Labor migration and children's educational progression in Kyrgyzstan

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[Manuscript prepared for the 2025 International Population Conference, Brisbane Australia]

Abstract:

Theories of labor migration posit that household migration exerts positive influence on children's health and well-being via economic remittances. Yet, there is mixed evidence that labor migration boosts the human capital acquisition of children of migrants who remain in sending communities. This paper considers the complex relationship between migration from the household and children's educational engagement. We test competing hypotheses whereby migration can support children's school enrollment and grade progress but is also negatively associated with attainment among adolescents. Recognizing that the impacts of migration may be particularly large for children and adolescents in contexts where economic development lags and migrant remittances are a significant contributor to household survival, the analyses rely on longitudinal data from the Life in Kyrgyzstan (LiK) survey. Results indicate children's educational trajectories are not significantly influenced by ongoing household labor migration. But the initiation of new migration may be disruptive and promote school dropout among adolescents. Although educational expectations are high in the Kyrgyz Republic among adolescents regardless of household migration, those in labor migration households are more likely to plan for their own labor migration than those who are not exposed to household labor migration. Thus, for some adolescents, education and migration may indeed be competing choices.

Introduction:

Household migration plays a key role in the lives of children around the world. The impacts of migration may be particularly large for children and adolescents in contexts where economic development lags and migrant remittances are a significant contributor to household survival (Chakraborty and Pandey 2022). Although research demonstrates some improvements in economic well-being, education and health among children of migrants in an array of sending communities (Bai et al. 2018; Donato and Duncan 2011; Edwards and Ureta 2003), it is increasingly clear that migration from the household also disrupts caregiving, labor and emotional well-being yielding poorer outcomes for some children in migrant sending communities (Dávalos et al. 2017; Ivlevs, Nikolova, and Graham 2019). There is increasing awareness that migration of others can lead to shifts in children's activities, engagement in schooling, and orientation towards the future.

Migration is a process that unfolds throughout the family life course so mixed research findings of the ways migration impacts children and adolescents may stem from inattention to the timing of migration in children's schooling experiences. Children's educational pathways are shaped early. Starting school 'on-time', attending regularly and progressing apace all forecast positive educational attainment. Disruptions in family life brought about by migration could alter these pathways and reduce educational attainment in adulthood. Yet few studies of "left behind" children include information on when migration occurs and how long migration lasts. Contrary to common perceptions of their increased vulnerability compared to their older peers, children exposed to labor migration from their households at young ages may be less negatively impacted than those for whom migration disrupts ongoing educational progress.

Relying on two waves of survey data collected in Kyrgyzstan, this paper addresses several hypotheses about the impact of household labor migration on children and adolescents' educational paths. The analyses go beyond simple measures of school enrollment to illustrate where along children's educational paths migration may have the most significant impact. We consider not only whether children are enrolled in school but also their "age-for-grade" status – that is the extent to which they are enrolled in a level of schooling normatively expected based on their age. Controlling for prior school progress, the analyses reveal how children's educational progress is altered when households initiate migration vs. households in which migration has been ongoing and those that never engage in migration. The analyses then use a unique sample of adolescents who report their own plans for future migration and education. With a large youth population, understanding how migration shapes transitions through education and the labor market are of critical importance in the Kyrgz Republic and other similar dynamic economic settings.

Background:

Household labor migration and education. The New Economics of Labor Migration (NELM) theoretical framework is often invoked to explain how labor migration impacts migrant-sending households. In this perspective, labor migration is an efficient household-level strategy to diversify risk, support local livelihoods, and invest in children's health and well-being (Massey et al. 1993). Labor migration is expected to have a positive impact on children's schooling via remittances, economic support sent by migrating household members, that are then used to support children's schooling by subsidizing school costs (i.e., school fees, uniforms, supplies). Remittances may also improve the predictability of household income and allow children to remain in school longer, increasing educational aspirations and subsequent attainment. Remittances may also be used to substitute for households' dependence on children's labor, thereby extending the ages at which children remain in school. Consistent with this theoretical perspective, research from a variety of sending communities around the world demonstrates that migrants send, and households use, remittances to benefit children (Dávalos et al. 2017; Edwards and Ureta 2003; International Organization for Migration 2022; Ivlevs et al. 2019; Wang, Hagedorn, and Chi 2021).

There is mixed evidence that migration, and remittance receipt, ultimately increase educational achievement and attainment. This has led to research into other mechanisms that may offset the expected benefits of migration for children's education. Migration is a disruptive event. The absence of migrants, particularly migrating parents, can lead to distress and reduce children's educational engagement and achievement. In Kyrgyzstan, popular social media posts, online media, and informal conversations, highlight the harm that labor migration can inflict on children left behind (Children of migrants | UNICEF Kyrgyzstan 2015.). Teachers and caregivers report challenges of keeping children engaged in school and bemoan additional constraints and labor demands imposed when parents and others from the household depart. Interviews with families in Kyrgyzstan reveal concerns about children's distress when parents migrate (Critelli et al. 2021). For young children, there may be fewer adults to provide supervision or support their engagement in school. For older children and adolescents, there may be more demands for their own labor contributions that erodes the time and attention they can devote to their own education. But negative emotional responses do not necessarily result in poorer educational aspirations our outcomes. For example, in Mexico, father's migration has a negative impact on children's educational aspirations but in households where the absent father covered children's expenses, educational aspirations remained as high as observed among children in households where both parents are present (Nobles 2011).

Children's educational pathways are shaped early in the life course and shift over time depending on when migration from the household occurs. There are many ways to measure educational progress, from

the timing of entrance to formal school settings, continuity of school attendance, grade progression and, ultimately, attainment of educational credentials. Many early studies of the impacts of migration on 'left behind' children focused on school enrollment and whether economic remittances from migrants improve the probability that children attend school at all. School enrollment may be particularly impacted by labor migration and migrant remittances in very low-income contexts where overall educational attainment levels and school supply are relatively low and the costs of schooling are relatively high. In more economically developed settings, school enrollment tends to be much higher, or even universal for younger children. Migration impacts in these settings may only emerge later in the educational progress of older children and adolescents. Migration may have a positive impact by allowing older children to devote more time to school, reducing grade repetition and delaying school attrition (i.e., dropout), resulting in higher primary and secondary school completion rates (Abraham 2024; Ezaki 2024). Grade repetition and school dropout are often positively correlated as children who are 'overage' become discouraged and lower their expectations for educational attainment (Ezaki 2024; Sunny et al. 2017). This paper focuses on children's age-for-grade status and school attrition as a more rigorous assessment of migration's role in children's education in a middle-income setting.

However, if migration is productive and successful over time, older youth may perceive migration as a better route to achievement that competes with remaining in school. For example, adolescents in one study in Mexico reduced their commitment to completing secondary education because they anticipated their own migration (Kandel and Kao, 2001). Similar results are found in Central Asia where lower educational attainment is observed among those who migrate when compared to those who remain in their origin countries (Abdulloev, Epstein, and Gang 2020). If household labor migration promotes migration goals among adolescents, then educational engagement may be reduced for older adolescents in migrant households even if there is a positive impact of household labor migration on children's school progression at younger ages.

Another possibility is that older youth view migration as a conduit to achieving their education goals rather than a replacement for these goals. In many low- and middle-income contexts, migration is necessary to achieve post-secondary education goals. In this case, migration and education aspirations are compatible rather than competing goals. For example, interviews with adolescents and families in Kyrgyzstan reveal high education aspirations and migration goals even in the absence of the socioeconomic resources and prior academic success to support such ambitions (Chicherina 2022, 2023). Even when youth do not achieve their highest goals, high educational aspirations are positively associated with educational attainment (Ansong et al. 2019; Chiapa, Garrido, and Prina 2012). In other words, education aspirations need not be 'realistically achievable' to promote higher achievement than would be

observed in the absence of such optimism. Similarly, migration aspirations are predictive of subsequent moves (Migali and Scipioni 2019) yet few studies contain information on self-reports of youth education and migration goals.

Hypotheses. This paper seeks to address the complexity of the family life course in which both migration and education unfold. The analyses go beyond much of the prior work that assesses education at one point in time following the onset of migration. Rather, we analyze educational progress and changes in migration over time. For example, household labor migration may be positively associated with children's school enrollment while exerting negative pressure on children's time, reducing their regular attendance and performance in school and ultimately reduce educational attainment (Suárez-Orozco, Suárez-Orozco, and Todorova 2008). Children who are not on track for grade progress (i.e., discontinuous attendance) or who are retained in lower grades (i.e., grade repetition) due to their academic performance are less likely to complete secondary education. Migration may be associated with more enrollment and engagement among younger students but still be negatively associated with educational attainment for adolescents and those transitioning to adulthood. Conversely, the initiation of migration may disrupt children's lives but involve less disruption to education as migration persists. This is because remittances are expected to improve and smooth fluctuation in household well-being over time. In this case we would observe an initial negative impact on children when migration begins with more positive outcomes for children in households in which migration has been ongoing.

We propose several hypotheses outlining the expected relationship between household labor migration and children's education that are also attentive to the timing of migration and children's age

> H1: Household labor migration is positively associated with youth school enrollment and grade progress at baseline. Children and adolescents in households currently engaged in labor migration will be more likely to be enrolled in school than children and adolescents in households not engaged in labor migration. Children and adolescents in households engaged in labor migration will also be enrolled in grades appropriate to their age (i.e., make average on-time progress through school) at baseline when compared to children and adolescents in households not engaged in labor migration.
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> H2: The relationship between household labor migration at baseline and children's grade progress over time will vary by child age. We expect household labor migration will be positively associated with grade progress over time for young children. But household labor migration will be negatively associated with grade progression/enrollment among older children (adolescents).

H3: Initiation of labor migration will be negatively associated with children's grade progress. Children and adolescents are more likely to make slower progress or disengage from school when households initiate labor migration when compared to children in households that never engage in labor migration or in households continuously engaged in labor migration.

H4: Based on the greater negative impact on children's education at older ages, adolescents are more likely to anticipate becoming labor migrants and less likely to anticipate post-secondary education when they are exposed to household labor migration.

We recognize that the role of household migration on children's schooling may operate differently for boys and girls, particularly among groups where roles and activities are highly stratified by gender. If migration reduces the number of adults available to provide domestic labour, for example, girls' educational engagement may decrease in response without a similar impact on boys' educational engagement. However, in gender stratified contexts where men are more likely to become labor migrants than women, boys' educational engagement may respond negatively. Our analyses consider the potential for differential responses to migration by boys and girls as well as differential responses by age.

Context. We test these hypotheses with household data from a middle-income country with a history of international labor migration, an ethnically diverse population, and a wide range of socioeconomic development across regions and in rural and urban areas. The Kyrgyz Republic has an established reliance on labor migration, both internal and international. Economic remittances from migrants contribute significantly to the overall economy and to rural households (Zhunusova and Herrmann 2018). Following the collapse of the Soviet Union, Kyrgyzstan experienced an economic crisis and high unemployment. The period was marked by a decrease in education and intergenerational educational mobility (Brück and Esenaliev 2018). This economic collapse also furthered the flow of labor migrants out of the country and increased household dependence on migrant remittances. Although Russia remains the top destination for Kyrgyz migrants, destinations have diversified since 1991 with many migrants in neighboring Kazakhstan, Türkiye, UAE, Germany, the United States and Korea (International Organization for Migration 2022).

Kyrgyz migrants originate from all parts of the country but labor migration has been particularly notable for its impact on rural southern regions that are less economically developed than the north (Agadjanian 2020; Thieme 2014). Bishkek, the Capital, serves as a destination for internal and international migrants as well as a sending area for skilled migrants and those seeking to study abroad. The Kyrgyz population is ethnically and culturally diverse with a substantial Russian and European origin population, primarily located in the capital city (Bishkek) and other more economically developed areas in the north (e.g., Issy-

Kul). Other Central Asian ethnic groups are more concentrated in southern (Uzbek and Tajik) and eastern (Dungan) regions that are less developed. Remittances make up a more significant proportion of economic resources in southern households overall. Despite this ethnic variation, migration flows are fairly gender balanced in comparison to other Central Asian countries (Agadjanian, Dommaraju, and Nedoluzhko 2013; Rocheva and Varshaver 2018). Yet, gender roles remain rigid in the Kyrgyz Republic and women carry responsibility for childcare and domestic labor despite their economic contributions. The national narrative around migration and children often focuses on hardships for children specifically when women migrate. (Kosec et al. 2023; Scott, Sexsmith, and Chi 2024; Urbaeva 2019).

Kyrgyz reliance on international and internal (rural to urban) migration has the potential to both positively and negatively impact children's educational progress and goals. Certainly, economic remittances could support children's access and engagement in school, particularly for the lowest income households. However, children in rural areas are instrumental actors in agricultural livelihoods and provide significant domestic and caregiving labor. When adults migrate out of these households, children and adolescents face increased demands for their labor that may reduce their engagement in education. It is important therefore to consider urbanicity and household resources in any analysis of migration in this context.

The role of migration on youth goals and aspirations in this context is also likely to vary by ethnicity, urbanicity and socioeconomic status (Agadjanian, Nedoluzhko, and Kumskov 2008). As with migration trends globally, there are multiple paths to migration in Kyrgyzstan. Older adolescents, along with adults, are often drawn into lower-skilled labor migration, joining other relatives or friends to work in Russia and other destinations. These migrants often originate from rural areas and households engaged in agricultural livelihoods. Youth from these labor migrant households are likely to anticipate becoming migrants themselves and may hold lower education goals. However, throughout Central Asia, education migration has increased so that adolescents from rural and urban areas alike are motivated to move to complete secondary and post-secondary education. In this case, migration and education goals will go together.

Data and methods:

To test our hypotheses, our analyses rely on the Life in Kyrgyzstan (LiK) survey, a longitudinal survey of approximately 3,000 households from across the country that includes detailed information on household income, expenditures and migration (Brück and Esenaliev 2018; Chakraborty and Pandey 2022; Wang et al. 2021). The first survey was conducted in 2010, starting with 8000 household members, which were followed in the five subsequent waves in 2011, 2011, 2012, 2013, 2016, and 2019. The data also includes sociodemographic information on all household members, including children. We follow children aged 6-

14 who are present in households at the 2016 wave of LiK through 2019 to observe changes in school enrollment and grade progress (n=1850). Though the household rosters include children aged 6-17 [1]in both waves, we limit the sample to 6-14 years in 2016 because the survey does not provide education information for any children over the age of 17 years in 2019. This eliminates 479 cases in 2016 (age 15-17 years). The sample of children aged 6-14 in 2016 is used to test our hypotheses about exposure to labor migration and children's educational progress.

We also hypothesize that exposure to migration will shape youth outlook and expectations beyond the direct impact on educational progression. To test these hypotheses, we turn to a sample of adolescents who were individually interviewed at the 2019 round of the LiK survey. Only youth aged 14 – 17 years of age are eligible to participate in these interviews. We explore how household migration and changes in migration are associated with the education (n=629) and migration goals (n=514) reported by these adolescents.

The analyses are attentive to the age patterns and gender differences in the role of migration on children's educational trajectories. Relying on the life course developmental perspective, we consider that children's educational outcomes may be particularly sensitive to the timing of migration and the disruption caused by migration at specific ages. Further, in Kyrgyz Republic, like many other countries in Central and South Asia, girls face more limited opportunities and encouragement for economic and political engagement and may, in return, receive less support for their educational goals (Chicherina 2022). In this case, even if educational aspirations are lower among boys, the returns to migration may be more positive for boys' educational progress and attainment than for girls.

Our first dependent variable reflects grade progression by 2019. Our measure of grade progression includes three categories that reflect youth enrollment and on-time progression through school (i.e., enrolled at a grade level expected for their age) (Crouch et al. 2022). We construct this variable from information on the household roster about school enrollment and the grade in which individuals are enrolled. As expected, school enrollment is very high among all children aged 6-14 in 2016 (92%). And most children are enrolled in a grade that is expected based on their age (i.e., 88% of 7-year-olds in our sample are enrolled in grade 1 or 2 in 2016 and 92% of 8-year-olds are enrolled in grades 2 or 3 in 2016, etc.)[2]. Also as expected, we observe more children whose grade progress stalls (e.g., they are enrolled in

[1] The data follows 2387 children ages 6-17 in 2016; we drop 39 cases for mismatches on gender, age, and/or birthyear, 473 cases ages 15-17 years in 2016, and 25 cases missing on educational variables in 2019 (because of age> 17 years)

[2] Acknowledging variation in birth month and school enrollment as well as some variability in age at first school entry, children are considered 'on time' within a two-year moving window (e.g., children aged 10 are considered on

a lower grade than we would expect based on their age) by 2019. Children are identified as making slower or 'off track' grade progress only if they are at least one full year older than most children in their grade level as of 2019. These youth are compared to those who are 'on track' (i.e., those in the grade expected based on their age) and those who are no longer enrolled in school at all. We rely on multinomial logistic regression due to the categorical nature of this dependent variable.

To understand how migration shapes adolescent orientation towards education and migration, we create two additional dependent variables from the smaller sample of older youth. Unfortunately, the LiK interview does not include a standard question about educational aspirations as found in many youth surveys. However, the young respondents are asked a range of questions about their current and future education plans. Adolescents age 14-17 report whether they are in secondary school, postsecondary education or not studying at all in 2019. Youth who are not in postsecondary education are then asked about their plans for further education. We combine these questions to create a single item indicating: (1) Plan to continue education beyond secondary school, (2) Currently in postsecondary education and (3) No plan to continue education in the future. We combine adolescents who are in postsecondary and who plan to continue to post-secondary and conduct bivariate logistic regression to analyze this dependent variable. To analyze migration goals, we draw from a different module in the adolescent interviews. Adolescents are asked to "rate the likelihood that you will work abroad during the next 12 months" on a scale from 1, indicating the lowest likelihood, to 5, indicating the highest likelihood. A sizable group of youth also express that they 'don't know' their own likelihood of becoming a labor migrant, a response more common among girls (20.8%) than boys (16%).

Our analyses address how household labor migration is implicated in educational progress, educational plans and intentions to become a labor migrant among youth in Kyrgyzstan. To measure exposure to international labor migration, households are coded as engaged in labor migration in 2016 if at least one person from the household is away at an international destination for work. Approximately 12% of children in our sample are from households with at least one labor migrant in 2016. There is also considerable growth in migration between 2016-2019. In 2019, approximately 23% of the children are living in households engaged in labor migration. Thus, there is a sizable group of children who are in households that initiate new migration between 2016 and 2019.

Other variables in our analyses describe characteristics of children and households that are associated with education and migration. Models include children's age and gender. Primary and secondary school

time if enrolled in any grade level 4 or above. Children aged 9 are considered 'in school but behind in grade' if they are enrolled in grade below level 4. This conservative approach results in over 80% of the sample considered 'on time' in grade progression.

enrollment is very high in Kyrgyzstan. Nonetheless, as in other contexts, children in Kyrgyzstan are more likely to leave school as at older ages with adolescent school enrollment lower than school enrollment for younger children. Similarly, our analyses consider child's gender because education and selection into labor migration vary between boys and girls.

Our analysis also includes a range of household characteristics. These include a measure of household wealth constructed from the report of assets owned at the time of the household survey in 2016. We use principal component analysis to weigh the assets recorded in the survey (bicycle, car or truck, motorbike, tractor, fridge, radio, television, cellphone, washing machine, computer, landline). We then use postestimation in STATA 18 to predict the asset index for each household, allowing us to reduce the number of variables or avoid making arbitrary choices about which assets to include in the final models. The analyses also include the number of people living in the household in 2016. Because resources and practices vary considerably by ethnicity in the Kyrgyz context (Agadjanian and Oh 2020), we include an indicator for the ethnicity of the person listed as the head of the household in 2016: Kyrgyz, Uzbek and "Other". The last category includes those of Russian and other European origins as well as Dungan and other Central Asian groups. Unfortunately, the small sample of these groups prohibits a more detailed analysis of their outcomes[3]. The regional concentration of ethnic groups does not allow for the inclusion of ethnic origin and region simultaneously in the same models. We also include a measure for urban residence because school supply, particularly access to post-secondary education, will vary considerably between rural and urban areas in the Kyrgyz setting.

Table 1 provides the summary statistics for our initial sample of all children in the focal households in 2016 (1) and those for the smaller sample of adolescents (2) from these same households who are individually interviewed in 2019.

[3] There is considerable overlap of ethnicity and region in the LiK dataset. For example, over 90% of households headed by someone of Uzbek origin, the largest non-Kyrgyz ethnic group in the dataset, are in two oblasts – Jalal-Abad and Osh. The 'other' group is also heavily concentrated with over 80% in Chui oblast. We do not include region and ethnicity in the same models due to this significant multicollinearity.

Table 1: Descriptive statistics of youth and households in LiK 2016-2019

	(1) *All youth in households in 2016*	*(2)* *Focal youth interviewed in 2019*
Child characteristics:		
Age in 2016		
6	14.8%	
7	11.5%	
8	13.2%	
9	10.9%	
10	10.7%	1.1%
11	9.7%	25.4%
12	10.0%	28.9%
13	9.7%	23.7%
14	9.7%	20.8%
Child's gender		
Male	52.2%	53.6%
Female	47.8%	46.4%
Household Characteristics		
Household asset index	.06 (1.3)	.072 (1.5)
Number of people in the household	6.9 (2.4)	6.6 (2.3)
Household head ethnicity		
Kyrgyz	74.3%	75.9%
Uzbek	14.1%	13.6%
Other	11.6%	10.6%
Household location		
Urban/city	24.4%	26.0%
Rural	75.6%	74.0%
Household labor migration in 2016	12.2%	11.9%
Household labor migration in 2019	22.8%	21.5%
Number of children	1,850	629

The primary difference between our two analytic samples is the age composition of the children themselves. All children aged 6-14 in 2016 for whom education information is available in 2019 are included in the first sample, so the age distribution is relatively even across age groups. The smaller sample consists only of youth aged 14 and older in 2019 who are eligible to be interviewed in 2019. Thus, our analyses of grade progression by 2019 are based on a sample of 1,850 children of whom around 40% are age 11 and older in 2016. In contrast, our analyses of education and migration goals are based on the sample of 629 youth of whom 43% are 16 years or older in 2019. The rest of the sample characteristics are quite similar across both samples with no statistically significant differences in household characteristics.

We conduct different regression analyses for each type of outcome. For the analyses of educational progress among all youth, we conduct multinomial logistic regression with a three-category dependent variable: (1) In school and in expected grade-for-age (reference group for all models), (2) In school but out of expected grade-for-age (off-track), and (3) Out of school. We conduct logistic regression when predicting postsecondary school plans expressed by adolescents in 2019: (1) Expect to continue/currently continuing in postsecondary education vs. (2) Does not expect to continue in postsecondary education. We conduct ordered logistic regression when predicting the self-reported likelihood of becoming a labor migrant among the adolescents in 2019. All multivariate analyses are conducted in STATA 19 with clustering to adjust for the non-independent observations of youth within households and robust standard errors.

Results

Household labor migration and children's educational progression. We first examine the educational progress of youth over time relying on the sample of all children and youth in the households surveyed in 2016. Table 2 provides the association between youth grade progression in 2019 and exposure to household labor migration in 2016.

Table 2: Labor migration from the household in 2016 and grade progression of youth in 2019, LiK

Educational progress in 2019	*All*	*HH labor migration in 2016*	*No HH labor migration in 2016*
In school with typical grade progress	77.6%	78.7%	77.5%
In school, behind typical grade progress	18.0%	15.5%	18.2%
Out of school	4.7%	5.8%	4.3%

Source: Life in Kyrgyzstan Survey, 2016 & 2019. n = 1,742[4] youth age 6-14 in 2016

As expected, over ninety percent of children and youth are enrolled in school in 2019. There is a sizable minority (18%) of children in school who are out of typical grade progression by 2019. Supplemental analyses demonstrate that most were not behind in grade progression in 2016 but fall behind over time: Over 80% of the children who are behind in grade progression in 2019 were in the appropriate grade for their age in 2016. Another small percentage (4.7%) of youth are out of school entirely by 2019. Here too we observe the majority were in school and in the appropriate grade level for their age in 2016. Finally, a slightly smaller proportion of youth in households engaged in labor migration in 2016 are out of normal grade progression in 2019 than those in non-migrant households (15.5% vs. 18.2%) but a slightly larger proportion of youth in migrant households are completely out of school by 2019 when compared to their peers in non-migrant households (5.8% vs. 4.3%). These differences, without controls, are not statistically significant.

We first conduct multivariate multinomial logistic regression models to test our initial hypothesis that there is a positive association between educational progress in 2016 and household labor migration in 2016 (H1). We test interactions between household labor migration and children's age (H2). Then we conduct a multinomial logistic regression predicting change in grade progress or school attrition in 2019 controlling for initial grade progress in 2016. This model includes a measure of household labor migration in 2019 to test our hypothesis that initiation of labor migration alters educational trajectories of children and adolescents (H2). The baseline and change models are presented in Table 3.

[4] In 2016, 63 6-year olds are noted as enrolled, though no grade-level information is available, & thus are treated as missing, while 45 children, ages 7-14 years, are reported as not enrolled. Information for these children is complete in 2019, and are included in the grade progression variable for 2019 but not for 2016.

Table 3: Multinomial logistic regression models predicting educational progress

	Model 1 – 2016 grade progression		*Model 2 – 2019 grade progression*	
Reference group: Typical grade progression	Behind grade progression	Out of school	Behind grade progression	Out of school
Child's age	1.20***	2.30***	1.25***	2.25***
Male (vs. Female)	1.00	1.4	.79(a)	.92
Household wealth	.85**	.90	1.05	.93
Number of people in the household	.93	.97	1.02	1.10
Household head ethnicity (vs. Kyrgyz)				
Uzbek	1.22	.92	.64(a)	3.97***
Other	.86	1.31	.75	2.42*
Urban household	1.39	.65(a)	1.05	.57(a)
Household labor migration (vs. no migration)				
Labor migration in 2016	.95	1.18	.72	1.31
Labor migration in 2019 only			.84	1.69(a)
Grade progression in 2016 (vs. typical grade progression)				
Behind in grade			1.69*	1.73
Out of school			.78	5.20*

Note: (a) p<.10 *p<.05 ** p<.01; ***p<.001; Sample includes 1,742 children in 1,046 households; Relative Risk Ratios presented; Models adjusted for non-independent observations within households with robust SEs.

Source: Life in Kyrgyzstan Survey, 2016 & 2019.

The results of Model 1 indicate considerable variation in initial grade progression by children's age with atypical grade progression and school attrition observed among the older youth in the sample in 2016. Boys are also more likely to fall behind in grade progression than girls. At the household level, we observe only small variation in grade progress or school attrition by ethnicity and location. Youth in urban areas are less likely to be out of school completely in 2016 when compared to their peers in rural areas as expected based on the considerable variation in livelihoods and school supply across urban and rural areas. However, the results in this baseline model also indicate little role of exposure to household labor migration on child and adolescent schooling observed in 2016. Coefficients in our models with interactions are consistent with the expectations for hypothesis 2 but are not statistically significant.

We also hypothesized that changes in labor migration could reduce available support for children's education. The initiation of labor migration, for example, may be associated with disruption, increased needs for children's labor and an adjustment period before labor migration provides additional resources to those left behind. Changes in labor migration may also indicate less stability in household resources or an increase in household need. In our sample from the Life in Kyrgyzstan survey, approximately 70% of children are in households never engaged in labor migration. Another 17% are in households that enter migration between 2016 and 2019. The remaining youth come from households that exit migration between 2016 and 2019 (7%) or remain continuously engaged in labor migration from 2016-2019 (5.4%). The second model in Table 3 demonstrates how grade progression changes in 2019 controlling for prior grade progression in 2016 and household migration initiated recently (e.g., after 2016 and ongoing by 2019). This is a more rigorous approach because we are separating the impact of labor migration on prior educational performance. We can interpret the results for household migration in 2019 to reflect the impact of the initiation of household migration on changes in school progress over time.

The results of Model 2 again demonstrate the importance of considering children's age when focusing on educational progress. Older children are more likely to be behind in grade progression and out of school in 2019 even controlling for their prior school status in 2016. Similarly, we observe important differences in grade progress by ethnicity with children of Uzbek and other ethnic groups more likely to leave school than their peers of Kyrgyz origin over time. There is much less impact of household migration on school progress. However, children and adolescents in households that initiate migration after 2016 (i.e., are observed to engage in labor migration only in 2019) are more likely to be out of school than those in households that are never engaged in migration. But the size of the effect is quite small; average marginal effects predict up to 7% out of school compared to only 4% among those in non-migrant households.

Supplemental analyses: We conducted additional analyses to more thoroughly investigate how children's educational progress varies in the Kyrgyz context. First, because we anticipated that older youth would be most likely to leave school, a finding confirmed in the models presented in Table 3, we considered whether labor migration plays a different role in the educational trajectories of older youth by adding an interaction term for child's age and household labor migration in 2016 (H2). Although the sample size is relatively small, we observe a greater likelihood of being out of school entirely in 2019 when living in a household that initiates migration after 2016 among the older youth in the sample (e.g., those age 13 and 14 in 2016). Second, we considered the importance of gender differences in household support for education and the importance of migration for the educational progress of girls and boys. Although boys are more likely to be behind in grade progress than girls, we do not find significant variations in the full

regression models with interactions. Nor do we observe significant differences when we conduct the models separately by sex (models not shown; available upon request).

We conducted additional robustness checks of the analyses presented in Table 3. First, we re-estimated models excluding youth who were already behind or out of school in 2016 from the analyses of grade progression in 2019 (n = 1,451 children and adolescents in 2019). Our substantive conclusions do not change. Starting with youth in school and in normative grade progression in 2016 demonstrates the increased risk of non-normative grade progression as children age. Adolescents are at an increased risk of falling behind in grade progression *and* school attrition by 2019 when compared to younger children even though they were in school and making normative age-for-grade progress in 2016. Results also provide even stronger support for the hypothesis that living in a household that enters labor migration is positively associated ($p<.05$) with school attrition (i.e., the odds of being out of school are significantly higher for youth in new labor migrant households in 2019 when compared to those in households that never include a labor migrant). Finally, recognizing differences in economic development and school access across the Kyrgyz Republic, we repeated the analyses excluding households in Chui Oblast (e.g., region incorporating the capital city of Bishkek and its surrounding communities). These models reaffirm the significant ethnic differences in school progression with those of Uzbek and other ethnic origins significantly more likely to leave school by 2019 even in the presence of controls for prior grade progression. Our conclusions about household labor migration do not change from the models presented above that included households in Chui Oblast.

Household labor migration and youth education and migration goals. The analyses presented above demonstrate that older children and adolescents are the most likely to change their school progress and are somewhat less likely to remain in school, particularly when households initiate labor migration. This suggests greater sensitivity to changes in household labor supply among adolescents as they grow up. The results in the full sample are modest and do not include information on adolescents' own perceptions and goals. To gain a greater understanding of how migration may shape the plans and goals of these adolescents in the Kyrgyz context, we turn to the smaller sample of older adolescents who were interviewed in the 2019 round of the LiK and self-report their own education plans and openness to labor migration as part of their own envisioned futures. These children range from 14[5] to 17 years old in 2019 so their education and migration goals are still being formed (see Table 1 for sample characteristics). We

[5] The eligible age for the targeted sample is 14-17 years, however the sample includes some who reportedly are 13-year-olds at the time of the 2019 interviews. This may reflect age misreporting at one of the two survey rounds and represents only 1% of the adolescents interviewed.

hypothesized that education goals will be lower, and migration goals higher, among adolescents in labor migration households (H4).

Adolescents are asked about their education plans beyond secondary school. As seen in Table 4, a substantial minority of the sample are already enrolled in a postsecondary education program (13.8%). Most adolescents who are still in secondary school intend to continue into some post-secondary education. There is little variation in education plans by exposure to household migration in 2016. Just under a quarter report that they do not plan to pursue education beyond secondary school regardless of their prior exposure to labor migration.

Table 4: Self-reported education plans, youth age 14 to 17, by household labor migration in 2016, LiK

Education plans beyond secondary school	*All*	*HH labor migration in 2016*	*No HH labor migration in 2016*
Intend to continue education	63.3%	64.0%	63.3%
No plan to continue education	23.0%	21.3%	23.2%
Already in postsecondary education	13.8%	14.7%	13.6%

Source: 2016 & 2019 LiK, Youth sample n = 629

Table 5 presents results of a logistic regression model predicting whether adolescents have plans to continue their education beyond secondary school (or are already enrolled in a post-secondary education program) vs. those who do not plan to continue their education. We again observe significant differences by ethnicity and urbanicity. Uzbek and other non-Kyrgyz origin youth are less likely to plan to continue beyond secondary school. Adolescents in urban areas are more likely to do so. We do not observe a statistically significant difference among youth in households engaged in migration when compared to those in non-migrant households. The models include a control for prior school progression in 2016. When we estimate the model excluding those adolescents who were already out of typical school progression or are out of school entirely in 2016, our substantive conclusions do not change.

Table 5: Logistic regression predicting youth plans to continue beyond secondary education, LiK youth 2019

	Odds ratios
Child's age	1.08
Male (vs. Female)	1.31
Household wealth	.97
Number of people in the household	.89*
Household head ethnicity (vs. Kyrgyz)	
Uzbek	.34***
Other	.30***
Urban household	1.64(a)
Household labor migration (vs. no migration)	
Labor migration in 2016	1.73
Labor migration in 2019 only	1.55
Grade progression in 2016 (vs. typical grade progression)	
Behind in grade	.71
Out of school	.72

Source: 2016 & 2019 LiK, Youth sample n = 629

The next question is whether migration intentions (e.g., plans for international labor migration) are impacted by prior school engagement/progress and exposure to household labor migration. The LiK youth are asked to assess the likelihood that they will become a labor migrant in the next 12 months. Although this question may identify adolescents with concrete migration plans and access to resources or information to facilitate their moves, it is unlikely to identify adolescents with migration aspirations in general or who have longer term migration goals (e.g., younger adolescents who intend to migrate after completing school). Table 6 reports the average likelihood (e.g., 1 = unlikely; 5 = highly likely) of becoming a labor migrant in the next year. We also include the percentage of adolescents who answer that they are unsure of the likelihood that they will become a labor migrant in the next year. Youth in non-migrant households are more likely to report that they are unsure of their future migration plans than those in-migrant households ($p<.05$). Adolescents in households engaged in labor migration in 2016 perceive a higher likelihood that they will become migrants and fewer report uncertainty about their migration plans.

Table 6: Self assessed likelihood of becoming a labor migrant, youth age 13 to 17, by household labor migration in 2016, LiK 2016-2019

	All	*HH labor migration in 2016*	*No HH labor migration in 2016*
Average likelihood	2.30 (1.4)	2.61 (1.4)	2.26 (1.4)
"Don't know"	18.2%	14.7%	18.7%

Source: 2016 & 2019 LiK, Youth sample, n = 629 (514 who report a likelihood of migration)

There are 514 adolescents who answer the question about the likelihood of becoming a labor migrant in the next 12 months. We estimate ordered logistic regression models for these adolescents to determine whether the greater anticipation of becoming a labor migrant among youth exposed to migration remains significant when we control for child and household characteristics (Model 1). The second model is designed to determine how education and migration plans covary or diverge when we include post-secondary education plans/involvement in 2019 (Model 2). These models are presented in Table 7.

Table 7: Ordered logistic regression models of the self-assessed likelihood of becoming a labor migrant, youth age 13-17, LiK 2016-2019.

	Model 1	*Model 2*
Child's age	.09	.09
Male (vs. Female)	-.02	-.02
Household wealth	.06	.06
Number of people in the household	-.07[(a)]	-.07[(a)]
Household head ethnicity (vs. Kyrgyz)		
Uzbek	.05	.05
Other	-.35	-.35
Urban household	.30	.30
Household labor migration (vs. no migration)		
Labor migration in 2016	.63**	.66**
Labor migration in 2019 only	.09	.10
Prior grade progression in 2016		
Enrolled and on time (vs. out of grade progression or not enrolled in 2016)	-1.17**	-1.16*
Plan to continue to post-secondary education.		-.33

The results of Model 1 confirm that adolescents in households engaged in labor migration in 2016 are more likely to anticipate that they will also become labor migrants in the next year. Those who were in school and making normative grade progress in 2016 are less likely to anticipate becoming a labor migrant. With prior exposure to migration and educational engagement in model 1, there are few other significant associations between child and household characteristics and adolescents' expectations that they will become a labor migrant. Controlling current education plans to continue to post-secondary education when predicting migration plans does not alter the results (Model 2). Although the coefficient is negative suggesting post-secondary education plans are in conflict or compete with migration goals, the result is not statistically significant.

Discussion:

Economic theories of migration anticipate that households engaged in labor migration can improve children's access to school and subsequent educational attainment. Much of the research on 'left behind children' has focused on young children's well-being in low-income settings. The analyses here focus on a relatively under-studied context to evaluate educational progress among children and adolescents and the education and migration plans of adolescents depending on their exposure to household labor migration. The narrative among many families and commentators in Central Asia, and the Kyrgyz Republic in particular, is that labor migration harms children left behind. Popular social media postings and conversations highlight the risks of neglect by non-parental caregivers and depression among children and adolescents when parents migrate abroad. Yet, children in the Kyrgyz Republic have high levels of school enrollment and engagement, particularly in primary and secondary education. Despite the stressors imposed by household labor migration, overall educational outcomes are high.

Our analyses draw on unique longitudinal data from children and adolescents in households in the Kyrgyz Republic to assess the individual impacts of household migration on educational progress and variations in these impacts depending on the timing of migration in children's lives. The analyses reveal modest evidence that household labor migration plays a significant role in the educational progress of children and adolescents in the Kyrgyz Republic. Children in households engaged in labor migration are no more likely to fall behind in grade progression than their peers in households without labor migration at the outset. But the impact of household migration varies according to the timing of migration in children's developmental trajectories. In general, adolescence is a time of increased risk for leaving school. Here school progression may be sensitive to the timing of household labor migration. The results indicate educational outcomes progresses similarly for those in migrant and non-migrant households in 2016. But

the new onset of migration by 2019 is marginally associated with increased risk of school dropout among children and adolescents. This provides some support for the developmental perspective in which disruptive events alter children's well-being.

Engagement and commitment to education on the part of adolescents may vary in response to other external opportunities and constraints. We gain greater insight into this process when we analyze the interviews conducted directly with the adolescents in these focal households. Although self-reported education goals do not appear to be associated with household migration, net of the impact on earlier grade progress, adolescents are more likely to plan their own labor migration if they are exposed to prior household migration. New initiation of migration does not additionally promote migration goals. These findings are consistent with a life course pattern in which educational engagement is lower among older adolescents in migrant households even if there is no impact of household labor migration on children's school progress at younger ages. The results also suggest that, in the case of immediate labor migration at least, education and migration goals are acting as substitute paths for adolescents in Kyrgyzstan.

This research is not without limitations. First, the Life in Kyrgyzstan Survey provides a relatively small sample of children and adolescents to follow over time. The sample size poses constraints on separate analyses of rural areas and southern regions where the impacts of migration on children have been of particular concern. Second, the questions posed to adolescents about their goals for the future are tied to specific circumstances and may not be representative of general aspirations among adolescents in Kyrgyzstan. For example, the question about migration goals specifies the purpose of migration (i.e., 'for work') and the timing (i.e., in the next 12 months'). We would likely find more migration aspirations among a wider group of adolescents if the question asked about preferences and moves for other reasons (e.g., for studying abroad). Finally, prior work has considered the importance of remittances as the mechanism through which household labor migration impacts children's education. However, in our LiK sample, most households engaged in labor migration also received remittances, so it is not possible to assess the role of migration separately from remittance receipt. Future research is needed to separate the potentially negative impacts of parental absence from the potentially positive impacts of remittance receipt.

Central Asia has experienced considerable changes in migration flows and economic development over the past decades. Migration flows from the Kyrgyz Republic are more varied by destination now than in the past. The population is also relatively young. Although fertility rates have fallen in recent years, the young adult population is still growing. Our analysis suggests that the ongoing outflow of migrants is somewhat self-perpetuating as more children and adolescents are exposed to labor migration from their households. Yet, many young people have high education goals that are not compatible with labor

migration goals. This likely reflects a growing demand for education migration and points to an even greater need for new data collection that assesses a broader range of migration, education and labor market outcomes in the region.

References:

Appendix/Extra material

Appendix Table 1: Multinomial logistic regression predicting grade progression in 2019 for children and adolescents who are in school and making typical grade progress in 2016, LiK 2016 & 2019

Typical Grade Progression = Reference group	Behind grade progress in 2019	Out of school in 2019
Child's age	1.29***	2.25***
Male (vs. Female)	.73*	.94
Household wealth	1.08	.94
Number of people in the household	1.02	1.10
Household head ethnicity (vs. Kyrgyz)		
Uzbek	.78	4.57***
Other	.71	2.19*
Urban household	.99	.57
Household labor migration (vs. no migration)		
Labor migration in 2016 & 2019	.53[(a)]	1.35
Labor migration in 2016 only	.84	1.27
Labor migration in 2019 only	.84	1.91[(a)]

Source: Life in Kyrgyzstan Survey 2016 & 2019; 1,451 children and adolescents who are enrolled in school and enrolled in the grade expected based on their current age in 2016.