Revisiting SCHIP and Extended Parental Coverage: The Effect of Public Policy on Health Insurance Coverage for Young Adults

Khoi Tran

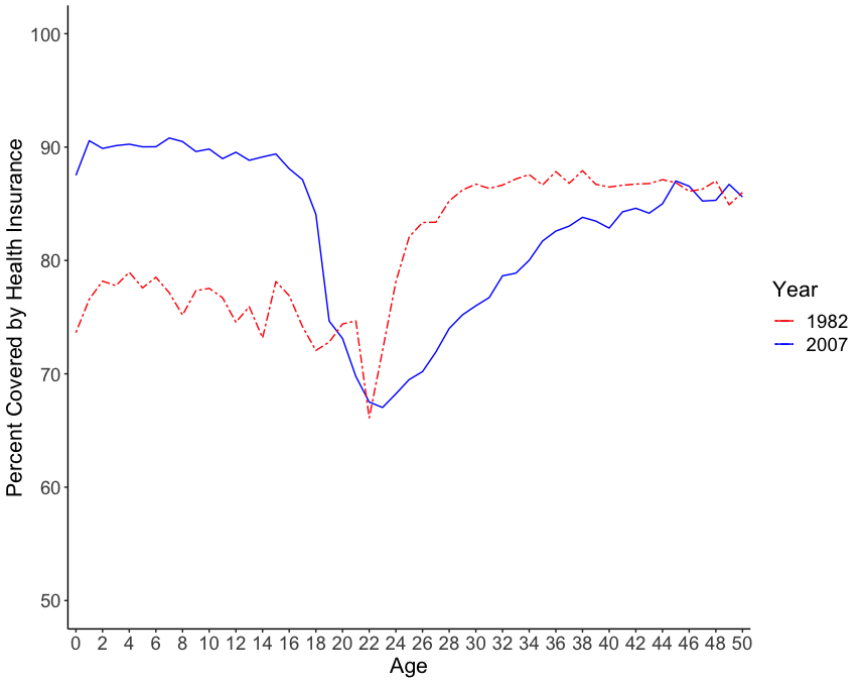
Abstract

Replicating Levine, McKnight, and Heep (2011), I assess the impact of public policy on the health insurance coverage rates of teenagers and young adults. I examine two policy efforts, the expansion of Medicaid by states to low-income teenagers following the introduction of SCHIP in 1997 and individual efforts by states allowing young adults aged 19 - 24 to remain on their parent's health insurance. I take use of a discontinuity at age 19 to examine the impact of SCHIP and quasi-experimental variation between states to measure the impact of extended parental coverage laws. My analysis shows that both SCHIP and extended parental coverage laws have been moderately successful in improving health insurance coverage for teenagers and young adults. However, significant violation of pre-trend testing may call into question the original work's estimations.

Introduction

Public health insurance in the United States has been highly studied and debated matter by both policymakers and scholars alike. Over the latter half of the 20th century, both states and federal governments made it a legislative priority to implement policy aimed at increasing health coverage amongst vulnerable populations. Existing scholarly research has shown moderate efficacy of such programs, with insurance coverage rates increasing for low-income families with the introduction and expansion of programs like Medicaid. [Card and Shore-Sheppard, 2004] However, a sizable portion of low-income Americans remained uninsured, most notably teenagers and young adults. The US Census Bureau estimated in 1999, 13.9% of those under 18 were uninsured and 29% between the ages of 18 and 24 were uninsured. [Mills, 2000]

Figure 1: Rate of Health Insurance Coverage by Age, 1982 and 2007



Two specific efforts in the subsequent years following the introduction of Medicaid were designed to address this demographic, the State's Children Health Insurance Program[1] and state extended parental coverage laws. The State Children's Health Insurance Program is a federal program that is designed to cover children of families who earn too much to qualify for Medicaid but not enough to afford private health insurance. [105th Congress, 1997] Extended parental coverage laws are a blanket term used to denote laws implemented individually by states that allow young adults aged 19 - 26 to remain on their parent's private insurance, provided they meet certain criteria. [Nicholson et al., 2009]

This paper contributes to existing literature by providing an estimate of take-up and crowd-out rates for teenagers and young adults in the wake of the aforementioned policy. Existing literature has evaluated the take-up and crowd-out rates for SCHIP for children, but no existing analysis pre-Levine, McKnight, and Heep (2011) has examined whether pre-existing estimates also apply to teenagers and young adults. Additionally, the work

[1]The State's Children Health Insurance Program was renamed the Children's Health Insurance Program under the Children's Health Insurance Program Reauthorization Act (CHIPRA) of 2009. In order to maintain consistency with the original work, I will continue to refer to the program as SCHIP throughout this paper.

provides estimates on "extended parental coverage laws", which have been introduced by states more recently. I measure the impact of SCHIP by leveraging regression discontinuity design, taking advantage of the strict break in eligibility for Medicaid at age 19, created by SCHIP rules. In order to evaluate extended parental coverage laws, I use the same regression framework, but instead compare states who do not have extended parental coverage laws to those who do, as well as using adults made ineligible by policy criteria.

In line with the original paper, I find that both SCHIP and extended parental coverage laws have been moderately successful in reducing the rate of un-insurance amongst teenagers and young adults. The introduction of SCHIP increased the health insurance coverage rate for all teenagers by roughly 3.2 percentage points. Low-income teenagers saw greater increases, nearly 6.7 percentage point increases for those under 150% of the federal poverty line, and 4.3 percentage point increases for those between 150% and 300% of the poverty line. Evidence of crowd-out is weaker than previous literature.

Replicating the original analysis, I find extended parental coverage laws increase private insurance coverage rates by 2.2 percentage points for eligible adults. In the triple-difference specification, the magnitude grows to 4.4 percentage point increase. Preliminary evidence may also suggest the presence of "reverse" crowd-out; the regressions show decreases in public insurance coverage.

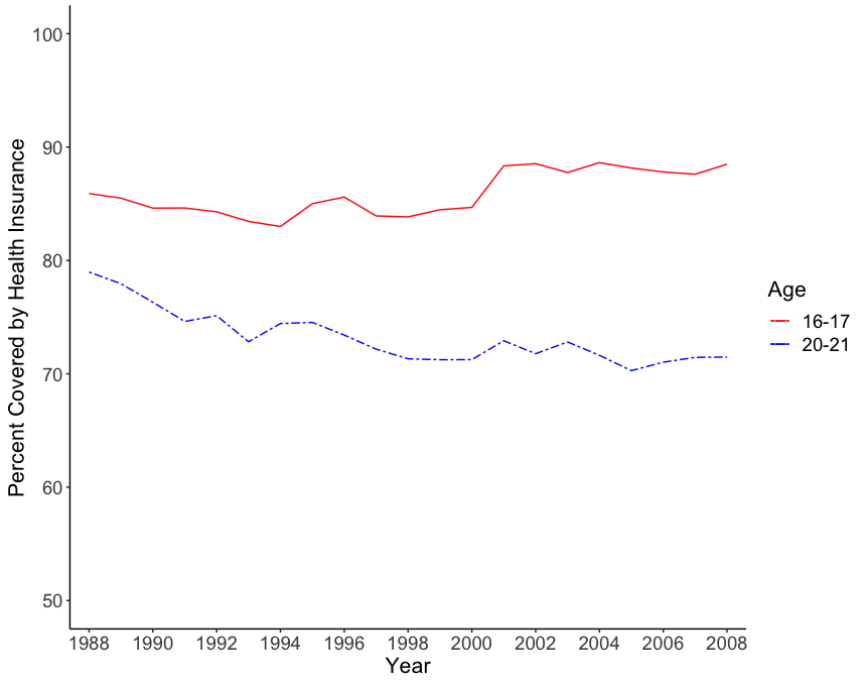
My extension on Levine, McKnight, and Heep's work is additional robustness checks. Recent new developments in statistical testing for the violation of parallel trends may find violations in the original work's SCHIP analysis. I find, using Roth (2022) pre-trend analysis testing, significant likelihood of parallel trend violation. At a standard 80% power level, I find low odds of "passing" the pre-test under a hypothesized trend relative to parallel trends. I postulate that this may be due to violations in plausibility due to differences in control and treatment levels, not just trends. Further research should be done to rigorously evaluate whether SCHIP and extended parental coverage laws do indeed have some effect.

Background

The question to be addressed in this paper is whether new public health policy, namely SCHIP laws and extended parental coverage laws, was effective in increasing the rate of health insurance coverage for uninsured teenagers and young adults.

The efficacy of health insurance policy is largely evaluated by two measures, take-up and crowd-out. The take-up rate for health insurance is defined as the number of people who enroll in health insurance divided by the number of individuals who

Figure 2: Health Insurance Rates over Time by Age Group, 16-17 & 20-21



are eligible for such insurance. [Cohen and Ball, 1965] Crowd-out refers to the rate by which private health insurance holders substitute their private plans for public plans as they become eligible for them. I measure crowd-out in this paper as the decrease in private insurance coverage as percentage of the increase in public insurance coverage. [Cutler and Gruber, 1996] Crowd-out is especially important in evaluating any public policy aimed at increasing take-up rates for public programs, as increases in take-up may not in actuality be representing a reduction in the number of uninsured. Additionally, crowd-out may also lead to increased expenditures on Medicaid. [Blumberg et al., 2000]

Trends for health-insurance take-up range widely, dependent on both year and age. Figure 1 shows that in 1982, health insurance coverage rates for children (those aged under 19) were roughly 15 percentage points lower than their age counterparts in 2007. This trend reverses for young adults, those aged 19 to 26, with notably higher rates of coverage for those in 1982 than in 2007. This is also reflected in Figure 2, where insurance rates have diverged between age groups 16-17 and 20-21. In 1988, the difference between the age groups was less than 10%, but now have diverged to a difference of 17% by 2008. The low rate of uninsurance amongst young adults is notable, as they account for nearly one-third of all uninsured individuals in the United States. By age 30, individuals begin

taking up insurance again, both private and public, and return to similar rates pre-falloff.

Table 1: Extended Parental Coverage Laws

State	Implementation Year	Age Limit	Must be Student	Cannot Be Married	Cannot Have Dependent
Colorado	2006	25		X	
Delaware	2006	24		X	X
Florida	2007	25		X	
Idaho	2007	25	X	X	
Indiana	2007	24			
Maine	2007	25		X	
Massachusetts	2006	26			
New Hampshire	2007	26		X	
New Jersey	2006	30		X	X
New Mexico	2005	25		X	
Rhode Island	2006	25	X	X	
South Dakota	2005	24	X		
Texas	2003	25		X	
Utah	1994	26		X	
Virginia	2007	25	X		
Washington	2007	25		X	
West Virginia	2007	25		X	

Sources: Nicholson et al. (2009) and Kronstandt. Mojerie, & Schwartz (2007)

High rates of un-insurance amongst young adults can be attributed to a variety of reasons. Holahan and Kenney (2008) find several reasons for why high rates of un-insurance are common amongst young adults. Young adults are often poorer than older adults, with more than half of young adults, aged 19-26, below 200% of the poverty line. Teens and young adults often have unstable employment patterns and are less likely to work for a firm that provides employee sponsored coverage. Additionally, even when given the option by their employer, young adults take-up health insurance less often. This could be due to them being unconcerned towards their own health, as often young adults face fewer medical problems. Finally, as previously mentioned, despite low-income, many young adults are not eligible for Medicaid as they earn too much, but no longer qualify for SCHIP due to age restrictions. [Holahan and Kenney, 2008]

Legislative History

Modern attempts to provide public health insurance coverage to the uninsured and low-income began in 1965, with the Social Security Amendments of 1965, introducing Medicaid. [Cohen and Ball, 1965] Under this program, the federal government and state

governments endowed public coverage to families with babies and young children. Low income teenagers were covered by the Aid to Families with Dependent Children (ADFC), but strict income eligibility limits in many states disqualified many teens. Medicaid in Alabama only covered teens aged 14-18 for households 15% of the federal poverty line, Florida only 28%, and South Carolina only 18%. (Shore-Sheppard 2003) Improvements were made with Omnibus Budget Reconciliation Act of 1990, which required states to cover children between the ages of 6 and 18, inclusive, with Medicaid coverage for families with incomes up to the 100% poverty level. [101st Congress, 1990] This expansion only covered children born after September 30, 1983 however, of which the oldest of which only reached the age of 14 at the time OBRA 1990 was passed.

An additional legislative step was taken in 1997, with the introduction of SCHIP, the State Children's Health Insurance Program. Enacted in Title 21 of the 1997 Balanced Budget Act, SCHIP provided matching federal funds for state public health insurance programs. [105th Congress, 1997] The extra funds could largely be allocated in three different ways. First, states could expand Medicaid by increasing the range of income eligibility. Second, states could extend coverage to a greater (older) age range. Finally, states could create entirely new insurance programs for children or combine the two previous methods. [Med, 2001] SCHIP programs vary not only their style of implementation, but also in in their eligibility rules, both age and income requirements. Table 1 details this fact, showing variability ineligibility by income in 1997, though by 2001, most states had increased eligibility to 200% or greater of the federal poverty line. This increasing of eligibility was paralleled in age requirements, with states covering teenagers up to and through the age of 18. [Association, 2001]

The first law requiring insurance companies to cover dependents above the age of 18 came in Utah in 1994 under Title 31A of Utah State Code. [Kriss et al., 2008] The law required that health insurance policies that covered dependents must extend eligibility to unmarried dependents up to age 26. In the following decade, many states followed suit. By the end of 2007, 27 states had laws that required insurance companies to extend coverage, with varying eligibility requirements. By and large, however, the states with extended parental coverage laws on the books allowed private insurance to cover young adults to the age of 25-26. Table 2 provides a detailed breakdown of extended parental coverage eligibility requirements by states. Some states have certain additional eligibility requirements past age, with most states requiring dependents to be unmarried, and some requiring them to be students and/or not to have dependents of their own.

Table 2: Income and Age Eligibility Limits Associated with Medicaid and the Introduction of SCHIP

	Pre-SCHIP		Post-SCHIP	
State	1997 (6-14)/(15-19)	2000 (6-14)/(15-19)	2002 (6-7)/(18-19)	Date Enrollment Began
Alabama	100/15	200/200	200/200	October 1998
Alaska	100/76	200/200	200/200	March 1999
Arizona	100/36	200/200	200/200	November 1998
Arkansas	200/200	200/200	200/200	October 1998
California	100/82	250/250	250/250	July 1998
Colorado	100/39	185/185	185/185	April 1998
Connecticut	185/185	300/300	300/300	July 1998
Delaware	100/100	200/200	200/200	February 1999
District of Columbia	100/100	200/200	200/200	October 1998
Florida	100/28	200/200	200/200	April 1998
Georgia	100/100	235/235	235/235	January 1999
Hawaii	100/100	200/200	200/200	July 2000
Idaho	100/29	150/150	150/150	October 1997
Illinois	100/46	185/185	185/185	October 1998
Indiana	100/100	200/200	200/200	January 2000
Iowa	100/39	200/200	200/200	January 1999
Kansas	100/100	200/200	200/200	January 1999
Kentucky	100/33	200/200	200/200	November 1999
Louisiana	100/16	150/150	200/200	November 1998
Maine	125/125	200/200	200/200	August 1998
Maryland	100/34	200/200	300/300	July 1998
Massachusetts	133/133	200/200	200/200	August 1998
Michigan	150/150	200/200	200/200	May 1998
Minnesota	275/275	275/275	275/275	September 1998
Mississippi	100/34	133/133	200/200	January 2000
Missouri	100/100	300/300	300/300	July 1998
Montana	100/41	150/150	150/150	January 1999
Nebraska	100/34	185/185	185/185	July 1998
Nevada	100/45	200/200	200/200	October 1998
New Hampshire	185/185	300/300	300/300	January 1999
New Jersey	100/41	350/350	350/350	March 1998
New Mexico	185/185	235/235	235/235	March 1999
New York	100/86	250/250	250/250	April 1998
North Carolina	100/100	200/200	200/200	October 1998
North Dakota	100/100	140/140	140/140	October 1999
Ohio	100/32	200/200	200/200	January 1998
Oklahoma	100/48	185/185	185/185	December 1997
Oregon	100/100	170/170	170/170	July 1998
Pennsylvania	100/100	235/235	200/200	May 1998
Rhode Island	250/250	250/250	250/250	October 1997
South Carolina	100/50	150/150	150/150	August 1997
South Dakota	100/100	200/200	200/200	July 2000
Tennessee	125/150	200/200	200/200	October 1997
Texas	100/17	200/200	200/200	April 2000
Utah	100/100	200/200	200/200	April 1998
Vermont	225/225	300/300	300/300	October 1998
Virginia	100/100	185/185	200/200	October 1998
Washington	200/200	250/250	250/250	February 2000
West Virginia	100/100	150/150	200/200	April 1999
Wisconsin	100/62	200/200	200/200	April 1999
Wyoming	100/55	133/133	133/133	December 1999

Source: Shore-Sheppard (2003), National Governors Association (2001), Kaiser Family Foundation (2002)

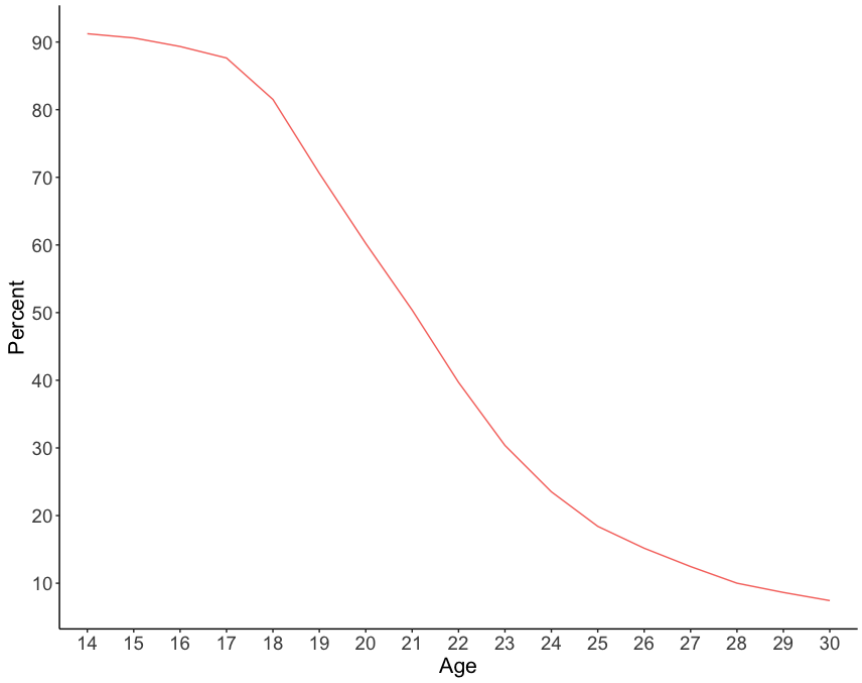
Previous Literature

Prior to Levine, McKnight, and Heep (2011), most of the literature studying federal and state policy focused either on Medicaid, or households with young children. Similar to this paper, the important measurements of interest are the rate by which newly eligible households take-up new health insurance programs and what percentage of the take-up is due to crowd-out, private plan holders switching to public plans. The earliest work is from Cutler and Gruber (1996). Cutler and Gruber (1996) found that Medicaid expansions between 1987 and 1992 led to roughly 25% marginal take up rate for Medicaid, but that anywhere from 50% to 75% of the take up was due to crowd-out. Even more interestingly, they found that many households reduced their use of employer provided insurance, and that this effect was largely an independent decision, not one encouraged by firms. [Dubay and Kenney, 1997] However, rather than specifically focusing on low-income, Medicaid eligible households, as a counterfactual for Medicaid expansions, Cutler and Gruber also use non-Medicaid-eligible households to control for trends in insurance coverage. Dubay and Kenney (1997), continue this analysis, using low-income men to control for insurance trends, who did not qualify for such Medicaid expansions, and find significantly lower estimates of take-up and crowd-out, at 14% and 17% respectively. [Dubay and Kenney, 1997]

Subsequent surveys also corroborate these lower take-up and crowd-out rates. Blumberg, Dubay and Norton (2000) find 23% of increase in Medicaid take-up being due to crowd-out, for an overall displacement rate of 4%. Additionally, they find no "reverse" crowd-out; expansions of Medicaid did not encourage uninsured households to enroll their children in private care. [Blumberg et al., 2000] This conclusion is especially important, as it could indicate that expansions of public health programs may not encourage take-up, but instead decrease the rate by which already-eligible children become uninsured as they lose eligibility. Currie and Gruber (1996) study this phenomenon, finding that take-up rates were higher amongst those already eligible for Medicaid, rather than those who were made newly eligible by Medicaid expansions. [Currie and Gruber, 1996] Card and Shore-Sheppard (2004) find similar results, with Medicaid expansions targeting the very poor being more effective at increasing take-up as compared to later expansions targeting those above the federal poverty line.

Of the papers studying Medicaid expansions, the most relevant is Card and Shore-Sheppard (2004). Card and Shore-Sheppard have very similar experimental design to Levine, McKnight, and Heep (2011); they use a regression discontinuity design, relying on the age discontinuity created by OBRA 1989, disqualifying families above the 100% Federal poverty line once their child turned 6. Remarkably, they find no effect on take-up whatsoever when comparing households below and above the eligibility limits formed by

Figure 3: Percentage of Young Adults who Live with their Parents, 2000 - 2008

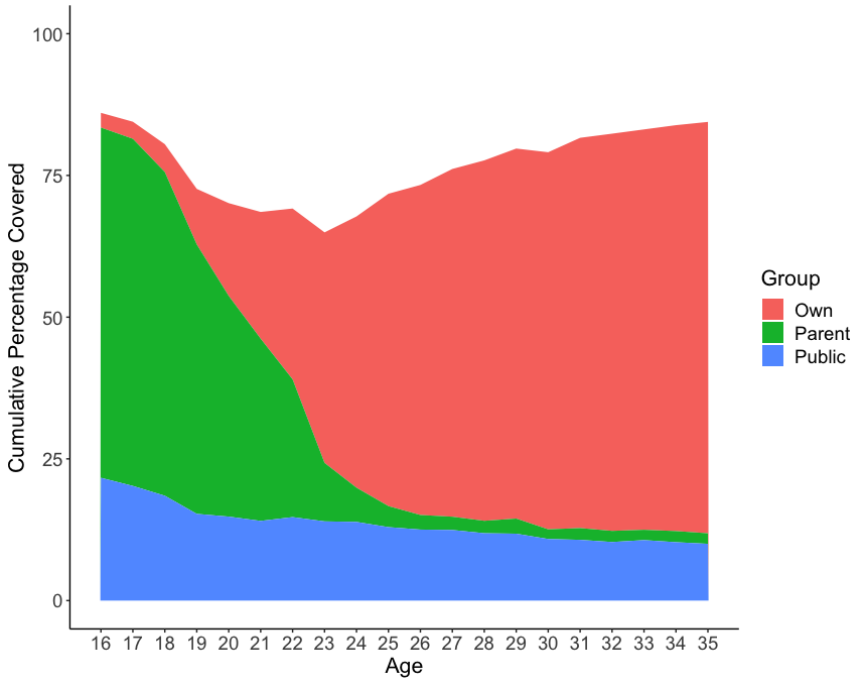


OBRA 1989. [Card and Shore-Sheppard, 2004]

The results of these initial studies, however, are not completely comparable to the public health coverage expansions under SCHIP. Both Blumberg, Dubay and Norton (2000) and LoSasso and Buchmueller (2002) point out that unlike previous expansions, SCHIP programs often expand income eligibility limits, thereby increasing the likelihood that households who already hold private insurance are now eligible for public insurance. Therefore, estimates of crowd-out for those covered under new SCHIP laws could be higher than previous Medicaid expansions. [Blumberg et al., 2000] LoSasso and Buchmueller (2002) are the first to study the potential of this phenomenon. Their study encompasses the years 1996 to 2000, only covering three years after the release of the Balanced Budget Act of 1997 and the introduction of SCHIP. Their initial results find that take-up was between 4% and 10%, with crowd-out estimates of between 18% and 50%, in line with previous studies on Medicaid. [LoSasso and Buchmueller, 2004]

The contribution of this replication is to provide later estimates of crowd-out and take-up, especially for teenagers covered under SCHIP. Having several years of data post 1997 allows for a more accurate measurement of SCHIP's impact, overcoming potential problems with early studies, namely households being unaware of SCHIP's existence.

Figure 4: Health Insurance Coverage Status by Age, 2000-2008

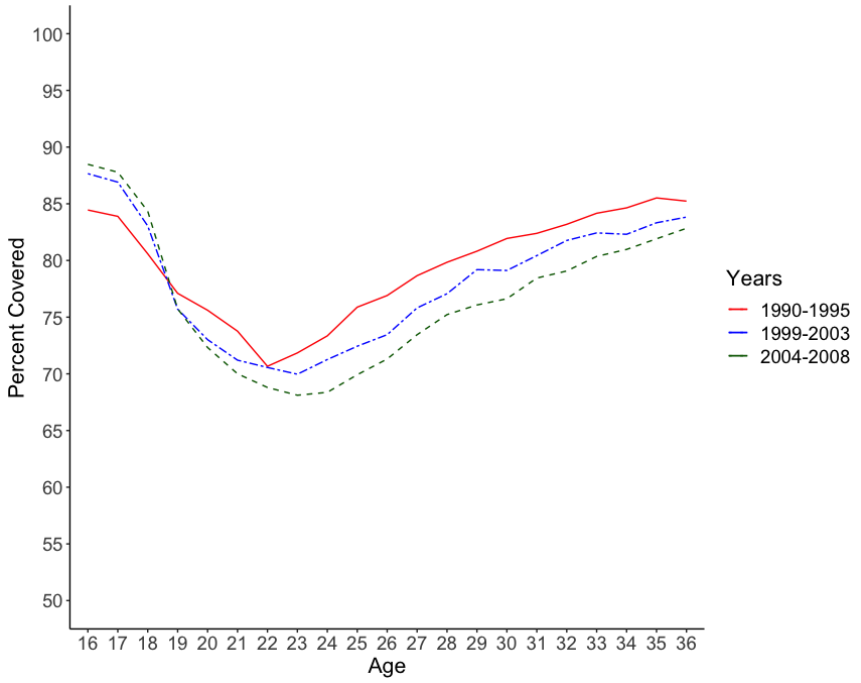


This wider time period also affords the ability to evaluate the impact of SCHIP on teenagers rather than young children. Similarly, literature on extended parental coverage laws is scarce, so this paper provides insights into health policy for an unstudied demographic, young adults. Additionally, new techniques in pre-trend analysis will allow me to evaluate whether significant evidence of a violation of parallel trends may call into question the original paper's work.

Data

In order to measure the efficacy of both SCHIP and extended parental coverage, I use data from the Current Population Survey (CPS). [Ruggles et al., 2022] CPS is a survey of roughly 65,000 American households taken in a joint effort by the United States Census Bureau and the Bureau of Labor Statistics. The survey gathers data on demographic, education, labor force status, and similar information on US households. Additional information is provided by the Annual Social and Economic Supplement, a component of the CPS that includes relevant questions on the rate and type of health

Figure 5a: Percent Covered by Any Insurance



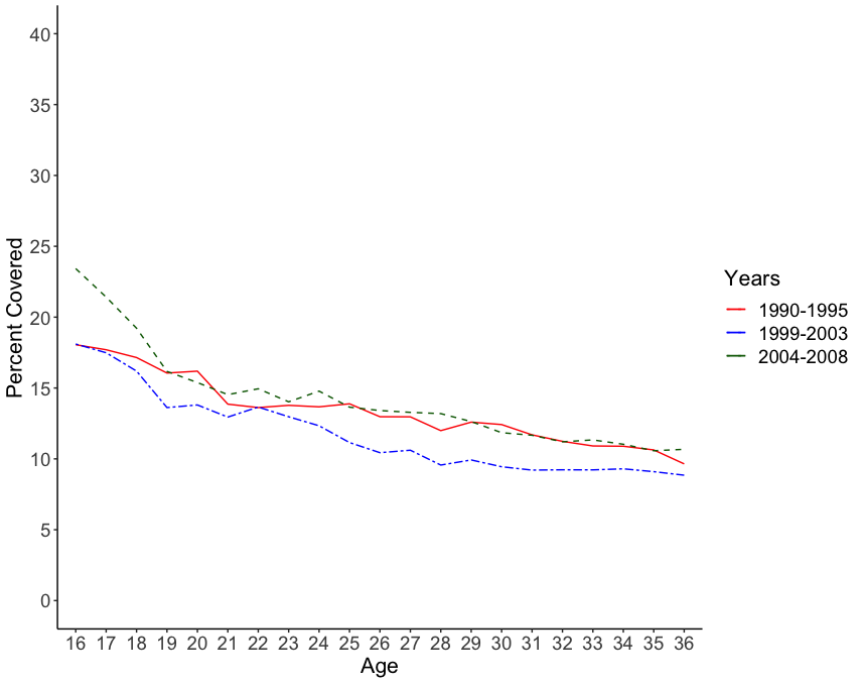
coverage possessed by American households.[2]

Analysis of SCHIP utilizes data from 1992 to 2008, while analysis of extended parental coverage laws utilizes data from 2000 to 2008. These time intervals were selected to have adequate observations before and after the enactment of relevant laws. Due to potential errors in year coding, as well as the possibility of misreporting, years are aggregated into one pre and one post period. Data on income is also pulled from CPS. Being a household survey, individuals still living at home have the same income as their parents. For young adults who have moved out, they form their own households, and thus report their own income. Figure 3 shows the percentage of young adults who still live with their parents, as per CPS measurements. We see that as individuals progress into adulthood, the proportion who still live with their parents decreases quickly. This is important to note, as part of the analyses done in this paper deals with income brackets.

Finally, figure 4 provides a summary of the overall trends of health insurance coverage of teenagers and young adults from 2000 - 2008. We see that as teenagers age into young adults, health coverage dips, as individuals come off their parent's plans, but do not acquire public or private coverage to keep the cumulative rate even. This trend reverses

[2]ASEC is also known as the March Supplement or the Average Demographic File.

Figure 5b: Percent Covered by Public Insurance

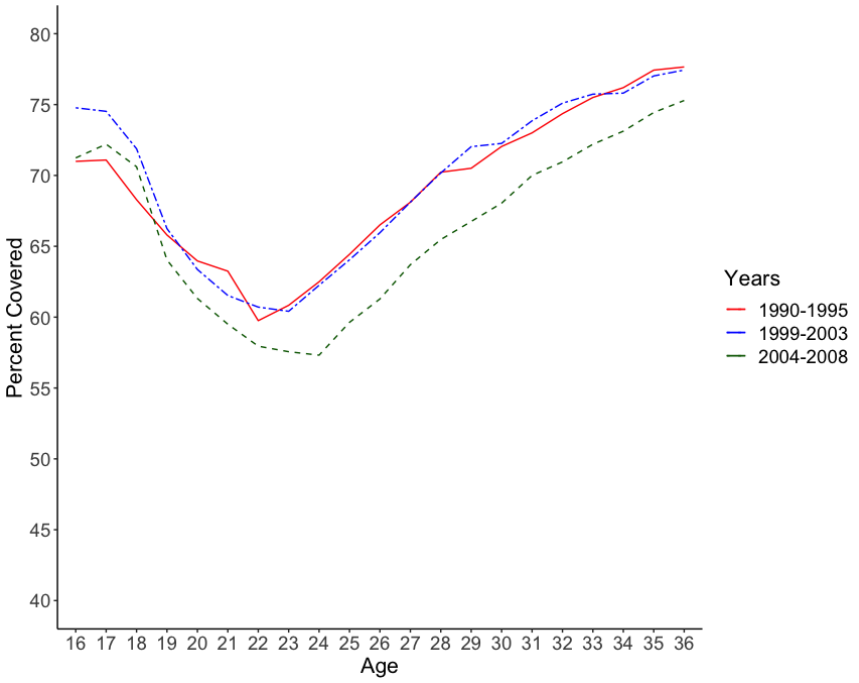


slowly as young adults age into their 30s, though not quite reaching the same coverage rates they did as teenagers.

SCHIP

The identification strategy for isolating the effect of SCHIP on older teenagers relies on the age discontinuity made by the new age eligibility requirements with the introduction of the Balanced Budget Act of 1997. With the implementation of SCHIP, 36 states raised the age to become eligible for public insurance to age 19. Thus I take advantage of this fact, examining the difference in insurance coverage for under-19 and over-19 year old's before and after 1998. We can see from figure 5a the rate by which certain age groups are insured, grouped by three different time periods. 1990 - 1995 are in the pre-SCHIP period, 1999 - 2003, the post-SCHIP period, and finally 2004-2008, longer-run impact post-SCHIP. Patterns for all three age groups are similar, but visual analysis shows that in the periods after the introduction of SCHIP, teenagers under the age of 19 have notably higher rates of insurance coverage, potentially implying SCHIP's introduction as having an impact on the health insurance coverage of teens. Figure 5b

Figure 5c: Percent Covered by Private Insurance



shows a similar result, a visual increase for those under-19 in the post-SCHIP periods. Figure 5c provides an initial estimate of crowd-out; if the introduction of SCHIP led to substantial crowd-out, one would see relative decreases in private insurance coverage for those under-19s in the post-SCHIP period, which are not observed. Thus, the figure suggests any estimate of crowd-out is not likely to be sizeable.

Analysis

$$Insurance_{iast} = \alpha + \beta Below19_a * Post1998_t + \delta_a + \tau_t + \pi_s$$

$$+\rho UnemploymentRate_{st} + \chi_{iast}\theta + \epsilon_{iast}$$

Insurance measures the health insurance status for an individual i in age group a, state s, and year t. Controls include state, year, and age fixed effects, as well as state and year unemployment rates. Additional individual covariates are controlled for, including gender, marriage status, student status, marker for resident with parent/guardian, and household income as a percentage of the poverty level. Regressions are ordinary least squares, and standard errors are clustered on age. Sample observations are between the

Table 3: The Effect of SCHIP on Insurance Coverage

		Estimation Results		
	Percent Covered By Any Insurance	Any Insurance	Public Insurance	Private Insurance
Full Sample	76.1	0.0316***	0.0447***	-0.0044
N = 291,118		(0.0047)	(0.0048)	(0.0043)
Living with Parents	81.8	0.0289**	0.0365***	0.0006
N = 218,818		(0.0096)	(0.0052)	(0.0079)
By Income				
< 150% of poverty line	63.9	0.0665***	0.0843***	-0.0037
N = 41,168		(0.0163)	(0.0156)	(0.0063)
150% – 300% of poverty line	80.6	0.0432*	0.0583***	0.0014
N = 77,562		(0.0188)	(0.0045)	(0.0177)
> 300% of poverty line	91.9	0.0015	0.0049***	-0.0022
N = 100,088		(0.0053)	(0.0010)	(0.0055)

Notes: Columns 2 - 4 are separate difference-in-difference regressions. Controls include state, year, and age fixed effects, state and year unemployment rates, and individual covariates. Standard errors are clustered on age. Data: IPUMS-CPS 1992-2009, Ages 16 - 22.
*** Significant at 1% level — ** Significant at 5% level — * Significant at 10% level

years 1992 - 2009, for ages 16 - 22. I look at three years above and below the age cutoff of 19 created by the introduction of SCHIP. The idea is that ages above and below the cutoff of 19 would've have had similar trends in insurance in the absence of SCHIP.

Results

Table 3 shows the main regression results for SCHIP. Columns 2 - 4 show results for a separate regression for each targeted populations. Results show a statistically significant 3.2 percentage point increase in overall insurance coverage for the full sample. The third column shows a statistically significant greater 4.5 percentage point increase for the rate of public insurance coverage. The fourth shows a statistically insignificant 0.4 percentage point decrease in private insurance, leading to a measure of crowd-out at 9 percent. However, as mentioned this result is not statistically significantly different from zero. These results indicate a decrease of 13% in the number of uninsured.

The lower rows of Table 3 report the results for targeted populations. Amongst those who live with their parents, I see similar results to the full sample, with smaller magnitudes. This group sees a statistically significant 2.9 percentage point increase in any insurance coverage and 3.7 percentage point increase in public insurance. Private

Figure 6: Impact of SCHIP by Year

insurance sees a decline of 0.4 percentage points, but like the full sample, the result for private insurance is not statistically significant.

Subsequent rows detail the effect of SCHIP by income. For individuals in the lowest income group, less than 150% of the federal poverty line, there is a sizeable 6.5 percentage point increase in the overall rate of insurance. This is paired with a greater 8.4 percentage point increase in public insurance coverage and a non-statistically significant decrease of 0.4 percentage point, giving a 5% crowd-out rate. This indicates a decrease of 19% in the number of uninsured.

For those in the middle income group, 150% to 300% of the federal poverty line, we see smaller but still notable gains. This group exhibits a 4.3 percentage point increase in any insurance coverage and 5.8 percentage point increase in the rate of public insurance coverage. This indicates a decrease of 22% in the number of uninsured. Once again, another non-statistically significant result for private insurance, with a flipped sign, indicating an increase of 0.1 percentage points in private insurance coverage.

Finally, those in the top income group studied, individuals in households making more than 300% of the federal poverty line, I see almost no gains, inline with logic of most states not extending SCHIP coverage for those making above the 300% poverty line. Only the public insurance coefficient sees a statistically significant result, reporting a small increase of 0.5 percentage points.

Table 4: The Effect of SCHIP on Insurance Coverage, Dynamic Specification

	Estimation Results		
Years	Any Insurance	Public Insurance	Private Insurance
1991–1993	-0.0052	0.0007	-0.0054
	(0.0093)	(0.0063)	(0.0068)
1994–1996	-0.0075**	0.0036	-0.0037
	(0.0025)	(0.0064)	(0.0047)
1998–1999	0.0057	0.0156***	0.0063
	(0.0036)	(0.0041)	(0.0044)
2000-2002	0.0181***	0.0357***	0.0086
	(0.0031)	(0.0041)	(0.0049)
2003–2005	0.0310***	0.0467***	-0.0075
	(0.0049)	(0.0074)	(0.0056)
2006–2008	0.0376***	0.0582***	-0.0087
	(0.0012)	(0.0050)	(0.0050)

Notes: Columns 2 - 4 are separate difference-in-difference regressions. Controls include state, year, and age fixed effects, state and year unemployment rates, and individual covariates. Standard errors are clustered on state. Omits 1997. Data: IPUMS-CPS 1992-2009, Ages 16 - 22, N = 291,118.
*** Significant at 1% level — ** Significant at 5% level — * Significant at 10% level

Figure 6 and Table 4 report the results of SCHIP for teens under 19 over time. Figure 6 reports the year by year effect sizes and Table 6 is the same regression framework, but instead years are grouped into time periods. Both omit the year 1997, the year before SCHIP became active, and thus all time periods are measured relative to the omitted year. Each column in Table 4 reports an independent regression. We can see from both Figure 6 and Table 4 relatively constant rates in public insurance coverage prior to 1997, with large leaps in effect sizes post implementation year. Both Figure 6 and Table 4 do not show similar trends for private coverage, implying a causal interpretation of SCHIP.

Robustness Checks

Important to difference-in-difference regressions is the assumption of parallel trends. The parallel trends assumption is the idea that the control sample provides an accurate counterfactual to the trend of the treated sample would have followed had there been no treatment. Violation of parallel trends can call into question any result of a difference-in-difference regression, even in the presence of statistical significance. Roth (2022) found, in an analysis of 12 AEA difference-in-difference papers, sizable violations of parallel

Table 5: Pre-trend Analysis for SCHIP Dynamic Specification

	Estimation Results		
Type	Power	Bayes Factor	Likelihood Ratio
Any Insurance	0.7995	0.2204	81.1288
Public Insurance	0.8005	0.0036	0.0156
Private Insurance	0.8016	0.2141	0.1610

trends. In many of these cases, the errors were greater than the estimated treatment sizes found by the regression specification.

In recent years, it has become common to do"pre-testing", statistical testing for significant violations of parallel trends. Kearney and Levine (2015) do such testing to evaluate whether watch time on MTV had any influence on teenage pregnancy. Passing the pre-test, they assume the parallel trends assumption has been fulfilled and subsequently find inverse correlation between MTV viewership and teen pregnancy. [Kearney and Levine, 2015] However, subsequent analysis from Jaeger, Joyce, and Kaestner (2020) take issue with such pre-testing. They find sizable correlation in MTV viewership with other factors like race and unemployment, and controlling for these factors causes the treatment effect to disappear. [Jaeger et al., 2020] Additionally, they find that the aforementioned pre-test fails when observing longer periods of pre-treatment. [Jaeger et al., 2020]

As such, Roth (2022) finds significant evidence that most pre-testing for parallel trends are under-powered. Furthermore, passing an ineffectual pre-test may in fact magnify biases in some violation of parallel trends, and thus "create" treatment effects when none are present. [Roth, 2022] Following this, Roth devises a new method for constructing "corrected event-study" plots, as well as a new method of pre-testing. As my extension to Levine, McKnight, and Heep (2011), I use Roth's new pre-test to evaluate whether there is significance presence of violation of parallel trends.

Table 5 reports the results of the pre-trend test. The first column reports the probability that one would find significant of pre-trend under some hypothesized pre-trend. This value, under the presence of some measurable pre-trend, will be close to a statistical power of 80%, with some numerical error, by design. The second column reports the Bayes Factor, the ratio of the probability of "passing" the pre-test under the hypothesized trend relative to under parallel trends. We can see significantly low probability in all three insurance categories, indicating extremely low likelihood of passing Roth's pre-test. Finally, the final column reports the likelihood ratio, the ratio of the likeli-

hood of the observed coefficients in the original difference-in-difference regression being present under a hypothesized trend relative to under parallel trends. From this, Roth's pre-test reports that despite the reported coefficients being possible under any type of insurance coverage, its unlikely that the estimates for public and private insurance from Levine, McKnight, and Heep's original work are not accurate due to significant violation of parallel trends.

A more intuitive understanding of this concept can be seen in Figure 7. The figure report event corrected plots for each of the insurance coverage types reported in Table 4. We can see that the corrected effect sizes for SCHIP do not deviate greatly from the hypothesized trend line in the absence of SCHIP. In other words, it's likely that significant bias has been introduced due to a violation of parallel trends. I hypothesize this is likely due to not just differences in trends, but in levels between the two groups. Figure 2 shows deviating trends in insurance coverage between the two age groups long after the introduction of SCHIP, and the 20-21 year old group has roughly 10 percentage point lower insurance coverage than the 16-17 year old age group. Thus the original control group of 19-22 year olds are likely to be an fallible counterfactual for the effect of SCHIP on those aged 16-19.

It's important to note that pre-testing is not a substitute for logical reasoning for why the parallel assumption holds. That being said, the results of my pre-trend analysis may call into question the results of the original Levine, McKnight, and Heep paper. For future researchers, I recommend longer pre-treatment time periods and controlling for within state differences using the triple-difference specification later on in this paper.

Extended Parental Coverage Laws

The identification strategy for extended parental coverage laws relies on the quasi-experimental variation created by the difference between implementation strategies by states.[3] I look at differences in health insurance coverage rates before and after in states that enact extended parental coverage laws to states that did not have such laws. As an additional step, I construct a triple-difference regression with an additional difference, adults who were made ineligible due to certain requirements made by extended parental coverage laws. This triple-difference specification can adjust for within state variation that may affect health insurance coverage rates.

I use a sample of adults living independently and with their parents between the ages of 19-24, the age grouping affected by extended parental coverage laws. This sample is subdivided into specific sub-samples that may be more or less affected based on possessing

[3] See Table 1.

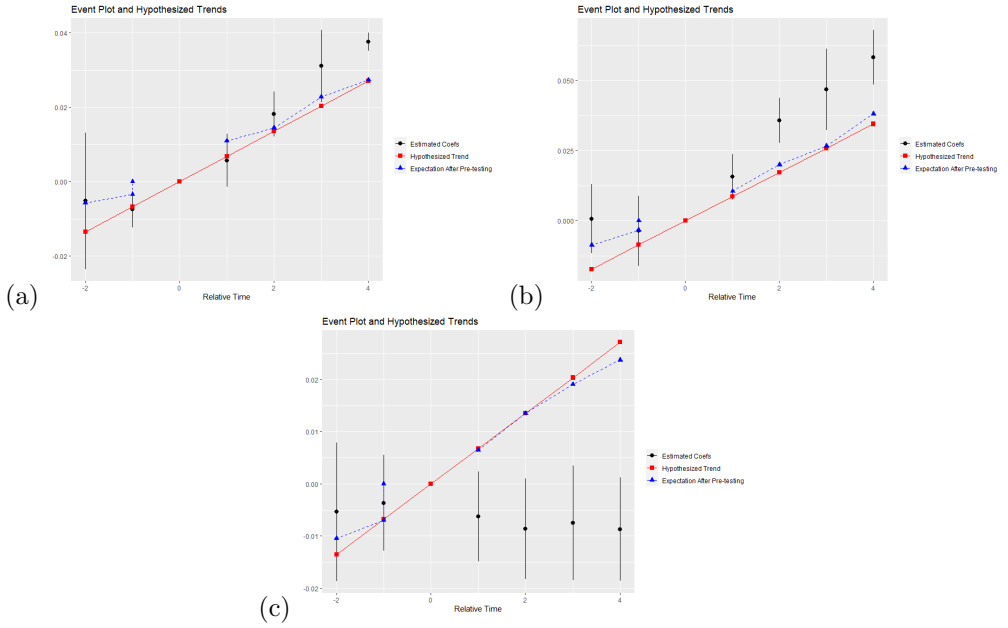


Figure 7: Pre-Trend Corrected Event Plot
(a) Any (b) Public (c) Private

some characteristics. In states without extended parental coverage laws, I use unmarried young adults. Observations are from the years 2001 to 2009.

Analysis

$$Insurance_{iast} = \alpha + \beta Law_{st} + \delta_a + \tau_t + \pi_s + \rho UnemploymentRate_{st} +_{iast} \theta + \epsilon_{iast}$$

Insurance measures the health insurance status for an individual i in age group a, state s, and year t. Controls include state, year, and age fixed effects, as well as state and year unemployment rates. Additional individual covariates are controlled for, including gender, marital status, student status, marker for resident with parent/guardian, and household income as a percentage of the poverty level. Regressions are ordinary least squares, and standard errors are clustered on state.

Results

Tables 6 and 7 report the results of the regression. Columns 2 - 4 of Table 6 show results for a separate regression for each targeted populations. Row 1 of Table 5 shows no statistically significant evidence for an increase in any insurance or in private insurance

Table 6: The Effect of Extended Parental Coverage Laws on Insurance Coverage

		Estimation Results		
	Percent Covered By Any Insurance	Any Insurance	Public Insurance	Private Insurance
Full Sample				
Difference-in-Difference				
Full Sample	69.3	-0.0005	-0.0128**	0.0100
N = 127,106		(0.0065)	(0.0062)	(0.0074)
Eligible Sample	69.4	0.0084	-0.0141**	0.0217***
N = 100,218		(0.0063)	(0.0062)	(0.0068)
Triple Difference				
Full Sample	69.3	0.0326**	-0.0053	0.0443***
N = 127,106		(0.0131)	(0.0116)	(0.01022)
Non-Students				
Difference-in-Difference				
Full Sample	63.2	-0.0012	-0.0080	0.0063
N = 77,861		(0.0084)	(0.0088)	(0.0103)
Eligible Sample	60.8	0.0179**	-0.0057	0.0262**
N = 54,417		(0.0084)	(0.0089)	(0.0108)
Triple Difference				
Full Sample	63.2	-0.0330**	0.0052	0.0541***
N = 77,861		(0.0146)	(0.0099)	(0.0138)

Notes: Columns 2 - 4 are separate difference-in-difference regressions. Controls include state, year, and age fixed effects, state and year unemployment rates, and individual covariates. Standard errors are clustered on state. Data: IPUMS-CPS 2001-2009, Ages 19 - 24.
*** Significant at 1% level — ** Significant at 5% level — * Significant at 10% level

for the full sample. In the second row, amongst those eligible for extended parental coverage laws, we see statistically significant gains in private insurance of 2.2 percentage points. This effect has greater magnitude in the triple-difference specification, at a gain of 4.4 percentage points in private insurance coverage. The triple difference estimate implies a reduction in un-insurance of 19-24 year olds of 11%. The net effect in the reduction of un-insurance is relatively muted, due to reductions in public insurance coverage. This suggests "reverse" crowd-out as a result of young adults moving onto their parent's private insurance as they become eligible under new laws. This may be due to private insurance policies having better coverage than

Table 7: The Effect of Extended Parental Coverage Laws on Insurance Coverage Amongst Targeted Populations

		Estimation Results		
	Percent Covered By Any Insurance	Any Insurance	Public Insurance	Private Insurance
Living with Parents	74.6	0.0155**	-0.0131**	0.0291***
N = 60,550		(0.0070)	(0.0065)	(0.0073)
By Income				
< 150% of poverty line	53.6	-0.0024	-0.0203	0.0013
N = 8,624		(0.0282)	(0.0287)	(0.0230)
150% – 300% of poverty line	66.8	0.0265**	-0.0135	0.0511***
N = 19,847		(0.0122)	(0.0105)	(0.0142)
> 300% of poverty line	85.2	0.0074	-0.0054**	0.0107***
N = 32,079		(0.0088)	(0.0059)	(0.0097)
By Parents' Insurance				
Group Coverage	84.0	0.0116	-0.0142***	0.0223***
N = 44,221		(0.0071)	(0.0054)	(0.0072)
Group & Firm Size < 100	80.6	0.0364	-0.0317	0.0552*
N = 10,264		(0.0204)	(0.0103)	(0.0199)
Group & Firm Size > 100	85.1	0.0040	-0.0085	0.0119
N = 33,957		(0.0079)	(0.0052)	(0.0068)
No Group Coverage	49.2	0.0088	-0.0006	0.0184
N = 16,329		(0.0196)	(0.0190)	(0.0111)

Notes: Columns 2 - 4 are separate difference-in-difference regressions. Controls include state, year, and age fixed effects, state and year unemployment rates, and individual covariates. Standard errors are clustered on state. Targeted groups live with their parents, eligible for coverage in treatment states, unmarried in control states. Data: IPUMS-CPS 2001-2009, Ages 19 - 24.
*** Significant at 1% level — ** Significant at 5% level — * Significant at 10% level

public insurance plans, thus young adults may move plans in order for better coverage or access to specific services. That being said, high standard error measurements call into question Levine, McKnight, and Heep's conclusion about "reverse" crowd-out; any result from Table 6 should be taken as an indication of a possibility, rather than conclusiveness.

Table 7 reports additional difference-in-difference regressions under different sub-groups. As insurance type and household income is required, this sample is restricted to those young adults still living with their parents. In line with the original work, there is no triple-difference specification under the rationale that few married individuals would live with their parents. This set of regressions find that amongst all those that live with their parents, a statistically significant increase in insurance coverage of 1.6 percentage

points, with a greater 2.9 percentage point increase for private insurance coverage.

Subsequent rows detail the same regression specification, by income. Those under 150% of the federal poverty line do not yield results significantly different from zero. This is unsurprising, as low-income households are unlikely to have private insurance coverage to begin with. In the 150% to 300% income bracket, I observe a 2.7 percentage point increase for any insurance coverage in this income group, and a greater 5.1 percentage point increase in private insurance. Unlike the original paper, I do find statistically significant results for those making above 300% of the federal poverty line, but I concur with their conclusion that 85% of those in this income group already possessed private insurance thus making the population that could swap small.

In the final section of the Table 7, I examine the effects of extended parental coverage laws based on the type of insurance. I expect that the effect for young adults with parents possessing group insurance to be sizable, as group coverage generally is cheaper than non-group coverage. In line with this, we see the lion's share of the increases to private insurance coverage is attributable to those under group coverage, with a statistically significant 2.2 percentage point increase. Subsequent rows of Table 7 analyse the original paper's hypothesis regarding ERISA legislation of 1974. Under the Employee Retirement Income Security Act of 1974, self-insured firms were exempted by state health insurance laws, i.e extended parental coverage laws. As a result, Levine, McKnight, and Heep predict extended parental coverage laws to be strongest in small firms, as they expect to find higher rate of self-insurance in large firms. In firms with less than 200 employees, roughy 12% were self funded, whereas in firms greater than 5,000, nearly 89% were in self-funded plans. [Foundation] That being said, my analysis does not concur with their conclusions. I do not find statistically significant evidence of group size having an effect on overall or public insurance rates, with only weak evidence of private insurance increase of 5.5 percentage points for individuals whose parents work for small firms. This analysis was repeated using firm sizes of 500 as the threshold, and similar results were obtained.

Conclusion

Initial results of the replication suggest that both SCHIP and extended parental coverage laws were effective in increasing rates of insurance coverage for both teenagers and young adults. Like the original paper, my analysis finds that SCHIP was effective an increasing public insurance coverage, especially for those households making between 150 and 300 percent of the federal poverty line, with small measures of crowd-out. In the same vein, extended parental coverage laws found more moderate effects amongst those eligible in increasing private insurance coverage amongst young adults.

That being said, my extension of the paper calls into question whether the original analysis suffered from notable pre-trend bias, failing multiple levels of parallel trend testing. I hypothesize this is due to differences baseline insurance coverage levels in the control group, older teens and adults. While Roth's pretest may also be susceptible to being underpowered, visual analysis of the effect sizes also calls into question the original work's results. With previous work done to evaluate Medicaid expansions also using similar regression discontinuity design, previous work should also be evaluated for similar error. Other potential conflicts with the original work include differing standard errors in group coverage regressions under extended parental coverage laws. More work should be done to evaluate the effectiveness of such laws, especially in the wake of the Affordable Care Act mandate.

References

[Med, 2001] (2001). Medicaid and SCHIP: State's Enrollment and Payment Policies Can Affect Children's Access to Care. *United States General Accounting Office*.

[101st Congress, 1990] 101st Congress (1990). Omnibus Budget Reconciliation Act of 1990.

[105th Congress, 1997] 105th Congress (1997). Balanced Budget Act of 1997.

[Association, 2001] Association, N. G. (2001). Maternal and Child Health (MCH) Update. *National Governors Association Center for Best Practices*.

[Blumberg et al., 2000] Blumberg, L., Dubay, L., and Norton, S. (2000). Did the Medicaid expansions for children displace private insurance? An analysis using the SIPP. *Journal of Health Economics*, 19(1):61 – 91.

[Card and Shore-Sheppard, 2004] Card, D. and Shore-Sheppard, L. (2004). Using Discontinuous Eligibility Rules to Identify the Effects of the Federal Medicaid Expansions on Low-Income Children. *The Review of Economics and Statistics*, 86(3):752 – 766.

[Cohen and Ball, 1965] Cohen, W. and Ball, R. (1965). Social Security Amendments of 1965: Summary and Legislative History. *Social Security Administration*, 82(4).

[Currie and Gruber, 1996] Currie, J. and Gruber, J. (1996). Saving Babies: The Efficacy and Cost of Recent Changes in the Medicaid Eligibility of Pregnant Women. *Journal of Political Economy*, 104(7):1263–1296.

[Cutler and Gruber, 1996] Cutler, D. and Gruber, J. (1996). Does Public Insurance Crowd out Private Insurance? *The Quarterly Journal of Economics*, 111(2):391–430.

[Dubay and Kenney, 1997] Dubay, L. and Kenney, G. (1997). Did Medicaid Expansion for Pregnant Women Crowd Out Private Coverage? *Health Affairs*, 16(1):185–193.

[Holahan and Kenney, 2008] Holahan, J. and Kenney, G. (2008). Health Insurance Coverage of Young Adults: Issues and Broader Considerations. *Urban Institute*.

[Jaeger et al., 2020] Jaeger, D., Joyce, T., and Kaestner, R. (2020). A Cautionary Tale of Evaluating Identifying Assumptions: Did Reality TV Cuase a Decline in Teenage Childbearing? *Journal of Business Economic Statistics*, 38(2):317–326.

[Kearney and Levine, 2015] Kearney, M. and Levine, P. (2015). Media Influences on Social Outcomes: The Impact of MTV's 16 and Pregnant on Teen Childbearing. *American Economic Review*, 105(12):3597–3632.

[Kriss et al., 2008] Kriss, J., Mahato, B., Collins, S., and Schoen, C. (2008). Rite of Passage? Why Young Adults Become Uninsured and How New Policies Can Help, 2008 Update. *Commonwealth Fund*.

[Kronstadt et al., 2007] Kronstadt, J., Mojerie, S., and Schwarz, S. (2007). State Efforts to Extend Dependent Coverage for Young Adults. *State Health Policy Monitor*, 1(5):1–6.

[LoSasso and Buchmueller, 2004] LoSasso, A. and Buchmueller, T. (2004). The effect of the State Children's Health Insurance Program on health insurance coverage. *Journal of Health Economics*, 23(5):1059–1082.

[Mills, 2000] Mills, R. (2000). Health Insurance Coverage in America: 1999. *United States Census Bureau*.

[Nicholson et al., 2009] Nicholson, J., Collins, S., Mahato, B., Gould, E., Schoen, C., and Rustgi, S. (2009). Rite of passage? Why young adults become uninsured and how new policies can help, 2009 update. *Commonwealth Fund*, 64:1–20.

[Roth, 2022] Roth, J. (2022). Pretest with Caution: Event-Study Estimates after Testing for Parallel Trends. *American Economic Review: Insights*, 4(3):305–322.

[Ruggles et al., 2022] Ruggles, S., Flood, S., Sobek, M., Brockman, D., Cooper, G., Richards, S., and Schouweiler, M. (2022). IPUMS USA: Version 13.0 [dataset].

[Shore-Sheppard, 2003] Shore-Sheppard, L. (2003). Expanding Public Health Insurance for Children: Medicaid and the State Children's Health Insurance Program. *Changing Welfare*, pages 95–118.