Parental Disability and Teenagers' Time Allocation

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Abstract:
Using the 2003–2019 American Time Use Survey, we examine how living with a parent who has a work-limiting disability is related to teenagers' time allocation. Girls living with a disabled parent spend less time on educational activities, including both class time and homework, less time on shopping, and more time on pet care and leisure. Boys living with a disabled parent spend less time sleeping on schooldays. In addition, when examining the time spent by girls and boys in two-parent households, we find that the gender of the disabled parent matters. Girls living with a disabled mother in a two-parent household spend less time on educational activities and shopping and more time on pet care. Girls living with a disabled father in a two-parent household spend less time on shopping and food preparation and cleanup. Boys living with a disabled mother in a two-parent household spend less time on housework and caring for household children. However, if their father is disabled, boys spend more time on food preparation and cleanup. Boys living with a disabled father also spend less time with their mother. Thus, there are differences in teens' time use that depend on both the gender of the teen and of the disabled parent, with teen girls likely being worse off than teen boys given the reduction in educational time. Our results suggest that differences in teenagers' time investments are a plausible mechanism for gender differences in intergenerational economic mobility by parental-disability status.

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1. Introduction

About one in five male household heads in the United States experiences a work-limiting disability by age 30 (Meyer and Mok, 2019), suggesting that such disabilities are relatively common. Disabilities are associated negatively with individuals' well-being as well as the well-being of their families. Most obviously, work-limiting disabilities reduce employment. According to the U.S. Bureau of Labor Statistics (2020b), only 19.3 percent of persons with a disability were employed in 2019, compared to 66.3 percent of persons without a disability. In addition, work-limiting disabilities are associated with both lower educational attainment and lower household income. Olkin et al. (2006), examining parents of teenagers, show that those with work-related disabilities are twice as likely to have less than a high-school education and have lower incomes than those without disabilities, on average. Meyer and Mok (2019) show that post-transfer incomes are below the poverty line for one-sixth of families in which the male household head experiences a chronic, severe disability.

Potentially compounding the negative effects of work-limiting disabilities on the livelihoods of the disabled are significant negative effects on their children. According to the Current Population Survey (CPS), the percentage of teenagers aged 15–17 who were living with a parent who had a work-limiting disability severe enough to keep them from working for the next six months ranged between 5.1 and 6.5 percent over the 2003–2019 period (Figure 1).[1] Teens living in households with parents experiencing such a work-limiting disability may be affected along several dimensions, including greater expectations to contribute time and money

[1] Authors' own calculations based on the CPS (U.S. Bureau of Labor Statistics and U.S. Census Bureau, 2003–2019).

to the household, a lack of parental supervision, added stress, reduced resources toward postsecondary education, and less time and money invested in them by their disabled parents.

In this paper, we explore one dimension—teenagers' time use—which may shed light on the mechanisms by which intergenerational transmission of human capital, income, and wealth outcomes may occur. Most previous studies of the effects of parental disability or health on children have not examined children's time use. Also, many studies examining the effects of parental health or disability on children have focused on countries other than the U.S. Using data from the 2003–2019 American Time Use Survey (ATUS), we focus on how U.S. teens' time use is related to living with a parent experiencing a work-limiting disability. We investigate whether teenagers take on additional caregiving and household responsibilities and, if so, whether this increased time spent on domestic responsibilities might be at the expense of time spent investing in educational activities. Given the gendered nature of such activities, we examine teens' time allocation separately for boys and girls. We also examine whether the gender of the disabled parent matters in two-parent households, because children spend more time with their mothers, and mothers and fathers invest their time differently in their teenage daughters and sons (Del Boca et al., 2014; Lundberg et al., 2017; Pabilonia 2017; Pabilonia and Vernon 2022). Mothers also spend more time actively engaged with their children in educational activities (Caetano et al., 2019).

Our results show that the associations of parental disability with teenagers' time use are gendered. For girls, we find that living with a disabled parent is associated with less time spent on educational activities, including both class time and homework, less time spent on shopping, and more time spent on pet care and leisure. For boys, living with a disabled parent is associated with less time spent sleeping on schooldays. In addition, when examining the time spent by girls

and boys in two-parent households, we find that the gender of the disabled parent matters. Girls living with a disabled mother in a two-parent household spend less time on educational activities and shopping and more time on pet care. Girls living with a disabled father in a two-parent household spend less time on shopping and food preparation and cleanup. Thus, it appears that the activities most affected by the gender of the disabled parent for girls are educational ones, although girls may take over some of the pet-care duties of their disabled mothers. Boys living with a disabled mother in a two-parent household spend less time on housework and caring for household children. However, if their father is disabled, boys spend more time on food preparation and cleanup. Boys living with a disabled father also spend less time with their mother. Thus, there are differences in teens' time use that depend on both the gender of the teen and of the disabled parent, with teen girls likely being worse off than teen boys given the reduction in educational time. Our results suggest that differences in teenagers' time investments are a plausible mechanism for gender differences in intergenerational economic mobility by parental-disability status.

2. Background

There are several mechanisms through which teens' time use may be affected by a parental disability. First, teens living with a disabled parent may be called upon to contribute more time or money to the household than teens not living with a disabled parent, which may affect their education negatively. Disabled parents may not be able to do housework or care for household children and may need extra assistance in caring for themselves. Teenagers may be requested to fill in these gaps and, given recent findings by Schulz (2021) that children's

housework time within the family continues to be gendered, the additional caregiving burden within the household may fall primarily on daughters.

In a large U.S. survey focused on learning more about young caregivers aged 8–18 who cared for either parents or grandparents, Hunt et al. (2005) find that young caregivers spend more time doing household tasks than young persons who do no caregiving. They also find that the caregiving responsibilities of young, female caregivers affect their schoolwork. Mont and Nguyen (2013) examine the effect of parental disability on the education of children in Vietnam and find that having a disabled parent reduces both a child's probability of attending school and the expected number of grades completed. They also find that the effect is larger for boys and that it is more pronounced when the mother is the disabled parent. Miles et al. (2011) show that children aged 0–17 living with disabled caregivers in North Carolina have lower grades and higher absenteeism. Haveman and Wolfe (1994) show a negative relationship between educational attainment and the length of time a parent has had a work-limiting disability.

Although not directly examining parental disability, Kalenkoski et al. (2011) find that teen girls living in single-parent households or with less-educated parents have extra household and/or market work responsibilities compared to other teen girls and spend less time on homework than teens not living in such households. Also related to teens' education, Kalenkoski and Pabilonia (2012) show that teen employment reduces time spent on homework. This may be an issue if teens work more in response to a parental disability.

Second, negative effects of living with a disabled parent may occur because of a lack of parental supervision as the parent struggles to deal with daily tasks. There is strong evidence that parental/adult supervision makes teens less likely to take part in risky behaviors and reduces truancy (Aizer, 2004; Averett et al., 2011; See, 2016), and that teens living in disadvantaged

households are less likely to be supervised (Kalenkoski et al., 2011). Parents invest time in their children to produce higher quality children (e.g., Bernal and Keane, 2010; Caetano et al., 2019). In supervising their activities, they may help or encourage their teenagers to do more homework and chauffeur them to extracurricular activities or sports practices and games (Ramey and Ramey, 2010). As children enter adolescence, they make more of their own decisions about how they will invest their time, and Del Boca et al. (2017) show that adolescents' own time investments matter more than maternal time investments for their cognitive development. If disabled parents do not supervise their teens, teens' investments in themselves may occur less often or not at all. For example, Pabilonia (2017) shows that as the state unemployment rate rose during the Great Recession and mothers worked more hours on weekends, teenage boys spent less time with their mothers, less time on homework, and more time watching TV. However, if disabled parents who are not working spend more time in the home than non-disabled parents, it is also plausible that they could spend more time supervising their children's activities in the home.

Third, having a parent with poor health could be stressful, which could have negative effects on teens. Hunt et al. (2005) find that children aged 12–18 who provide household adults or relatives with at least one activity of daily living exhibit more fluctuations in their moods and feelings. Many of them report missing schoolwork or being absent from school. Kristiansen (2021) finds that Danish children are more likely to be prescribed ADHD medication and go to therapy following a parental health crisis, and the effects on their mental health persist even five years later. In addition, their school test scores are lower, and they are less likely to be enrolled in school.

Fourth, educational attainment beyond high school may be reduced if parental disability lowers family income and/or greatly increases medical expenses and thus reduces the household's ability to afford post-secondary schooling (Manoli and Turner, 2018; Hardy and Marcotte, 2022). Lower incomes also may result in lower parental monetary investments in extracurricular activities, such as SAT prep classes, music lessons, or private club sports, that have the potential to increase their children's probability of acceptance to college or motivate their children to pursue their education further (Kaufman and Gabler, 2004; Buchmann et al., 2010; Park et al., 2016).

Fifth, future earnings may be lower if children of disabled parents invest less in their education. Jajtner (2020) finds that living with a parent who has a work-limiting disability negatively affects girls', but not boys', intergenerational economic mobility, especially those from lower-income households. Those who live with a parent with a severe disability (one that interferes a lot or completely with the ability to work) are the most affected.

3. Related Literature on Parental Health Shocks

There is a growing literature showing that parental health shocks lead to reduced educational outcomes for children, and some studies have found that the gender of the parent and the child matter in determining these outcomes. For example, using detailed longitudinal data from Denmark, Aaskoven et al. (2022) find that the first onset of cancer in a parent negatively affects the likelihood that children will start and finish secondary education and lowers their ninth-grade final-exam scores. The effects are stronger for girls than for boys when the mother is the parent experiencing the health shock and when the shock is more severe, as measured by cancer specific survival rates. Their study points to the effects being driven by reduced parental

time and emotional investments rather than negative income shocks. In a longitudinal study of childhood poverty in Ethiopia, India, Peru, and Vietnam, Dhongde and Shemyakina (2018) find that parental health shocks reduce grade attainment, but they do not examine gender differences.

A few papers also report the effect of parental health shocks on children's time allocation in developing countries. Dinku et al. (2018) show that Ethiopian children whose fathers experience a health shock spend less time in school, while Ethiopian children whose mothers experience a health shock spend less time playing and in market work but more time on household tasks. They also show that maternal health shocks affect daughters more than sons and that paternal health shocks affect sons more than daughters. Dillon (2012) shows that in Mali, parental health shocks lead to an increase in children's time in household enterprises and child care fof other siblings. Using longitudinal time-use data and fixed effects, Alam (2015) shows that in Tanzania, a father's illness negatively affects primary-to-middle-school-aged children's school attendance and suggests that this likely results from the inability of the family to pay for schooling when the primary breadwinner can no longer work. Using individual fixed effects, Bratti and Mendola (2014) find that in Bosnia and Herzegovina, a mother's illness negatively affects the school enrollment of teenagers and young adults. Using panel data from Vietnam, Mendolia et al. (2019) also find that a mother's illness negatively affects the likelihood that adolescents, particularly girls, are enrolled in school and positively affects their working time, while a father's illness has no effect on their schooling but increases their likelihood of being employed.

4. Data and Descriptive Statistics

The ATUS is a time-use survey that draws its respondents from households that have completed their final CPS interview (U.S. Bureau of Labor Statistics, 2003–2019). For a subsample of these CPS households, one individual aged 15 and over per household is selected randomly for the ATUS. Besides answering some survey questions that update information about the respondent provided in the CPS (but not information about their parents other than their presence in the household), one 24-hour time diary is collected that details how the respondent spent his or her time beginning at 4 a.m. on the day prior to the interview and ending at 4 a.m. on the day of the interview. Respondents are interviewed most days of the year, except for major holidays. Half are interviewed on weekdays, while the other half are interviewed on weekend days. We use ATUS final weights, reweighted separately for equal-day-of-the-week representation for our male and female teen samples, in all our analyses to provide nationally representative estimates of time use for an average day.

For this study, we restrict the sample to unmarried teenagers aged 15–17 who lived with their parents, did not have their own children, and who were interviewed between 2003 and 2019.[2] In addition, because we are interested in examining the time that teenagers spend on school-related activities, we restrict the sample to school-year months (September–May). Our main independent variable is an indicator for whether a teenager lived with at least one parent who had a severe work-limiting disability. This indicator is created using several variables from the ATUS-CPS file which contains information collected in the final CPS interview approximately two to five months prior (85 percent of ATUS interviews occur within 2–3 months after the CPS) and is intended to identify parental disabilities that are severe enough to

[2] STATA code to replicate the analyses in this paper are available at: https://doi.org/10.5281/zenodo.4793763 (Kalenkoski and Pabilonia, 2021).

prevent the parent from doing any kind of work for the next six months.[3] In the labor force section of the CPS, respondents initially are asked whether they are working: "Last week, did you do ANY work for pay?" If they respond that they are disabled or unable to work, then they are asked additional disability questions to determine whether the disability is long-term rather than a temporary illness. Specifically, CPS respondents are asked, "Does your disability prevent you from accepting any kind of work during the next six months?"[4] Thus, at the time that teens are interviewed in the ATUS, their parents' work-limiting disability status should still be valid.[5] We acknowledge that this information is self-reported and may be subject to measurement bias, in which case our estimates would be biased toward zero. Our ATUS sample includes 3,021 females and 3,304 males (see Appendix Table A1 for information about the sample

[3] To verify that the information is not outdated at the time of the ATUS interview, we looked at a sample of mothers and fathers with teenagers aged 15–17 to check whether any who had reported that they were disabled in the final CPS month later reported that they were employed and at work at the time of their ATUS interview, because respondents are asked to update their labor force status. Only 8 of 231 (3 percent) reported working at the time of the ATUS interview. In addition, we were able to match about half of our ATUS sample to CPS month-in-sample 4 and find that, of those reporting a disability in CPS month-in-sample 8, 77 percent also reported a disability in CPS month-in-sample 4. This means most had a work-related disability for at least 14 months prior to their ATUS interview.

[4] In the U.S., working-age individuals may qualify for Social Security Disability Insurance (SSDI) if they have earned enough Social Security work credits within a certain time and meet the following criteria: 1) You are unable to do substantial gainful activity (work), 2) Your disability is expected to last for at least one year or result in death, and 3) Your impairment is on Social Security's list of disabling medical conditions. Once approved, there is a 5-month waiting period for benefits (USA.gov, 2022). Private long-term disability insurance is also an option that must be paid for prior to experiencing a disability.

[5] Since June of 2008, the monthly CPS also has asked respondents whether they or other household members aged 15 and older have any type of disability, which could include any physical, mental, or emotional condition that impacts activities of daily living (ADLs), but the condition does not have to limit employment. Approximately 6.4 percent of teenagers in our sample lived with a parent reporting any type of disability. For all teenagers who report a parental disability (either any type or a work-limiting disability), the two measures overlap for only 37 percent and measure different types and degrees of disability.

construction), of which 162 females and 185 males lived with a parent who had a work-limiting disability (about 5.8 percent of teenagers aged 15–17).[6]

For the time-diary portion of the interview, respondents report the start and stop time for their primary activities only (except for secondary child care of children under age 13), as well as where the activities took place and who was with them during the activity (for most activities). We examine teenagers' major time-use activities (school, work, household production, leisure, and sleep) as well as specific subcategories that may vary by parental-disability status (class time, homework, sports and other extracurricular activities, housework, shopping, food preparation and cleanup, caring for household children, caring for or helping household adults, and pet care). Appendix Table A2 details which activities are grouped into the categories examined. We also look at the time that respondents spend with a parent, one measure of parental supervision. When at home, "with whom" information covers all persons in the same room as the respondent at the time of the activity, unless the activity is sleeping, grooming, private activities, refused to classify type, or can't remember.[7] It is possible that parents may be home and aware of their children's activities but are not directly involved in them, and thus this indirect supervision would not be captured in our measure. While away from home, "with whom" information covers all persons who accompanied the respondent during the activity. In an exploratory analysis, we also considered all time teenagers spend with younger siblings as a measure that they were helping to care for household children while doing another primary activity; however, we did not find any support for this hypothesis.

[6] This percentage is in line with our findings based on the larger CPS sample (Figure 1). Meyer and Mok (2019) find that by age 50, about 9 percent of male household heads in the U.S. have a chronic and severe disability.

[7] Before 2010, "with whom" information was also not asked during time when the respondent was working. For consistency, we exclude time "with whom" while working throughout.

Table 1 presents the mean time spent in these activities on the average day for girls, by parental-disability status. We observe that girls living with a disabled parent spend about 80 minutes less on school and schooling-related activities on an average day than girls not living with a disabled parent. This includes 42 minutes less in class, 35 minutes less doing homework, and 3 minutes less on sports and extracurricular activities (although this latter difference is not statistically significant at conventional levels). Table 2 presents the same descriptive statistics, but for teen boys. For boys, we find no statistically significant differences in mean time spent on school and schooling-related activities when a disabled parent is present in the household.

There are no differences in overall household production activities for either girls or boys by parental-disability status, but there is a small, statistically significant difference in shopping time for girls. On the average day, girls who live with a disabled parent spend 8 minutes less shopping than girls who do not live with a disabled parent. These results suggest that teens living with disabled parents are not overburdened by housework or caregiving activities. Indeed, girls are spending more time on leisure activities (38 minutes more) on the average day than teens who do not live with a disabled parent. There is no difference in the amount of time that they spend with a parent by parental-disability status.

In Table 3, we present descriptive statistics for our control variables, by parental-disability status. We observe several clear demographic differences between teenagers living in households with a disabled parent and those living in households without a disabled parent. For both boys and girls, those living with a disabled parent are more likely to be living with a single mother, less likely to live with a parent who has a bachelor's degree, less likely to have younger siblings, and more likely to live in households with incomes less than $30,000 per year. Girls

living with a disabled parent are more likely to be nonwhite, have fewer siblings overall, and are less likely to live in a metropolitan area.

5. Econometric Analyses

5.1 Estimation Methods

To examine the relationship between parental disability and teenagers' time use, we estimate two models. Given the large number of zeroes for minutes spent in several activities (see column 1 in Tables 1 and 2) and because teens may not regularly participate in these activities, especially when we consider schooldays and non-school days, we estimate tobit models by maximum likelihood estimation rather than linear models by ordinary least squares (OLS) for those activities.[8] Outcomes in the tobit models include daily minutes spent on activities in the broad time-use categories of school and schooling-related activities, work and work-related activities, and household-production activities. Daily minutes spent in the various subcategories of school and schooling-related activities and household-production activities are examined in separate models as well. These models are specified as follows:

$$Y^* = \beta_0 + \beta_1 D + \beta_x X + \varepsilon, \quad (1)$$

$$Y = Y^* \text{ if } Y^* > 0,$$

$$Y = 0 \text{ if } Y^* \leq 0,$$

[8] If teens do an activity regularly but they do not do the activity on the one random day that they are surveyed, then OLS would be appropriate. This is because the zero is not a true zero; that is, they are true participators in the activity, but we do not observe them doing it. However, some teenagers are not enrolled in school, are not working, do not have a pet, or do not regularly help around the house. These are true non-participation zeros and thus warrant the use of tobit models (Kalenkoski and Pabilonia, 2012).

where Y* is a latent variable for desired time use; Y is the observed time-use variable measured as daily minutes spent on an activity; D is an indicator variable equal to one if the teenager lives with a parent who has a work-limiting disability and zero otherwise; and X is a vector of control variables. Bratti et al. (2020) among others show that family size and sibling age structure are important in explaining parental investments in children. Therefore, we include a continuous measure of the number of siblings (to control for family size) and indicator variables for having younger siblings in the home (as they might require care or supervision from the teen), having older siblings in the home (as they may be more likely called upon to provide care than the teen respondent or may act as a role model), and having same age siblings in the home (to more completely control for sibling structure). X also includes demographic and economic variables that are standard in time-use studies, including indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, extra adult (older than age 18) in the household, household income ($30,000–74,999, ≥$75,000, missing), lives in a metropolitan area, Census region, weekday, month, and year.[9] β_0 is a constant. The coefficient β_1 and vector of coefficients, β_x, are to be estimated. The error term, ε, follows a normal distribution with mean 0 and variance σ^2. The subscripts indicating individual observations are suppressed.

Daily minutes spent sleeping, daily minutes spent in leisure activities, and daily minutes spent with a parent are examined in separate models. As all students regularly spend some time sleeping, in leisure, and with a parent, we estimate the following linear models by OLS for these activities:

[9] Teenagers' health or disability status could also impact their time allocation. From June 2008 forward, we have information on teenagers' ADLs (hearing, seeing, dressing, concentrating, walking, dressing, and going out); however, only 3.2 percent of teens report this type of disability. When we included a control for teen disability status in our models, our results were similar (estimates not shown here).

$$Y = \gamma_0 + \gamma_1 D + \gamma_x X + \mu \quad (2)$$

where Y is daily minutes spent in each time-use activity and the other variables are defined as above. γ_0 is a constant. The coefficient γ_1 and vector of coefficients, γ_x, are to be estimated; μ is the error term with mean 0 and variance σ^2.

5.2 Results

Table 4 presents our main results showing the estimated average marginal effects for the observed time-use outcomes from the tobit models and coefficients for the linear models.[10] These show the relationships between parental-disability status and teens' time use on the average day, controlling for demographic and economic factors.[11] Boys' time use is largely unrelated to living with a disabled parent with the exception that they spend 29 minutes less time sleeping than boys not living with a disabled parent. Girls living with a disabled parent, however, spend substantially less time in school and schooling-related activities on the average day (55 minutes less) compared to girls not living with a disabled parent. They spend 19 minutes less doing homework and 41 minutes less in class. Girls with a disabled parent spend more time doing pet care (3 minutes more) and less time shopping (6 minutes less) than girls without a disabled parent. They also get more leisure than girls without a disabled parent (28 minutes more). The estimated negative relationship between homework time and parental disability and the estimated positive relationship between leisure and parental disability for teen girls are

[10] As a robustness test, we also estimated linear models using OLS and zero-inflated Poisson models and find similar results, though the marginal effects from the zero-inflated Poisson models, which allow for different effects on the intensive and extensive margins, are not directly comparable because they are for those teens participating in the activity, while the marginal effects from the tobit models are for the observed outcomes (see Appendix Tables A.3 and A.4 for more details).

[11] We also estimated specifications without controls for household income. Results are similar, suggesting that income is not an important mediating factor. This is consistent with the conclusions of Kristiansen (2021) and Aaskoven et al. (2022).

consistent with the hypothesis that children living with a disabled parent receive less supervision (or the disabled parent is more lenient) than children not living with a disabled parent, although we find no direct evidence that they spend less time with a parent.[12]

We consider whether our main results differ by whether a teen has younger siblings or older siblings by adding interactions of these indicators with parental-disability status to our models. For girls, we do not find that the results are meaningfully different for schooling or pet-care activities by sibling-age structure (Table 5). However, we do find that girls with younger siblings spend more time on leisure activities and with a parent compared to girls without younger siblings if they live with a parent who is disabled, while girls with older siblings do not differ from girls without older siblings in their time use on these activities by parental-disability status. In addition, girls with older siblings are more likely to work if their parent is disabled, perhaps because their older siblings can provide them with job connections. For boys, we do not find that the results are different for sleep by sibling-age structure. However, we find a negative relationship between parental disability and shopping for boys with younger siblings and a small negative relationship between parental disability and caring for household children for boys with older siblings. The latter is consistent with prior research suggesting that older children may have more responsibilities in the household than younger siblings.

Table 6 shows the relationships between parental-disability status and teenager time use for the major time-use categories and homework on schooldays and non-schooldays separately.

[12] Using an alternative indicator of disability (a measure of disability that is activity limiting but not necessarily work limiting), we also find a negative relationship between girls' school and schooling-related activities and parental disability (though not as strong) and a positive relationship between girls' pet-care activities and parental disability (see Appendix Table A5). In addition, we find that girls spend more time with their parents when at least one parent is disabled.

Girls living with a disabled parent spend less time in school and schooling-related activities, with one fourth of the reduction coming from homework time, on schooldays only. Boys living with a disabled parent do not have a reduction in educational time on any day, but they do sleep less and engage more in paid work on schooldays. On non-schooldays, however, they spend less time on paid work. Thus, the timing of teens' educational activities, work activities, and sleep are related to a parent's disability, with potentially detrimental effects on grades.[13] Sample sizes are reduced significantly when examining schooldays and non-schooldays separately, so we do not look at this breakdown when we look at two-parent households and single mothers separately.

Tables 7 and 8 examine the time use of teenagers living in two-parent households to determine whether the gender of the disabled parent matters. Table 7 shows the results for girls and Table 8 shows the results for boys. For teen girls living in two-parent households, mother's disability status matters more for their time allocation than father's disability status. Girls spend 71 minutes less in school and schooling-related activities when they live with a disabled mother compared to girls that do not. They also spend 9 minutes more on pet care if they live with a disabled mother. Girls living with a disabled father spend 5 minutes less on food preparation and cleanup. Regardless of the gender of the disabled parent, girls spend 9 minutes less time shopping if they live with a disabled parent.

Looking at the results in Table 8, we observe that, for the most part, father's disability status matters more than mother's disability status for teen boys' time allocation in two-parent households, which is consistent with research suggesting that gender-specific parental role

[13] For example, Groen and Pabilonia (2019) find that teenagers who sleep less on weekdays earn lower grades.

modeling is pervasive, as fathers spend more time with sons and mothers spend more time with daughters (Morgan et al., 1988; Noller & Callan, 1990; Lundberg et al., 2017). Boys living with a disabled mother spend 5 minutes less on housework and 3 minutes less caring for other household children. Boys living with a disabled father spend about 9 minutes more in food preparation and cleanup than boys who do not and less time with their mothers (31 minutes less). One plausible explanation for the latter result is that their mothers are busy caring for their husbands, because formal care is often prohibitively expensive or not preferred (Lee, 2020). Another plausible explanation is that their mothers are more likely to be employed or working longer hours to support the family.[14] To explore these hypotheses, we use a separate sample of mothers living with teenage boys in coupled households from the ATUS to examine the relationship between mothers' time allocation and the disability status of the mother and father; however, we do not find any relationship between the employment status or minutes worked by the father's disability status nor do we find mothers reporting that they spend less time with their sons or more time with their partners (see Appendix Table A.6). Milke et al. (2021) show,

[14] A labor-leisure model does not provide a clear prediction as to how household members' labor supply will respond to severe health shocks experienced by the family breadwinner (Muller et al., 1979). Nils (2014) finds that disability has no effect on German parents' labor market outcomes. Mussida and Sciulli (2019) find that women in Italy are less likely to be employed when living with a disabled partner, while women in France and the UK are more likely to be employed. Using long panels of administrative data on Danish families, Fadlon and Nielsen (2021) find that spouses do not substantially alter their labor supply on average when their partners experience a severe but non-fatal health shock (specifically, a heart attack or stroke), but there is heterogeneity in the response to the shock, and their paper suggests that families to some extent use spousal labor supply to self-insure. Using the Panel Study of Income Dynamics and the ATUS, Meyer and Mok (2019) do not find that wives statistically significantly reduce their labor supply following a spousal disability. Using the Survey of Income and Program Participation, Anand et al. (2021) find that the labor force participation of potential caregivers decreases after the onset of a spousal work-limiting disability.

however, that parents and teens perceive and report time together differently, so this may be why we are not seeing the expected associations.

Finally, in Table 9, we examine boys and girls in single-mother households (the sample of single fathers is too small to examine separately). We find that boys' time use is unrelated to mother's disability status. However, girls living with a disabled single mother spend less time in class and on homework (61 minutes and 18 minutes, respectively) and more time on leisure activities (52 minutes) than girls living with non-disabled single mothers.

6. Summary and Discussion

Using the 2003–2019 ATUS, we examine the relationship between a parent's severe, work-limiting disability and teenagers' time allocation. We find that girls living with a disabled mother are at risk for poorer educational outcomes, as they spend about an hour less on school and schooling-related activities on the average day than those not living with a disabled mother. The reduction appears to be concentrated primarily on schooldays, as expected, and it is true both in two-parent families and in single-mother families. The sizeable negative relationship between educational time and living with a disabled parent for girls, but not boys, in the full sample is consistent with Jajtner's (2020) finding that girls', but not boys', intergenerational economic mobility is affected negatively by parental disability.

Another important finding for girls is that they spend more time in leisure when living with a disabled mother, even as they are spending less time in educational activities. Perhaps this is because living with a disabled mother means less supervision of teen girls' activities. Girls' time use appears to be largely unaffected by a father's disability, consistent with other

empirical evidence showing that mothers and fathers spend time differently with girls and boys (e.g., Lundberg et al., 2017; Schulz, 2021).

Although the educational time use of teen boys is unrelated to having a disabled parent, boys spend less time sleeping and more time in market work, which could still have negative implications for their educational outcomes. Their time use also appears to be more related to the father having a disability than the mother, again consistent with the idea that mothers and fathers spend time with girls and boys differently.

Finally, we note that controlling for income does not affect our findings. Thus, further policies beyond SSDI that provide income to disabled parents may not improve their children's time allocations.

7. Limitations

A limitation of the current study is that we cannot control for unobserved household heterogeneity in this cross-sectional analysis. However, unobserved parental characteristics may affect both a parent's health and a teen's activities (Bratti and Mendola, 2014). One example might be future orientation. Parents who place less emphasis on the future may engage in risky behaviors that affect their future health. They also may convey to their children this lack of emphasis on the future, which might cause them to spend less time in educational activities.[15] Future research in the U.S. could use panel-data techniques to control for this unobserved household heterogeneity if repeated observations were available on the same families. In

[15] For example, Pabilonia and Song (2013) find that single mothers who smoke spend less time with their young children under the age of 13 in educational activities such as reading and homework.

addition, future research should explore how changes in teens' time allocation resulting from parental disability affect future educational outcomes.

Another limitation is that a teenager's co-residence with a parent may be endogenous to the parent's disability. That is, whether a teen lives with a disabled parent may be related to the disability itself. We cannot address this issue with our data because we only have information about parent's disability status if teens live with their parents. However, the impact of this potential endogeneity is likely to be small, given that the age group selected for this study, teens aged 15–17, are legally considered minor children in the U.S., and thus the responsibility of their parents. A further limitation is that we do not know when the parent's disability started. Teenagers' time use may be affected differently if they lived their entire life with a disabled parent than if the disability occurred more recently in their lives.

A final limitation is that we use self-reported disability status, which could be measured with error. If this measurement error is random, then our estimates could be biased toward zero. Nevertheless, we find large negative effects of parental disability on girls' educational time that is consistent with the prior literature, suggesting time use as one potential mechanism for the intergenerational transmission of educational outcomes.

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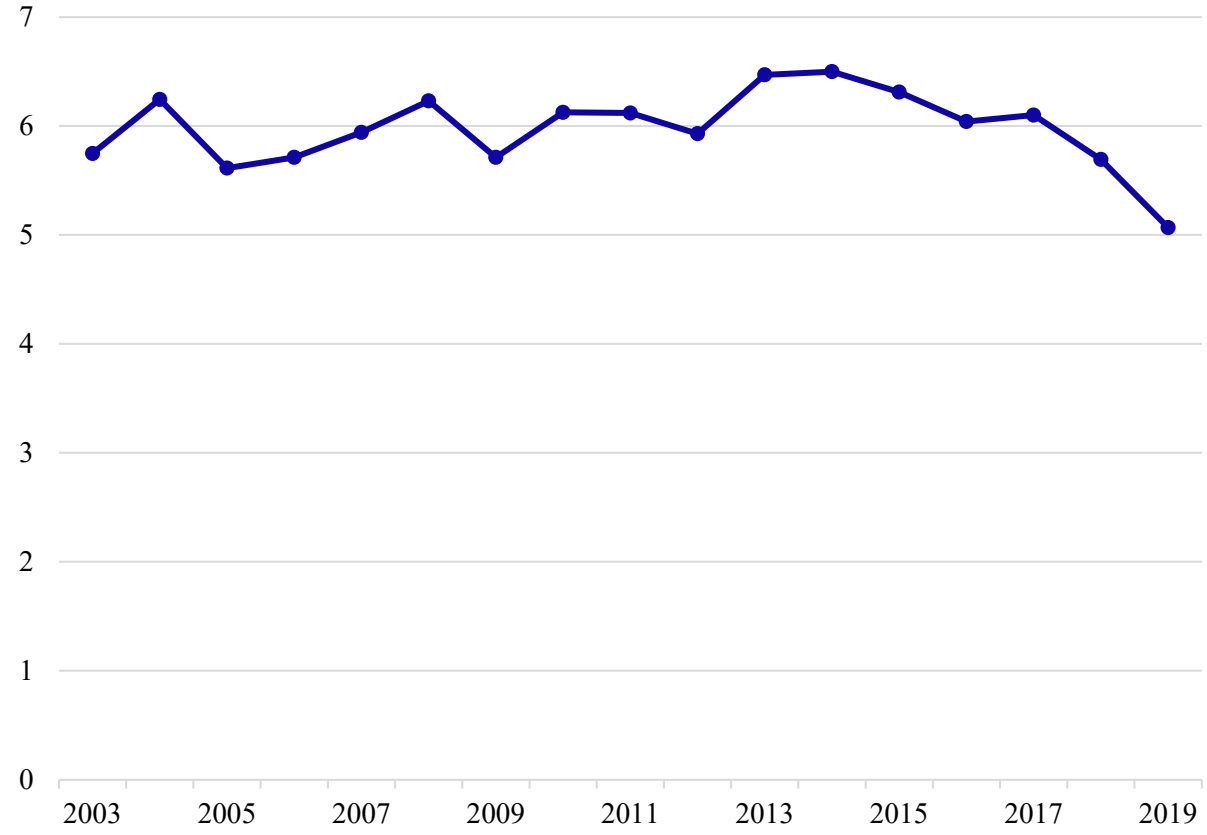
Figure 1. Percentage of teenagers aged 15–17 living with a parent who has a work-limiting disability (Percent)



Note: N = 1,075,439. The sample is restricted to those teens living with a parent.

Source: Authors' calculations based on the Current Population Survey.

Table 1. Summary statistics for teen girls' activities, by parental work-limiting disability status

Activity	% engage in activity	Minutes per Average Day: Parental Disability Mean	Minutes per Average Day: No Parental Disability Mean	Difference	p-value
School and schooling-related activities	75.5	233.454	313.566	-80.112	0.001
Class	56.2	174.211	215.798	-41.587	0.044
Homework	50.3	32.027	67.241	-35.214	0.000
Sports/extracurricular activities	26.4	27.216	30.527	-3.311	0.622
Work and work-related activities	11.7	36.707	27.127	9.580	0.286
Household production	71.5	65.131	64.489	0.642	0.936
Housework (cleaning, laundry, etc.)	22.5	17.621	14.874	2.748	0.449
Shopping	31.7	11.648	19.256	-7.608	0.012
Food preparation and cleanup	28.4	12.063	11.153	0.910	0.721
Caring for household children	10.3	3.736	4.677	-0.941	0.558
Caring/helping household adults	4.4	1.363	0.976	0.387	0.603
Pet care	9.7	5.670	3.279	2.391	0.153
Leisure	99.7	353.441	315.485	37.956	0.032
Sleep	100.0	578.793	555.549	23.244	0.115
Time with a parent	84.5	192.523	165.246	27.277	0.196
Time with mother	77.7	170.891	143.673	27.218	0.198
Time with father	53.2	78.638	79.040	-0.401	0.976
Number of observations	3,021	162	2,859		

Note: ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. P-values are from Wald tests of the equality of means of teens living with a disabled parent and those not living with a disabled parent. The sample includes unmarried teenagers aged 15–17 living with their parents. The sample has been restricted to school-year months. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 2. Summary statistics for teen boys' activities, by parental work-limiting disability status

Activity	% engage in activity	Minutes per Average Day: Parental Disability Mean	Minutes per Average Day: No Parental Disability Mean	Difference	p-value
School and schooling-related activities	80.2	300.694	324.338	-23.644	0.356
Class	56.3	194.881	218.864	-23.983	0.200
Homework	43.3	43.138	48.496	-5.358	0.630
Sports/extracurricular activities	41.1	62.675	56.978	5.698	0.534
Work and work-related activities	12.4	28.425	29.736	-1.311	0.871
Household production	58.0	41.012	39.451	1.561	0.780
Housework (cleaning, laundry, etc.)	12.6	8.711	7.016	1.695	0.514
Shopping	21.1	8.335	9.248	-0.912	0.632
Food preparation and cleanup	17.8	9.981	4.851	5.130	0.135
Caring for household children	6.2	1.187	2.167	-0.980	0.361
Caring/helping household adults	2.8	1.429	0.703	0.726	0.285
Pet care	7.0	2.497	2.153	0.343	0.678
Leisure	99.8	383.144	350.474	32.670	0.110
Sleep	99.9	558.909	568.086	-9.177	0.487
Time with a parent	79.6	120.812	129.842	-9.030	0.531
Time with mother	70.5	86.895	98.769	-11.874	0.335
Time with father	54.1	68.889	83.089	-14.200	0.227
Number of observations	3,304	185	3,119		

Note: ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. P-values are from Wald tests of the equality of means of teens living with a disabled parent and those not living with a disabled parent. The sample includes unmarried teenagers aged 15–17 living with their parents. The sample has been restricted to school-year months. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 3. Summary statistics for control variables, by teen's gender and parental work-limiting disability status

	GIRLS				BOYS			
	Parental Disability	No Parental Disability			Parental Disability	No Parental Disability		
	Mean	Mean	Difference	p-value	Mean	Mean	Difference	p-value
Age 15	0.293	0.288	0.005	0.909	0.274	0.270	0.003	0.935
Age 16	0.324	0.365	-0.041	0.364	0.366	0.370	-0.004	0.932
Age 17	0.383	0.347	0.036	0.484	0.360	0.360	0.000	0.991
White	0.700	0.789	-0.089	0.054	0.715	0.780	-0.065	0.138
Nonwhite	0.300	0.211	0.089	0.054	0.285	0.220	0.065	0.138
Hispanic	0.213	0.210	0.004	0.940	0.286	0.230	0.056	0.197
Single mother	0.375	0.221	0.155	0.002	0.296	0.206	0.089	0.026
Single father	0.063	0.038	0.025	0.269	0.083	0.048	0.035	0.197
Two parents in household	0.562	0.741	-0.179	0.000	0.622	0.746	-0.124	0.005
Parent has bachelor's degree	0.164	0.448	-0.284	0.000	0.080	0.428	-0.348	0.000
Extra adult age 19+	0.344	0.341	0.003	0.961	0.400	0.343	0.057	0.227
Number of siblings	1.139	1.449	-0.310	0.008	1.361	1.407	-0.046	0.743
Younger sibling(s)	0.348	0.565	-0.217	0.000	0.406	0.549	-0.143	0.002
Older sibling(s)	0.406	0.384	0.022	0.680	0.434	0.383	0.051	0.282
Same age sibling(s)	0.020	0.030	-0.010	0.497	0.052	0.027	0.025	0.283
Income missing	0.058	0.052	0.006	0.783	0.106	0.059	0.047	0.097
Income < $30,000	0.542	0.181	0.361	0.000	0.486	0.186	0.300	0.000
Income $30,000–$74,999	0.287	0.344	-0.057	0.218	0.354	0.348	0.007	0.885
Income ≥ $75,000	0.113	0.423	-0.310	0.000	0.054	0.407	-0.353	0.000
Lives in metropolitan area	0.723	0.859	-0.137	0.005	0.810	0.849	-0.039	0.254
Census region (Northeast)	0.193	0.230	-0.037	0.341	0.235	0.230	0.005	0.907
Census region (South)	0.485	0.345	0.140	0.006	0.360	0.358	0.002	0.967
Census region (West)	0.209	0.264	-0.055	0.212	0.190	0.249	-0.059	0.087
Weekday (non-holiday)	0.700	0.696	0.004	0.916	0.671	0.699	-0.028	0.484
Number of observations	162	2,859			185	3,119		

Note: ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. P-values are from Wald tests of the equality of means of teens living with a disabled parent and those not living with a disabled parent. The sample includes unmarried teenagers aged 15–17 living with their parents. The sample has been restricted to school-year months (September–May). Month and year fixed effects are included as controls in regressions but not shown here. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 4. The relationship between parental work-limiting disability and teen's time spent on activities in minutes per average day, by teen's gender

	GIRLS (N = 3,021)		BOYS (N = 3,304)	
Dependent Variables	**Marginal Effect**	**Std. Error**	**Marginal Effect**	**Std. Error**
School and schooling-related activities	-55.406***	(19.630)	11.272	(23.216)
Class	-41.266**	(17.800)	-6.511	(15.154)
Homework	-18.714***	(6.465)	7.681	(9.505)
Sports/extracurricular activities	3.061	(8.034)	0.578	(9.049)
Work and work-related activities	13.973	(9.264)	10.971	(9.601)
Household production	0.570	(7.318)	-0.991	(4.746)
Housework (cleaning, laundry, etc.)	3.214	(3.381)	-0.141	(1.954)
Shopping	-6.163**	(2.960)	-0.921	(2.079)
Food preparation and cleanup	-1.404	(2.233)	3.011	(2.055)
Caring for household children	2.792	(3.098)	-0.759	(0.853)
Pet care	3.148*	(1.753)	1.042	(1.040)
Leisure	28.217*	(16.500)	16.602	(20.924)
Sleep	2.951	(13.720)	-28.697**	(11.985)
Time with a parent	20.676	(20.527)	-3.044	(14.359)

Note: Marginal effects presented with robust standard errors in parentheses. ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 5. The relationship between parental work-limiting disability and teen's time spent on activities in minutes per average day, by sibling age structure

	GIRLS (N = 3,021)				BOYS (N = 3,304)			
	Younger Sibling		Older Sibling		Younger Sibling		Older Sibling	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
School and schooling-related activities	-92.671***	(30.214)	-103.148***	(30.075)	33.111	(38.850)	17.565	(36.284)
Class	-75.271**	(31.981)	-83.614***	(28.941)	18.493	(21.146)	11.078	(24.372)
Homework	-23.646**	(9.337)	-28.157***	(10.358)	12.953	(20.366)	-1.080	(12.482)
Sports/extracurricular activities	-3.007	(11.977)	0.922	(13.260)	-5.040	(12.970)	-4.072	(15.519)
Work and work-related activities	11.611	(13.128)	32.058*	(19.361)	-2.880	(11.393)	0.954	(11.486)
Household production	19.830	(13.124)	14.472	(14.520)	-7.001	(6.258)	-3.585	(7.657)
Housework	3.811	(5.230)	4.198	(5.775)	-2.146	(2.443)	-1.959	(3.011)
Shopping	0.563	(4.896)	-3.501	(5.503)	-7.465***	(2.491)	-2.545	(3.207)
Food preparation and cleanup	2.172	(4.084)	-2.468	(2.940)	2.654	(3.394)	2.345	(3.451)
Caring for household children	-1.360	(2.947)	2.607	(3.621)	-1.321	(1.411)	-1.721***	(0.375)
Pet care	5.679	(3.562)	7.554*	(3.999)	0.657	(1.308)	0.931	(1.747)
Leisure	71.659***	(27.630)	13.255	(23.364)	22.644	(34.295)	45.679	(38.948)
Sleep	-12.855	(19.398)	25.045	(20.386)	-53.869***	(20.232)	-39.104**	(18.935)
Time with parent	60.429**	(30.249)	7.830	(28.854)	-22.533	(25.295)	-25.192	(22.745)

Note: Marginal effects presented with robust standard errors in parentheses. ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 6. The relationship between parental work-limiting disability and teen's time spent on activities in minutes per day, by teen's gender and on schooldays and non-schooldays

		GIRLS			BOYS	
Dependent Variables	**N**	**Marginal Effect**	**Std. Error**	**N**	**Marginal Effect**	**Std. Error**
Panel A. Schooldays	1,457			1,568		
School and schooling-related activities		-79.475***	(29.710)		-4.889	(34.388)
Homework		-22.314***	(8.177)		10.835	(13.744)
Work and work-related activities		15.903	(11.452)		24.465*	(13.167)
Household production		8.977	(9.319)		0.250	(5.435)
Leisure		28.145	(21.580)		37.170	(26.039)
Sleep		3.047	(17.424)		-46.477***	(15.506)
Time with a parent		26.712	(22.983)		-3.735	(15.267)
Panel B. Non-schooldays	1,564			1,736		
School and schooling-related activities		-19.249	(13.262)		27.938	(20.576)
Homework		-12.812	(9.837)		2.243	(9.924)
Work and work-related activities		7.631	(14.462)		-20.972***	(6.981)
Household production		-17.822	(11.130)		-3.436	(9.266)
Leisure		32.375	(24.327)		-23.437	(29.948)
Sleep		-11.979	(17.056)		16.122	(16.612)
Time with a parent		19.291	(36.468)		-8.392	(29.230)

Note: Marginal effects presented with robust standard errors in parentheses. ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 7. The relationship between parental work-limiting disability and teen girl's time spent on activities in minutes per average day in two-parent households, by gender of disabled parent (N = 2,077)

	Mother disabled		Father disabled	
Dependent Variables	**Marginal Effect**	**Std. Error**	**Marginal Effect**	**Std. Error**
School and schooling-related activities	-71.313*	(36.797)	-1.426	(37.028)
Class	-71.338**	(36.159)	18.260	(30.323)
Homework	-22.498**	(10.863)	-9.125	(14.891)
Sports/extracurricular activities	5.391	(18.691)	-2.009	(10.760)
Work and work-related activities	26.314	(16.002)	22.924	(18.491)
Household production	15.488	(15.047)	-9.141	(10.576)
Housework (cleaning, laundry, etc.)	5.206	(5.725)	-2.619	(5.208)
Shopping	-9.431*	(5.033)	-9.150*	(5.087)
Food preparation and cleanup	3.971	(4.191)	-5.059*	(2.764)
Caring for household children	0.365	(4.431)	5.106	(8.904)
Pet care	8.863**	(4.131)	3.948	(2.879)
Leisure	28.010	(36.664)	-5.468	(25.011)
Sleep	-22.039	(23.523)	-3.020	(30.026)
Time with parent	25.850	(34.269)	-4.704	(32.206)
Time with mother	10.895	(33.779)	4.712	(32.685)
Time with father	14.367	(24.072)	24.711	(30.776)

Note: Marginal effects presented with robust standard errors in parentheses. ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 8. The relationship between parental work-limiting disability and teen boy's time spent on activities in minutes per average day in two-parent households, by gender of disabled parent (N = 2,312)

	Mother disability		Father disability	
Dependent Variables	**Marginal Effect**	**Std. Error**	**Marginal Effect**	**Std. Error**
School and schooling-related activities	42.592	(52.781)	-9.107	(34.586)
Class	-9.321	(30.883)	-7.951	(21.573)
Homework	50.321	(31.736)	-5.884	(10.546)
Sports/extracurricular activities	-8.424	(13.736)	0.046	(14.858)
Work and work-related activities	15.898	(21.511)	10.666	(13.107)
Household production	-2.718	(7.233)	0.550	(7.644)
Housework (cleaning, laundry, etc.)	-4.842**	(1.975)	2.107	(3.286)
Shopping	1.859	(4.692)	-3.253	(2.818)
Food preparation and cleanup	-1.377	(2.065)	8.658*	(4.633)
Caring for household children	-2.552***	(0.442)	-0.975	(1.553)
Pet care	2.621	(2.270)	0.409	(1.377)
Leisure	-26.226	(43.878)	-7.970	(28.879)
Sleep	-12.729	(27.490)	-17.668	(15.937)
Time with a parent	-3.082	(31.870)	-14.751	(22.177)
Time with mother	2.059	(29.937)	-31.463**	(14.327)
Time with father	-2.509	(28.863)	2.022	(20.505)

Note: Marginal effects presented with robust standard errors in parentheses. ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table 9. The relationship between parental work-limiting disability and teen's time spent on activities in minutes per average day in single mother households, by teen's gender

	GIRLS (N = 803)		BOYS (N = 794)	
Dependent Variables	**Marginal Effect**	**Std. Error**	**Marginal Effect**	**Std. Error**
School and schooling-related activities	-72.434***	(28.597)	-0.842	(27.374)
Class	-60.952**	(26.746)	-1.724	(23.939)
Homework	-18.491***	(7.031)	-7.455	(6.803)
Sports/extracurricular activities	3.008	(8.994)	-3.785	(12.695)
Work and work-related activities	-1.618	(11.787)	18.648	(16.825)
Household production	-7.138	(9.718)	-1.249	(9.161)
Housework (cleaning, laundry, etc.)	2.413	(4.657)	3.311	(5.232)
Shopping	1.022	(5.207)	0.179	(3.056)
Food preparation and cleanup	-4.411	(3.543)	-0.107	(2.023)
Caring for household children	2.980	(2.481)	1.784	(2.001)
Pet care	-0.335	(1.387)	-	-
Leisure	51.778**	(22.963)	38.573	(27.835)
Sleep	16.805	(21.130)	-27.907	(18.255)
Time with a parent	32.146	(33.534)	25.297	(21.926)

Note: Marginal effects presented with robust standard errors in parentheses. ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, parent has a bachelor's degree, number of siblings, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month and year. For boys, the pet care model would not converge. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Authors' calculations based on the ATUS (2003–2019).

Appendix

Table A.1 Sample selection

Criteria	**N**
Teenagers aged 15–17	8,741
Drop if interviewed in June–August	6,650
Drop if not living with a parent in ATUS	6,411
Drop if living with same-sex parents	6,405
Drop if married or living with partner	6,389
Drop if have children	6,354
Drop if missing parent information from ATUS-CPS (disability, etc.)	6,325
Girls	3,021
Boys	3,304

Table A.2 Activity codes used for time-use categories

Time-Use Category	ATUS Activity Codes
School and schooling-related activities	06: Education
	1301: Participating in sports, exercise, and recreation
	130301: Waiting related to playing sports or exercising
	130401: Security related to playing sports or exercising
Select subcategories:	
Class	0601: Taking class
Homework	0603: Research/Homework
Sports	1301: Participating in sports, exercise, and recreation
	130301: Waiting related to playing sports or exercising
	130401: Security related to playing sports or exercising
Extracurricular activities	0602: Extracurricular school activities (except sports)
Work and work-related activities	05: Work and work-related activities
Household production	02: Household activities (cleaning, laundry, etc.)
	03: Caring for and helping household members
	07: Consumer purchases
Select subcategories:	
Housework (cleaning, laundry)	0201: Housework
Shopping	07: Consumer purchases
Food preparation and cleanup	0202: Food and drink preparation, presentation, and clean-up
Caring for household children	0301: Caring for and helping household children
	0302: Activities related to household children's education
Caring/helping household adults	0304: Caring for household adults
	0305: Helping household adults
Pet care	0206: Animals and pets
Leisure	11: Eating and drinking
	12: Socializing, relaxing, and leisure
	1302: Attending sports/recreational events
	130302: Waiting related to attending sporting events
	130402: Security related to attending sporting events
	14: Religious and spiritual activities
	15: Volunteer activities
	160101: Telephone calls to/from family members
	160102: Telephone calls to/from friends, neighbors, or acquaintance
Sleep	0101: Sleeping

Source: ATUS Activity Lexicon 2003–2019 (U.S. Bureau of Labor Statistics 2020a)

Table A.3 The relationship between parental work-limiting disability and teen's time spent on activities in minutes per average day, by teen's gender (OLS estimates)

	GIRLS (N = 3,021)		BOYS (N = 3,304)	
Dependent Variables	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**
School and schooling-related activities	-54.726***	(19.069)	15.297	(22.825)
Class	-35.556**	(16.276)	-2.870	(14.004)
Homework	-21.866***	(6.101)	11.965	(10.719)
Sports/extracurricular activities	2.696	(7.489)	6.203	(9.160)
Work and work-related activities	11.048	(8.789)	1.205	(8.804)
Household production	1.044	(8.020)	-1.552	(5.192)
Housework (cleaning, laundry, etc.)	0.713	(3.760)	0.288	(2.688)
Shopping	-6.806**	(3.336)	-1.139	(1.990)
Food preparation and cleanup	-0.512	(2.667)	4.516	(3.255)
Caring for household children	0.781	(1.678)	-0.678	(1.125)
Pet care	2.756	(1.680)	0.219	(0.859)
Leisure	28.217*	(16.500)	16.602	(20.924)
Sleep	2.951	(13.720)	-28.697**	(11.985)
Time with a parent	20.676	(20.527)	-3.044	(14.359)

Note: ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Robust standard errors are presented in parentheses. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Authors' calculations based on the ATUS (2003–2019).

Table A.4 The relationship between parental work-limiting disability and teen's time spent on activities in minutes per average day when teens are participating in the activity, by teen's gender (Zero-inflated Poisson model estimates)

	GIRLS (N = 3,021)		BOYS (N = 3,304)	
Dependent Variables	**Marginal Effect**	**Std. Error**	**Marginal Effect**	**Std. Error**
School and schooling-related activities	-51.211***	(18.403)	17.276	(23.652)
Class	-37.202**	(15.011)	-9.134	(12.904)
Homework	-23.264***	(6.499)	15.795	(13.759)
Sports/extracurricular activities	6.924	(9.517)	4.721	(9.292)
Work and work-related activities	17.845*	(10.258)	8.347	(11.145)
Household production	0.799	(7.959)	-1.368	(4.899)
Housework (cleaning, laundry, etc.)	1.008	(3.342)	0.052	(2.191)
Shopping	-6.859**	(3.253)	0.764	(2.560)
Food preparation and cleanup	-0.560	(2.299)	2.702	(1.704)
Caring for household children	3.831	(3.684)	-0.992	(0.909)
Pet care	2.758	(2.012)	0.702	(1.124)
Leisure	27.355*	(15.998)	15.527	(20.373)
Sleep	3.105	(13.349)	-28.119**	(11.621)
Time with a parent	25.795	(19.916)	-2.577	(15.021)

Note: ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Robust standard errors are presented in parentheses. For leisure and sleep outcomes, the Poisson model is used as almost all are participating. Marginal effects are for those participating in the activity, while tobit marginal effects presented elsewhere are for the observed outcome. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations based on the ATUS (2003–2019).

Table A.5 The relationship between any parental disability and teen's time spent on activities in minutes per average day, by teen's gender

	GIRLS (N = 1,616)		BOYS (N = 1,798)	
Dependent Variables	**Marginal Effect**	**Std. Error**	**Marginal Effect**	**Std. Error**
School and schooling-related activities	-39.068*	(21.457)	4.109	(22.602)
Class	-22.120	(17.385)	15.137	(17.588)
Homework	0.266	(8.483)	-3.105	(7.671)
Sports/extracurricular activities	-7.691	(5.918)	0.854	(9.798)
Work and work-related activities	16.169	(11.088)	6.085	(10.098)
Household production	11.298	(8.141)	6.096	(5.428)
Housework (cleaning, laundry, etc.)	0.812	(4.175)	1.447	(2.492)
Shopping	2.290	(5.780)	2.075	(2.732)
Food preparation and cleanup	2.588	(3.130)	1.112	(2.012)
Caring for household children	0.497	(2.400)	0.719	(1.684)
Pet care	6.637**	(3.007)	0.708	(1.204)
Leisure	5.592	(19.716)	-3.900	(19.297)
Sleep	-2.803	(14.120)	-6.148	(14.668)
Time with a parent	42.239**	(20.901)	-9.814	(14.775)

Note: These regressions use an alternative measure of disability introduced in the CPS in June 2008 (not necessarily work-limiting); data cover the period from June 2008–2019. Marginal effects presented with robust standard errors in parentheses. ATUS final weights reweighted separately for equal-day-of-the-week representation for our male and female teen samples are used. Control variables include number of siblings and indicators for age, nonwhite, Hispanic ethnicity, single mother, single father, parent has a bachelor's degree, younger sibling(s), older sibling(s), same age sibling(s), extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. For boys, the work model would not converge. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations based on the ATUS (2008–2019).

Table A6. The relationship between parental work-limiting disability and mother's activities in coupled households with teen boys aged 15–17, by gender of disabled parent (N = 2,540)

	Mother disability		Father disability	
Dependent Variables	**Marginal Effect**	**Std. Error**	**Marginal Effect**	**Std. Error**
Employed	-	-	-0.054	(0.056)
Work and work-related activities (min/day)	-	-	-21.677	(37.025)
Household production (min/day)	69.679*	(38.707)	-82.722***	(24.960)
Leisure (min/day)	142.227***	(32.347)	74.300**	(32.014)
Sleep (min/day)	35.234	(25.000)	15.901	(21.157)
Time with boys (min/day)	83.938**	(41.978)	3.725	(38.382)
Time with partner (min/day)	27.504	(27.631)	4.978	(30.993)

Note: The first row contains estimates from a probit model. The second row contains estimates from a tobit model. If mother is disabled, she is, by definition, not working. The remaining rows are estimated using OLS. ATUS final weights reweighted separately for equal-day-of-the-week representation for our sample. Robust standard errors are presented in parentheses. Control variables include a quadratic in age, number of own household children under age 19, and indicators for nonwhite, Hispanic ethnicity, cohabiter, parent has a bachelor's degree, extra adult age 19+, income ($30,000–$74,999, ≥$75,000, missing), lives in a MSA, Census region, weekday, month, and year. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source*: Calculations based on the ATUS (2003–2019).