Identifying causes of dropout through longitudinal quantitative analysis in rural Cambodian basic schools

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Abstract

Dropout constitutes a chief obstacle to EFA in many developing countries including Cambodia. To prevent dropout, it is important to identify the reasons why children leave school. So far, much research has been conducted on the causes of school dropout mainly by asking stakeholders, especially dropped-out students and their parents to state their personal reasons why children are not in school. Unlike most of the previous studies, this study, in order to find out reasons more objectively and accurately, employed a longitudinal quantitative analysis. The study was conducted in five primary schools and five lower secondary schools in rural parts of Kampong Cham Province. The result of the follow-up study of three cohort groups showed that late school entry, repetition and low achievement were the main causes of dropout throughout the grades. To belong to some schools was another factor that influences student dropout decision. On the other hand, poverty which was mentioned as the main cause of dropout in many studies in Cambodia was found insignificant in this study.

1. Introduction

Undeniably, education is a fundamental survival necessity for each individual in any society. It helps to boost the socioeconomic growth of a nation and increasing individual incomes at grass-roots level. The effect of educational attainment on incomes was not so pronounced a century ago, but it becomes strongly marked at the present time. For example, in the United States, the difference in incomes between 25-34 year-old male dropouts at the high school level and the college graduates was only 30% in 1949, but in the twenty-first century, it rises to more than 150% (Stringfield & Nunnery, 2010). The sharp income differences between high school dropouts and college graduates are clearly visible in developed nations, let alone the differences between primary school dropouts and university graduates in developing world. The widening income gap produced by education can result in a social unrest. Hence, many international organizations and UN bodies have been working with each individual government of a nation to ensure the equitable access to the quality schooling for all. Those efforts can be witnessed by the appearances of many internationally joint commitment statements, such as the Universal Declaration of Human Rights in 1948, Convention on the Rights of the Child in 1989, the 1990 World Conference on Education for All in Jomtien, Dakar Framework for Action in 2000, and later the Millennium Development Goals (MDGs), where all the nations pledged to achieve universal primary education for all by 2015.

Cambodia, of no exception, has placed a great emphasis on education as a major tool for social and economic development of the country. Since 2000, it has committed itself to achieving universal nine-year basic education by 2015, which is reflected in the

product of the twelve-year EFA National Plan 2003-2015. The success has been shown in a remarkable increase in both gross and net enrollment rates in basic education level (Overseas Development Institute [ODI], 2010). After the national election in 1993, the access to education was rapidly improved. Many schools, primary and lower secondary, were established in rural as well as urban areas, so that all children could have access to basic education. Because of the increase in the number of schools together with the abolishment of school fees in 2001, the net enrollment rate (NER) in primary level increased from 77.8% in 1998 to 94.8% in 2009. Gross enrollment rates (GER) have been high, around 120%, since 2001. On the other hand, the survival rate to grade six was still 61.7% in 2009. Clearly, the problem is no more the capacity of schools. A high dropout rate of 8.4% in primary schools and 19.8% in secondary schools constitutes the major obstacle for the Cambodian government to realize its national goal of the nine-year basic education for all children (Cambodian Ministry of Education, Youth and Sport [MoEYS], 2010).

High GER together with high dropout rates which result in a low completion rate is seen not only in Cambodia, but also in many developing countries. After the declaration of EFA plan, the attempts to achieve universal basic education, mainly by improving school supply and abolishing tuition fee, were drastically effective in increasing GER. To the question "If we build it, will they come?", Filmer (2004) confidently answered "yes, if education is free of charge." Then, the question is shifting to "If they come, will they acquire basic skills by the time they finish their education career?" The answer seems to be, "No, not always." In many countries, a large number of children leave schools without accomplishing the stage of basic education. Some even leave school before finishing the fifth grade (UNESCO, 2004). They are likely to stay illiterate for life.

In order to achieve universal basic education, a must-do task now is to keep children in schools until they complete the desired level of schooling. To find means to solve this problem, thus it is important to uncover the reasons why they drop out so early.

2. The purposes of the research

This study was aimed to identify the causes of dropout by employing longitudinal data collection, using logistic regression as the main analysis tool. The researchers asked all students the same questions to obtain the information about them and their families, and then followed them for three years to see who dropped out and who remained in school. However, this paper presents the result of the first year, when the data were obtained from the students who were in the first grade and passed to the second grade; the fourth grade and passed to the fifth grade; and the seventh grade and passed to the eighth grade.

This method, which followed survival analysis in epidemiology, had three merits, in comparison with the simple interview and causal comparative research methods. First, the data obtained from the students who remained in schools were likely to be more objective and less biased. Second, by employing logistic regression analysis, it was possible to identify which factors had stronger, weaker or no impacts on dropout probability. Third, it was also possible to predict the effect size: if an indicator of a specific factor would be improved in a certain extent, dropout rates would improve to some certain extent accordingly.

This research tried to collect data on many different factors and put them into the analysis, because this is important in logistic regression analysis, as well as regression analysis in general, to detect the real causes of school dropout. This method of collecting data first and following up later has been employed in some previous studies implemented in developing countries (eg. Lloyd, Mensch & Clark, 2000), but they had used only available data in school records. Research employing longitudinal follow-up data collection and logistic regression analysis with all possible factors of dropout is the first attempt in this field.

3. Previous research

Since the 1970s, determinants of dropout in developing countries have been a matter of research concern. Levy (1971), employing a causal comparative method, showed causes of dropout in 42 developing countries. Many researchers, government bodies, international organizations, and NGOs have conducted much research to identify causes of dropout. Various individual factors, family factors, school factors and government factors were argued to influence dropout decision.

Later on, thousands of studies, both cross-sectional and longitudinal, were further carried out in different settings to dig out the causes of school dropout. Those studies usually focused on several kinds of theoretical perspectives, such as psychological, behaviorist, societal, interactional, economic, organizational, etc., that were formed to study a complex nature of school dropout. Those studies have shed light on the evolutionary process of this educational problem at every hierarchical level where the problem is nested. Methodologically, rather asking dropouts or other education stakeholders to rate the reasons of drop-out, the studies whose main findings will be included in the review below used more objective indicators in their quest to understand the nature of school drop-out.

3.1 Drop-out predictors at individual level

A large body of literature on school drop-out at the individual student level is sub-categorized based on the theorists' interests. Normally, when behavior scientists look at the causes of school drop-out, they usually investigate it through the lens of students' behaviors. The similar practices are applied when psychologists or academic achievement experts look at this problem.

Usually, students who possess some kinds of unchangeable backgrounds are at risk of leaving their educational careers early. Educational inequality theorists always look for relationship among school dropout, student gender and races. Generally they found that girls tended to stay in school shorter than boys (Diyu, 2002; Holmes, 2003). From birth, in some societies, people value education of boys more than that of girls, for girls are believed to serve their future husbands' family welfares after being married off daughters. Very little empirical evidence showed that girls retained in schooling longer than boys (Mansory, 2007; Open Society Institute [OUI], 2007). In Mongolia, the boys help raise their family incomes better than do girls (UNICEF, 2005). It was also proved that students from minority groups were more vulnerable to leaving school earlier than their counterparts from majority groups (Chatterji & DeSimone, 2005; Laird et al., 2007; Roebuck et al., 2004). Minority groups usually reside in rural or remote parts of a country where education-required job availability and public funding are not so high.

Several more predictors on student background domain have been cited continually, such age at school entry, preschool experience and poor health condition. By and large, students who were overage for their grades had been shown to be at the greater risk of dropping out (Lloyd, Mensch & Clark, 2000; Wils, 2004). In its study on out-of-school children in 15 countries, UNESCO (2005) found out that in nine countries, the majority of children left school when they were three or more years older than expected ending age for primary school education. Generally, those late entrants find themselves difficult in socializing with younger classmates. Plus, the opportunity costs of schooling become large. Next, children who participate in preschool tend to have high completion rates (Barnett, 1995; Reynold et al., 2007). Preschool experience does not only reduce dropout rates but also positively influences later school performance and well-being of children. Another point was that children who have poor health conditions possess the high possibility of leaving school earlier (OUI, 2007).

For the studies which focus on academic performance of students, there are two important predictors, grade repetition and academic achievement. Voluminous literature ascertains that children with higher achievement are more likely to attend school and survive longer in their educational careers (Abrams & Haney, 2004; Bedi & Marshall, 2002; Jimerson et al., 2005; King, Orazem & Paterno, 2008). In New Zealand, Maani & Kalb (2005) convinced that any policy that could improve the academic performance of students by one point of a grade would reduce dropout rates by 4.3 percent. Another main determinant is grade retention. It is clearly evident that grade retention or repetition reduces the likelihood of children's schooling continuation (Andre, 2008; King, Orazem & Paterno, 2008; UNESCO, 2005). More precisely, Grissom & Shepard (1989) stated that grade retention increased dropout rates by as much as 20-30 percent, after controlling for other potential predictors. Surprisingly, in Chicago, testing-based promotion policy that increased repetition rate of eight-graders from 1% to 10% actually lowered later dropout rates (Allensworth, 2004). It was claimed that repetition effectively prepared students for the next grade and raise their achievement in later grades.

Behaviorists argue that it is important to observe some misbehavior activities of children since they can inform educational stakeholders of who are at risk of dropping out. Usually, students who are involved in delinquency activities (Chavez & Oetting, 1994; Natriello, 2002) and substance abuse (Farahati et al., 2003; Chatterji & DeSimone, 2005; Roebuck et al., 2004; TEA, 2006) tend to end their educational careers earlier than the normal students. Practically, such misbehavior activities occur at higher grades of schooling, say high school level. At school or classroom level, teachers or principals can observe two detrimental behaviors that signal the onset of dropout. Much research proved that students who have low class attendance soon become less interested in schooling and dropout will be the ending school pathway (Bridgeland et al., 2006; OUI, 2007). Rumberger and Lim (2008) in their review of dropout research in the last 25 years stated that students who are less involved in class participation, such as homework completion, are at a greater risk of dropping-out.

Social scientists consistently concluded that adolescent behaviors were more influenced by their peers than any other socialization institutions. Youngsters whose friends had already dropped out and engaged in any income-generating work were more likely to drop out of school (OUI, 2007). In their longitudinal study using data from the National Longitudinal Study of Adolescent Health in America, Staff & Kreager (2008) found that boys with high status in violent groups were at much greater risks of high school dropouts than other students (also Evans, Oates & Schwab, 1992; French & Conrad, 2001).

Much literature in developing country contexts often proved a positive relationship between the amount of time that students work to help their families and high dropout rates (Bickel & Pagaiannis, 1988; OUI, 2007; Rumberger, 1983). Some researchers even set a clear threshold of its detrimental effect, for example, over 14 hours a week by Mann (1989), or 20 hours a week by Winters (1986) (as cited in Mike et al., 2008). Working for some hours, however, could help fund their schooling because the costs of schooling were often reported as a main obstacle for students to progress beyond a certain point of schooling (Cardoso & Verner, 2006).

From a psychological perspective, high dropout rates are strongly correlated with low educational aspiration (St. John & Starkey, 1995), low self-esteem and low motivation (Bridgeland, 2006; Finn, 1989; Natriello, 2002; OUI, 2007). Generally students with high learning motivation and education goals tended to have high levels of self-regulation to achieve their set goals (Hidi & Harackiewicz, 2000). Student motivation level is mainly increased in the school setting by their teachers' care, professional enthusiasm, interesting teaching methodology, and stimulating classroom environment (Cothran & Ennis, 2000). However, according to Hammer (2003), home environment also plays a crucial role in shaping motivation of a child. Positive parental encouragement and involvement in their children's education generally raise their children's intrinsic and extrinsic motivation.

3.2 Drop-out predictors at family level

On the family level, there are several sub-domains that can determine the school fates of many children around the world. Usually the children who stay in the families with disadvantageous structures or less resources are likely to leave school early, whereas those whose families generally exercise a good practice of involving in their children's schooling are more advantageous for schooling.

Family structures and mobility influence the rates of dropout in several ways. It is a commonplace that a student who lives under the same roof with their biological parents has a high schooling survival rate than that whose parents passed away, got divorced or moved to work in other areas (Nicaise, Tonguthai & Fripont, 2000). Next, a large family size means less learning opportunity for each of its household members and its influence becomes much stronger for older siblings (Nicaiso, Tonguthai & Fripont, 2000; Rosati & Rossi, 2003). However, some studies (e.g. Chernichovsky, 985; Mike et al., 2008) found that children in larger households were less likely to drop out.

On family resource domain, it is widely believed that low socioeconomic status of a family adversely influences dropout. A survey conducted by Open Society Institute in 2007 in six developing countries found that low economic status of a family was the prominent reason for education withdrawal. This finding was consistent with many other studies in different settings, such as in Brazil by Cardoso and Verner (2006), in China by Diyu (2002); in Thailand by Nicaise, et al. (2000) just to name a few. Regardless of contextual areas, students whose parents are highly-educated tend to stay in school long (Beherman et al., 2000; Mike et al., 2008; Swada & Lokshin, 2001). More specifically, Holmes (2003) showed that the educational attainment of a father increased the expected level of school retention of boys, while the education of a mother enhanced girls' schooling in Pakistan. Furthermore, having experienced a birth of an unwanted child and a sudden loss in remittance in the past six years that increase a high level of financial instability in a family also increases the likelihood of dropout (Lloyd, Mete & Grant, 2006). Cardoso and Verner (2006) suggested that when a father suddenly became unemployed, his children tended to drop out of school earlier in order to engage in income-generating jobs to help relieve the financial burdens of the families. Besides, a number of researchers ascertain that the economic crisis drastically changes the household patterns and then creates the high dropout possibility (e.g., Behrman et al., 2000). It is clear evidence that a sudden change in family resources would ignite high dropout possibility.

Finally, students whose parents monitor and regulate their school activities, provide emotional support, encourage independent decision making and are involved in their schooling are less likely to drop out of school (Astone & McLanalan, 1991; Odaga & Heneveld, 1995; Rumber, 1987). Usually, motivation levels of parents with higher educational attainment were found higher than those with lower attainment. The paucity of professional role model in their community hindered their imagination of education value, which resulted in devaluation of education for their children (Nicaise, Tonguthai & Fripont, 2000). The studies in America also revealed similar results (e.g. Natriello, 2002).

3.3 School drop-out in Cambodia

In the context of Cambodia, there were three main empirical studies to pinpoint the causes of dropout. The problem was that the majority of research studies drew conclusions based on interviews with dropped-out children themselves, their parents, teachers and administrators. Through interviews, what can be clarified are perceptions or opinions of the respondents. Are perceptions on the reasons of dropout the same as the reasons themselves? Researchers are usually trained to differentiate a perception from a fact. Also, responses might be biased by self-justification. It is likely that a dropout explains the causes of drop-out by stating "My family was poor. I wanted to help my parents" rather than "My achievement was poor." Even though the data are processed statistically, the research based mainly on interviews with the dropouts inevitably face these limitations. Some other studies which used more objective indicators to represent a cause of drop-out usually utilized the retrospective data. Willets and Singer (1991) highlighted the inappropriateness of such a data to investigate the dropout phenomenon. There is no single study that has used perspective or two-wave data yet in Cambodia.

The first two studies in the early 2000s focused on girls because there was a large gap in GER and NER between boys and girls. Velasco (2001), through focus groups, argued that the main causes of girls' dropout were the high level of housework and

income-generating work expected on girls. She also stated an association between school dropout and several important predictors, such as distance to schools, security risks, late school entry and early marriage. By selecting two groups of dropout and non-dropout girls, Keng (2003) conducted a causal comparative study and found that late school entry, high absence rate, repetition, low educational aspiration, low aspiration for formal employment, household work, parents' low educational attainment were the main predictors of dropout. The studies focusing solely on girls are not helpful, because after 2001, the introductory year of free basic education in Cambodia, the primary school enrollment rates of boys and girls have been almost the same. According to UNICEF (2011), the average GER 2007-2010 of boys and girls were 120% and 113% respectively, and NER are 87% and 84% respectively.

The newest and largest study was conducted by the World Bank (2005). Based on the Education Information Management System (EMIS) data in the academic year 2002-03, the commune-level household survey data and the World Food Program data, it concluded that poverty, late school entry, inequality, low availability of schools, poor school management, low monetary incentive for teachers, low community participation, poor school facility, low quality of teachers and geographical disadvantage were the main reasons of dropout. Specifically, poverty was identified as the most influential factor. Based on this finding, many international organizations launched scholarship programs for the poor secondary school students. The later evaluation, however, found that scholarship had very limited effect on the seventh grade students' enrollment, and no effect on that of the eighth-graders. It strongly suggests that poverty might not be the main cause of dropout.

4. Research method

4.1 Sample

Sample schools were selected from Kampong Cham Province, which is the largest rural province and shows similar dropout rates as those in the whole rural Cambodia. In 2008, the dropout rate of this province was 11.9% at primary school and 25.5% at lower secondary school level, while those of the rural areas of the whole country were 11.3% and 23.7% respectively. Within the province, five primary schools and five lower secondary schools were chosen by stratified random sampling based on dropout rates, in order to examine school effects.

Finally, 282 students in the first grade, 286 in the fourth grade and 337 in the seventh grade were chosen by means of cluster random sampling method. As explained later, as the amount of data to be collected from each student was huge, the number of valid samples was 269, 271 and 328 in the first, fourth and seventh grades respectively.

4.2 Instrumentation and implementation

The first data collection was implemented from November to December in 2007. That period was chosen because the Cambodian school year officially starts at the beginning of October, but in reality, many rural schools are fully operational from late October.

In order to obtain data on individual and family factors, questionnaires were administered to the fourth and seventh grade students, while guided interviews were carried out with the first-grade students. Interviews and questionnaires were carefully implemented to ensure the accuracy of the data obtained. For the fourth-graders, considering their low literacy level, questions and answer choices were read and illustrated on white-boards to them one by one. Two research assistants carefully checked whether students fully understood questions and were able to answer on their own. Some questions were flexibly modified on site; for example, realizing that many students did not know their own ages, their zodiac animal signs were asked, since almost all Cambodian students know their birth signs.

The factors included in the questionnaires were gender, age of school entry, repetition, absenteeism, delinquency, ethnic status (Khmer or Cham), aspiration for further study, self-reported health condition, self-esteem, relation with teachers, relation with other students, family economic status, parents' educational background, parents' aspiration for further study, parents' encouragement, family size, time of doing housework and income generation work, and various family problems (including single parent status caused by death or divorce and existence of chronically ill members) and so on (see Table 2 for the variables included in the analysis). Achievement level within schools was defined by standardized scores (z-score) of school tests of the first three months obtained from the homeroom teachers. Ages at first school entry to grade one or late school entry was asked in Question 6 of the student questionnaire. The students were required to note down the ages when they started grade one for the first time. In case that a handful of students did not remember when they officially started grade one, it was calculated by students' ages at that time of fieldwork minus the years of repetition and the grade they were in. Repetition experience itself was self-reported by students on the number of repetitions in each of the earlier grades. The sample students were asked to report how many times they had repeated grades so far. Five alternative answer choices were provided (1) Never repeated, (2) Once, (3) Twice, (4) Three times

and (5) Four times or more. With regards absenteeism, the question "In the last two full weeks you were in school, how many times were you absent from the class?" was included on the questionnaire. This question was adapted from the OECD student questionnaire (2003). Subsequently, five answers choices were provided: (1) Never repeated, (2) Once, (3) Twice, (4) Three times and (5) Four times or more. Actually, it would be much more reliable if the homeroom teachers accurately checked students' attendance every day. However, it was found that most Cambodian teachers paid almost no attention on students' absences. Rarely had they checked attendance though student attendance books were provided. They checked only once or twice a month (for further information on each variable, see the questionnaire in Appendix). One primary school is situated in a village of Cham people, who are also called Muslim Cambodians. They speak a different language from Khmer, the language spoken by the majority ethnic group in Cambodia. It should be noted that Khmer is the language of instruction in Cambodian public schools. In secondary schools, most of sample students were Khmer (the majority group is also called Khmer); very few of them were Cham.

Table 1. Result of factor analysis on possession of eight household items and utilities and possession percentage of each item (N=905)

Items	Factors			Possession percentage
	1	2	3	
Bicycles	.056	-.009	.605	94%
CD or VCD players	.218	.195	.332	48%
Mobile phones	.680	.347	.085	26%
TVs	.595	.050	.308	63%
Motor bikes	.849	.123	.149	43%
Electricity	.334	.655	.076	10%
Running water	.037	.455	.052	1%
Cars	.121	.718	.086	3%

On family and school levels, a number of variables deserve a big space of explanation. First, family economic status was measured by possession of six items (car, motorbike, bicycle, cell phone, TV and CD or VCD players), and availability of two household utilities (electricity and tap water). The reason why these items were used to represent household economic condition was that an asset-based approach for measurement of family economic condition has been claimed to be more consistent than income or consumption expenditure, because it uses uncomplicated and straight questions. As a result, it suffers less from memory limitation or social desirability bias (Sahn & Stifel, 2003). As mentioned by Berkman and Macintyre (1997), variables, such as wealth, savings, employment profit, or possession of homes, some vehicles or household items, are used in measuring the economic status of the household. Due to complexity of questioning techniques dealing with wealth, employment profit and savings, most of recent studies used only possession of household items and vehicles (e.g. OECD, 2003) to estimate the economic condition of household. This study adapted some of the items used in OECD questionnaires and added two important variables on possession of tap water and electricity. Possession of these two utilities was considered as a cutting point between the rich and the poor in Cambodia (National Institute of Statistics, 2005). As shown in Table 1, there were small variations on possession of cars, electricity and tap water. Less than 10% of households in this study had access to electricity and tap water, while 3% of them lived in families that possessed cars. Since some colinearity problems were found within these item variables, a factor analysis was employed to group them. Three main factors were extracted. All of them were taken in the analysis. Father's educational background and that of mothers had a strong correlation. In order to avoid co-linearity, the researchers chose the father's educational background, since it had a wider variety than that of mother. Besides, schools were put in the analysis as dummy variables.

The follow-up data collection to see which student had dropped out was conducted from December 2008 to January 2009. Those who were officially taken out from the list of students made by schools were counted as dropouts. Also, those who were absent on the two days of the field work and 95% of their classmates testified that they had not come to school for more than one month were regarded as dropouts as well. Some students repeated the grades. The researchers also noted their statuses; however, they were considered as non-dropouts. A few students transferred out of sample schools. School documents on transferring were carefully checked, so that it could be ascertained. Those students were cut out from the sample.

After the second fieldwork, it was found that 19 out of 282 students in the first grade, 37 out of 286 in the fourth grade and 67 out of 337 seventh-graders dropped out between the first and the second visit. This trend was in consistency with the general tendency in Cambodia that low rates were found in lower grades of schooling.

One of expected limitations of the research was that students' factors might change their values in one year because of sudden

Table 2. Variables included in analysis and their measures

Variables	Measures/Instruments	Data type	Range
Individual Student Factor			
Gender (boys)	Student questionnaire Q1	Nominal	1-2
Preschool experience	Student questionnaire Q2	Ordinal	0-1
Ethnicity status	Student profile record from school	Nominal	0-1
Repetition	Student questionnaire Q7	Scale	
Absenteeism	Student questionnaire Q8	Ordinal	0-4
Educational Aspiration	Student questionnaire Q10	Ordinal	0-4
Doing homework	Student questionnaire Q11	Ordinal	0-4
Relation with other students	Student questionnaire Q26&27	Ordinal	0-4
Relation with teachers	Student questionnaire Q28	Ordinal	0-4
Self-esteem	Student questionnaire Q4a&b	Ordinal	0-6
Academic achievement	Z-score of the three monthly tests	Scale	
Age at first school entry	Student questionnaire Q6	Scale	
Self-reported health	Student questionnaire Q3	Ordinal	1-3
School distance	Student questionnaire Q24	Ordinal	0-4
Drug abuse	Student questionnaire Q30	Ordinal	0-4
Perceived local security	Student questionnaire Q29	Ordinal	0-4
Family Factor			
Family size	Parent questionnaire Q19	Scale	
Sibling order	Parent questionnaire Q20	Scale	
Presence of both parents	Student questionnaire Q17	Nominal	0-1
Divorced parents	Student questionnaire Q18	Nominal	0-1
Decease of parent(s)	Student questionnaire Q17&18	Nominal	0-1
Father's education	Parent questionnaire Q13	Ordinal	0-5
Mother's education	Parent questionnaire Q12	Ordinal	0-5
Economic status	Regressed scores of house items Q15 &16	Scale	
Parental aspiration	Parent questionnaire Q14	Ordinal	0-4
Family academic support	Student questionnaire Q22	Ordinal	0-4
Time helping family	Student questionnaire Q23	Ordinal	0-6
School Factor			
Dummied schools	School ID	Nominal	0-1

changes in their family and within themselves; for instance, the family became poorer, their parents got divorced, and so on. The researchers selected some students randomly and posed the same questions as in the first field work. The result showed that minor change was seen. It also proved that the data collected in the first year were reliable enough.

5. Results

The result from the logistic regression analysis using Backward Likelihood Ratio is shown in Table 3. It should also be informed that in logistic regression analysis, as well as other kinds of regression analyses, sample size influences the number of significant predictors. In this research, more sample students had dropped out in the grade seven while the number of dropouts in the grade one was smaller. This was considered to be the main reason why many predictors were found significant in seventh grade group, followed by the forth grade and the first grade.

In grade one, late school entry (B=1.43) and father's educational attainment (B=0.29) were found significant. Of the two, late school entry seemed more interesting to study, because this can be solved by human effort in a short term, while father's educational attainment cannot be changed by any means. While late school entry was nominated as one of the causes of dropout by the World Bank (2005), in this study, the effect size could be estimated. If a child entered school one year later, the probability for him or her to drop out would be 1.43 times higher. Seventy six point two percent of the children entered primary school at the age of seven or older, which made the average age of entrance in this sample be 8.12. If they had entered school at the required age of

six, the dropout rate of the whole sample would have decreased from 6.74% to only 3.29%. Globally, a handful of reasons can be explained why most children are enrolled in schooling late, namely child malnutrition, distance to school, high cost of education and school quality (Moyi, 2010). Unfortunately, there is no empirical evidence of delayed enrollment or late school entry in Cambodia. Based on a vast global literature available, it could be concluded that late school entry is associated with the early school departure in a number of ways. First, older children share more burdens of family incomes than their younger counterparts (Grogan, 2009). Simply explained, the older they are, the more economically active they turn to be. That makes their opportunity cost of schooling become so high (Bray & Bunly, 2005). Second, late school entry is a variable that represents parental motivation for their children's education (Wils, 2004). Usually, motivated parents send their children to school early and let them prosper in schooling long. It is very logical in Cambodia context where there is no compulsory education law. The enrollment of children is solely the parents' decision. Third, usually older students tend to academically perform poorer and enjoy less schooling than the young ones. That finally forces them to leave school early.

Table 3. Causes of dropout by grades

			95% CI for exp(B)		
	β	SE	Lower	Exp(B)	Upper
1st Grade (N= 269)					
Constant	-2.87	1.64		0.057	
Age at first school entry	0.36**	0.14	1.10	1.43	1.87
Fathers' education	-1.23**	0.46	0.12	0.29	0.73
4th Grade (N= 271)					
Constant	-5.55***	1.26		0.004	
Age at first school entry	0.54***	0.15	1.29	1.72	2.30
Repetition	0.51*	0.24	1.04	1.66	2.64
Ethnicity (Khmer)	-1.25**	0.41	0.13	0.29	0.64
Gender (Male)	-1.04*	0.43	0.15	0.35	0.82
7th Grade (N= 328)					
Constant	1.55*	1.38		4.72	
Repetition	0.91***	0.24	1.56	2,49	3.96
Family size	0.28*	0.11	1.06	1.32	1.64
Parents' educational aspiration	-0.29*	0.11	0.60	0.75	0.94
Achievement	-0.04***	0.01	0.94	0.96	0.98
School 1	-0.85***	0.57	0.05	0.16	0.48
School 3	-0.75***	0.20	0.32	0.47	0.70
School 4	-0.33***	0.12	0.57	0.72	0.91

Note: * $p<0.05$, ** $p<0.01$, *** $p<0.001$

In grade four, late school entry still strongly influenced the odds of dropout (B=1.72). Moreover, repetition appeared as one of the significant factors (B=1.66). The two factors indicated that the overage of children was one of the most important causes of dropout. Repetition in Cambodian public schools is a consequence of poor academic performance in class and heavy absenteeism. According to the article 23 of the internal regulation for public schools dated on February 26, 1998, students shall repeat the grade if they have been absent more than 30 times. To most Cambodian teachers and education administrators, repetition is seen a preparation for slow learners to master the required curriculum before they proceed to the next grade. However, from international evidence, repetition deteriorates the self-esteem of students and jeopardize their socialization process. Above all, it raised the opportunity cost of education. These finally put students at high risk of ending their educational careers early. Darling-Hammond and Falk (1997) highlighted several drawbacks of repetition. First, child development is continuous, uneven and multi-dimensional, so to repeat a pupil is like to halt his or her natural, social and intellectual cycles. Second, the norm-referenced tests used to make grade retention decision are to rank students, not to retain them. Also it is very hazardous that the decision to fail students is solely in the hands of teachers. Last, grade repetition is more attributable to factors, such as quality of teaching, school management, school setting, and so on, rather than the pupils themselves.

For ethnicity and gender, the situation was quite difficult to generalize. All ethnic minority students (Cham) belonged to one sample school, and drop-out of female students occurred more frequently than males among Cham students, not among Khmer students. In the village where this school was situated, there was a religious school supported by a foreign NGO, but it was not officially recognized as a school by the Cambodian government. Most dropouts were actually studying in that non-secular school. They preferred to move to that school because it provided students with Arabic and Malaysian language courses, which might give them a chance to work in foreign countries in the future. In this research, from the definition, those who shifted from formal education to non-formal education were treated as dropouts. In fact, in grade one, the dropout rate was lower among Cham rather than in Khmer in the sample. Maybe, Cham parents wanted their children to learn Khmer language in the early stage of their education. Then, they made their children move to a non-formal school, which they believed to be more beneficial for the children's future. However, these students were rather exceptional. Not all Cham had such alternatives. Further research should clarify how Cham students behave if there is no good non-formal school in a commutable distance.

For the seventh-graders, influence of repetition was even stronger (B=2.49, p<.001). Achievement was detected to be strongly significant (B=0.96, p<.001). In this study, achievement was defined by average z-score of in-school tests for three months, so even B was close to one, the effect was quite large. Why high achieving students were less likely to drop out? In Cambodia, as well as many developing countries, education is often considered as an investment. Parents and students themselves tend to make a decision on continuation of education if they can expect high return rates on that investment. High rates of return to education mean better job opportunity and higher income. It was probable that good achievement was conceived as the sign of expected high return, while repetition meant more cost for investment. Thus, in the stage of the seventh grade, as the opportunity cost of education had risen, students might have made life-changing decision based on cost and benefits of education. Other new factors which appeared in grade seven were schools. Those who attend School 1 tended to drop out much less (B=0.16, p<.001) than students of other schools. The same phenomenon was seen with students of school 3 (B=0.47, p<.001) and those of school 4 (B=0.72, p<.001). Family size (B=1.32, p<.05) and parental educational aspiration (B=0.75, p<.05) were also found significant, but the level of significance was not quite strong.

6. Discussion and conclusion

The result of the analysis in the first stage showed that this method of longitudinal research with logistic regression analysis was effective for finding objective causes of dropout with their effect sizes.

It was shown that in all grades, overage children had a higher possibility of dropout, probably because it was related to the opportunity cost of education. Over age was caused by late school entry and repetition. These problems can be solved by some policy means. Good achievement, which appeared in grade seven, decreased the odds of dropout, maybe because it was related to expected return of education. Also taking the decision of Cham students into consideration, Cambodian parents and students in general seemed to make rational decisions based on cost benefit principle. They appeared to know the importance of education very well; on the other hand they consider the cost and possible benefit very thoroughly.

At the lower secondary school level, schools were found to significantly influence the odds of dropout. At the primary level, whether schools do not have influence or the influence was not significant because of a small sample size should be clarified in the further research.

What was completely different from the researchers' first hypothesis was that poverty (family economic factors) and child labor (amount of time they spent helping their families) did not appear significant at all. This finding contradicted most research findings in Cambodia, as well as views of the majority of teachers and government officials. Family economic situation did not show any significant influence on the odds of dropout. Time of work was also irrelevant to the odds. This finding was consistent with the one in Keng' causal-comparative research (2003). As she defined economic status by possession of goods, no difference in economic level was found between dropouts and non-dropouts. In the World Bank report, poverty, measured by the aggregated income levels in districts, indirectly influenced the dropout through some significant predictors, such as late school entry, child labor, and so forth. Thus, we built interaction variables between family economic status and late school entry, and family economic status and child labor to include in the analysis, but we were still unable to obtain any significant impact of these two predictors. It would be better if we had a larger sample size so that we could conduct more precise analysis on their indirect relationship, using structural equation modeling, for instance. However, from the results of correlation analysis of the relationship between family economic status and child labor and other significant factors, it could be tentatively concluded that there were weak between family economic status and ages at first school entry ($r= -.171, p<.01$) and repetition ($r= -.159, p<.01$). This study, regrettably, failed to examine the relation between the types of work they performed and drop out. In addition, since this study focused on the rural parts of Cambodia, it should be noted that poverty may be visible in any comparative study among urban, rural and remote areas when

wide variations between household economic conditions could be observed.

Acknowledgement

This work was supported by JSPS KAKENHI (Grant-in-Aid for Scientific Research B22330230).

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Appendix

Code: _____

Questionnaire

Please read each question carefully and answer as accurately as you can, by <ticking> a box. For a few questions, you will need to write a short answer. If you make a mistake when <ticking> a box, cross out your error and mark the correct box. If you make an error when writing an answer, simply cross it out and write the correct answer next to it. You may ask for help if you do not understand anything or are not sure how to answer a question.

In this questionnaire, there are no 'right' or 'wrong' answers. Your answers should be the ones that are 'right' for you. Your answers will be combined with others to make totals and averages in which no individual can be identified. All your answers will be kept confidential.

*Please **answer** the following questions or **tick (✓)** the box or boxes relevant to you.*

<u>Section 1:</u> About You

1. Are you <female> or <male>?
   ☐ Male ☐ Female
2. How old are you? Or if you cannot remember it, what is your birth sign?
   _____
3. How is your health condition?
   ☐ Good ☐ Normal ☐ Not good
4. To what extent do you agree with the following statements about yourself?
   a. I can do things as well as the others can.
   ☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree
   b. I feel I am a useless person.
   ☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree

Section 2: Your Education

5. Have you ever attended kindergarten or unofficially enrolled in grade one?
   ☐ No ☐ Yes
6. How old were you when you started grade one?
   _____
7. How many times did you ever repeat the grade?
   ☐ No, never ☐ Once ☐ Twice
   ☐ Three times ☐ Four times or more
8. In the last two full weeks you were in school, how many times were you absent from the class?
   ☐ No, never ☐ Once ☐ Twice
   ☐ Three times ☐ Four times or more
9. Are you now involved in any private classes?
   ☐ Yes ☐ No
10. Which of the following do you wish to complete?
    ☐ University ☐ Upper secondary ☐ Lower-secondary
    ☐ Elementary school ☐ Stopping schooling as soon as possible
11. How often do you finish the assigned homework given by your teacher?
    ☐ Never because my teacher has never given any homework
    ☐ Never ☐ Rarely ☐ Sometimes
    ☐ Often ☐ Always

Section 3: Your Family

12. What is the highest level of education has your mother finished?

☐ Never attended school ☐ Primary school ☐ Junior high school
☐ Senior high school ☐ Bachelor or higher

13. What is the highest level of education has your father finished?

☐ Never attended school ☐ Primary school ☐ Junior high school
☐ Senior high school ☐ Bachelor or higher

14. What is the highest education level that your parents expect you to complete?

☐ University ☐ Upper secondary ☐ Lower-secondary
☐ Elementary school ☐ Stopping schooling as soon as possible

15. What is your house wall made of?

☐ Brick ☐ Wood ☐ Thatch

16. Which of the following items do you have at home? (*you can tick more than one*.)

	No		Yes	
a. Bicycle	☐ 0	☐ 1	☐ 2	☐ 3
b. CD player	☐ 0	☐ 1	☐ 2	☐ 3
c. Television	☐ 0	☐ 1	☐ 2	☐ 3
d. Motorbike	☐ 0	☐ 1	☐ 2	☐ 3
e. Cellular phone	☐ 0	☐ 1	☐ 2	☐ 3
f. Car	☐ 0	☐ 1	☐ 2	☐ 3
g. Electricity	☐		☐	
h. Running Water	☐		☐	

17. Do you live with your parents?

☐ Yes ☐ No, my parents are working/living in other place.
☐ No, I live with my mum. ☐ No, I live with my dad.
☐ No, both of them passed away.

18. Are your parents still living together?

☐ Yes ☐ No, they were divorced.
☐ Other options

19. How many brothers and sisters do you have? (*excluding yourself*)

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4
☐ 5 ☐ 6 ☐ _____ (specify)

20. What sibling order are you at?

☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th
☐ other _____

21. Are there any chronically ill persons in your family?

☐ Yes ☐ No

22. How often do you receive teaching at home?

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Most of the time

23. How much time do you help your parents with household chores and business a day?

☐ 0 – 0.5 hour ☐ 0.5 – 1 hour ☐ 1 – 2 hours
☐ 2 – 3 hours ☐ 3 – 5 hours ☐ More than 5 hours

24. How far is it from your house to school?

☐ 0 – 0.5 km ☐ 0.6 – 1 km ☐ 1.1 – 2 km ☐ 2.1 – 3km
☐ 3.1 – 4km ☐ 4.1 – 5km ☐ More than 5 km

25. How do you come to school?

☐ On foot ☐ Bike ☐ Motor-bike ☐ others _____

<u>Section 4:</u> Your schooling experience

26. Now how many friends do you have in your class and in this school?

☐ A lot ☐ Some ☐ A few ☐ Almost no ☐ No

27. Do you have a good relationship with your friends?

☐ Very good ☐ Good ☐ Neutral ☐ Not quite good
☐ Not good at all

28. How would you define your relationship with your teacher(s)?

☐ Very good ☐ Good ☐ Normal ☐ Bad ☐ Very bad

Section 4: Your community

29. How often does crime happen in your community?

☐ Never ☐ Rarely ☐ Sometimes ☐ Often

30. Are there people doing drug in your village? Around how many of them have you heard doing drug in your village?

☐ None of them ☐ 1 – 5 people ☐ 6 – 10 people
☐ 11 – 20 people ☐ 21 – 30 people ☐ more than 30

Thank you so much for your kind participation!