No time for college? An investigation of time poverty and parenthood

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Abstract

Postsecondary outcomes are significantly worse for student parents even though they earn higher G.P.A.'s on average. This study used institutional records and survey data from a large urban U.S. university to explore whether time poverty explains this trend. The results of regression and KHB decomposition analysis reveal that students with preschool-aged children have a significantly lower quantity and quality of time for college than comparable peers with older or no children, and that time spent on childcare is the primary reason for this difference. Both quantity and quality of time for education had a significant direct effect on college persistence and credit accumulation, even when controlling for other factors. Thus, greater availability of convenient and affordable childcare (e.g. increased on-campus childcare, revised financial aid formulas that include more accurate estimates of childcare costs) would likely lead to better college outcomes for students with young children.

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No Time for College? An Investigation of Time Poverty and Parenthood

More than one-quarter of U. S. undergraduates have dependent children; proportions are even higher among low-income and first-generation students (36%) and minorities (e.g. 39% of Black undergraduates). On average, student parents earn higher G.P.A.'s, yet their college degree outcomes are significantly worse: 52% of student parents dropout within six years of enrolling, compared to 32% of non-parents. Research indicates that parenthood decreases college persistence more strongly for women: although fewer women than men dropout within six years, the gap in dropout rates between parents and non-parents is larger for women than men (U. S. Department of Education, 2009; 2012). One possible explanation for this gender difference is the time that fathers versus mothers commit to childcare and other unpaid household work (Chatzitheochari & Arber, 2012).

The significant investment of time that parenthood requires (Pew Research Center, 2013) likely explains why student parents dropout at high rates despite their strong academic qualifications. Hence, the concept of *time poverty* may illuminate why student parents persist at lower rates than their childless peers. However, the relationship between time poverty, parenthood, and college outcomes has not been assessed empirically. This is critical, as a deeper understanding of which factors explain lower rates of college persistence for student parents will enable colleges and policy-makers to target interventions that are the most likely to improve academic momentum and degree attainment for these students.

Research Questions

This study explores how parenthood may interact with time poverty to predict college outcomes. Specifically:

1. Do parents of preschool-aged children have higher levels of time poverty (i.e. lower quality and quantity of time for college) than students without preschool-aged children? To what extent does time spent on childcare and/or paid work mediate this relationship?

2. Do students with preschool-aged children have lower rates of college persistence (i.e. re-enrollment in the subsequent semester) and academic momentum (i.e. credit accumulation) than students without preschool-aged children? To what extent does time poverty (i.e. lower quality/quantity of time for college) mediate this relationship?

Student parents and college outcomes

Research suggests that student parents suffer from a loss of academic momentum [stopping, dropping out or attending college on a part-time basis], which is strongly linked with degree attainment (Adelman, 1999; Adelman, 2006; Attewell, Heil & Reisel, 2012). For students who began college in 2003-2004, 53.4% had attained a degree or certificate by 2009; however, only 32.6% of student parents in that cohort had attained a degree or certificate after six years, and most earned certificates rather than baccalaureate degrees (U. S. Department of Education, 2009). Between 30-37% of community college students report spending significant time on dependent care and 29% indicate "caring for dependents" as a reason for college dropout (Center for Community College Students Engagement, 2014). Parents with very young children have been shown to have lower academic motivation and attainment goals than parents of older children, potentially due to the more time and labor-intensive nature of childcare for young children (Lovell, 2014). In one study, student parents' time to college completion was between 6-15 years. In another study, a third of low-income single mothers and 29% of low-income married women with children took more than ten years to get a degree, significantly more time in

comparison to childless women and all men (Attewell & Lavin, 2007; Center for Women's

Policy Studies, 2004). Adults who become parents at a young age are less likely than any other

group to have earned a college degree by the age of 24 or to be enrolled in postsecondary

education (Osgood et al., 2005).

Being a student parent also correlates with other "nontraditional" student characteristics,

many connected with higher risk of dropout. Student parents are proportionately highest among

Black students (47% for women and 25% for men), followed by American Indian/Alaska Native

students (41% and 24%), Native Hawaiian/ Pacific Islander students (39% and 15%) and

Hispanic students (32% and 18%) (Gault, Reichlin, Reynolds, & Froehner, 2014a). Almost a

third of women are student parents, versus 18% of men. More than half (57%) of student parents

are classified as low-income and nearly half work full-time. Student parents are more likely to

be first-generation college students; need financial assistance; have more student debt; attend

school part-time; need remedial coursework; and enroll in community colleges (Gault, Reichlin,

Reynolds, & Froehner, 2014a; Miller, Gault & Thorman, 2011).

The impact of college attainment on students' families

The outcomes of student parents are important because of the impact that they can have

on students' families. A bachelor's degree in the U.S. increases earnings by 68% (compared to a

high school diploma), and roughly halves the unemployment rate (U. S. Bureau of Labor

Statistics, 2015). Parents who return to college frequently state that they are motived to return

because of their children—to provide for them financially or to set a good example (Hess,

Krohn, Reichlin, Román, & Gault, 2014). Parental education level strongly predicts the

educational outcomes of children, although the effects are less clear when parents enroll in, but

do not complete, college (Adelman, 2006; Jones-DeWeever & Gault, 2008; Monaghan, 2017; Pascarella, & Terenzini, 2005; Wilsey, 2013). One study found that parents who attended college also altered their parenting behaviors: parents with at least some college education were more involved in their children's schooling, and this explained part of the improved educational outcomes of their children (Attewell & Lavin, 2007; Jones-DeWeever & Gault, 2008). Other research indicates that when mothers acquire additional education, there are positive changes in the home environment, and that these improvements are greater for low-income households (Magnuson, Sexton, Davis-Kean, & Huston, 2009).

Education is the surest route out of poverty, and yet attaining an education is difficult for student parents. Most student parents are single parents, but single parents are also more likely to be in poverty (MacGregor, 2009; Tucker & Lowell, 2015). And because the impact of parenthood is felt more acutely by women and ethnic minorities, who have lower incomes and accumulate larger student debt, continued high dropout rates for student parents will likely increase socioeconomic stratification across race and gender (Gault, Reichlin, Reynolds, & Froehner, 2014b). Thus, equity in educational attainment, as well as economic stability for students' families, likely depends heavily on our ability to support student parents in college.

Conceptual Framework and Prior Related Research

Time poverty and parenthood

Our conceptual framework posits that time poverty, a by-product of student parenthood, reduces the quantity and quality of time that student parents can spend on their studies and that this in turn results in lower college persistence and academic momentum (see Figure 1). While traditionally defined as insufficient time to maintain physical and mental well-being (Vickery,

1977), in the context of this study, *time poverty* is defined as insufficient time to devote to college work, and is measured by assessing both the number of hours and the self-rated quality of time available for college.

Households with children are more time poor (Kalenkoski, Hamrick, and Andrews, 2011), and parents, on average, spend more hours on unpaid work (Pew Research Center, 2013). This translates into parents having less leisure time and less satisfaction with their work/life balance [e.g. only 48% of parents with young children felt that they had enough free time, compared with 70% of all other adults (Pew Research Center, 2013)]. Mothers in comparison to fathers have been shown to be even more time poor (Chatzitheochari & Arber, 2012).

Student parents may not only have fewer hours to devote to their studies, but may also have lower *quality* of time for college work. Time quality is diminished when time: occurs at less useful times (Fagan, 2001); is "contaminated" by other activities (e.g. childcare); or is fragmented; all of which occurs more often for mothers (Mattingly & Bianchi, 2003). For example, if study time is only available late at night, or if schoolwork is frequently interrupted by childcare, then that time is of lower quality than time in which students are sufficiently alert, are uninterrupted, and have larger blocks of time to focus more deeply on learning goals.

One nationally-representative study revealed time-use patterns that might explain differences in college outcomes (Wladis, Hachey & Conway, 2017). Student parents (particularly mothers) were shown to have less discretionary time and higher rates of part-time enrollment versus comparable peers. As a result, parents spent less time on their education than non-parents; although interestingly, they spent a larger *proportion* of their discretionary time on education compared to non-parents. These results suggest that current observed differences in college outcomes between parents and non-parents may under-state the impact of time poverty

on college persistence and momentum. Thus, models that compare college outcomes for parents versus non-parents while controlling for time-use patterns need to be explored in order to better understand this relationship.

Research has shown that the quantity and quality of time dedicated to academic work relates directly to college success (e.g. Astin, 1993; Michaels & Miethe, 1989; Svanum & Bigatti, 2006). The documented links between parenthood and time poverty, and between the time spent on academic work and college outcomes, supports the hypothesis that parents have lower rates of college persistence and completion as a direct effect of being time impoverished (Choy, 2002; Horn & Carroll, 1996; U. S. Department of Education, 2009). However, to date, no empirical studies have formally analyzed whether time poverty mediates the relationship between parental status and college outcomes.

Method

Data source and sample

This study uses a dataset collected from the City University New York (CUNY), the third largest university system in the U. S. (Yale Daily News, 2013). CUNY's 275,000 students are extremely diverse: 45% are first generation college students; 42% are non-native English speakers, and more than three-quarters identify as non-white. More than half are Pell grant recipients, 40% have household incomes under $20,000, roughly one-third work full-time, and 65% spend time during the week caring for others. While CUNY is not nationally-representative, because of the composition of its student body, it is a logical choice for exploring the relationship between parenthood, time poverty, and college outcomes for lower-income families and groups that have traditionally been underrepresented in higher education.

The sample frame consisted of all students enrolled in a cross section of commonly-taken courses across a wide range of disciplines from all CUNY two- and four-year campuses in fall 2014. The dataset combined institutional records with 15,385 student surveys collected from the sample frame. The survey response rate was 10.6%, a rate similar to other official surveys conducted with this population. Students enrolled in the courses in the sample frame were invited to participate in an online survey near the end of the semester, and several follow-up reminders were sent to both school and personal email addresses. Institutional data, available for all students in the sample frame regardless of survey response status, was used to weight data to account for survey non-response. Propensity scores for the likelihood of survey completion were computed using logistic regression based on: age, gender, ethnicity, ESL status, college re-enrollment, remedial course placement, G.P.A, credits earned, online course-taking, and college level (community college, baccalaureate, graduate), and weights were normed to reflect the sample frame size.

Measures

We operationalized parenthood in multiple ways in initial exploratory phases of this study: whether a student was a parent, the number of children, the age of the youngest child, whether the student had a child under a certain age. The results of this study focus on students with children under six (preschool-aged) because this group spent the most time on childcare and was also more uniform in age; however, similar patterns to the ones reported here were also observed for parents with older children (although effects weakened as child age increased). College outcomes measured were *college persistence*, or re-enrollment at CUNY in the spring semester, and *academic momentum*, or the number of credits earned by the end of the fall semester (Attewell, Heil & Reisel, 2012). We chose these two measures because they are

significant predictors of longer-term academic outcomes [e.g. transfer, degree completion] (Attewell, Heil & Reisel, 2012; Attewell & Monaghan, 2016) and because they are temporally closely related to the student's time use and parental status as reported for the semester under study. Future research exploring longer-term outcomes would also be worthwhile, but would need to carefully track and control for changes in time use and parental status (as well as other relevant time-variant factors) over time.

Measures of time poverty included a scale derived from a set of Likert-scale questions rating the *quality* of time available for college, as well as student reports of time use during the semester that were used to calculate total non-discretionary time. *Discretionary time* (sometimes also called free time) is defined as the time left over after performing some set of necessary activities (activities classified as "necessary" varies in the literature). We follow an often-used model that classifies discretionary time as time available after paid work, housework, and childcare (Aas, 1978; Kalenkoski, Hamrick, & Andrews, 2011).

To record time use, the survey asked students to report on the number of hours they spent on different activities during a typical week that semester; the specific categories and descriptions were modeled after those used in the American Time Use Survey (ATUS) (U. S. Bureau of Labor Statistics, 2014), but for simplicity the number of categories in the survey was reduced to only those relevant to the research (e.g. ATUS breaks non-childcare household work into many sub-categories, but this study did not). Additionally, some ATUS categories were refined if they were relevant to childrearing or college. For example, ATUS does not distinguish the purpose behind tasks such as shopping or health care, whereas this study asked students to report more specifically on time spent on any activities related to their children (e.g., shopping for children, children's healthcare); activities were coded based on whether the children were

present or not. Inputs for these questions were restricted to numerical values that prevented

students from entering invalid values (e.g. more than 168 hours per week, or negative values).

The survey responses also included a series of questions intended to assess students'

evaluations of the quality of the time that they had available for their studies, rated on a 7-point

Likert scale. This scale included questions asking about finding quiet and/or uninterrupted time

to work, multi-tasking and interruptions while studying, etc. Roughly half the questions were

reverse coded with the aim of limiting response bias. Confirmatory factor analysis using

structural equation modeling (SEM) modeled this scale as a single latent construct: the resulting

standardized root mean squared residual was 0.065, the average variance extracted was 0.50 and

composite reliability was 0.85, indicating convergent validity and good reliability of the scale

(Hair, et al., 1998), and a single factor structure (Hu & Butler, 1999).

Control variables were included in the analysis to account for factors that may correlate

strongly with parental status, time poverty, or educational outcomes. These factors included:

gender, race/ethnicity, age, immigrant generational status (whether the student was native born,

or whether one or both of their parents were native born), English-as-a-second-language status,

marital/co-habitation status, G.P.A., remedial course placement, household income, level of

parental education, college level (two-year, four-year, graduate-level), whether the student was a

first-time freshman, time spent on paid work, and time spent on "housework[i]".

Analytical approaches and data analyses

Survey responses were weighted based on likelihood of responding to the survey by

running a logistic regression model with survey response as the independent variable and all

dependent and independent variables of interest in subsequent analyses used as independent

variables. Multivariate multiple imputation by chained equations imputed values for survey

questions with missing responses, using all independent variables to be used in the subsequent analyses. Depending on variable type, logit models or predictive mean matching using three nearest neighbors was used. A median of 3.7% of data were missing across imputed variables. The final imputed dataset contained 10 imputations. Binary logistic regression (BLR) and ANOVA models were used to model relationships described in the research questions.

KHB decomposition (Kohler, Karlson & Holm, 2011) was used to calculate direct and indirect effects for multiple mediators simultaneously. This model is preferable to others because it generates an indirect effect that is not distorted by the rescaling that occurs when a potential mediator variable that is correlated with the dependent variable is added to a nonlinear model. While other methods have also been developed to address the problems of rescaling that occur during mediation analysis with logistic regression, Monte Carlo studies have shown that the KHB method always performs as well or better than these methods in terms of recovering the degree of mediation net of the impact of rescaling (for more details, see Kohler, Karlson & Holm, 2011).

Equations and software packages used for analytical models

All statistical analyses reported in this paper used Stata: the *mi* command for multiply-imputed data, the *svy* command for survey-weighted data, *logit* for logistic regression, *regress* for linear regression, and the *khb* package for KHB decomposition.

For logit models (survey completion as the dependent variable for survey weighting, or persistence as the dependent variable in the main analyses), the equation was:

(1) $\lambda(y) = \beta_0 + \beta_1 x_1 + \cdots + \beta_n x_n + \epsilon$ logit link $\lambda(y) = \frac{e^y}{1+e^y}$.

For linear regression (non-discretionary time, time quality scale, credits accumulated that semester as dependent variables) the equation was:

(2) $y = \beta_0 + \beta_1 x_1 + \cdots + \beta_n x_n + \epsilon$

For both equations, x_1 represents whether the student had a child under six, $x_2, \ldots, x_n$ represent the other independent variables (e.g. age, ethnicity), and ϵ represents the difference between actual versus predicted probability (e.g. of persistence) or values (e.g. credits earned) of the dependent variable for each student.

Results and Discussion

Summary statistics for the weighted survey population show (see Table 1) that there are notable differences between students with children under age six and those without them: students with young children spent significantly more time on "non-discretionary" activities, including paid work, housework and childcare. They were also more likely to have additional "nontraditional" characteristics including being: female, older, married or cohabiting, non-native English speakers, black or Hispanic, first-generation college students, and enrolled in a two-year college or a master's program instead of a four-year Baccalaureate program. These demographics are consistent with prior research on student parents (Gault, Reichlin, Reynolds, & Froehner, 2014a; Miller, Gault & Thorman, 2011). While student parents had higher average household incomes, after controlling for family size, their income was significantly lower than students without children. This is also consistent with prior data showing that student parents are more likely to be working and have higher expected family contributions, and are thus likely to qualify for less financial aid (Goldrick-Rab & Sorenson, 2010). There was no significant difference in G.P.A. between students with and without children under age six.

Overall, student parents had significantly less discretionary time and rated the quality of time they had for study as significantly poorer than non-parents (see Table 2). Students with

children under six spent 86 additional hours per week on non-discretionary tasks than students without young children. Even after controlling for demographic differences between parents and non-parents, students with young children still spent 74 additional hours per week on non-discretionary tasks. This reinforces patterns of time use found in national datasets (Wladis, Hachey & Conway, 2017), in which student parents had significantly less discretionary time than non-parents, even after controlling for other factors. After controlling for the number of hours that students with young children spent on childcare, the difference in non-discretionary time per week drops to only three hours and is no longer significant. Adding in paid work hours to the model eliminates the difference.

In comparison to students without young children, students with children under six rated the quality of their time as significantly worse; this difference remained significant even after controlling for demographic characteristics, time spent on childcare, and time spent on paid work. This difference had a medium effect size even after controlling for demographic characteristics ($d = 0.61$ for the base model, $d = 0.57$ for the full model); the effect was still highly significant but its size was small after controlling for time spent on childcare and paid work [$d = 0.34$ and $d = 0.31$, respectively] (Cohen, 1988), suggesting that lower quantity and quality of time for college are correlated. These results reaffirm prior research that shows that parents on average have lower quality of time than non-parents (e.g. Mattingly & Bianchi, 2003). However, whereas previous research has investigated the quality of leisure time for parents versus non-parents, this study also provides new information about the quality of time that parents versus non-parents have available for college study.

These results suggest that the difference in discretionary time available for college for students with young children versus those without is almost entirely explained by time spent on

childcare and can be entirely explained by time spent on both childcare and paid work.

However, even controlling for time spent on childcare and paid work does not completely

explain the difference in quality of time that students of young children report compared to their

comparable peers. This suggests that there are other factors (e.g. lack of sleep, stress, availability

of a quiet workplace or uninterrupted blocks of time) affecting the quality of time that parents of

young children can dedicate to their studies.

KHB models reveal that time spent on childcare fully mediates the relationship between

parental status and total non-discretionary time, accounting for 93.1% of the difference in total

non-discretionary time between parents and non-parents; work hours partially mediate this

relationship and account for 7.1% of this difference (see Table 3). Work hours and childcare

hours together account for 100% of this difference before and 98.1% after controlling for other

covariates. Both childcare hours and work hours partially mediate the relationship between

parental status and rated quality of time, accounting for 47.5% and 10.3% separately,

respectively, of the difference in rated quality of time for parents versus non-parents. Together

childcare hours and paid work hours account for 57.5% of this difference before and 42.9% after

controlling for other covariates. This reinforces the patterns observed in the regression models in

Table 2, which suggest that time spent on childcare accounts for differences in discretionary time

between parents and non-parents, and that work hours contribute significantly to this difference

as well, although much less so than childcare. While childcare and paid work hours account for

about half of the difference in rated quality of time for parents versus non-parents, there are

likely other factors affecting the quality of time that student parents have for their studies. Thus,

interventions that help student parents with childcare and allow them to work fewer hours have

the potential to close the discretionary time gap between parents and non-parents so that students

with children can spend just as much time on their education as their childless peers. Such

interventions could also improve the gap in rated quality of time for study between parents and

non-parents, but are unlikely to close this gap completely.

Table 4 details regression models showing the relationship between parental status and

college outcomes. Students with preschool-aged children accumulated significantly fewer

credits by the end of the fall semester (1.25 fewer credits on average) and were significantly less

likely to re-enroll in college in the spring (14.5% less likely to re-enroll). This is similar to the

college outcomes for student parents found in national datasets (Wladis, Hachey & Conway,

2017), but this study is the first to directly test the extent to which time poverty explains these

differences. Both measures of time quality and total non-discretionary time were individually

significant predictors of both persistence and momentum. Adding these factors to the model

substantially reduced the strength of the relationship between parental status and college

outcomes (M1), rendering these differences insignificant at the $\alpha=0.05$ level; adding other

covariates to the model reduced the strength of this relationship further (M2). This suggests that

both qualitative and quantitative measures of time poverty mediate the relationship between

parental status and college outcomes.

KHB decomposition results on these models, which formally test the role of time quality,

total non-discretionary time, and other covariates as mediators between parental status and

college outcomes are in Table 5. Both rated quality of time and total non-discretionary time had

a significant direct effect on college persistence and credit accumulation, with the effect

particularly strong for credit accumulation. Total non-discretionary time was a stronger

predictor than rated quality of time. In base models including each time poverty variable

separately, rated quality of time explains 12.8% and 18.1% of the differences in college

persistence and credit accumulation, respectively, between students with young children and those without; total non-discretionary time explains 32.6% and 72.8% of the differences in college persistence and credit accumulation, respectively, for students with young children versus those without. Thus, the total discretionary time available for college was a much stronger mediator than rated quality of time (as measured by the scale used in this study), and time poverty was a stronger mediator for academic momentum than college persistence, although it did significantly mediate the relationship between having a young child and both types of college outcomes.

In combination, together qualitative and quantitative measures of time poverty explained 39.5% and 81.6% of differences in college persistence and momentum, respectively, for students with children under six versus those with older or no children, before controlling for other covariates (e.g. gender, age). After controlling for other covariates, they explained 64.7% and 100% of differences in college persistence and momentum, respectively, for parents versus non-parents[ii]. These two measures of time poverty together fully mediate the relationship between parental status and college outcomes so that the direct effect of parental status on persistence and credit accumulation is not significantly different from zero at the $\alpha=0.05$ level, both before and after controlling for other covariates (the 95% confidence intervals for the coefficients of the direct effect of parental status on persistence and credit accumulation all contain zero in Table 5). This mediating relationship is particularly strong for credit accumulation.

The results of this study indicate that the availability of affordable and convenient childcare is likely a major factor affecting college outcomes of student parents. Students with preschool-aged children drop out of college at higher rates and accumulate credits at slower rates than students without young children, and this lack of academic momentum and degree

completion can largely be explained by the fact that they had less time, and lower quality of time, to devote to their studies. Differences in available discretionary time for college between students with young children and those with older or no children disappeared after accounting for hours spent on childcare. Student survey data further reinforces this pattern: sixty-one percent of student parents did not agree with the statement, "The childcare available to me (through family, friends, daycare or paid caretakers) provided me with enough time for my schoolwork".

In addition to the 45 hours per week that CUNY student parents reported spending on childcare, they also reported spending an average of 12 hours per week on other child-related tasks; and they reported spending nine hours per week more on housework and nine hours per week more on paid work than non-parents (these differences were significant at the $\alpha = 0.001$ level). National data is similar: one-third of single parents at community colleges reported working more than thirty hours per week, and single parents reported spending a like amount of time on childcare (Miller, Gault, & Thorman, 2011). Roughly 78% of CUNY students who work do so to pay for living expenses (The City University of New York, 2014), and thus these paid work hours are often essential to support their families. While student parents in this study had a higher average household income, after controlling for family size, student parents had significantly lower incomes than students without children. Thus, the burden of longer hours than their non-parent peers, in combination with the added time burdens of childcare, housework, and child-related activities, seems to contribute to the overall lack of discretionary time for education. This suggests that financial interventions for student parents must consider not only financial need based on current earnings, but also the need for both reduced paid and unpaid work hours in order to allow time for student parents to pursue their studies.

Limitations

There is a possibility that the time measures in the student surveys were impacted by desirability bias or inaccurate recollections of time use because they are retrospective and self-reported. It is uncertain if other approaches to determine time use, such as the experience sampling method, could result in more accurate time use data (see e.g. Sonnenberg, Riediger, Wrzus & Wagner, 2012). Because of this, we note that it may be important for future studies to use alternate measures of time use to replicate this work.

As with any survey research, it is not possible to account for all sources of non-response bias. Our analysis accounts for survey non-response by using weight adjustments; however, there is still the potential that some subsets of the student population not distinguished by the various control variables did not respond at all. If this is so, then these subsets were not included in the population to which the survey results could be generalized. However, significant efforts were made to counteract this potential risk by including a wide array of predictors in the non-response weighting models.

While the CUNY student population is highly diverse and therefore the study results are likely generalizable to a wider national student population, the dataset used is not necessarily nationally representative. CUNY does not include rural campuses, so caution should be used before extending findings from this study to the roughly 18% of U. S. undergraduate students who attend colleges in rural areas (U. S. Department of Education, 2013). The CUNY student population used in this study is also more diverse than the average U. S. college population, including a higher proportion of ethnic/racial minorities, foreign-born students, first-generation students, lower SES students, and students requiring developmental coursework. While this may affect the sample's national representativeness, it also makes the dataset an excellent source for

investigating the relationship between parenthood and college outcomes for traditionally

underrepresented groups who are often at higher risk of dropout.

Finally, we note the potential for regional policy factors influencing results: for example,

New York City expanded universal pre-kindergarten in 2014, possibly reducing the strength of

the relationship between parental status, time poverty, and college outcomes for parents with

children in this age group. In addition, New York state provides a higher proportion of on-

campus childcare than 47 other U.S. states (Eckerson, et. al., 2016), and New York City spends

more on public benefits than any other U. S. municipality. Thus, the relationship between

parental status and time poverty in this study may actually *underestimate* national trends.

Implications

This study indicates that student parents (particularly those with preschool-aged children)

have significantly less time for their studies than comparable peers, and that this directly explains

differences in college persistence and momentum. Time spent on childcare almost entirely

explained these differences. Thus, one approach to improving college outcomes for student

parents would be to expand access to affordable and convenient childcare.

One way to address this is for colleges to provide more on-campus childcare. Fewer than

half of U.S. campuses provide onsite childcare, and estimates suggest that available on-campus

childcare meets only 5-10% of the demand (Goldrick-Rab and Sorenson, 2010; Miller, Gault and

Thorman, 2011). While the number of college student parents has increased over the last fifteen

years, the availability of on-campus childcare has steadily decreased (Gault, Reichlin, Reynolds,

& Froehner, 2014b). In addition, many states place strict restrictions on qualifying for childcare

subsidies, often requiring that student parents work a minimum number of hours per week,

maintain a minimum enrollment intensity, and/or finish their degree in a limited amount of time (Eckerson, et. al., 2016). However, these requirements contradict what the data from this study tells us: that student parents have significantly less time available for their studies than their childless peers—requiring students to work additional hours only adds to their time poverty and puts them at greater risk of dropout and slower degree progress. This study strongly suggests that to improve degree attainment for student parents, colleges and policymakers should focus on providing greater access to campus-based childcare, including creating and expanding programs, preventing downsizing, and removing restrictions such as required work hours or enrollment intensities that will only increase time pressures on student parents. For example, the Child Care Access Means Parents in School (CCAMPIS) Program, a federally-funded grant program that provides campus childcare for low-income parents, has demonstrated promising results at several colleges. At Pikes Peak Community College in Colorado and at Northampton Community college in Pennsylvania, students overwhelmingly cite the available childcare support as the reason for their ability to remain in college and complete their degree. The University of Wisconsin Milwaukee cites an 84% graduation rate for the student parents served in their childcare program, and a 100% employment rate for those graduates within nine months of graduation (Center for the Education of Women, 2013; Institute for Women's Policy Research, 2016).

Further, the results of this study suggest that colleges should consider serving as a childcare resource and referral agency (helping students locate and access local off-campus childcare services that meet their specific childcare needs), in addition to providing flexible financial aid, emergency funds, subsidy/scholarship support programs, and help in accessing public benefits in order to afford student parents the greatest ability to obtain childcare both on

and off campus and in variety of childcare settings (Goldrick-Rab & Sorenson, 2010; Miller, Gault, & Thorman, 2011; Foley, 2016). This kind of advisement would be relatively cost-neutral, and could help students to take advantage of existing programs and resources to help alleviate some of the time pressures that they face. Single Stop, a public/private partnership, available at community colleges in nine states, provides students with information and referrals to more than 40 free public-benefit services. The program has affected over one million student households, with an average of $1,934 in benefits received, for a total impact of $3 billion (http://singlestopusa.org/#home-page).   However, there will still be cases where even with the best referral services possible, existing resources will be insufficient for student childcare needs.

Revising federal financial aid calculations to reflect the needs of student parents could address their time poverty more systematically than on-campus childcare and referral services alone. In the federal financial aid process, the cost of attendance (COA) outlines a student's expected cost of attending college and limits the total amount of financial aid that a student can receive. However, currently only the living expenses for the student themselves, and not for their dependent children, are permitted to be included in the COA, even though the time that students spend working to provide for their children directly supplants time that the students could be spending on their education. As this study shows, forcing student parents to work additional hours can be counter-productive because it can lead directly to higher college dropout and slower progress towards a college degree. Thus, living expenses on the COA should be modified to include those of dependent children in addition to the student themselves to ensure that student parents can spend their time studying instead of working to provide for their families.

In addition, while the COA is intended to include childcare costs, there is no specific federal guidance on exactly how to calculate these costs, nor is there any requirement that they be sufficient to meet actual costs. Individual colleges calculate their own COA, and this has led to widespread inconsistencies in calculation methods and significant incidence of underestimation of actual costs in various COA categories (Kelchen, Goldrick-Rab, & Hosch, 2017). For example, many colleges distinguish only between students with children under 13 versus those with older or no children; however, the costs of childcare for younger children is typically many times higher than for a school-aged child, and so this approach dramatically underestimates costs for preschool-aged children. For example, in the metro area around CUNY, the hourly cost of childcare in a licensed daycare center is roughly double for a preschool-aged child than a school-aged child (New York State Office of Children and Family Services, 2016), and in addition, school-aged children receive roughly 32 hours/week of free childcare in public school. Accounting for both the higher hourly cost of care and the availability of free public school, the total net cost of 40 hours of childcare per week is almost nine times higher for a preschool-aged child than a school-aged child. In the U.S., full-time childcare for preschool-aged children on average exceeds the cost of full-time in-state tuition for their student parents (Schulte & Durana, 2016). Thus, clearer federal guidance on how to calculate these expenses is essential in order to address the time poverty gap between parents and non-parents and subsequently improve college outcomes for student parents.

One simple improvement would be to include the numbers and ages of dependent children on the Free Application for Federal Student Aid (FAFSA). Currently, the FAFSA only asks whether a student has dependent children, and therefore colleges have insufficient data from the FAFSA to correctly calculate the dependent care costs for each student's COA. As a result,

student parents must typically take an extra step and request that childcare be included in their COA, which leads to inconsistent inclusion of these costs in financial aid calculations. If the FAFSA collected this information, colleges could be required to automatically include a childcare allowance in the COA for all students with children who are young enough to require childcare, and this would ensure fairer and more consistent implementation. In addition, the federal government should provide clearer guidance to colleges about how to calculate childcare costs in order to ensure that they reflect actual expenses, including how to: obtain market-rate data, estimate reasonable hours of childcare needed to complete academic work, and adjust calculations based on child age and number of children.

And finally, financial aid programs or policies that disadvantage part-time attendance, such as the Federal Pell program, could be modified to better serve student parents who cannot attend full-time. At the same time, services such as Head Start, food stamps, and the nutrition program for Women Infants and Children, could be coordinated and simplified (Goldrick-Rab & Sorenson, 2010).

Increased upfront costs associated with changes in financial aid or other programs should not be a deterrent. One of the more expensive student support programs (on a per student basis) is the Accelerated Studies in Associates Degree Programs (ASAP) started at CUNY's community colleges. The program provides a host of supports including free tuition, free books, transportation allowances and increased assistance from tutors, counselors and advisors. Despite high upfront costs, the faster time to graduation and the overall increase in graduation rates results in a significant net benefit to taxpayers (Levin & Garcia, 2017). Other colleges across the country are now replicating ASAP. A modified ASAP program for student parents that

specifically targets issues of time poverty, including childcare and the need for reduced work hours, could potentially produce similar benefits.

Conclusion

This study reveals that students with preschool-aged children have significantly less discretionary time for their college studies than comparable peers without young children, and that this lower amount of discretionary time completely explains the relationship between having a young child and lower college persistence and credit accumulation. These differences are almost entirely accounted for by time spent on childcare, with some smaller differences accounted for by time spent on paid work. Because of insufficient childcare and longer hours spent working to support their families, students with preschool-aged children are at a significant disadvantage in comparison with their peers without young children, and this explains their significantly higher college dropout rates, longer times to college completion, and lower rates of college momentum. At the same time, obtaining a college degree can be particularly significant for student parents, as the returns to higher education benefit not only the students themselves, but their families—improving financial, psychological, health, and academic outcomes for their children.

To address this issue, significant changes to institutional and federal supports for student parents are necessary. Both childcare referral and assistance services as well as a substantial increase in the availability of on-campus childcare are essential for supporting student parents. But perhaps most importantly, changes to federal financial aid procedures that provide accurate calculation of childcare costs and allow student parents to work less, are essential to accurately represent the cost of college attendance for student parents, and subsequently award student parents financial aid in line with their actual financial needs.

Closing the gap in outcomes for student parents versus non-parents is an important equity issue when we consider that lower-income students, first generation students and students who are members of ethnic minority groups are all significantly more likely to have children. It is essential that future research consider exactly how various components of federal funding for on-campus childcare, as well as institutional practice and federal regulations related to financial aid, can exacerbate or alleviate the time poverty of student parents, and in turn, significantly impact their college outcomes. Further data on the impact of various federal funding policies and institutional financial aid procedures on the time poverty and college outcomes of student parents is essential if these mechanisms are to better reflect the needs of the more than 7.7 million college students with children in the U.S. (U. S. Department of Education, 2012).

Notes

[i]Housework is defined as all unpaid work necessary to sustain the household, except childcare (e.g. cooking, cleaning, household errands, grocery shopping, paying bills, household maintenance, etc.).

[ii]Technically, these two measures of time poverty explain 583.6% of the reduction in credit accumulation attributed to having a child under six (when controlling for all other co-variates). This confounding percentage is above 100% because the direction of the relationship reverses, with students with young children completing more credits than comparable peers after accounting for measures of time poverty (although this difference is still not significantly different from zero), as we can see in Table 5.

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