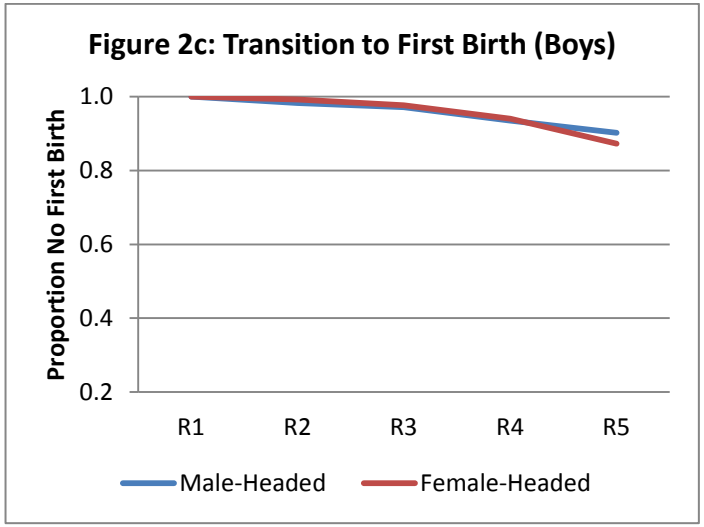
Figure 2c: Transition to First Birth (Boys)
Proportion No First Birth
1.0
0.8
0.6
0.4
0.2
R1
R2
R3
R4
R5
Male-Headed
Female-Headed