**Gender Differences in time use among adolescents in developing countries:**

**the implications of rising school enrollment rates**

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## I. Introduction

There has been a dramatic growth over the last twenty years in the school enrollment rates of adolescents in developing countries. As a result, the mean age of school exit is rising and the gender gap between boys and girls in school participation and grade attainment is narrowing rapidly. The dramatic growth in school participation and attainment worldwide has been accompanied by a decline in the labor force participation rates of youth, especially children and young adolescents (National Research Council, forthcoming). Thus, more and more boys and girls are spending longer periods of time into early or middle adolescence engaged in similar types of activities, with some of that time typically together in the same classroom. These changes in enrollment and labor force participation rates have implications for the process of gender role differentiation that takes shape during adolescence. Because adolescence is the stage of the life cycle when gender role differentiation intensifies, this is also the life cycle stage which is of increasing concern to researchers who are interested in understanding the formation of gender roles and to policymakers who are committed to promoting gender equality and women's empowerment (United Nations Millennium Development Goal No. 3).

Surprisingly, however, most past research on gender role differentiation focuses on adults. A recent comprehensive treatment of gender issues in developing countries (World Bank, 2001) catalogues the many ways in which greater gender equality can contribute to development but does not explore the ways in which gender role differentiation develops during adolescence or the factors that come into play during adolescence that contribute to shaping that process. The United Nations Millennium Project Task Force on Gender Equality is only now beginning to recognize that

adolescents and youth should be target groups for policies designed to eliminate gender inequality (United Nations Millennium Project Task Force 3 Interim Report on Gender Equality 2004).

The analysis of adolescent time use in key domains such as labor market work, non-economic household work, school and leisure can enrich our understanding of the circumstances within which young people experience transitions to adulthood. Comparative research that examines time use separately for different groups of adolescents (by gender, age, school status) and in different developing countries, has not been possible in the past due to data constraints. The goal of this paper is to explore and compare data on time use among adolescent students and non-students using recent and reasonably comparable data from a heterogeneous sample of developing countries. In particular we focus on the following question: What implications do rising rates of school attendance have for gender differences in time use?

The paper begins with a brief review of literature, noting the scarcity of published data on time use among adolescents in developing countries which are differentiated by enrollment status. Next we introduce our data, summarizing some of their strengths and weaknesses. This is followed by a description of differences in enrollment patterns across the diverse settings covered by our data so that the time use data can be interpreted within the proper context. The data analysis proceeds in two steps. First, time use patterns are described and compared according to enrollment status across countries. Then, results of a series of tobit regressions are summarized, focusing in particular on gender differences in the change in time use patterns associated with school enrollment including non-economic household work and leisure activities.

## II. Review of the Literature

Mensch, Bruce and Greene's (1998) comprehensive review of research and policy on adolescence in the developing world notes the lack of multidimensional research on the lives of adolescents. Most research on adolescents in developing countries focuses on specific domains of adolescents' lives, such as reproduction, education, work or health, but rarely does this research examine the context of adolescents' behaviors or the interrelationships between various domains of their lives. In recent years, there has been a growing interest in the interrelationships between labor market work and schooling but this rarely extends more broadly to encompass interrelationships among other domains of young people's lives.

Initially, a primary goal of this review was to include in our comparative data analysis as much recent data as possible from the published literature on patterns of time use by enrollment status over the course of the transition to adulthood in developing countries. All the studies we reviewed presented detailed data on the allocation of working time, differentiating non-economic household work from labor market work. Most of the studies explored the interrelationships between time spent working and school participation, although data on the actual amount of time spent on school-related activities were rarely presented and probably often not collected. Only a few of the studies, primarily those based on time use data from 24-hour recall, presented data on actual time spent in all three major domains of time use: work, school and leisure time. It is rarer still that average amounts of time spent on different activities are published separately by gender and by school enrollment status.[1]

[1] Arends-Kuenning and Amin (2003) report on time use data collected in rural Bangladesh using open-ended 24 hour recall and provide comparisons by gender of time in agricultural work. Among those 11-19,

There are three major empirical findings that we draw from this review that appear to apply universally. These will come as no surprise. The first is that there are significant differences in the way boys and girls spend their work time, regardless of age, with boys more likely to work for pay or family economic gain and girls more likely to do non-economic household work or domestic chores.[2] The second is that the total amount of time devoted to all work activities (labor market activities and non-economic household activities combined) rises with age for both boys and girls.[3] Thus, as boys and girls age over the transition to adulthood and take up more work responsibilities, their lives become increasingly different. The third is that girls tend to work longer hours on all work activities combined than boys, leaving boys more time for leisure activities.[4]

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male non-students do about 2.5 hours per day more agricultural work than male students (the time spent by males students on agricultural work varies from 1.5 to 2.5 hours a day depending on the season); Girls typically never work more than an hour a day in agricultural work with female non-students working slightly more than female students. Data on time in domestic work are only provided for girls and data on wage work time are only provided for boys. Mason and Khandker (date?) report on two time use data sets from Tanzania and compare total work time for students and non-students but the methodology of data collection (e.g. identity of respondent, length of recall ) is not discussed. They show heavier work burdens for girls at every age whether they be students or non-students but lighter work loads for students than non-students. In the most recent Ugandan DHS survey, parents were asked to report on their children's time spent working in the previous week. The average work hours are surprisingly similar between students and non students. Mean hours spent on all work activities combined (domestic work, family farm or business or paid work) averaged 19.2 hours a week for male students and 18.4 hours a week for male non-students (aged 6-17) and for females, 20.5 hours were reported for female students and 22.8 hours for females not in school (derived from data provided in Uganda Bureau of Statistics and ORC Macro 2002)

[2] See recent literature reviews on time use including Torun et al 1994; Larson and Verma 1999*)* Specific examples including Jain's (1966) analysis of time use data from Rajasthan and West Bengal, India, shows that that girls ages 9-19 spend 1.7 to 4 hours per day more on domestic work than boys of the same age. A number of other studies confirm this finding (Canagarajah and Coulombe 1998; Evenson et.al. 1980; Kramer 2002; Levison 1993; Cain 1977 and White 1975 as cited in Rodgers and Standing 1981; Skoufias and Parker 2002). In Peru, Ilahi (2001) finds that boys spend on average 3.7 hours per week on wage work while girls spend 2.8 hours per week.

[3] Data from several early pioneering studies of time use clearly document the rise in work time with age during the adolescent years (Cain 1977 for rural Bangladesh, Nag et al 1978 for Java, Indonesia and Nepal). More recent data from Bolivia show that the average time spent in work activities begins at less than 1 hour for children age 6 and rises to 6.9 hours for young people age 18 (Psacharopoulos 1997)

[4] Levison, Moe and Knaul (2000) using 1996 data from urban Mexico show that at every age from 12 to 17, girls spend more hours per week than boys in labor force work and household chores combined. Drawing on time use data from a diverse range of settings, Ersado (2002) documents the heavier work load of girls in Nepal, Peru and Zimbabwe.

Larson and Verma's (1999) review of adolescent time use studies documents the widespread tendency for boys to have more leisure or "free" time than girls. They contend that this is because boys typically spend less time in domestic work. However, their review includes relatively little data from developing countries. In a study of time use in South Africa, Chobokoane and Budlender (2002) found that, while a slightly higher percentage of boys engages in social and cultural leisure activities than girls, among those who do report leisure activities, boys and girls spend about the same amount of time on leisure activities.

With rising enrollments and with an increasing percentage of adolescents participating in higher levels of schooling, it is often assumed that young people will have less time available to work. It would also seem logical to expect that the types of work that students do might differ from the types of work taken up by adolescents who are not enrolled in school. In many countries, however, school days are short and school holidays and vacations are long. Thus it is not always difficult to combine some work activities with school attendance. Indeed, estimates based on 15 UNICEF household surveys fielded in Africa in 1995 suggest that the percent of enrolled students combining some work with schooling rises with age, reaching a majority by age 12 (Huebler and Loaiza 2002).[5] This might suggest that, with later ages of school exit, there will be an increasing tendency for students to combine some work with schooling as they progress through the transition. A suggestion that this might indeed be happening in Mexico comes from an analysis of trends in time use among Mexican youth from 1984 to 1992 -- the only study that we are aware of which is able to analyze trends in time use using

[5] Huebler and Loaiza (2002) defined young people as working if they reported either at least one hour of economic activity in the last week or more than four hours a day of domestic work.

comparable data (Abler, Rodriguez and Robles 1998). For both boys and girls in urban and rural areas, the authors found a decline in the percentage of adolescents (12-18) who are categorized as students exclusively (rather than students who also do some labor market work), at the same time that there has been a rise in enrollment rates. As students get older, they are increasingly likely to take up some labor market work in order to earn money to support their continued school attendance (National Research Council, forthcoming).

Evidence about school/work trade-offs comes from evaluations of several recent anti-poverty programs promoting children's schooling among poor families in Bangladesh and Mexico, among others, with grants that are conditional on school attendance. In their analysis of the effects of the Food for Education program in Bangladesh, Ravallion and Wodon (2000) found that school subsidies lead to higher enrollment rates and lower labor market participation rates among program participants but the decline in recorded work was only a quarter of the increase in enrollment. In their analysis of the effects of PROGRESA in rural Mexico, Skoufias and Parker (forthcoming) found that the decline in labor force participation rates for boys was in balance with the rise in school enrollment, except among older adolescents (16-17). Adolescent female participants balanced school attendance against some declines in non-economic household work. The results of these studies would suggest that the relationship between various types of work and schooling is complex. Work and schooling are not just mirror images of each other. Not only do some young people combine both but some actually do neither.

These studies and others like them typically focus on changes in participation rates rather than changes in the actual amounts of time spent on different activities – a problem that has been previously noted by others (Ilahi 2001; Levison and Moe 1998). As the nature of adolescents' activities is so variable between and within countries, comparing adolescents on the basis of participation rates in different activities can mask significant differences in how much time they spend in each activity.

While there is a burgeoning literature on work and school interrelationships, the focus of that literature has been primarily on labor market work and its implications for schooling. There has been much less attention to other aspects of work (in particular non-economic household work),[6] to the total time devoted to schooling or to the ways in which leisure time is used. Furthermore, few studies provide information on the typical length of the school day or the school year which is highly variable across countries and which has to be an important contextual factor explaining variations among adolescents in time use patterns.

Finally, differences in measurement techniques often compromise comparability of surveys within and across countries. Among the studies reviewed, a few relied on direct observation but most used either 24-hour or 7-day recall, occasionally supplemented by time logs. Some data sets relied on adults to report on the time use of adolescents and some relied on direct reports from the adolescents themselves. Lloyd and Grant (2004) compare the results of two different reporting approaches in Pakistan and found huge differences. In the 1991 Pakistan Integrated Household Survey (PIHS), women and girls were asked how many times in the past 7 days they did 12 different non-

[6] With the notable exception of several articles authored or co-authored by Deborah Levison (Levison 1993; Levison and Moe 1998; Levison, Moe and Knaul 2001).

economic household work activities and for each activity how much time they spent. In the 2001-2002 Adolescent and Youth Survey of Pakistan (AYSP) young people were asked to recall their activities in the previous 24-hour period in half hour increments and it was up to the interviewer to record them in the appropriate category. In the AYSP, all adolescent respondents responded directly about their own activities; in the PIHS only 53% of adolescent respondents answered about their own activities (Durrant 2000; 2003*).[7] In comparing these two data sources, the authors found significantly greater time reported on non-economic household chores in the AYSP, which relied on 24-hour recall. Mean weekly hours for those reporting housework was 27.4 from the PIHS but 43.5 in AYSP (by converting daily hours to weekly hours) – a difference that is too large to plausibly represent actual trends in time devoted to household chores over the 10 years between the two surveys. Instead, these differences suggest that 7-day recall leads to a substantial underestimate in time devoted to particular activities.

**III. Data and Context**

In the last 5 years, various researchers at the Population Council have been involved in the collection of time use data from adolescents in developing countries as part of a major research initiative on transitions to adulthood. In each country where a research study has been undertaken, the survey of adolescents which has been fielded has included a time use module based on a 24-hour recall in one hour increments. The 24-hour recall approach was preferred to the last 7-day approach because of evidence that time use reported over a 7-day recall period leads to substantial underestimates of time spent on activities which take place outside of school and which are unremunerated or

[7] On average, girls themselves reported more time in each activity than their surrogates.
* Valerie Durrant 2003: personal communication.

non-economic. The collection of time use data has served two purposes: (1) to shed more light on the realities of every day life among adolescents in developing countries and (2) to provide insights about the optimal timing of interventions for youth.

Sufficient data have now been collected to allow for comparative analysis. These data include a national sample of youth in Pakistan (2001-02), a sample of rural communities from three districts in Kenya (1996), a sample of urban slums in Allahabad, India (2003), and a sample of largely urban households in Durban, South Africa (1999). These data can be supplemented by data from Living Standard Measurement surveys in Guatemala and Nicaragua where a similar approach to the measurement of time use was used. While age ranges vary from survey to survey, all surveys include most or all of the teen years. Table 1 summarizes the key features of each of these data sets.

Because of the interest in comparing the time use of students to similarly aged young people who are not attending school, special care was taken in the surveys undertaken by the Population Council to field the surveys during the regular school year when schools were in session.[8] Furthermore, leisure time was never taken as a residual after school time and work time have been accounted for. Time spent sleeping, eating, traveling (sometimes) and on personal maintenance were not included in leisure time but accounted for separately.

In our descriptive analysis, we focus on the broad categories of time devoted to school, time devoted to all types of work and time devoted to leisure. Time devoted to work is further divided into paid labor market work, unpaid economic work and non-economic household work and is measured in reasonably comparable categories across

[8] However, a few of the interviews in Nicaragua and Guatemala may have taken place during school vacation and this may explain why the work rates for students in these two countries, particularly Guatemala, seem higher than in the other countries.

the surveys. When we report average hours in each activity, we are including those who did not participate in that activity as well. All data are presented separately by residence (urban, rural) and enrollment status (student, non-student).

Table 2 provides the actual wording printed in each questionnaire describing the activities to be included under each category: school, non-economic household work, paid labor market work, unpaid labor market work and leisure. The intention in each survey was to limit non-economic household work to domestic chores such as housework, caring for family members, fetching fuel and water, raising food directly for the family and home maintenance.[9] Unpaid labor market work by contrast includes work for family profit or gain. Paid labor market activity includes work for pay regardless of whether or not the work takes place within or outside the household. The questionnaire wordings are not identical and there is the possibility that some minor differences exist between the categories used in each country. It is our view that these differences are very unlikely to affect the overall conclusion, however. Leisure time categories tend to be more country-specific but certain broad categories potentially lend themselves to cross-country analysis including time devoted to sports and time devoted to TV, movies,

[9] In Kenya and Guatemala, home construction, repair and maintenance are included under unpaid labor market work while in South Africa home construction, maintenance and work in yard are included under non-economic household work. According to UN guidelines (The UN Draft International Classification of Activities for Time-Use (ICATUS), such activities as "do-it-yourself decoration, maintenance and small repairs" and "cleaning and upkeep of dwelling and surroundings" should be listed under non-economic household work. Given the slight differences in wording and vocabulary of these questions, and that these questions were not designed to ICATUS standards, it's not entirely clear whether or not they should be re-classified for our analysis. In any case, given the low levels of time reported for these variables, re-categorizing these variables would not change considerably in any meaningful way the distribution of time use between categories.

reading and socializing with friends (although we do not plan to pursue this further in this paper).

The six surveys included in this comparative analysis took two different approaches to the measurement of time use for those currently enrolled in school. In three of the surveys (Kenya, Pakistan, and India), the interviewers were instructed to ask currently enrolled students to report their time use on the most recent school day, if the previous day was not a school day. Thus, for these three data sets, reported time use of currently enrolled students is confined to days when school was in session (typically weekdays) whereas the time use reports of those not currently in school could apply to any day of the week.[10] Because the time use patterns of students differ on school days from those on non-school days, this approach is likely to lead to an underestimate of the amount of time students spend working and enjoying leisure activities relative to non-students over the course of a week. Nonetheless, it should be representative of the differences in time use between students and non-students that occur on a school day.

The other three surveys (South Africa, Nicaragua and Guatemala) collected data on the previous 24 hours regardless of whether or not they fell on a school day or non-school day. Thus, for these three surveys we can compare time use of students and non-students over the whole week and for two of the three (South Africa and Nicaragua), we can also compare time use on a school day as well because information on the day or date of the interview was provided.

Table 3 provides a comparison of these two approaches to the measurement of time use as illustrated by the cases of Nicaragua and South Africa. For non-students, these two approaches to the measurement of time use present a very similar picture.

[10] Assuming that interviews were conducted on every day of the week.

However, for students, leisure time and work time are substantially undercounted if we confine the measurement of time use only to days when school is in session. For example, the estimate of mean daily hours spent working (economic and non-economic work combined) is 2.5 hours for rural male students in Nicaragua if the measure is confined to a school day but 3.6 hours if the measure represents any day of the week. The same comparison for girls is 2.6 hours for a school day and 3.8 hours if non-school days are included in the average. The differences in leisure time are even greater. As a result differences between students and non-students in the amount of leisure time shrink substantially when school days and non-school days are combined. Not surprisingly, students trade off hours in school for work time and leisure time over the course of the week, spending relatively more time on work and leisure on non-school days than on school days. However, this is less possible when school is in session six rather than five days a week. In our sample of countries, schools in Pakistan are in session 6 days a week and schools in India are in session five and a half days a week.

As background before presenting our data, we provide school participation rates for 15-19 year-olds by sex and by residence (urban, rural) from each of the data sets in order to show that there is a substantial range in enrollment rates represented in these surveys (see Figure 1). Among the urban samples, South Africa has the highest levels of school participation at this age for both boys and girls (about three quarters), followed by Guatemala, India and Nicaragua (over 50 percent) with Pakistan at the bottom of the distribution with slightly over a third. The greatest gender gaps present in this sample of countries are in Pakistan (9 percentage points) and in South Africa (7 percentage points). Among the rural samples, South Africa also has the highest levels of school participation

(again about three quarters) followed by Kenya with over 50 percent. Enrollments at this age in rural areas are extremely low in Nicaragua, Pakistan and Guatemala with sizeable gender gaps in all countries but Nicaragua.

## IV. Descriptive Data Analysis

We begin by looking at overall patterns of daily time use in school related activities on a school day for students (Figure 2).[11] To increase comparability across countries, we confine these comparisons to those aged 15 to 19 – an age range that is common to all surveys. School-related activities include time spent in school as well as time spent studying. School-related time varies substantially from a little over 5 hours in South Africa to roughly 10 hours in Kenya. These variations are primarily explained by variations across countries in the length of the school day. Within each country, girls and boys spend about the same amount of time in school-related activities. Any small differences between boys and girls are due to gender differences in study time, which are trivial in most settings except India where boys appear to spend at least one more hour studying than girls.

Next we look at comparisons of total time spent in all types of work including paid labor market work, unpaid labor market work, and non-economic household work using two different reference periods – a school day or any day. Comparisons are possible for 5 countries for a school day – Pakistan, South Africa, India, Kenya and Nicaragua) - and for three countries for any day – South Africa, Nicaragua and Guatemala (Figure 3) . Again, we confine our comparison to the age group 15-19. In all

[11] Guatemala is not included in this comparison because it is not possible to determine whether or not time is reported on a school day.

cases, those that are not enrolled in school report substantially more work hours than enrolled students regardless of the reference period. This is not surprising given that school takes up a significant portion of the day (see discussion above). In almost all cases but rural Nicaragua, girls report more total work hours than boys whether or not they are students. Among students, gender disparities in total work time are greatest for urban India, with girls reporting on average 2 more hours of work on days when school is in session than boys. Gender differences in students' total work time on a school day are typically about an hour. Among non-enrolled adolescents as well, gender differences in total work time are typically about an hour, but are slightly more in rural Pakistan and urban South Africa and Guatemala. Thus, while school attendance reduces total work demands, female students still work longer total hours than male students.

A final observation on the links between school participation and work comes from a comparison of Figures 2 and 3. South Africa has the shortest school day and Kenya the longest. Kenyan students appear to work less time in total on a school day than students in any other country because they have less time available for work. Thus, variations in the length of the school day between countries may be one factor explaining variation across countries in the extent to which work and schooling are combined. Our sample of countries is too small to pursue this relationship more fully.

When we explored the subcategories of work separately (i.e. non-economic household work, unpaid labor market work and paid labor market work) we found that adolescents in all countries report very little time in unpaid labor market work (less than 1 hour per day) except in rural Kenya. Thus, we combined unpaid and paid labor market

work into one combined measure of labor market work and contrast that measure with time devoted to non-economic household work.

In all cases, girls spend much more time than boys in non-economic household work and these differences become very substantial among those who are not enrolled in school (Figure 4). Among non-enrolled girls, their mean daily hours in non-economic household work vary from roughly 5 to over 7 hours while for non-enrolled boys the range is from about half an hour to three hours. The gender differences in non-economic household work burdens never exceed two hours on average among students but range from 2 to 5 hours among those who are not in school. Among non-enrolled adolescents, the most gender equitable time use patterns in non-economic household work are found in South Africa. Young men in urban Pakistan and urban India as well as rural Kenya do not appear to spend much time performing domestic chores whether or not they are in school. Adolescent girls and boys in rural areas spend about an hour/day more in domestic work than their urban counterparts, which is contrary to findings from Peru where urban adolescents were found to do more domestic work than rural adolescents (Ilahi 2001; Levison and Moe 1998).

A significant finding is that male students typically spend more time in non-economic household work than in labor market work (Figure 5). It is often assumed that boys don't do domestic household chores, but our findings show that boys contribute more to the household in terms of non-economic household work than to economic activity when they are enrolled. This represents an additional factor making the daily lives of male and female students more similar to one another. Female students, however,

still do more non-economic household work than male adolescents who are not enrolled in school.

Time spent in labor market work is rarely substantial among students. The main exception is Guatemala where male students appear to be working about three hours a day in rural areas and all students in urban areas appear to work about two hours a day. Among non-enrolled male adolescents in this age group, the mean time devoted to labor market work on a school day varies enormously across countries in rural areas from less than one hour in South Africa to seven hours in Kenya. The variation is smaller in urban areas and is reflective of variations in the ease of entry into the labor force in these economies. Only in Nicaragua, Guatemala and Kenya does labor market work seem at all significant among girls.

Because of differences between countries in the measurement of leisure time, we focus primarily on differential patterns within countries rather than on differences in overall levels of leisure time across countries. In every comparison, it is clear that, on days when school is in session, students enjoy less leisure time than those who are not enrolled (Figure 6). In almost every case, it is also true that male students enjoy more leisure time than female students. Gender differences in leisure are greatest in South Africa. This pattern is slightly less typical among non-students. Among non-students, young women enjoy roughly the same amount of leisure time as young men in urban Pakistan and India and in rural Kenya. In rural Nicaragua, it would appear that young women who are not in school may enjoy slightly more leisure time.

These patterns allow us to conclude fairly confidently that the sharp increases in school participation and attainment that have occurred around the world in the last 20

years can be linked with a decline in overall work burdens as well as a decline in labor force participation rates among adolescents. As these data are also very recent and gender gaps in enrollment are closing rapidly, we can also conclude that the time use of male and female adolescents, at least during the early and middle phases of the transition is becoming more similar despite the fact that the reduced work burdens that accompany school attendance are still differentially carried by girls. Finally, it is in those countries where the school day is relatively long that the lives of female and male students become most similar over the course of the school week as enrollment rates continue to rise and gender gaps continue to close.

## V. Gender differences in the implications of enrollment status for time use

From the figures presented above, it is difficult to detect whether or not being enrolled in school implies greater changes in time use for boys or for girls. To test for gender interactions in the relationship between enrollment status and time use, we use Tobit IV estimation techniques to regress daily hours devoted to work and leisure activities on age (using dummies for age groups), enrollment status, marital status and age/enrollment interaction terms.[12] This allows us to avoid the asymptotic bias of OLS regression that occurs when there are a reasonable percentage of cases of zero observations. Our intention is not to develop a causal model. We are well aware that many of the same factors that determine enrollment status also determine time allocation. Instead, we use this approach purely as a descriptive device to identify patterns in the

[12] To be more precise, the variables in the regressions are dummies for age groups (12-14), (17-19), (20-21) with ages 15-16 as a reference group, enrollment status (student = 1), marital status (married =1), and interactions terms for each age group with enrollment status. The age variable (17-19) is common to all surveys. However, the age group (12-14) is only available for Kenya, Nicaragua and Guatemala and the age group (20-21) is available for all countries but Kenya.

relationship between enrollment status and time use by gender while controlling for age effects.

Tables 4, 5, 6 and 7 summarize our findings for each time use category separately (total work time, time devoted to non-economic household work, time devoted to labor market work and time devoted to leisure) in terms of the signs and statistical significance of the regression coefficient on enrollment status. The statistical significance of gender differences in the measured relationship is derived by pooling the separate male and female regressions and running gender-interaction terms on each of the right-hand side variables. The direction and significance of gender differences are indicated in a separate column of each table.

Table 4 summarizes the results by country and reference period (school day or any day of the week) for the difference in daily hours devoted to all types of work (labor market work and non-economic household work combined) between students and non-students. With only one exception in the case of females in rural South Africa, school enrollment is significantly associated with a reduction in total work time. However, in every case but urban South Africa when the reference period is any day of the week, the difference in work time associated with enrollment is less for girls than for boys and these gender differences are sometimes but not always significant. The gender differences in effects are most significant in India and Pakistan which are known to have strongly differentiated patterns of time use by gender. In such settings, school participation makes a particularly significant contribution to equalizing work burdens by gender.

Table 5 summarizes the results for time devoted to non-economic housework. For females, school enrollment is associated with less time devoted to non-economic household work and the relationship is always significant. For males this is true in most cases (although the association is less often significant) but there are some interesting exceptions in urban Pakistan and Guatemala where boys' time devoted to non-economic household work actually appears to be greater for students than non-students. Everywhere except rural South Africa, girls show greater differences due to enrollment status in non-economic household work than boys which is to be expected given that they are starting from a much higher base. Furthermore, these gender differences are almost always highly significant.

Table 6 complements Table 5 and explores differences in time devoted to labor market work that are associated with school enrollment. Because so few young people in South Africa actually participate in labor market work, we are not able to present findings for South Africa, for labor market work as the results are unstable and implausible.[13] The differences in market work for boys according to enrollment status are always significant and are occasionally significant for girls as well. In general, the patterns of gender differences are complementary to the pattern of gender differences found with respect to non-economic household work. Thus school participation serves to reduce gender differences in work patterns.

Finally Table 7 presents differences in daily hours devoted to leisure activities according by enrollment status. Except in Guatemala, girls who are students have less leisure time than non-student girls and the differences in leisure time by enrollment status

[13] In South Africa, less than 7 percent of males and 5 percent of females report any labor market work in the last 24 hours (or school day). In all other surveys, the overall percent reporting any labor market work exceeds 40 percent for males and 15 percent for females.

are sometimes but not always significant. For boys, the patterns across countries are divergent. In some cases students appear to have more leisure time than non-students whereas in other cases the reverse is true, particularly in rural areas. In most cases, the differences in leisure time between the enrolled and the non-enrolled are greater for young women than young men.

## VI. Conclusions

The main point of this paper is a very simple one. The lives of adolescent boys and girls in developing countries are becoming more similar as they spend more of their adolescent years in school. Our data document this pattern clearly across a diverse sample of countries. While female adolescent students still work somewhat longer hours than male adolescent students, the gender division of labor that typically develops during adolescence is much attenuated among students when time devoted to labor market work is combined with time devoted to non-economic household work. This is not only because male and female adolescent students spend much of their day together in school rather than working, but also because the distribution of their work time when they are students is much more similar.

In most cases, male students devote a majority of their work time to non-economic household work while young men who are not in school devote the majority of their work time to labor market activities. Students also enjoy slightly less leisure time which, in many cultural settings, tends to be spent very differently by boys and girls. The length of the school day and the number of days during the week that school is in session are further factors that can affect the distribution of time use among students.

Our data show that for girls (particularly non-student girls) and student boys, non-economic household work takes up a considerable amount of their work time. Most policies and programs aimed at reducing child labor focus on paid and economic work as the primary deterrents to schooling. These findings suggest that the effects of non-economic household work – as performed by girls and boys – on school status and performance should be explored further and addressed in policy and programs that seek to improve and equalize educational attainment for all adolescents.

Schooling for girls into their adolescent years can be seen as a first building block in a societal pathway towards greater gender equality as adults. This is true not just because of the learning that takes place in school, but also because school brings adolescent boys and girls together in the same place to spend their time similarly during a critical phase of the transition to adulthood. While female students still carry a slightly heavier work load and enjoy less leisure time than male students during their adolescent years, these gender differences are trivial in comparison to the gender differences in time use that are apparent among adolescents that do not attend school.

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**Table 1** Summary of time use datasets

| COUNTRY | Pakistan | India | Kenya | South Africa | Guatemala | Nicaragua |
|---|---|---|---|---|---|---|
| **Survey date** | 2001/02 | 2003 | 1996 | 1999 | 2000 | 1998 |
| **Total sample size** | 8062 | 6148 | 774 | 3051 | 16045 | 5115 |
| **Urban** | 3,327 | 6148 | n.a. | 2385 | 6648 | 2605 |
| **Rural** | 4,735 | n.a. | 774 | 666 | 9397 | 2510 |
| **Student** | 1358 | 2717 | 589 | 2198 | 8061 | 2765 |
| **Non-student** | 6704 | 3431 | 185 | 853 | 7984 | 2350 |
| **Coverage** | National | Urban slums in Allahabad | Kilifi, Nakuru, and Nyeri provinces | KwaZulu-Natal province | National | National |
| **Age range** | 15-24 | 15-21 | 12-19 | 14-22 | 7-25 | 7-25 |
| **Period of recall** | 24 hr. recall (or previous school day) | 24 hr. recall (or previous school day) | 24 hr. recall (or previous school day) | 24 hr. recall | 24 hr. recall | 24 hr. recall |
| **Data collection method** | Interview with adolescent | | | | | |
| **Units of time reported** | 1 hr increments | 1 hr increments | 1 hr increments | 1 hr increments | Hours and minutes | Hours and minutes |

**Table 2** See separate Excel file

**Table 3** Mean hours, total work time, and leisure, 15–19 year olds, South Africa and Nicaragua, by residence

| | SOUTH AFRICA | | | | NICARAGUA | | | |
|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Male | | Female | |
| | School day | Any day | School day | Any day | School day | Any day | School day | Any day |
| TOTAL WORK | | | | | | | | |
| Urban | | | | | | | | |
| Non-Student | 4.6 | 4.0 | 5.6 | 5.6 | 7.2 | 7.0 | 8.3 | 8.1 |
| Student | 1.1 | 1.4 | 2.2 | 2.5 | 1.8 | 2.3 | 3.2 | 3.6 |
| Difference | 3.5 | 2.6 | 3.4 | 3.1 | 5.4 | 4.7 | 5.1 | 4.5 |
| Rural | | | | | | | | |
| Non-Student | 3.9 | 4.3 | 5.7 | 5.4 | 8.5 | 8.3 | 7.4 | 7.6 |
| Student | 2.0 | 2.6 | 3.4 | 4.0 | 2.5 | 3.6 | 2.6 | 3.8 |
| Difference | 1.9 | 1.7 | 2.3 | 1.4 | 6.0 | 4.7 | 4.8 | 3.8 |
| LEISURE | | | | | | | | |
| Urban | | | | | | | | |
| Non-Student | 7.0 | 7.6 | 5.0 | 5.0 | 6.0 | 6.2 | 4.8 | 4.9 |
| Student | 5.4 | 6.4 | 3.5 | 4.5 | 4.3 | 6.0 | 3.2 | 5.1 |
| Difference | 1.6 | 1.2 | 1.5 | 0.5 | 1.7 | 0.2 | 1.6 | -0.2 |
| Rural | | | | | | | | |
| Non-Student | 6.8 | 6.8 | 5.0 | 5.1 | 4.8 | 5.0 | 5.6 | 5.5 |
| Student | 4.2 | 5.2 | 2.7 | 3.5 | 3.5 | 5.7 | 3.2 | 5.3 |
| Difference | 2.6 | 1.6 | 2.3 | 1.6 | 1.3 | -0.7 | 2.4 | 0.2 |

**Table 4** Direction and significance in the association between total work time and school enrollment

| All | URBAN | | | RURAL | | |
|---|---|---|---|---|---|---|
| **Work** | **Male** | **Female** | **[F <> M] [a]** | **Male** | **Female** | **[F <> M] [a]** |
| India – School Day | —*** | —*** | <*** | n/a | n/a | n/a |
| Pakistan – School Day | —*** | —*** | <*** | —*** | —*** | < |
| South Africa | | | | | | |
| – School Day | —*** | —** | < | —*** | —* | <* |
| – Any Day | —*** | —*** | > | —* | — | < |
| Kenya – School Day | n/a | n/a | n/a | —*** | —*** | < |
| Guatemala – Any Day | —*** | —*** | < | —*** | —*** | < |
| Nicaragua | | | | | | |
| – School Day | —*** | —*** | < | —*** | —*** | <* |
| – Any Day | —*** | —*** | <* | —*** | —*** | <** |

[a] The relationship between females and males is based on the relative size of their coefficients, while the significance is based on the interaction of sex and enrollment status.
Based on Tobit Regression:
Dependent variable: Total work time (daily hours)
Independent variables: age, enrollment status, interactions of age and enrollment status and marital status
*** P≤ .001
** P≤ .01
* P≤ .05

**Table 5** Direction and significance in the association between non-economic household work and school enrollment

| All | URBAN | | | RURAL | | |
|---|---|---|---|---|---|---|
| **Work** | **Male** | **Female** | **[F <> M] [a]** | **Male** | **Female** | **[F <> M] [a]** |
| India – School Day | —*** | —*** | >*** | n/a | n/a | n/a |
| Pakistan – School Day | + | —*** | >*** | —*** | —*** | >*** |
| South Africa | | | | | | |
| – School Day | —*** | —*** | > | —*** | —** | < |
| – Any Day | —*** | —*** | >*** | —*** | — | < |
| Kenya – School Day | n/a | n/a | n/a | — | —*** | >*** |
| Guatemala – Any Day | + | —** | >*** | + | — | >** |
| Nicaragua | | | | | | |
| – School Day | — | —*** | >** | —* | —*** | >** |
| – Any Day | — | —*** | >* | — | —*** | >*** |

[a] The relationship between females and males is based on the relative size of their coefficients, while the significance is based on the interaction of sex and enrollment status.
Based on Tobit Regression:
Dependent variable: Total time in non-economic household work (daily hours)
Independent variables: age, enrollment status, interactions of age and enrollment status and marital status
*** P≤ .001
** P≤ .01
* P≤ .05

**Table 6** Direction and significance in the association between labor market work and school enrollment

| All | URBAN | | | RURAL | | |
|---|---|---|---|---|---|---|
| **Work** | **Male** | **Female** | **[F <> M] [a]** | **Male** | **Female** | **[F <> M] [a]** |
| India – School Day | —*** | —*** | <*** | n/a | n/a | n/a |
| Pakistan – School Day | —*** | —*** | <*** | —*** | —*** | < |
| South Africa | | | | | | |
| – School Day | n/a | n/a | n/a | n/a | n/a | n/a |
| – Any Day | n/a | n/a | n/a | n/a | n/a | n/a |
| Kenya – School Day | n/a | n/a | n/a | —*** | — | <** |
| Guatemala – Any Day | —*** | —*** | <*** | —*** | —*** | > |
| Nicaragua | | | | | | |
| – School Day | —*** | — | <* | —** | — | < |
| – Any Day | —*** | — | < | —*** | — | < |

[a] The relationship between females and males is based on the relative size of their coefficients, while the significance is based on the interaction of sex and enrollment status.

Based on Tobit Regression:

Dependent variable: Total time in labor market work (daily hours)

Independent variables: age, enrollment status, interactions of age and enrollment status and marital status

*** P≤ .001

** P≤ .01

* P≤ .05

**Table 7** Direction and significance in the association between leisure time and school enrollment

| All | URBAN | | | RURAL | | |
|---|---|---|---|---|---|---|
| **Work** | **Male** | **Female** | **[F <> M] [a]** | **Male** | **Female** | **[F <> M] [a]** |
| India – School Day | —*** | —*** | >*** | n/a | n/a | n/a |
| Pakistan – School Day | —* | —*** | >* | —*** | —* | <* |
| South Africa | | | | | | |
| – School Day | — | — | > | — | — | >* |
| – Any Day | + | — | > | + | — | > |
| Kenya – School Day | n/a | n/a | n/a | — | —* | > |
| Guatemala – Any Day | + | —*** | >[b] | +* | +** | >[a] |
| Nicaragua | | | | | | |
| – School Day | — | —*** | > | — | —*** | >* |
| – Any Day | + | — | > | +* | — | >* |

[a] The relationship between females and males is based on the relative size of their coefficients, while the significance is based on the interaction of sex and enrollment status.

[b] Leisure time increases more for girls.

Based on Tobit Regression:

Dependent variable: Total time in leisure (daily hours)

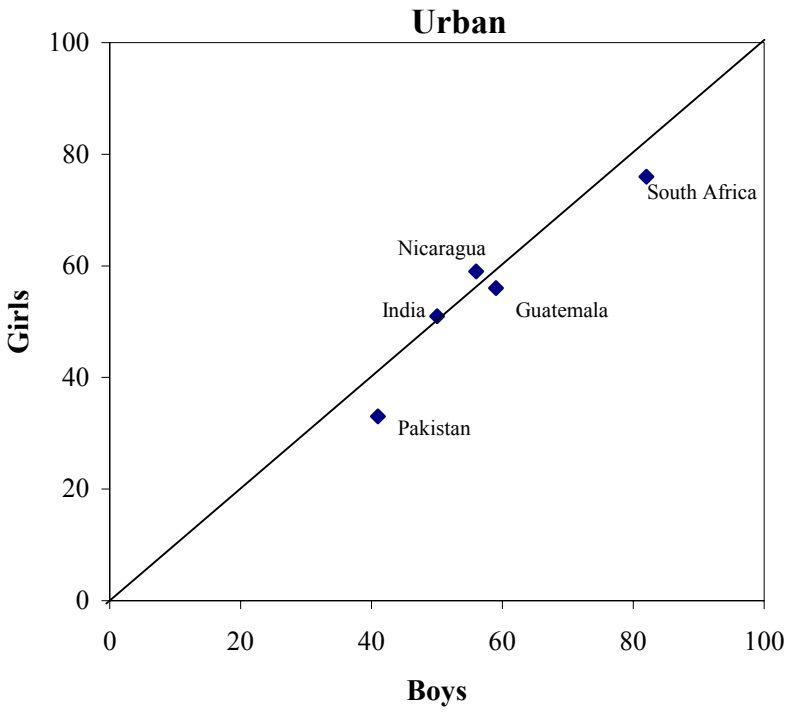
Independent variables: age, enrollment status, interactions of age and enrollment status and marital status

*** P≤ .001

** P≤ .01

* P≤ .05

**Figure 1** Currently Enrolled in School, 15–19 year olds



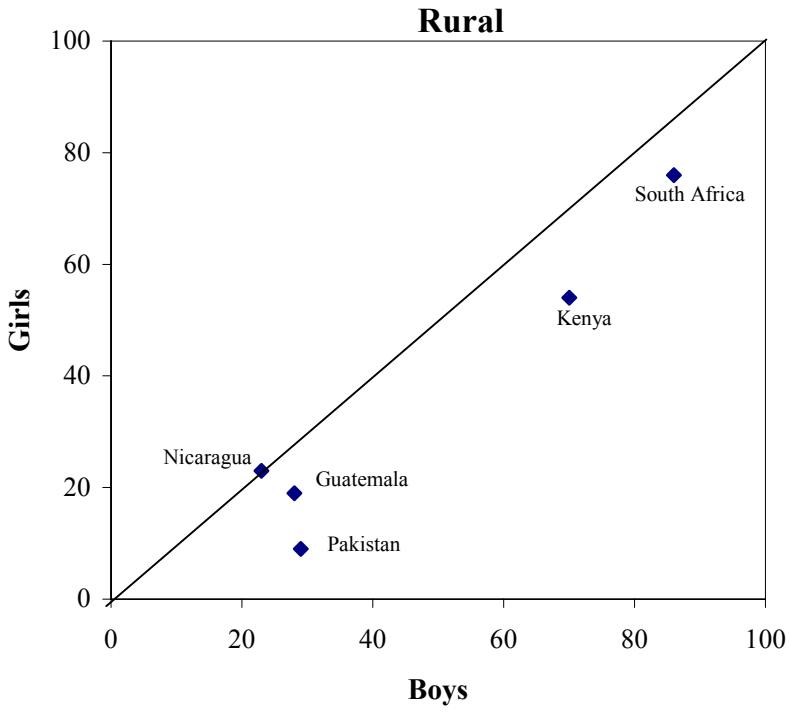
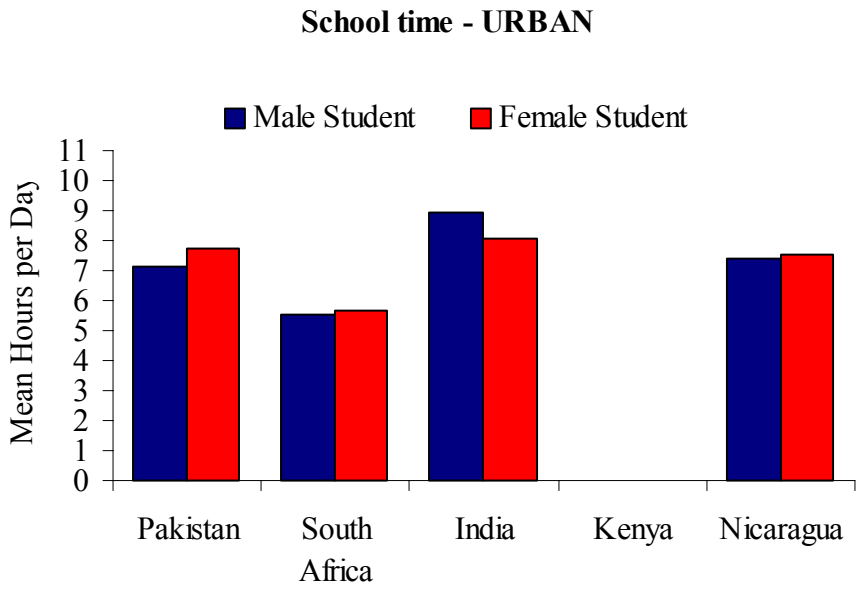



**Figure 2** Total time spent in school and studying by 15-19 year olds on a school day



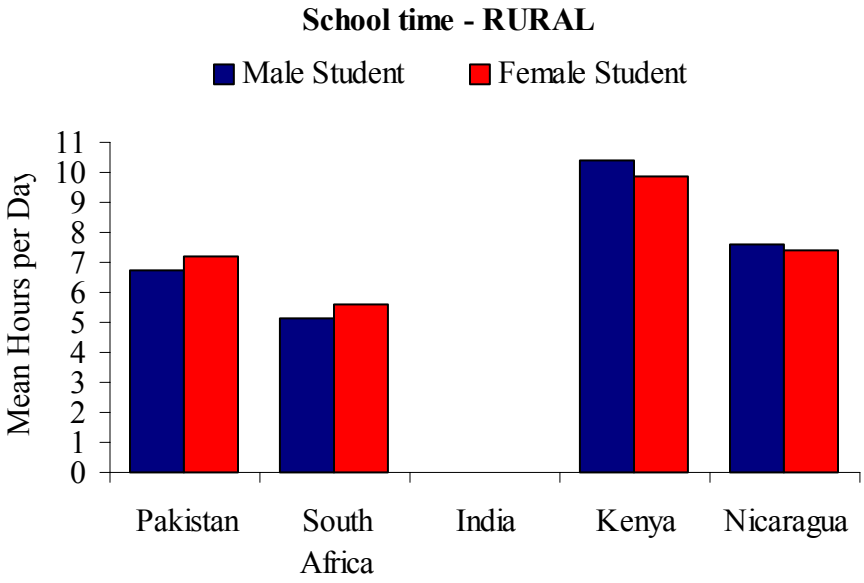
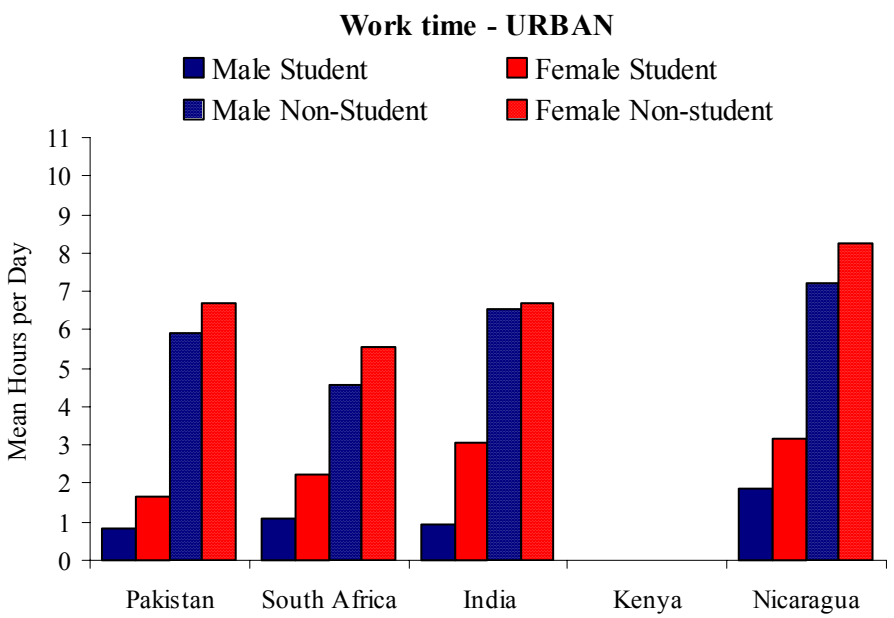
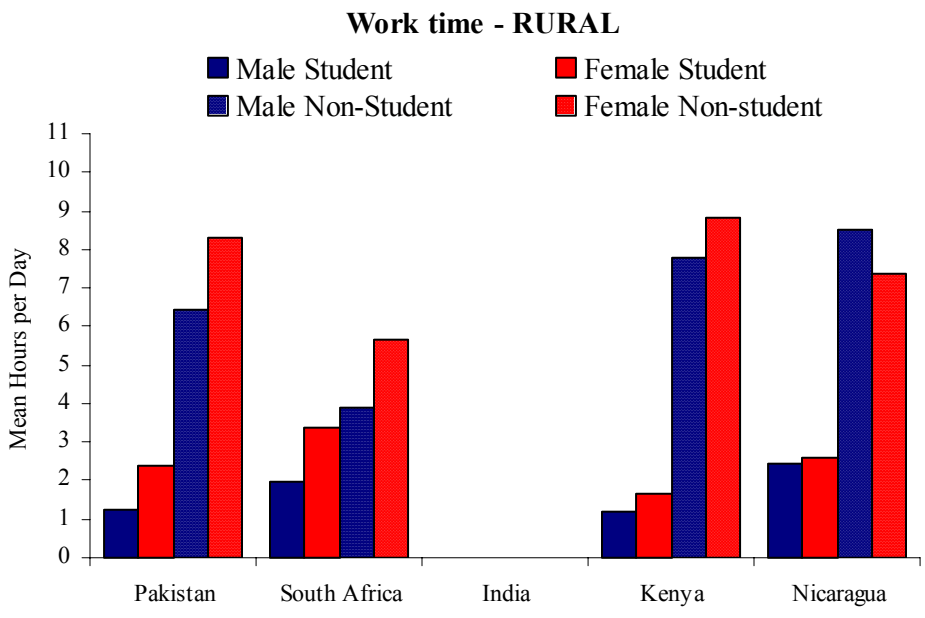



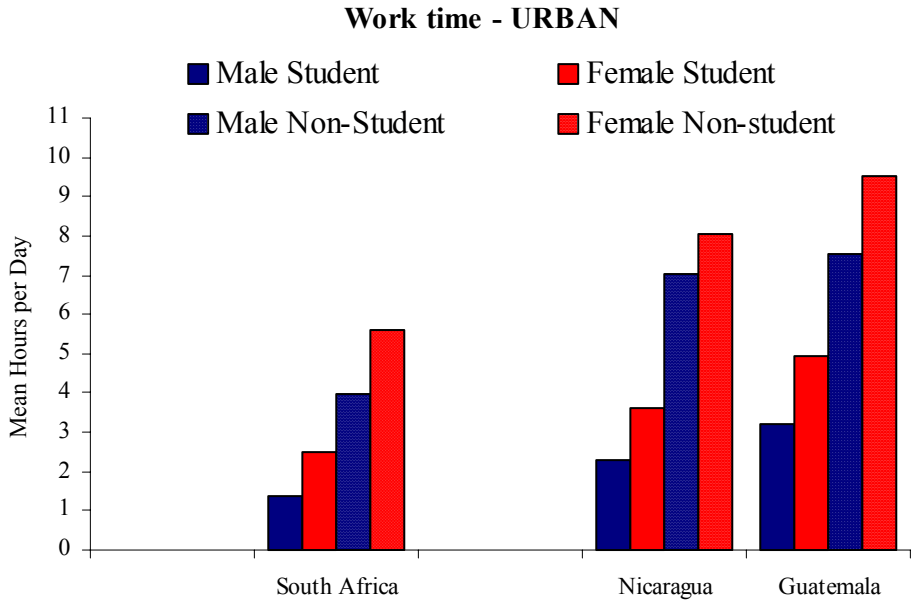
**Figure 3** Total time spent in work by 15–19 year olds (labor market work and non-economic household work combined)

**School Day**




**Any Day**



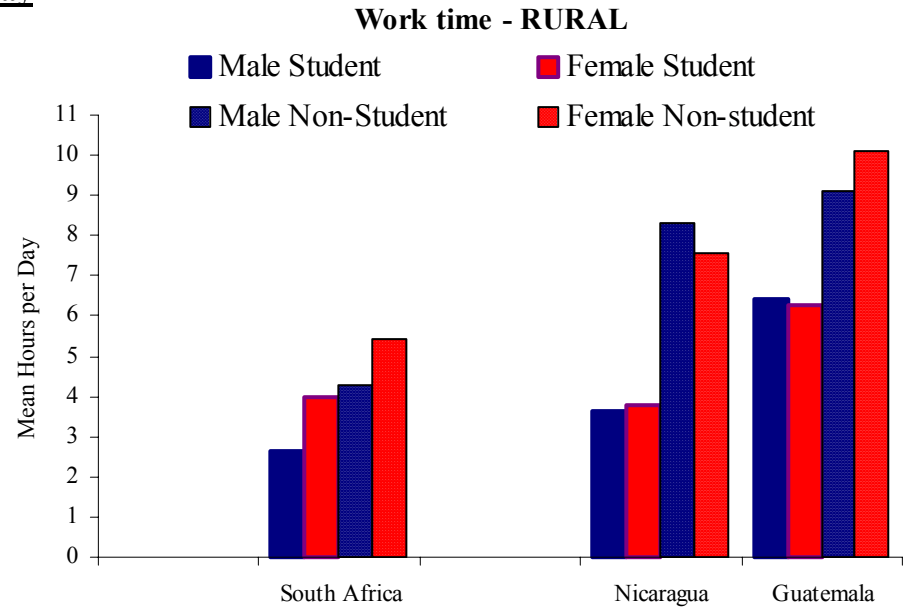
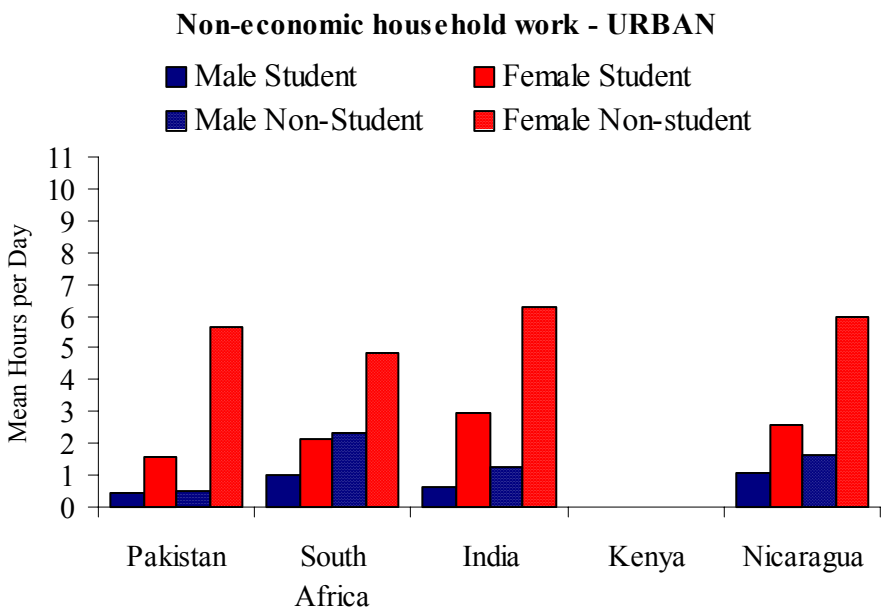
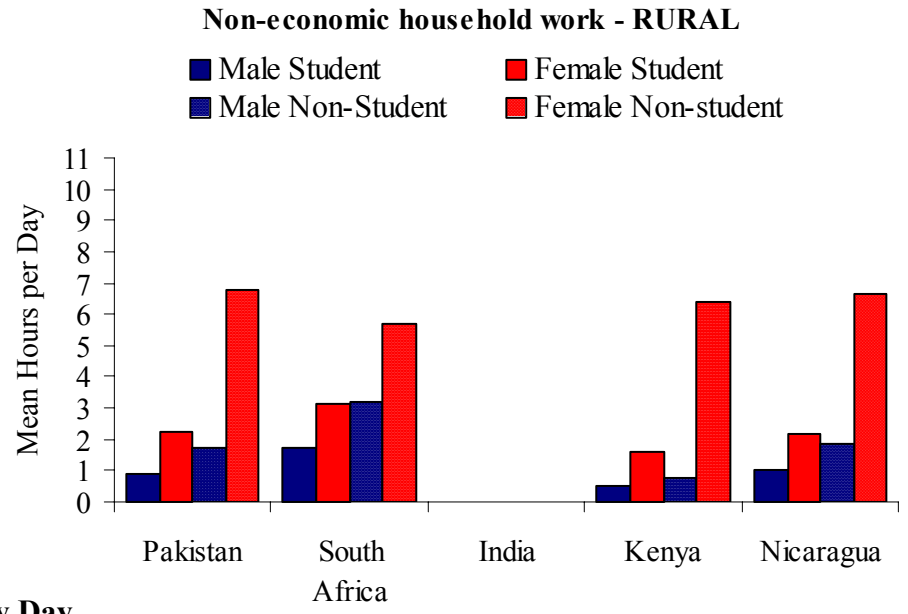



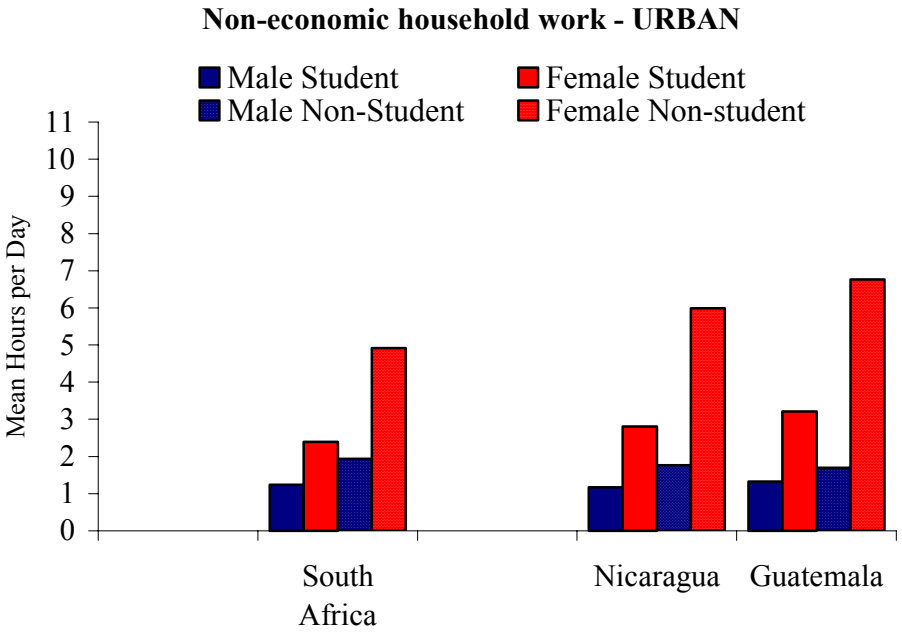
**Figure 4** Total time spent in non-economic household work by 15–19 year olds

**School Day**




**Any Day**



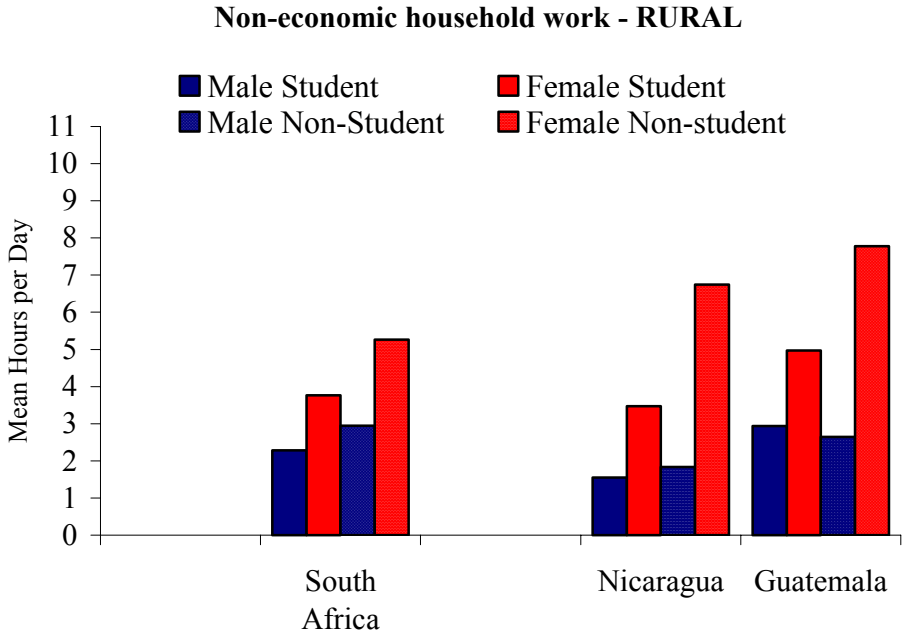
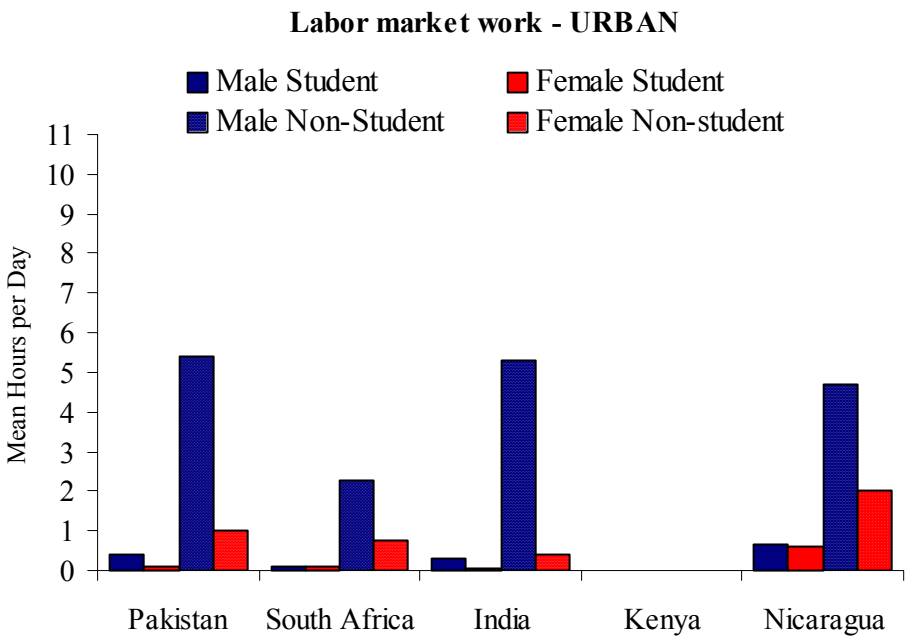
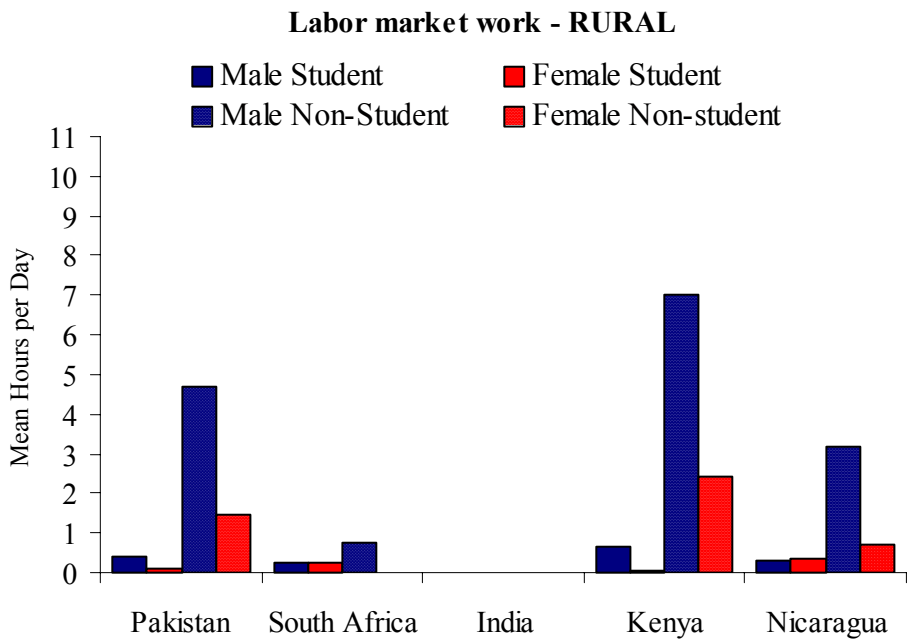



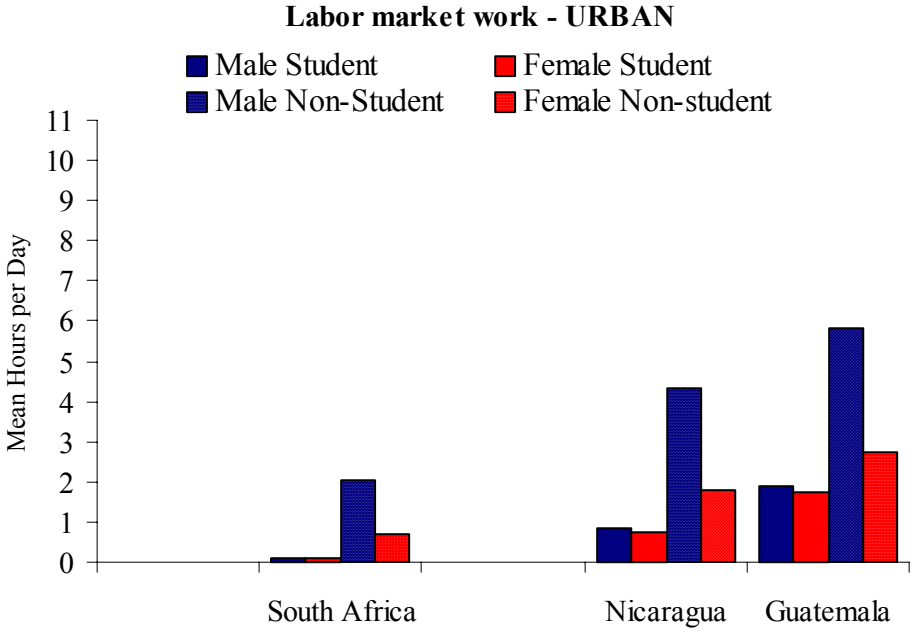
**Figure 5** Total time spent in labor market work by 15–19 year olds

**School Day**




**Any Day**



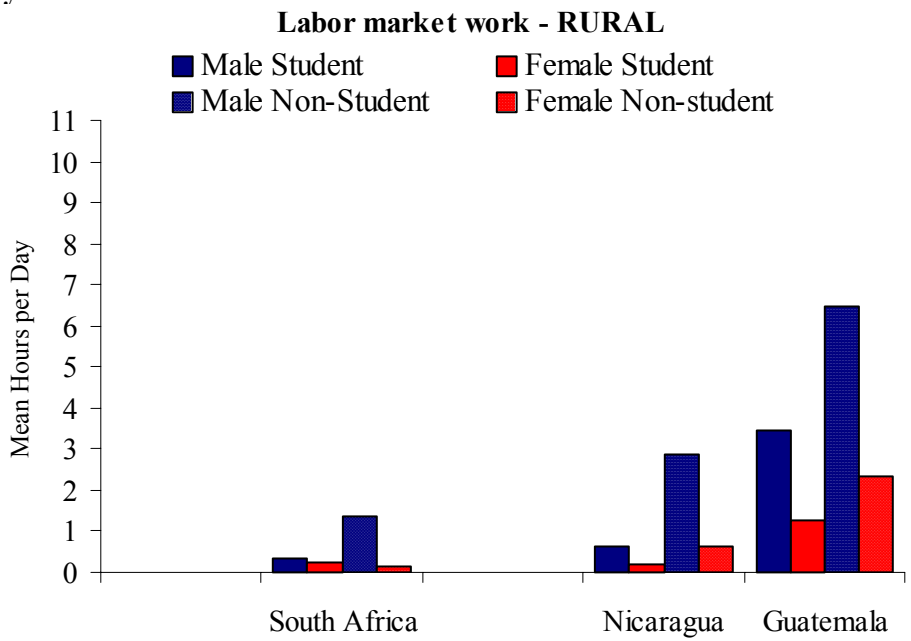
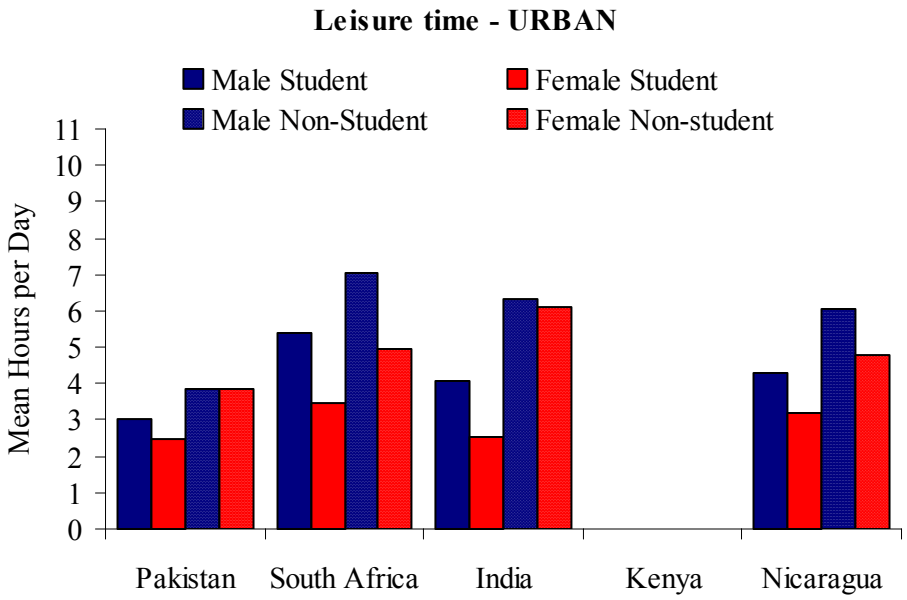
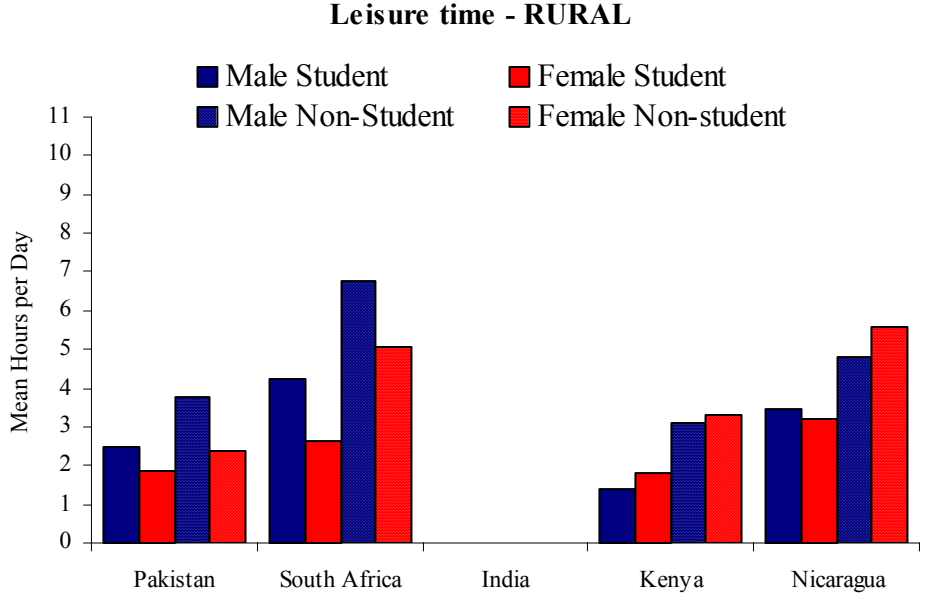



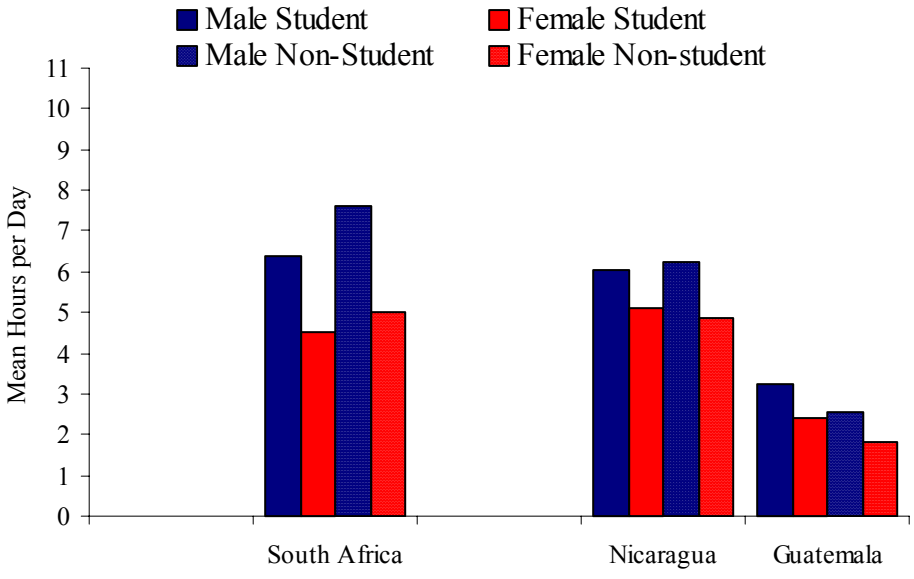
**Figure 6** Total time spent in leisure by 15–19 year olds

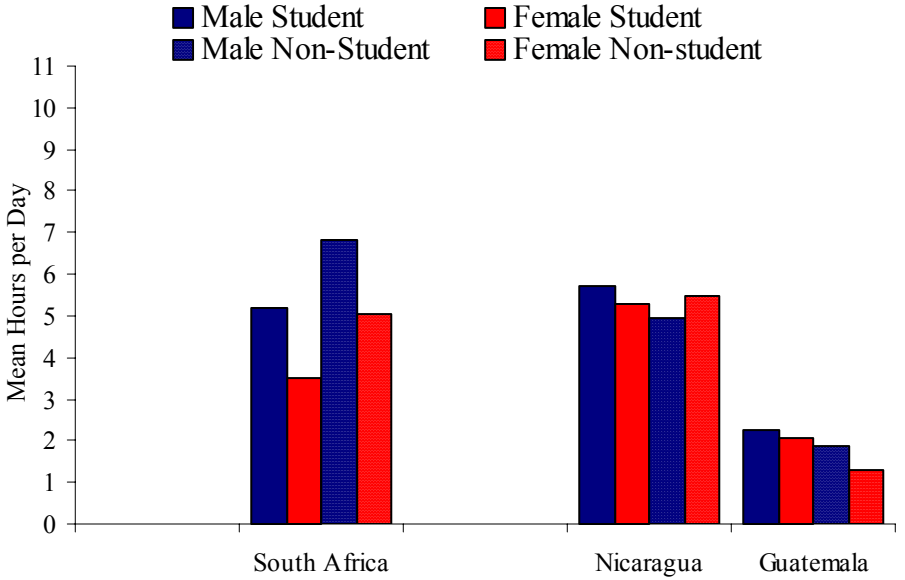
**School Day**




**Any Day**



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