MEDIA ROLE MODELS AND BLACK EDUCATIONAL ATTAINMENT: EVIDENCE FROM THE COSBY SHOW

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This paper assesses the influence of role models on educational attainment by examining the impact of a popular 1980's sitcom: The Cosby Show*. The show portrayed an upper-middle class black family, and frequently emphasized the importance of a college education. If role model effects exist, young black people should have responded more strongly to this message. I test this hypothesis by relating educational attainment to city-level* Cosby *ratings, using Thursday NBA games and very warm Thursdays as instruments. I find that* Cosby *increased years of education by 0.2-5.0% among the black sample, but had no effect in the white sample.*

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Black-white education gaps are a striking feature of the U.S. economy. White men and women obtain about one more year of education, on average, than their black counterparts. For cohorts born in the early 1980's, white women (the group with the highest educational attainment) were about five percentage points more likely to graduate from high school than black men (the group with the lowest attainment); for college completion, the same gap was a full twenty percentage points. In spite of the large increase in the return to college over the past sixty years (Goldin and Katz 2008), college attainment has stagnated or declined over this period for both black men and black women.

There is a great deal of research attempting to account for these gaps and their patterns over time. A recurring theme in this literature is the possibility that role model effects may help explain the persistence of black-white (as well as male-female) education gaps. Papers by Thomas Dee (Dee 2004, Dee 2005, Dee 2007) and Fairlie, Hoffman and Oreopoulos (2014), for example, show that students perform better, and are more positively evaluated, in classrooms with same-race and same-gender teachers. Kling, Liebman and Katz (2007) and Clampet-Lundquist et al. (2011) suggest that the lack of positive effects for adolescent boys in the Moving to Opportunity studies may be explained by changes in contact with father figures. Evans, Garthwaite and Moore (2012) suggest that role model effects may have amplified the impact of crack cocaine on black men's high school graduation rates. Autor and Wasserman (2013) argue that men's declining educational outcomes may be due, in part, to the increasing prevalence of single motherhood (particularly in the black community) and the resulting lack of close male role models for young men raised in these households. In all of these

cases, however, it is difficult to rule out the possibility that differences in parental or teacher inputs are driving the results.

Role models do not, of course, have to take the form of teachers or parents; they need not even exist in real life. Popular belief suggests that children learn from and mimic the characters they observe on television, in movies, and in video games. Recent empirical evidence supports the claim that people are influenced by what they see on television, even when it is primarily comprised of fiction and has little informational content. Jensen and Oster (2009) show that rural villagers in India dramatically changed their attitudes and behavior towards women once satellite television was introduced. As the most popular programs were soap operas and game shows, this was unlikely to be driven by exposure to educational or informational programs. Similarly, Eliana La Ferrara and Duryea (2012) show that exposure to soap operas in Brazil was associated with reductions in fertility. Kearney and Levine (2015*b*) show that MTV's Sixteen and Pregnant influenced teen fertility outcomes, while Kearney and Levine (2015*a*) show that exposure to Sesame Street may have improved educational outcomes for poor and minority children. These studies do not provide direct evidence about role modelling, because they do not distinguish between alternative channels through which learning from television occurs. They do suggest, however, that television is powerful enough to tell us about role model effects, given the right setting.

In this paper, I use the introduction of a popular television show in the 1980's - *The Cosby Show* - to estimate the impact of television role models on the educational decisions of young people. The show depicted the family life of the fictional Huxtables, a black family headed by Heathcliff (a doctor)

and Clair (a lawyer.) The show's focal point is Cliff, played by show creator Bill Cosby, who guides his five children through their struggles with school, dating and other day-to-day issues. The show placed an unusually strong emphasis on education and family values. The parents frequently discuss the importance of a college education with their children, and the three oldest Huxtable children all go to college during the course of the show.

The Cosby Show was immensely popular. At its peak, nearly one-third of Americans tuned in to watch it on any given Thursday night. The show therefore had the potential to influence a large number of young people. My hypothesis is that it had a particularly strong impact on black children and teenagers, who would identify most with its main characters.

I test this hypothesis by relating educational attainment among cohorts who were children or teenagers during *The Cosby Show*'s run to city-level Cosby Show Nielsen ratings. Of course, Cosby Show ratings are unlikely to be random. In order to address the potential endogeneity of Cosby Show popularity, I instrument for Cosby Show ratings using two potential sources of competition for Cosby Show viewership: Thursday night NBA games, and the number of unusually warm Thursday nights. I show that in cities where NBA teams tended to play frequently on Thursday nights over this period, or where the weather happened to be unusually pleasant on Thursdays (relative to the rest of the week), Cosby Show ratings were significantly lower. Using variation produced by the instruments, I show that Cosby Show exposure appeared to increase the educational attainment of black cohorts born in the 1960's or later, relative to earlier cohorts in the same cities. Each Thursday with an NBA game over this period reduced college attainment in the black sample by about 0.1 percentage points and years of education by about 0.006

years (relative to a base of about 15.4 percentage points and 12.8 years, respectively.) For very warm Thursdays, these numbers are 0.5 percentage points and 0.025 years, respectively. The response among the white sample was much smaller and less statistically significant.

Assessing the "per hour" magnitude of the response is difficult in this context, for two reasons. First, while the instruments strongly predict Cosby exposure at the monthly and season level, the instrument is statistically weak once I aggregate to the city level. Second, there is measurement error in the first stage induced by limitations in my ratings data. After attempting to correct for these issues, my preferred estimates suggest that Cosby increased years of education among post-1960 black cohorts by between 0.02-0.6 years, a percentage increase of 0.02-5.0%. The same estimates for the white sample suggest a response of no more than 0.08 years, or 0.6%. It should be noted, however, that there is some uncertainty surrounding the true first stage response and the associated magnitudes.

The IV strategy requires that Thursday night NBA games or very warm Thursday nights have no effect on educational attainment, other than through exposure to *The Cosby Show*. In support of this assumption, I show that the instruments did not have similar effects in the years leading up to (1976-1984) or following (1992-2000) *The Cosby Show*'s run. I also show that Thursday night NBA games that were less likely to conflict with *The Cosby Show* because of their timing had a weaker effect on both ratings and education. These findings strongly suggest that my results are driven by Cosby exposure. I also provide evidence that the effects were driven by role-modelling, rather than through reduced discrimination.

The next section provides background on *The Cosby Show*. Section 3

presents my data, and describes my empirical strategy. I then present my main results in Section 4, and perform a number of placebo and robustness tests, described in Section 5. In section 6, I adjust the magnitude of the IV estimates to account for measurement error in the Cosby Show exposure index. Section 7 concludes.

I. Background

The Cosby Show premiered on NBC in 1984, and was an instant critical and commercial success. Critics called it "the best, funniest and most humane show of the new season" (Shales 1984) and "a rare commodity – a truly nice development in a medium that seems increasingly preoccupied with trash." (O'Connor 1985). The show was also popular among viewers, vaulting to third place in the Nielsen ratings in its first season, and holding the number one spot for the following five years.

The show followed the lives of Clair and Heathcliff Huxtable and their five children: Sondra, Denise, Theo, Vanessa and Rudy. Episodes of *The Cosby Show* frequently showed the Huxtable parents correcting their children's behavior, discussing and enforcing household rules, and attempting to guide their children towards good decisions. By portraying the family in this way, the creators of the show were consciously attempting to provide role models for both parents and children. Alvin Poussaint, a Harvard professor of psychiatry who acted as psychological consultant on the show, remarked:

"We'd like to think [the show] has influenced black family life and family life in general - that it's changed attitudes and values a bit within families, changing white attitudes toward black families and providing role models for black youngsters. I hear from mothers and fathers who say they learn how

to be better parents. A lot of parents drag their kids to the TV set to watch it because they believe it has good values and good lessons." (Martin 1989)

One of the values that the show consistently promoted was the importance of education. A large number of the episodes revolved around the children's day-to-day issues at school. A synopsis of an episode from season 1 is typical of the series:

"Vanessa prepares for the science fair. She believes that her project is very good, but Denise warns that she may need to work harder to keep up with the kids in her new advanced class. Vanessa is shocked by the quality of the other kids' projects, and begins to feel embarrassed. She finishes 14th in the competition, and alienates best friend Janet by accusing her of getting help from her parents. Vanessa assures Cliff that she is capable of succeeding in the class, but needs to put in more of an effort. [...]" (Tv.com)

Other episodes focused on the college decisions of the older children. The eldest daughter, Sondra, is already at Princeton when the show begins and later decides to attend graduate school. The next two children, Denise and Theo, graduate from high school and go to college during the course of the show.

There have been no large scale, credible studies that investigate whether *The Cosby Show* had a long term effect on the behavior of young people. Rosenkoetter (2009) links Cosby viewership to pro-social behavior in children; Mattabane and Merrit (2014) show that Cosby Show viewership is correlated with attendance at historically black colleges. Both studies are quite small scale, however, and neither attempts to control for the endogeneity of Cosby Show exposure. Other research on *The Cosby Show*'s impact has generally focused on its effect on racial attitudes. Most notoriously,

a study funded by Bill and Camille Cosby found that white viewers used the show to reaffirm their beliefs that anyone could "make it" in America, and that racial discrimination was not a major barrier to success for blacks (Jhally and Lewis 1992). As I show below, any change in white attitudes induced by the show did not appear to change the labor market prospects of young black people.

II. Data and empirical strategy

A. Data

Educational outcomes

In order to link Cosby Show exposure to educational outcomes, I use data from the 1990, 2000, and 2010 public use Census samples, and the 2015 5-year American Community Survey, provided by the IPUMS website (Ruggles et al. 2015). For each city, I calculate average educational attainment for respondents born from 1950-1984 who are at least 25 years of age at the time of the survey. Note that respondents are assigned to the city in which they currently live, which may not be the same city they lived in as a child or teenager. This will introduce some measurement error into my estimates. To minimize this error, I restrict the sample to individuals living in their state of birth.

My empirical strategy will examine changes in educational attainment across cohorts within a city. I define a city as a Designated Market Area (DMA), which is the unit of measure for my Nielsen ratings data (described in detail in the next section.) There are 190 DMAs in the Nielsen data, which I match to Census metropolitan areas by hand. DMAs typically comprise several Census metropolitan areas. I have 129 DMAs that can be linked to

metropolitan areas in all Census samples.[1] Of these, 119 also have available weather data, which is used to construct one of the instruments (described in more detail below.)

Unfortunately, the number of black respondents in each city-cohort cell is often quite small: about 20% of these cells have fewer than 10 individuals, which makes it difficult to precisely measure changes in educational attainment. In order to maintain a consistent set of cities across cohorts, I do not impose a restriction on the cell size, but I do restrict the sample to cities with a population of 250,000 or more in 1980.[2] This threshold corresponds to about the 20th percentile of population for the cities in my data, leaving 94 cities in my sample. In the robustness section, I show that my results are qualitatively similar but slightly weaker when I do not impose this restriction.[3]

My dependent variables are the proportion of respondents falling into four educational categories (no high school, high school, some college and college graduate), along with a composite measuring average years of education.[4] Table 1 shows the means of the education variables for members of my sample. The black-white gap in educational attainment for this set of cohorts is

[1]This includes the 1980 Census, which I use to construct control variables (as described below.) I am able to link 192/256 metropolitan areas in the 1980 Census to DMAs; 194/250 in the 1990 Census; 231/258 in the 2000 Census; and 238/291 in the 2015 ACS.

[2]The results are robust to alternative sample restrictions, such as imposing a minimum average cell size.

[3]I also examine the impact of an alternative way to deal with this issue, which is to use population weighting. I show that the first stage is substantially weaker when using population weights, which suggests that individuals in smaller cities may have responded more strongly to the instruments. The reduced form results are commensurately weaker in this specification.

[4]The coding of the years of education index is: 7 years for individuals with grade 8 or less ; 9, 10, 11 years for grades 9-11, respectively; 12 years for high school graduates or those with 12 years of education; 13 years and 14 years for those with one or two years of college; 14 years for those with a college degree; and 18 years for those with more than a college degree.

about 1 year, with whites attaining about 13.7 years of schooling on average and blacks attaining 12.8 years.

[Table 1 about here]

Cosby Show exposure

I construct a measure of average Cosby Show exposure using Nielsen ratings. These ratings measure the average proportion of a city's population that watched each episode of the show over the course of a ratings period. I use data from 'sweeps', which are conducted across a large number of cities four times per year, in February, May, July and November.[5] Nielsen Media Inc provided me with the ratings for each sweeps month throughout *The Cosby Show*'s run.[6] *The Cosby Show* had an average rating of 21.6 across all ratings months during its run, indicating that about one-fifth of Americans watched *The Cosby Show* on a given Thursday night. Its popularity peaked in its third season, when over 30% of television viewers watched an average episode.

For ease of interpretation, I convert the Nielsen ratings to an exposure index that captures the average number of hours of *The Cosby Show* watched by residents of a city over a particular time period. I first multiply the Nielsen rating for each city and month by two hours - the maximum possible

[5]The sweeps ratings are constructed through the use of diaries, which record what was on the television for each 15 minute segment throughout the day. Currently, Nielsen ratings include viewership of shows that have been previously recorded. I have not been able to discover whether this was standard practice in the 1980's. About 21% of households in the U.S. had a VCR by 1985 (Television Bureau of Advertising 2012). Time shifting is not a major concern for my analysis, however. If the ratings do not include viewership of taped episodes of *The Cosby Show*, my first stage will overestimate the impact of the NBA on Cosby Show viewership. In this case, I should not expect to see a strong second stage.

[6]Nielsen data are proprietary and are licensed to researchers under strict non-disclosure agreements.

exposure available during a four-week month. Because *The Cosby Show* was in reruns in July, I drop observations in this month.[7] I then add up this exposure over the relevant time period - by season for some versions of my regressions, and over all seasons for others.

Table 2 provides summary statistics on city-level Cosby exposure. The average total exposure for the cities in my sample ranges from 5-16 hours, with a mean of about 10 hours. Around 50% of observations in the sample have between 9-11 hours of exposure. Table 3 shows how exposure varies with several city characteristics, including the educational distribution among an older cohort (born from 1950-1959); the racial and age composition of the city, mean household income and population as of 1980; and Census division. There are no statistically significant relationships in the table, suggesting that Cosby popularity was not strongly related to city demographics. There does appear to be a somewhat negative relationship between Cosby exposure and black educational attainment, however.

[Table 2 about here]

There are two important limitations of the Nielsen data. First, they are not demographic-specific. They capture the viewership behaviour of all residents of a city, not the viewership of my population of interest (young black and white people.) Secondly, they capture only a part of total exposure - that acquired during sweeps months. I discuss these issues in detail in a later section.

[7]The exclusion is also motivated by the IV strategy, which partially depends on NBA games. The NBA does not play in July, which means that these months do not add useful or exogenous variation in this instrument.

Instruments: NBA games and weather

In order to address the potential endogeneity of Cosby Show exposure, I use two instruments that provided competition for Cosby viewership: Thursday NBA games, and good weather on Thursday nights. To construct the NBA games measure, I first assign each city the two geographically closest NBA teams, giving priority to within-state teams. I then created an indicator variable for whether either of these teams was playing on a given Thursday night, using information on the historical schedule gathered from the website Land of Basketball. The instrument is the number of Thursdays during the NBA season on which either of a city's two teams were playing. It is possible that NBA games have a direct effect on educational attainment if they crowd out more educational activities such as homework. In order to control for this channel, I also add the total number of nights on which either of these teams played as a control to the regression. The results can therefore be interpreted as the effect of shifting an NBA game to Thursday from another night of the week. The exclusion restriction is that there is no other reason why NBA games have a differential effect on Thursdays, relative to other nights of the week. I show in the robustness section that this appear to be true: there is no estimated effect of NBA Thursdays outside of the period 1984-1992.

The second instrument is the number of Thursdays during the Cosby era on which the weather was unusually nice. I construct this instrument using information on historical weather patterns provided by the National Climatic Data Centre. Using daily data from each weather station in the U.S. over the period 1976-2000, I calculated the average temperature for each month and city. I then calculated the number of Thursdays during

the Cosby period on which the temperature was at least 1 standard deviation above the city's typical temperature for that month.[8] [9] As with NBA games, the weather may have a direct effect on educational attainment by providing competition for alternative activities. It may also be correlated with educational trends over time, because the number of very warm days rises over the sample period. To control for these direct effects of the weather, I also calculate the total number of days on which the weather was unusually warm and add this as a control to the regressions. I use the number of very warm days during the regular Cosby season (October-May) only, which corresponds to the NBA season as well.

Table 2 provides summary statistics on both instruments. Across cities, the mean number of Thursdays with an NBA game over all 8 seasons was around 128 (out of a possible 279 Thursdays occurring during the NBA season over this period.) The mean number of very warm Thursdays is smaller, at 48.

Table 3 examines how both measures vary with city characteristics. This provides an indirect test of the exogeneity of the instruments; ideally, we would not see any significant difference in pre-existing characteristics across cities with respect to the instruments. While the coefficients in Table 3 are mostly insignificant, there are some exceptions. In particular, both instruments appear to be positively related to education for an older cohort of blacks.[10] The relationships are insignificant for NBA Thursdays, and only marginally significant for very warm Thursdays; however, I show later

[8]Other weather-related measures, such as the number of very cold days or the amount of precipitation did not have a significant relationship with Cosby ratings.

[9]The results are not sensitive to small changes in the 1 standard deviation threshold; however, the first stage relationship becomes smaller and weaker as I lower the threshold and becomes larger in magnitude but statistically less significant as I raise the threshold.

[10]Note that this is the opposite of what I would expect to see for my main sample.

that the relationship is significant in my main specification (which includes more precise geographic controls, and examines black and white educational attainment separately.) There are also a few other marginally significant relationships between the instruments and city covariates. In the next section, I argue that these relationships arise as a result of geographic correlation in the instruments, and present a difference-in-differences specification that looks for significant changes in these relationships across cohorts.

[Table 3 about here]

Controls

In all of my regressions, I include controls for city characteristics taken from the 1980 Census. These include the fraction of the city's population that is black, white or Hispanic; the fraction of the population that are immigrants; the fraction of the population that falls into four twenty-year age group categories (0 to 20; 21 to 40; 41 to 60 and 61 to 80); the fraction of the population that is black or white and falls into the same age categories; the mean household income; and the population. I also include Census region indicators in all regressions.

B. Empirical Strategy

My empirical strategy uses a combination of instrumental variables and difference-in-differences to identify the effect of *The Cosby Show* on young viewers. The differences-in-differences component of the empirical strategy - which I argue is not sufficient to eliminate any bias in OLS regressions relating education to Cosby exposure - is used to net out a pre-existing correlation between the instruments and educational attainment among an

older sample. My regressions therefore tell us whether cities with higher Cosby exposure induced by the instruments saw increases in educational attainment among younger cohorts, relative to older cohorts in the same cities.

Regression equations

My main regression equation relates mean educational attainment for individuals of race r and cohort (birth year) c living in city m to total Cosby exposure:

$$y^r_{cm} = \alpha^r + \beta^r Exp_m + \gamma^r Exp_m * G_c + C^r_c + X'_m \eta^r + \epsilon^r_{cm} \tag{1}$$

In this equation, y^r_{cm} is a measure of educational attainment and Exp_m is city-level Cosby exposure. The variables G_c are indicators for 5-year groups of cohorts starting in 1960 (1960-1964; 1965-1969, etc.) The control group in this regression are cohorts born from 1950-1959. These cohorts should have largely completed their education by the time *The Cosby Show* began in 1984. C^r_c are birth year fixed effects, and X_m are a set of controls, described in the last section. All controls are interacted with birth year fixed effects, so that the regression can be interpreted as if it was run separately for each birth cohort. I cluster standard errors at the city level.

A second specification uses information on how Cosby exposure varies across seasons within a city to examine the impact of exposure at different ages. The regression equation in this case relates final educational attainment to exposure at age range a:

$$y^r_{cm} = \alpha^r + \beta^r Exp_m + \Sigma_a \gamma^r_a Exp_{cma} + C^r_c + X'_m \eta^r + \epsilon^r_{cm} \quad (2)$$

where Exp_{cma} is the amount of Cosby exposure occurring during the age range a for people in city m who were born in year c. The age ranges I use will be 0-4, 5-9, 10-14, 15-19 and 20-24. The coefficients γ^r_a therefore capture the differential effect of Cosby exposure age range a, relative to getting it at age 25 or older.

IV STRATEGY

Clearly, Cosby Show viewership is unlikely to be randomly assigned. People with different educational propensities may have been differentially attracted to *The Cosby Show*, although the direction of this relationship is not clear. On one hand, we would expect Cosby viewership to increase with overall television viewing time, which is negatively related to educational attainment[11] On the other hand, it is possible that *The Cosby Show* may have disproportionately attracted viewers who shared the Huxtables' belief in the importance of education, which would lead to a positive correlation between education and Cosby exposure.

The difference-in-differences specification in equations 1 and 2 does not entirely address this problem, because it is possible that the correlation between educational propensities and Cosby Show viewership is different across cohorts. Suppose we saw, for example, that educational attainment increased in cities where *The Cosby Show* was more popular. It would not

[11]Appendix Table A1 shows evidence from the General Social Survey in the 1980's which suggests that each additional year of education is associated with about a 10-minute decline in television time each day.

be clear whether this was a causal effect, or whether the higher popularity of the Cosby Show was the result of having a large number of young people who cared about education and enjoyed *The Cosby Show*'s message.

In order to address the potential endogeneity of Cosby Show viewership, I instrument for Cosby Show exposure using two sources of competition for *The Cosby Show*: NBA games and very good weather on Thursday nights. If a city had either a large number of Thursday NBA games, or unusually good weather on Thursdays, I hypothesize that viewers would have been less likely to watch *The Cosby Show*. I show in the results section that this predicted first stage relationship holds. If *The Cosby Show* had a positive effect, this implies that the instruments should be negatively related to educational attainment among young people.

A second condition for these instruments to be valid is that they must have no other relationship to educational attainment among young people, except through *The Cosby Show*. Table 3 suggests that this may not be the case. Both instruments appear to be positively related to education among black people born from 1950-1959. The most likely reason for these relationships is related to the strong geographic correlation in both instruments. For example, the 5 cities with the highest number of NBA games are Oklahoma City; Tulsa; Little Rock; Fort Smith, Arkansas; and Sherman, Texas. The 5 cities with the highest number of very warm Thursdays are Chico, Fresno and Bakersfield (all in California); Jacksonville, Florida and Greenville, South Carolina. Because cities close to each other tend to have similar levels of the instruments and similar characteristics, this introduces the possibility that the instruments - while plausibly random - are related

to education levels in a way that has nothing to do with *The Cosby Show*.[12]

The relationship between the instruments and the educational attainment of earlier cohorts motivates the difference-in-difference specification in equations 1 and 2. My empirical strategy looks for *changes* in the correlation between the instruments and educational attainment for cohorts young enough to be affected by the Cosby Show. In other words, I ask: did cities with high levels of competition for Cosby viewership see declines in educational attainment for people who were young enough to be affected, relative to earlier cohorts? Of course, the same problem that leads to a relationship between the instruments and the educational attainment of older cohorts - regional correlation - could also produce a spurious decline in educational attainment associated with my instruments. However, the placebo tests that I present in a later section suggest that regional correlation is not driving my results. In particular, I show that there is no significant change in the relationship between NBA Thursdays or very warm Thursdays and education for Thursdays prior to 1984 or after 1992; there is also a weaker effect for NBA games that did not conflict with *The Cosby Show* because of their timing. Based on these results, I argue that the declines I find are causally related to Cosby exposure.

Figure 1 shows the difference-in-differences strategy visually. This figure plots the coefficients from a regression of years of education on the instru-

[12]The relationship between the instruments and earlier cohorts' educational attainment is unlikely to be driven by non-random allocation of the instruments. This is clearly true for the weather, which is a random event. The NBA schedule is also likely to be random with respect to educational attainment. The schedule is made each year using an algorithm which ensures that each team plays every other team in its division and conference a set number of times, and which also takes into account teams' preferred dates and veto dates as well as travel times and the number of back-to-back games each team must play. These factors should not be related to the educational decisions of young people.

ments separately by cohort. For the black sample, the coefficients for NBA Thursdays are positive and stable at 0.005 for cohorts born from 1950-1965, at which point they begin to decline; they reach a minimum at just below zero for cohorts born in the mid-1970's. There is a similar pattern for whites, but the size of the decline is much smaller (note the difference in the scales of the axes in each sub-graph.) The coefficient on very warm Thursdays shows a similar pattern, but begins to decline slightly earlier - in the late 1950's. As cohorts born in the late 1950's were in their mid-20's when Cosby began, it seems plausible that this could be an early causal effect of *The Cosby Show*.[13] To the extent that I incorporate this decline into my control group, I will underestimate the effect of the show on later cohorts. Appendix Table A confirms that there are no significant pre-trends in educational attainment associated with the instruments.

[Figure 1 about here]

First stage measurement error

As noted in the Data section, there are two key limitations of the Nielsen data that introduce measurement error into my first stage results. First, the ratings are not demographic specific. My first stage estimates therefore capture the response of an average viewer to the instruments, not the response of young black and white people. This issue will not affect the significance of my results (which is driven by the relationship between the instruments and educational attainment), but it will affect the estimated magnitudes.

[13] In the appendix, I show the figures for the four educational categories separately. The early decline for the weather instrument is present only at the top end of the education spectrum: there is no effect on high school completion until about 1970. In unreported results, I also show that the effect for the cohorts in the late 1950's is present only for early episodes of *The Cosby Show*.

In particular, if the members of my sample responded more strongly to the instruments than the general population, then the IV results will overstate the impact of *The Cosby Show*.

A second issue is that I observe Cosby viewership only in ratings months. While I believe that NBA Thursdays or very warm Thursdays in all months were likely to affect Cosby viewership, I can only observe this relationship directly in November, February or May. While it seems reasonable to assume that the first stage response will be similar in other months, I cannot directly test whether this is true.

A related problem with observing ratings only three times per year is that an NBA Thursday or very warm Thursday may affect viewership in months other than the one in which it occurred. This will be the case if there is habit formation in either Cosby viewership or in the other activities induced by the instruments. I show in the first-stage section that there does appear to be some habit formation: aggregating the data from the monthly to season to city level results in progressively larger first stage coefficients on the instruments, implying that the total number of Cosby hours crowded out by an instrument is stronger than the initial response within the same month. The measured amount of "magnification" will be smaller than the true amount, however, because I am not capturing the cross-month effects that occur outside of ratings periods.

Because I do not observe the first stage directly, I do not attempt to implement the IV in the standard way. Instead, I begin by presenting first stage and reduced form results showing that the instruments are significantly related to both Cosby exposure and educational attainment. In the last section of the paper, I discuss how I attempt to overcome the measurement

error issues to infer the true first stage for my sample. I construct predicted values of exposure based on these results and use them in a two-stage least squares regression in order to estimate the "per hour" magnitude of the results.[14]

III. Results

A. OLS

Table 4 shows the OLS estimates of the city-level regression in equation 1, for the black sample. Looking first at the composite "years of education" variable in column (5), the table shows that Cosby exposure was slightly negatively related to education among black cohorts born from 1950-1959, which is consistent with the results in table 3. While this relationship fluctuates somewhat by cohort, these differences are never statistically significant. Table 5 repeats this exercise for the white sample. Here, there appears to be a slightly negative relationship between exposure and educational attainment for cohorts born from 1960-1964 and 1980-1984; however, there is no stable pattern in this relationship across cohorts. Tables 6 and 7 show the OLS estimates of the cohort-level regressions from equation 2, which examine the effect of exposure at different age ranges. Again, there are very few significant relationships in this table.

On the whole, the OLS estimates suggest that there is no strong relationship between Cosby exposure and the educational attainment of any

[14]This two-stage least squares procedure does not produce the correct standard errors in general; without observing the first stage directly, I have no way to correct them. Because I am more interested in the magnitudes in this section of the paper - having established a statistically significant relationship between the instruments and educational attainment in the reduced form results - I do not address this issue further, and present the standard errors for completeness only.

cohort. This is consistent with the results in Table 3, which show very little variation related to city demographics. As noted in the previous section, however, this may be the result of bias in the OLS.

[Table 4 about here]

[Table 5 about here]

[Table 6 about here]

[Table 7 about here]

B. First stage

Table 8 shows the relationship between Cosby show exposure and the instruments, for the months of November, February and May. In the first column, the regression is run at the city by month level. Both Thursday night NBA games and the number of very warm Thursdays significantly and negatively predict Cosby Show exposure. The coefficient on each instrument is around -0.006 hours, or about 30 seconds. This corresponds to a change in ratings of about 0.3 percentage points on average over the course of a month.

In the next column of Table 8, I aggregate the data to the city by season level. The effect of adding a Thursday NBA game or a very warm Thursday on total exposure at the season level will be the sum of the same-month effect from column (1) and any cross-month viewership effects. These cross-month effects could be positive (if people who miss a Cosby episode one night are more likely to watch the show on another night) or negative (if the opposite is true.) The NBA instrument becomes slightly more negative

in this specification at -0.007, while the weather instrument becomes substantially more negative, at -0.017. This suggests that there may be some habit formation in either Cosby viewership or in the alternative activities induced by the instruments. The coefficient on NBA Thursdays is now statistically insignificant, while the coefficient on very warm Thursdays remains significant at the 5% level.

Finally, in column (3), I aggregate the data to the city level. The coefficients are larger than in columns (1) and (2), at -0.031 hours for NBA games (around 2 minutes) and -0.201 (5 minutes) for very warm Thursdays. The coefficients on both instruments are now statistically insignificant. The weakness of the instruments in the city level regression poses a problem for estimating the magnitude of the IV results, because it introduces bias into the 2SLS estimates. It does not, however, affect the significance of the results, which is driven by the underlying relationship between educational attainment and the instruments.[15] In other words, my conclusion that the effect of *The Cosby Show* on young black men and women was non-zero is not affected by this issue; the precise magnitude of the results is. For this reason, and because of the measurement error issues outlined in the empirical strategy section of the paper, the confidence bounds around the magnitude of the IV results may be large.

[Table 8 about here]

[15]Of course, if we truly believed the effect of the instruments on Cosby ratings was zero, we would not believe that the relationship between the instruments and educational attainment was driven by *The Cosby Show*. The monthly and season-level regressions, however, suggest that the coefficients in the city-level regressions are not negative purely by chance.

C. Reduced form results

Table 9 shows the results from reduced-form regressions of educational attainment on the instruments, using a similar specification as in equation 1. There is a reduction in educational attainment associated with NBA Thursdays beginning in about 1970, although the relationships are only marginally significant. For the oldest cohorts, born from 1970-1975, the impact is primarily to shift people from the "some college" to the "college" category; for younger cohorts, there are significant effects in high school completion as well. For the cohort with the largest decline in educational attainment - those born from 1975-1979 - each NBA Thursday is associated with a 0.1 percentage point increase in the fraction of individuals not completing high school, and a 0.1 decrease in individuals with a college degree. This leads a reduction in years of education of about -0.007 years.

The effect of very warm Thursdays is larger and more significant than for NBA games, which is consistent with the first stage results shown in Table 8. The effects begin to become apparent slightly earlier, with marginally significant declines in education for cohorts born from 1960-1969. As with NBA games, however, the largest effects are for cohorts born after 1970. Again, the peak effect is for the 1975-1979 cohort. For this group, each very warm Thursday is associated with a 0.5 percentage point increase in the fraction of individuals not completing high school, and a 0.4 percentage point decrease in individuals with a college degree. The net effect on years of education is -0.025 years.

[Table 9 about here]

Table 10 shows the same set of regressions for the white sample. For NBA

games, the coefficients on years of education are uniformly very close to zero. There does appear to be a small shift for the 1975-1979 cohort, with a significant increase in the fraction of individuals with high school only, at the expense of both the "some college" and "college" categories. The coefficients are also mostly insignificant for the weather variable, although the coefficients do suggest that there was some decline in educational attainment for cohorts born in the 1970's an later. On the whole, the table suggests that there may have been some effect of the instruments on the white sample; this effect is much more muted than for the black sample, however.

[Table 10 about here]

Table 11 shows how the impact of the instruments varies by age. The coefficients for NBA Thursdays suggest an impact that is concentrated around the ages of 5-9.[16] The weather instrument also has its strongest effect at this age range, although there remain significant effects throughout the age range 5-19.

[Table 11 about here]

Table 12 shows the same regressions for the white sample. For NBA games, there appears to be little effect overall. If anything, the results are consistent with a slight increase in educational attainment: NBA games prior to the age of 15 are associated with marginally significant *reductions* in the proportion of people without a high school diploma, and games from

[16]Note that the results are slightly less significant in this form; as I detail in a later section, there appears to be some serial correlation in the NBA Thursdays measure, which will make it more difficult to identify the effects of NBA games in different years separately from each other.

age 20-24 are associated with a shift from high school to some college or college. In the magnitude section, I will provide evidence that the first stage effect of NBA games may have been positive for the white sample, which would explain this result.[17]

For very warm Thursdays, there are significant effects of the weather on educational attainment at very young ages - the coefficient for years of education on warm Thursdays from age 0-4 is -0.026, which is very close to the coefficient for exposure at ages 5-9 for the black sample. There are smaller effects throughout the age range 5-19.

[Table 12 about here]

On net, the results suggest that both instruments are associated with significant reductions in educational attainment for the black sample. While there are some changes in the behaviour of whites, these changes have a minimal overall impact on educational attainment. In a later section, I will argue that both groups appeared to respond to the instruments, implying that the difference between blacks and whites is not driven by differences in the first stage. I will also show that there does not appear to be any reduction in discrimination against blacks associated with the instruments. This evidence suggests that the differential changes in the black sample are driven by role model effects.

[17]A general problem with the NBA instrument is that its effects may be non-monotonic. If it replaces something that a group of people likes better than *The Cosby Show* (e.g., a hockey game), it may induce these people to watch *The Cosby Show* more. I discuss this issue further in that section.

IV. Robustness and placebo tests

A. *Placebo tests*

A key assumption in interpreting these results as causal is that neither NBA Thursdays nor very warm Thursdays have any effect on educational attainment, other than through *The Cosby Show*. In this section, I present the results of two placebo tests that support this assumption. First, I examine the impact of the instruments in the pre-Cosby and post-Cosby eras (1976-1984, and 1992-2000) and compare this to the effects of the instruments during *The Cosby Show*'s run. For the city-level version of this exercise, I group the cohort indicators from Table 9 into a single indicator for being born after 1960. I run a regression of years of education in the black sample on the number of NBA and very warm Thursdays occurring in the pre/post-Cosby era and during the Cosby era, and the interaction of all of these variables with the post-1960 indicator. For the cohort-level regressions, I examine the impact of the instruments from age 5-19, again examining the pre/post era and the Cosby era separately.

Tables 13 and 14 show the results of this analysis for the city- and cohort-level regressions, respectively. Both tables show that, for very warm Thursdays, the negative effects are present only during the Cosby era. The coefficient on very warm Thursdays outside of the 1984-1992 is -0.006 and is insignificant; the coefficient on very warm Thursdays during the Cosby era is -0.018 and is significant at the 5% level. While the pre/post and Cosby coefficients are not significantly different in this form of the regression, they are significantly different for cohort-level version of the regression in Table 14. Prior to the Cosby era, the coefficient on very warm Thursdays from

age 5-19 is 0.008 and insignificant; during the Cosby era, it is -0.020 and is significant at the 5% level. The difference between the two coefficients is significant at the 1% level.

For NBA Thursdays, the effects are either more negative during the Cosby-era (in the city-level regressions) or only present during the Cosby era (in the cohort-level regressions); however, the difference between the pre/post and Cosby eras are not statistically significant. It is worth noting, however, that neither the pre/post or Cosby-era measures has a significant impact in this form of the regression. The problem here may be that the number of NBA Thursdays is highly correlated over time: the correlation between the number of NBA Thursdays in the pre/post era and those during the Cosby era is 0.763 (compared to 0.150 for the weather), while the partial correlation after adding controls is 0.675 (compared to -0.272 for the weather.) It is therefore much more difficult to distinguish the difference between the effect of Cosby-era NBA games from those occurring before or after.

[Table 13 about here]

[Table 14 about here]

An alternative placebo test for the NBA Thursdays measure uses the fact that some Thursday NBA games during the Cosby era did not conflict with *The Cosby Show* because of their timing. NBA games typically start between 7-8 pm in the time zone in which they are played, while *The Cosby Show* began at either 7 or 8 pm local time. When a city's team played in a different time zone, therefore, the games often started either too early or too late to conflict with *The Cosby Show*. In Table 15, I examine the effect of conflicting games separately from non-conflicting games. Note that there

is some error in the process of assigning games to the status of "conflicting" or "not conflicting" because I do not know the precise time at which the game began (7, 7:30 or 8 pm local time.) In unreported results, I show that the first stage is still negative for non-conflicting games, but is about twice as large for conflicting games. Table 15 shows that the same thing is true for the reduced form results. The coefficient on non-conflicting games is -0.002 and is insignificant; the coefficient on conflicting games is -0.004 and is marginally significant.

[Table 15 about here]

These results in this section show that the effect of the instruments on educational attainment is concentrated during times when they competed with *The Cosby Show*. This strongly suggests that the channel for the results is Cosby exposure.

B. Robustness

Table 16 examines whether the results are robust to different specifications and sample restrictions, focusing on the city-level regressions for the black sample. The top panel of the table shows the reduced form regressions, while the bottom panel shows the first stage regressions. In column (1), I replicate the main result for reference.

In the main analysis sample, I have not excluded individuals living in group quarters, due to a desire to maintain as large a sample as possible. Column (2) of Table 16 shows that the results are quite similar if the group quarters population is excluded. Column (3) shows that the results are still present, but become substantially weaker, when including individuals living outside their state of birth and immigrants who arrived after 1984. This

would be consistent with these individuals being more likely to live outside the city where they grew up, which would introduce measurement error into the instruments. Columns (4) and (5) show that the results are similar when using only NBA Thursdays or very warm Thursdays separately, although both the first stage and the reduced form results for weather are somewhat weaker. Column (6) eliminates the population restriction of 250,000, expanding the sample to 119 cities. This weakens both the first stage and reduced form results for weather slightly, but the overall results are qualitatively similar. Finally, column (7) maintains the full sample of 119 cities but uses population weights. The substantially reduces the effect of the weather, while the effect of NBA Thursdays becomes smaller but slightly more significant. The first stage results are substantially weaker in this case, however.

[Table 16 about here]

C. Interpretation

In this section, I explore an alternative channel for my results: reduced discrimination against black workers. If *The Cosby Show* improved racial attitudes, it may have increased the return to education for young black people.

Direct evidence on racial attitudes is available from the General Social Surveys. Unfortunately, the number of respondents in each sample year is too low to permit a geographic analysis relating Cosby Show exposure directly to racial attitudes. The evidence in Table 17 suggests that the country as a whole did not see a marked change in racial attitudes during *The Cosby Show*, relative to earlier trends. The table shows time trends for

two items: an indicator for whether the respondent thought the government was spending too little to improve the conditions of blacks, and an indicator for whether the respondent was against inter-racial marriage. Responses to both items showed a strong improvement in attitudes towards blacks prior to 1984, with the pace of change levelling off thereafter. Of course, the declining pace of improvement was probably related to the unusually rapid pace of growth in the 1970's. However, the table does suggest that any change in racial attitudes induced by *The Cosby Show* was, if present, offset by other factors.

[Table 17 about here]

An alternative measure of racial discrimination is the black-white wage gap. If the impact of *The Cosby Show* was driven by changes in racial attitudes, this should be reflected in a declining wage gap between observably similar black and white workers. In Table 18, I examine whether there are any differential changes in the black-white wage gap associated with either of the instruments. I examine the wage gap for individuals with a high school diploma only or a bachelor's degree separately. Because the instruments affect the educational distribution of younger workers, I focus on an older set of workers whose educational attainment did not change as a result of the show: workers aged 41-50 (born from 1930-1939 in 1980, 1940-1949 in 1990 and 1950-1959 in 2000.) Higher values of the instrument should be associated with higher wage gaps, if Cosby helped improve racial attitudes. I see no evidence of this pattern in Table 18. There is in fact some evidence that wage gaps became *lower* in areas with more Thursday competition, although only one of these coefficients is significant.

[Table 18 about here]

In short, there appears to be little evidence that *The Cosby Show* led to a large change in either attitudes or in the labor market prospects of black youth. It seems more likely that the estimated impact of the show on educational attainment was driven by role model effects.

V. Magnitude

As noted earlier, a key problem with implementing the IV regressions is that the first stage is only partially observed. There are two limitations of the ratings data that affect our ability to measure the first stage response. First, because the ratings are not demographic-specific, I observe how the population in general responds to an NBA game or very warm Thursday - not the response among members of my sample. Secondly, because I only observe ratings during sweeps months, I do not observe any response to my instruments in other months. I must therefore assume that the response in other months is similar to ratings months. I also need to account for any cross-month effects of the instruments. In this section, I attempt to quantify the full first stage response, in order to understand the magnitude of the impact of *The Cosby Show*.

Although the ratings are not demographic specific, it may be possible to learn something about how different demographic groups respond to the instruments by comparing the first stage response across cities with different demographics. In Table 19, I allow the first stage coefficients to vary with the fraction of the city's population that is black; the fraction of the city's population that was under 20 in 1980 (roughly corresponding to my treatment group); and the fraction of the city's population that was black and under 20 in 1980. In order to maximize the power of the regressions to

detect any significant differences in the first-stage response across cities, I use the monthly-level data for these regressions. Column (1) replicates the original first-stage; column (2) allows the effect of the instruments to vary by race only; column (3) allows the effect of the instruments to vary by age only; and column (4) is the full specification.

[Table 19 about here]

The first thing to note is that few of the coefficients on the interaction terms are significant. In other words, I cannot rule out the possibility that there is no variation in the first stage associated with city demographics. I nonetheless show the implied coefficients for members of my black and white samples at the bottom of the table. The results from the full specification suggest that the NBA game instrument is stronger for young black men and women than for the population as a whole; the implied coefficient for this group is -0.114 compared to -0.006 for the main regressions in column (1). For young whites, the reaction to the instrument appears to be positive, at 0.042. This would be consistent with NBA games replacing something that whites preferred to *The Cosby Show*. The potential non-monotonicity of the NBA instrument (for both blacks and whites) would tend to work against finding significant results in either the first or second stage. This means that I cannot rule out the possibility that Cosby had an influence on some whites on the basis of this instrument. This is not true for the weather instrument, however. I would not expect any failure of monotonicity for very warm Thursdays, and both young blacks and whites appeared to respond more strongly to the weather than did the general population. The implied coefficient for the white sample is -0.209, compared to -0.006 in the main regressions; for the black sample, it is -0.369. In the IV results I present

below, most of the variation (70-90%) in predicted exposure is based on the weather instrument. I still fail to find significant effects for the white sample, which suggests that a lack of response to the instrument is not driving my results.

With regard to the cross-month effects, the results in Table 8 suggest that an NBA game crowds out -0.006 hours of Cosby in the month in which it is played, and a further -0.025 hours over the remaining ratings periods.[18] This suggests that an NBA game has an average cross-month effect of about -0.001 per month. Multiplying this by 63 months (8 months per season, over 8 seasons, minus the month in which the NBA game occurred) and adding the same-month effect suggests that the final impact of an NBA game should be on the order of -0.078 - about 13 times as large as the same-month coefficient shown in Table 19. The same exercise for very warm Thursdays suggests a final effect of about -0.195 hours, about 33 times as large as the coefficient from the monthly-level first stage.

If we assume that the cross-month effects are proportionally similar for young black men and women and the rest of the population, we can combine the results in the preceding two paragraphs by multiplying the implied coefficients from the demographic exercise by about 13 (for NBA games) and 33 (for very warm Thursdays.) This suggests that each Thursday NBA game crowded out about 1.5 hours of Cosby viewership for young black men and women, while each very warm Thursday crowded out about 12.2 hours of Cosby viewership. While the latter estimate seems quite large, I note that this will lead to conservative estimates of the impact of Cosby exposure. For

[18]I abstract here from the timing of the NBA games or warm Thursdays. However, in unreported results, I confirm that the negative effects of the instruments on viewership in other months only occur for months following the NBA game or very warm Thursday; there are no effects on the preceding ratings periods.

whites, the implied estimates are + 0.546 hours for NBA games and -6.9 hours for the weather.

There is clearly going to be significant measurement error in these first stage estimates, induced by both potential bias in the demographic regressions, and by the overall weakness of the instrument at the city level. While I proceed with a 2SLS analysis, I caution that the confidence intervals around these estimates are likely to be quite large.

In Table 20, I show the IV estimates for the years of education variable, using three versions of the first stage. In columns (1) and (4), I use the unadjusted first stage from Table 8. In columns (2) and (5), I adjust for cross-month effects, but do not make any adjustment for demographics. The first stage coefficients for both races are -0.113 for NBA games and -0.561 for the weather. In columns (3) and (6), I adjust for both cross-month and demographic effects. The first-stage coefficients are the same as those calculated in the last paragraph.

Regardless of the first-stage coefficients, there appears to be no significant effect of Cosby exposure on the white sample. Using the unadjusted first-stage results in the largest estimates of the impact of *The Cosby Show*, with the coefficient on the variable "Exposure x Post" (where "Post" indicates cohorts born after 1960) of 0.020. At the mean exposure of 10.3 hours, this would imply an increase in years of education of about 0.206, an increase of about 1.5% over the mean for these cohorts. Adjusting for cross-month effects brings this coefficient to 0.008 (implying a 0.082 year increase, or 0.6% relative to the mean); allowing demographic-specific effects brings the coefficient to almost exactly 0.

For the black sample, the unadjusted estimates imply that each hour of

The Cosby Show increased years of education by about 0.155 years. This would imply a nearly 1.6 year increase at the mean, which is a 12.6% increase relative to the mean for people in this era. Adjusting for cross-month effects reduces the coefficient to 0.036. The implied increase in years of education is 0.628, a 4.9% increase relative to the mean. Finally, allowing demographic-specific effects reduces the coefficient to 0.002. The implied increase in years of education associated with an hour of exposure to *The Cosby Show* is 0.024, an increase of about 0.2% relative to the mean.

It seems clear from Table 8 that there are significant cross-month effects of the instruments, which are not fully accounted for by the observed first stage. The unadjusted estimates in columns (1) and (3) are therefore almost certainly too large. It is less clear whether it is appropriate to use demographic-specific first-stage estimates, given that there do not appear to be significant differences in the first stage response across cities related to race or age composition. In particular, assuming that each very warm Thursday leads to an 12-hour decline in Cosby viewership is probably too extreme. On the other hand, the estimate of a 5% increase in years of education based purely on the cross-month effects is probably also too large, especially given that the race-specific point estimates point to much larger first stage effects for the black sample. I therefore consider the results in columns (5) and (6) bounds on the potential impact of *The Cosby Show*.

[Table 20 about here]

VI. Conclusion

The results in this paper suggest that *The Cosby Show* had a significant influence over the educational decisions of young black men and women in

the 1980's. The show did not have a significant effect on the white youth, although there is some evidence that educational attainment increased by a smaller amount for this group. Given that the results do not appear to be driven by changes in white attitudes or reduced discrimination, I conclude that the results are driven by role model effects. To my knowledge, this is the first evidence causally relating media role models to the black-white education gap.

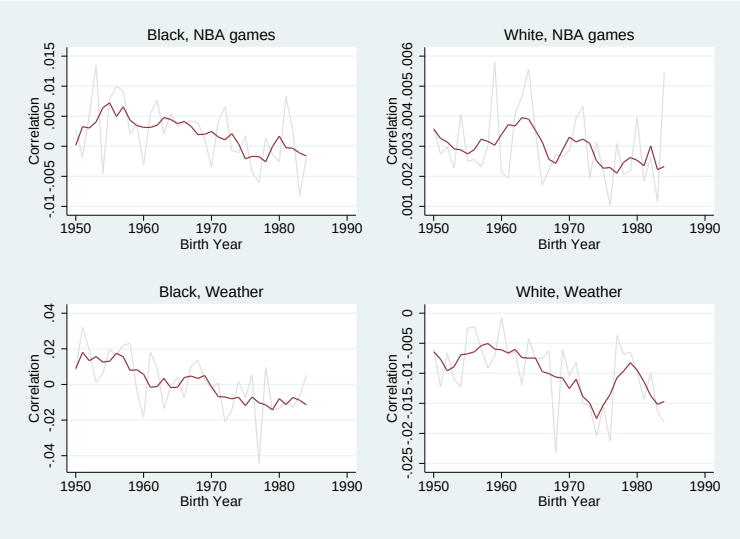
The results also suggest a potentially cheap and effective policy tool for addressing the declining education levels of young black people: the increased representation of educated minorities in the popular media. Black children watch an average of around 5 hours of television per day, slightly more than their white counterparts (Nielsen Media Inc. 2014). My results suggest that changing the television portrayals of African Americans has the potential to significantly influence these children's perceptions of the value of education.

VII. Tables and Figures

A. Figures

B. Tables

FIGURE 1. RELATIONSHIP BETWEEN THE INSTRUMENTS AND YEARS OF EDUCATION, BY COHORT



This figure plots the coefficients from city-level regressions of years of education on the instruments and controls, where the regressions are run separately by birth year and race. The gray lines represent the coefficients, while the red lines are smoothed versions of the same data. Details of the underlying regressions can be found in the notes for Tables 9 and 10.

TABLE 1—SUMMARY STATISTICS: EDUCATIONAL ATTAINMENT

	White sample	Black sample
Percent:		
No high school	5.7	12.5
High school	36.8	44.0
Some college	26.3	28.2
College	31.3	15.3
Years:		
Years of education	13.7	12.8

This table shows average educational outcomes for white and black cohorts born between 1950-1984, measured in the 1990, 2000 and 2010 Census samples and the 2015 5-year American Community Survey. The sample is restricted to individuals living in one of the 94 cities in my main sample at the time of the survey, who lived in their state of birth. Educational categories are constructed using the IPUMS variable "educ". The years of education variable is constructed using information on highest grade attained. See the text for more details on the sample construction and variable definitions.

TABLE 2—SUMMARY STATISTICS: COSBY SHOW EXPOSURE, NBA GAMES AND WEATHER

	Cosby show exposure (hours)	NBA Thursdays	Very warm Thursdays
Min	5.1	97.0	19.0
25th percentile	9.3	111.0	43.0
Median	10.2	128.0	49.5
75th percentile	11.5	145.0	55.0
Max	15.7	168.0	66.0
Mean	10.3	128.5	48.4
Standard Deviation	1.9	20.6	8.6
N	94	94	94

This table shows the mean and distribution of city-level Cosby Show exposure and the instruments. The sample is the set of cities for which there is information on all three measures, and that had a population of at least 250,000 in 1980. The exposure index is derived from Nielsen ratings data, and represents the mean number of hours of Cosby exposure for a person living in that city, over all 8 seasons. The variable "NBA Thursdays" is the total number of Thursdays over the period 1984-1992 on which either of a city's two closest NBA teams was playing. The variable "Very warm Thursdays" is the number of Thursdays over the period 1984-1992 (in the months between October and May) on which the temperature was at least 1 standard deviation above the norm for that month and city. See the text for more details on the construction of the exposure index and the instruments.

Table 3—Relationship between Cosby exposure, instruments and city-level covariates (1980)

	Cosby Show exposure	NBA Thursdays	Very warm Thursdays
% no high school - white	-8.143	-131.097	33.479
% high school - white	4.256	10.926	1.726
% some college - white	-1.071	86.972	26.550
% no high school - black	5.227	-68.793	-20.921*
% high school - black	5.033	-18.076	-7.434
% some college - black	4.277	-29.093	-17.671*
% black	-0.120	-3.321	-0.529
% white	-0.247	-3.074	-0.453
% Hispanic	-0.271	-2.918	-0.569*
% immigrant	-0.068	-1.423*	0.340**
% age - under 20	-0.468	-4.827	-1.324
% age - 21-40	-0.713	-7.994	-1.222
% age - 41-60	-0.471	-9.129	-1.257
% age - 61-80	-0.697	-7.474	-1.460
Mean household income ($1000)	-0.390	3.231	-0.594
Population (thousands)	-0.000	0.001	-0.000
Division - Northeast	-0.739	9.927	1.145
Division - Midwest	-0.522	-7.231	-0.037
Division - South	-0.593	23.488**	2.209
NBA nights - total	-0.006	0.099***	-0.000
Very warm nights - total	-0.002	-0.059	0.143***
N	94	94	94

This table shows the results from a regression of city-level Cosby exposure and the instruments on a number of city covariates. The measures of education are for individuals aged 25-34 at the start of *The Cosby Show*, and are taken from the 1990, 2000 and 2010 Census and the 2015 5-year ACS. All other variables are measured in the 1980 Census. The sample is the set of cities for which there is information on all three measures, and that had a population of at least 250,000 in 1980. The exposure index is derived from Nielsen ratings data, and represents the mean number of hours of Cosby exposure for a person living in that city, over all 8 seasons. The variable "NBA Thursdays" is the total number of Thursday over the period 1984-1992 on which either of a city's two closest NBA teams was playing. The variable "Very warm Thursdays" is the number of Thursdays over the period 1984-1992 (in the months between October and May) on which the temperature was at least 1 standard deviation above the norm for that month and city. See the text for more details on the construction of the exposure index and the instruments. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 4—OLS RESULTS BY BIRTH COHORT, BLACK SAMPLE

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
Cosby exposure:					
Baseline (1950-1959)	-0.006	0.687	-0.395	-0.285	-0.027
	(0.288)	(0.419)	(0.317)	(0.300)	(0.022)
x Birth cohort 1960-1964	-0.027	0.339	-0.041	-0.272	0.010
	(0.374)	(0.591)	(0.427)	(0.294)	(0.022)
x Birth cohort 1965-1969	0.269	-1.150**	0.501	0.380	0.032
	(0.360)	(0.579)	(0.503)	(0.320)	(0.021)
x Birth cohort 1970-1974	0.723*	0.240	-1.049	0.087	-0.010
	(0.373)	(0.543)	(0.942)	(0.584)	(0.026)
x Birth cohort 1975-1979	0.015	0.573	-0.428	-0.159	-0.008
	(0.541)	(0.493)	(0.515)	(0.505)	(0.028)
x Birth cohort 1980-1984	0.685	-1.039*	0.074	0.280	0.012
	(0.429)	(0.553)	(0.531)	(0.540)	(0.029)
N	3,267	3,267	3,267	3,267	3,267
R^2	0.432	0.454	0.447	0.483	0.489

This table shows the results from OLS regressions of educational attainment variables on Cosby Show exposure interacted with birth cohort indicators. The sample is the set of black, non-Hispanic individuals in the 1990, 2000 and 2010 public use Census samples and the 2015 5-year American Community survey who were at least 25 years old at the time of the survey, who lived in their state of birth and who lived in cities with a population of at least 250,000 as of the 1980 Census. The exposure index is derived from Nielsen ratings data, and represents the mean number of hours of Cosby exposure for a person living in that city, over all 8 seasons. Controls include the total number of NBA games and very warm days over the same time period; birth year fixed effects; Census region indicators; variables capturing the age and racial composition of the city in 1980; the city's population and mean household income in 1980; and all of the latter controls interacted with birth year fixed effects. Standard errors are clustered at the city level. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 5—OLS RESULTS: BY BIRTH COHORT, WHITE SAMPLE

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
Cosby exposure					
Baseline (1950-1959)	-0.012	0.383	-0.304	-0.090	-0.008
	(0.183)	(0.292)	(0.207)	(0.287)	(0.019)
x Birth cohort 1960-1964	0.074	0.136	0.050	-0.259**	-0.010*
	(0.084)	(0.161)	(0.111)	(0.111)	(0.006)
x Birth cohort 1965-1969	-0.040	0.108	0.029	-0.098	-0.002
	(0.094)	(0.190)	(0.103)	(0.171)	(0.010)
x Birth cohort 1970-1974	-0.028	0.173	-0.099	-0.045	-0.001
	(0.136)	(0.249)	(0.122)	(0.199)	(0.010)
x Birth cohort 1975-1979	-0.088	-0.000	-0.197	0.285	0.014
	(0.124)	(0.248)	(0.164)	(0.275)	(0.014)
x Birth cohort 1980-1984	0.121	0.145	0.086	-0.352*	-0.015
	(0.142)	(0.249)	(0.170)	(0.198)	(0.011)
N	3,290	3,290	3,290	3,290	3,290
R^2	0.671	0.725	0.666	0.782	0.765

This table shows the results from OLS regressions of educational attainment variables on Cosby Show exposure interacted with birth cohort indicators. The sample is the set of white, non-Hispanic individuals in the 1990, 2000 and 2010 public use Census samples and the 2015 5-year American Community survey who were at least 25 years old at the time of the survey, who lived in their state of birth and who lived in cities with a population of at least 250,000 as of the 1980 Census. The exposure index is derived from Nielsen ratings data, and represents the mean number of hours of Cosby exposure for a person living in that city, over all 8 seasons. Controls include the total number of NBA games and very warm days over the same time period; birth year fixed effects; Census region indicators; variables capturing the age and racial composition of the city in 1980; the city's population and mean household income in 1980; and all of the latter controls interacted with birth year fixed effects. Standard errors are clustered at the city level. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 6—OLS RESULTS: BY AGE, BLACK SAMPLE

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
Cosby exposure					
Baseline (age over 25)	-0.156	0.667*	-0.268	-0.243	-0.015
	(0.264)	(0.389)	(0.302)	(0.292)	(0.018)
x Age 0-4	0.905	-1.406	-0.473	0.975	0.027
	(0.698)	(1.336)	(1.231)	(0.953)	(0.051)
x Age 5-9	0.020	-0.291	0.174	0.096	0.009
	(0.586)	(0.657)	(0.811)	(0.561)	(0.026)
x Age 10-14	0.666	0.590	-1.013*	-0.243	-0.032
	(0.531)	(0.503)	(0.602)	(0.554)	(0.031)
x Age 15-19	0.561	-0.899	0.263	0.074	0.008
	(0.416)	(0.663)	(0.512)	(0.379)	(0.023)
x Age 20-24	0.660	-0.423	-0.347	0.109	-0.016
	(0.469)	(0.576)	(0.468)	(0.404)	(0.026)
N	3,267	3,267	3,267	3,267	3,267
R^2	0.438	0.454	0.454	0.486	0.495

This table shows the results from an OLS regression of educational attainment variables on Cosby show exposure at different age ranges. Hour of exposure at each age is constructed separately for individuals from each birth year and city, using information on Cosby Show ratings in each season. The total number of NBA games and very warm days (which are added as controls for consistency with the later regressions) are also allowed to have an effect that varies by age; otherwise, all details of the regression and sample construction are the same as in Table 4. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

Table 7—OLS results: by age, white sample

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
Cosby exposure					
Baseline (age over 25)	0.039	0.340	-0.345*	-0.033	-0.005
	(0.182)	(0.295)	(0.195)	(0.297)	(0.019)
x Age 0-4	0.045	0.262	0.220	-0.528	-0.025
	(0.189)	(0.551)	(0.372)	(0.498)	(0.022)
x Age 5-9	0.115	-0.072	0.077	-0.119	-0.002
	(0.190)	(0.301)	(0.216)	(0.279)	(0.016)
x Age 10-14	-0.234	0.146	-0.085	0.173	0.012
	(0.147)	(0.308)	(0.227)	(0.287)	(0.014)
x Age 15-19	-0.024	0.067	-0.051	0.008	0.001
	(0.190)	(0.297)	(0.173)	(0.223)	(0.012)
x Age 20-24	-0.074	0.242	0.214	-0.382*	-0.012
	(0.120)	(0.242)	(0.191)	(0.221)	(0.012)
N	3,290	3,290	3,290	3,290	3,290
R^2	0.682	0.725	0.673	0.789	0.771

This table shows the results from an OLS regression of educational attainment variables on Cosby show exposure at different age ranges. Hour of exposure at each age is constructed separately for individuals from each birth year and city, using information on Cosby Show ratings in each season. The total number of NBA games and very warm days (which are added as controls for consistency with the later regressions) are also allowed to have an effect that varies by age; otherwise, all details of the regression and sample construction are the same as in Table 5. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 8—FIRST STAGE REGRESSIONS

	Dependent variable: exposure (hours)		
	By month	By season	By city
	(1)	(2)	(3)
Thursday games, two closest teams	-0.006**	-0.007	-0.031
	(0.002)	(0.006)	(0.038)
Number of unusually warm Thursdays (winter)	-0.006**	-0.017**	-0.082
	(0.003)	(0.008)	(0.104)
Region fixed effects	X	X	X
Season fixed effects	X	X	
Month fixed effects	X		
1980 Covariates	X	X	X
Number of unusually warm days - all days	X	X	X
Number of NBA games - all days	X	X	X
N	2,143	747	94
R^2	0.762	0.845	0.659

This table shows the results from a regression of Cosby Show exposure (in hours) on the instruments. The first column shows the regression run at the city by season by month level; the second column aggregates the data to the city by season level; and the third column aggregates to the city level. The instruments are the number of Thursdays on which either of the two geographically closest NBA games were playing; and the number of Thursdays when the weather was unusually warm (more than 1 standard deviation above the normal temperature for that city in a given month.) Both exposure and the instruments are measured in February, November and May; for the number of unusually warm Thursdays, I use variation in February and November only. Controls include season and month fixed effects where appropriate, along with Census region fixed effects and controls for the racial composition, income and population of a city taken from the 1980 Census (see the text for more details on the controls.) The sample is restricted to cities with a population of 250,000 or more at the time of the 1980 Census. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 9—REDUCED FORM RESULTS: BY BIRTH COHORT, BLACK SAMPLE

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
NBA Thursdays:					
Baseline (1950-1959)	-0.031	-0.133*	0.121***	0.042	0.005**
	(0.038)	(0.072)	(0.046)	(0.038)	(0.003)
x Birth cohort 1960-1964	0.016	-0.020	0.012	-0.008	-0.001
	(0.046)	(0.077)	(0.048)	(0.035)	(0.002)
x Birth cohort 1965-1969	0.035	0.015	-0.052	0.002	-0.001
	(0.039)	(0.081)	(0.060)	(0.042)	(0.002)
x Birth cohort 1970-1974	0.012	0.005	0.068	-0.085*	-0.004
	(0.048)	(0.060)	(0.060)	(0.049)	(0.002)
x Birth cohort 1975-1979	0.104	0.078	-0.084	-0.097*	-0.007*
	(0.063)	(0.058)	(0.061)	(0.051)	(0.003)
x Birth cohort 1980-1984	0.071*	0.008	-0.032	-0.048	-0.005*
	(0.041)	(0.070)	(0.054)	(0.052)	(0.003)
Very warm Thursdays:					
Baseline (1950-1959)	-0.113	-0.062	-0.096	0.271*	0.014
	(0.119)	(0.198)	(0.156)	(0.145)	(0.009)
x Birth cohort 1960-1964	0.144	0.010	0.062	-0.216	-0.015*
	(0.124)	(0.227)	(0.193)	(0.158)	(0.008)
x Birth cohort 1965-1969	-0.038	0.146	0.134	-0.243	-0.010
	(0.130)	(0.244)	(0.206)	(0.177)	(0.007)
x Birth cohort 1970-1974	0.219	-0.150	0.325	-0.394**	-0.021**
	(0.158)	(0.207)	(0.214)	(0.190)	(0.010)
x Birth cohort 1975-1979	0.509*	-0.223	0.143	-0.430*	-0.025*
	(0.265)	(0.228)	(0.239)	(0.216)	(0.013)
x Birth cohort 1980-1984	0.047	0.134	0.305	-0.486*	-0.021*
	(0.194)	(0.293)	(0.223)	(0.246)	(0.012)
N	3,267	3,267	3,267	3,267	3,267
R^2	0.434	0.458	0.452	0.486	0.491

This table shows the results from reduced form regressions of educational attainment variables on the instruments interacted with birth cohort indicators. The sample is the set of black, non-Hispanic individuals in the 1990, 2000 and 2010 public use Census samples and the 2015 5-year American Community surveys who were at least 25 years old at the time of the survey, who lived in their state of birth and who lived in cities with a population of at least 250,000 as of the 1980 Census. The variable "NBA Thursdays" is the total number of Thursday over the period 1984-1992 on which either of a city's two closest NBA teams was playing. The variable "Very warm Thursdays" is the number of Thursdays over the period 1984-1992 (in the months between October and May) on which the temperature was at least 1 standard deviation above the norm for that month and city. Controls include the total number of NBA games and very warm days over the same time periods; birth year fixed effects; Census region indicators; variables capturing the age and racial composition of the city in 1980; the city's population and mean household income in 1980; and all of the latter controls interacted with birth year fixed effects. Standard errors are clustered at the city level. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 10—REDUCED FORM RESULTS: BY BIRTH COHORT, WHITE SAMPLE

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
NBA Thursdays:					
Baseline (1950-1959)	-0.013	-0.097**	0.088**	0.022	0.003
	(0.020)	(0.047)	(0.037)	(0.033)	(0.002)
x Birth cohort 1960-1964	-0.003	-0.015	0.008	0.010	0.000
	(0.007)	(0.018)	(0.013)	(0.011)	(0.001)
x Birth cohort 1965-1969	0.011	-0.007	0.006	-0.009	-0.001
	(0.009)	(0.020)	(0.015)	(0.020)	(0.001)
x Birth cohort 1970-1974	-0.003	0.027	-0.016	-0.008	0.000
	(0.012)	(0.031)	(0.019)	(0.024)	(0.001)
x Birth cohort 1975-1979	-0.001	0.069**	-0.041	-0.027	-0.001
	(0.011)	(0.033)	(0.025)	(0.034)	(0.002)
x Birth cohort 1980-1984	-0.010	0.041	-0.020	-0.011	-0.000
	(0.015)	(0.036)	(0.027)	(0.033)	(0.002)
Very warm Thursdays:					
Baseline (1950-1959)	0.086	0.010	0.015	-0.110	-0.008
	(0.067)	(0.139)	(0.106)	(0.125)	(0.008)
x Birth cohort 1960-1964	-0.030	0.013	0.009	0.008	0.001
	(0.027)	(0.056)	(0.038)	(0.044)	(0.002)
x Birth cohort 1965-1969	0.009	-0.007	0.067	-0.069	-0.003
	(0.034)	(0.079)	(0.055)	(0.065)	(0.003)
x Birth cohort 1970-1974	-0.002	0.134	0.037	-0.168*	-0.006
	(0.044)	(0.109)	(0.067)	(0.087)	(0.004)
x Birth cohort 1975-1979	0.001	0.076	0.024	-0.100	-0.003
	(0.042)	(0.118)	(0.082)	(0.113)	(0.005)
x Birth cohort 1980-1984	0.007	0.136	-0.018	-0.125	-0.006
	(0.055)	(0.140)	(0.093)	(0.122)	(0.005)
N	3,290	3,290	3,290	3,290	3,290
R^2	0.676	0.733	0.688	0.785	0.772

This table shows the results from reduced form regressions of educational attainment variables on the instruments interacted with birth cohort indicators. The sample is the set of white, non-Hispanic individuals in the 1990, 2000 and 2010 public use Census samples and the 2015 5-year American Community surveys who were at least 25 years old at the time of the survey, who lived in their state of birth and who lived in cities with a population of at least 250,000 as of the 1980 Census. The variable "NBA Thursdays" is the total number of Thursday over the period 1984-1992 on which either of a city's two closest NBA teams was playing. The variable "Very warm Thursdays" is the number of Thursdays over the period 1984-1992 (in the months between October and May) on which the temperature was at least 1 standard deviation above the norm for that month and city. Controls include the total number of NBA games and very warm days over the same time periods; birth year fixed effects; Census region indicators; variables capturing the age and racial composition of the city in 1980; the city's population and mean household income in 1980; and all of the latter controls interacted with birth year fixed effects. Standard errors are clustered at the city level. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

Table 11—Reduced form results: by age, black sample

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
NBA Thursdays					
Baseline (age over 25)	-0.028	-0.133**	0.119***	0.042	0.045*
	(0.038)	(0.063)	(0.045)	(0.035)	(0.002)
x Age 0-4	-0.160	-0.016	0.123	0.053	0.003
	(0.131)	(0.201)	(0.171)	(0.117)	(0.007)
x Age 5-9	0.219**	-0.039	-0.101	-0.079	-0.008*
	(0.097)	(0.102)	(0.073)	(0.086)	(0.005)
x Age 10-14	0.061	-0.003	0.003	-0.061	-0.002
	(0.089)	(0.091)	(0.096)	(0.070)	(0.004)
x Age 15-19	-0.057	0.107	-0.003	-0.046	-0.002
	(0.039)	(0.085)	(0.073)	(0.062)	(0.003)
x Age 20-24	0.055	-0.038	-0.028	0.011	-0.001
	(0.063)	(0.087)	(0.078)	(0.066)	(0.003)
Very warm Thursdays:					
Baseline (age over 25)	-0.113	0.052	-0.129	0.0.190	0.011
	(0.134)	(0.170)	(0.155)	(0.116)	(0.008)
x Age 0-4	-0.373	0.330	0.084	-0.041	0.006
	(0.291)	(0.395)	(0.308)	(0.290)	(0.017)
x Age 5-9	0.173	0.118	0.230	-0.521**	-0.026**
	(0.237)	(0.254)	(0.210)	(0.221)	(0.012)
x Age 10-14	0.420*	-0.370*	0.289	-0.339	-0.018
	(0.252)	(0.215)	(0.192)	(0.209)	(0.012)
x Age 15-19	0.346**	-0.176	0.083	-0.253	-0.021**
	(0.154)	(0.179)	(0.218)	(0.163)	(0.092)
x Age 20-24	-0.021	-0.418*	0.385*	0.054	0.002
	(0.153)	(0.233)	(0.216)	(0.133)	(0.008)
N	3,267	3,267	3,267	3,267	3,267
R^2	0.443	0.463	0.455	0.492	0.502

This table shows the results from a reduced form regression of educational attainment variables on the number of NBA Thursdays and very warm Thursdays occurring at different age ranges. The number of games at each age is constructed separately for individuals from each birth year and city, using information on the number of NBA/very warm Thursdays in each season. The total number of NBA games and very warm days is also allowed to have an effect that varies by age; otherwise, all details of the regression and sample construction are the same as in Table 9. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 12—REDUCED FORM RESULTS: BY AGE, WHITE SAMPLE

	Dependent variable:				
	No high school	High school	Some college	College	Years of education
Thursday NBA games:					
Baseline (age over 25)	-0.012	-0.096**	0.081**	0.026	0.003
	(0.020)	(0.046)	(0.034)	(0.032)	(0.002)
x Age 0-4	-0.071*	-0.072	0.062	0.081	0.007
	(0.041)	(0.081)	(0.056)	(0.090)	(0.005)
x Age 5-9	-0.002	0.047	-0.047	0.002	-0.000
	(0.023)	(0.051)	(0.038)	(0.055)	(0.003)
x Age 10-14	-0.026*	0.053	0.007	-0.034	0.000
	(0.015)	(0.042)	(0.033)	(0.042)	(0.002)
x Age 15-19	-0.006	-0.002	0.002	0.006	0.001
	(0.019)	(0.040)	(0.024)	(0.027)	(0.001)
x Age 20-24	-0.003	-0.067**	0.044*	0.026	0.002
	(0.016)	(0.033)	(0.022)	(0.029)	(0.002)
Very warm Thursdays:					
Baseline (age over 25)	0.061	-0.002	-0.020	-0.039	-0.004
	(0.068)	(0.143)	(0.097)	(0.133)	(0.008)
x Age 0-4	0.083	0.334	0.096	-0.513**	-0.026**
	(0.107)	(0.207)	(0.145)	(0.225)	(0.012)
x Age 5-9	0.056	0.104	-0.093	-0.066	-0.005
	(0.052)	(0.145)	(0.113)	(0.114)	(0.006)
x Age 10-14	-0.021	0.136	-0.004	-0.110	-0.004
	(0.044)	(0.120)	(0.082)	(0.103)	(0.005)
x Age 15-19	-0.005	0.098	0.061	-0.153**	-0.006
	(0.043)	(0.101)	(0.071)	(0.077)	(0.004)
x Age 20-24	0.003	0.036	-0.018	-0.021	-0.002
	(0.003)	(0.076)	(0.058)	(0.063)	(0.003)
N	3,290	3,290	3,290	3,290	3,290
R^2	0.689	0.739	0.704	0.792	0.780

This table shows the results from a reduced form regression of educational attainment variables on the number of NBA Thursdays and very warm Thursdays occurring at different age ranges. The number of games at each age is constructed separately for individuals from each birth year and city, using information on the number of NBA/very warm Thursdays in each season. The total number of NBA games and very warm days is also allowed to have an effect that varies by age; otherwise, all details of the regression and sample construction are the same as in Table 10. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

Table 13—Placebo test - by birth cohort

	Dependent variable: Years of education		
	Pre/post Cosby	Cosby	Difference
NBA Thursdays x Post	-0.001	-0.003	-0.001
	(0.002)	(0.003)	(0.005)
Very warm Thursdays x Post	-0.006	-0.018**	-0.012
	(0.007)	(0.008)	(0.009)
N	3,267	3,267	3,267
R^2	0.514	0.514	0.514

This table shows the results from a regression of years of education on the number of NBA Thursdays and very warm Thursdays, and these measures interacted with an indicator for being born after 1960, for the black sample. In column (1), I show the results for these measures in the pre- and post-Cosby era (1976-1984, and 1992-2000) and in column (2), I show the results for the Cosby era. Column (3) shows the difference between the two sets of estimates. These results are derive from the same regression, which simultaneously includes the number of NBA Thursdays and very warm Thursdays in the pre/post and Cosby eras. The regressions also include birth year fixed effects and the same set of city-level controls as in the main regressions, as well as the number of total NBA/very warm nights (on any night of the week) during the Cosby era and during the entire 1976-2000 period. The latter measures are also interacted with birth year fixed effects. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 14—PLACEBO TEST - BY AGE

	Dependent variable: Years of education		
	Pre/post Cosby	Cosby	Difference
NBA Thursdays	0.001	-0.003	-0.002
x age 5-19	(0.002)	(0.003)	(0.004)
Very warm Thursdays	0.008	-0.020**	-0.028***
x age 5-19	(0.006)	(0.009)	(0.010)
N	3,267	3,267	3,267
R^2	0.523	0.523	0.523

This table shows the results from a regression of educational attainment measures on the number of NBA Thursdays and very warm Thursdays occurring in the age range 5-19 for the black sample. In column (1), I show the results for these measure during the pre/post-Cosby era (1976-1984 and 1992-2000) and in column (2), I show the results for these measures during The Cosby Show's run. Column (3) shows the difference between the two sets of estimates. These results are derive from the same regression, which simultaneously includes the number of NBA Thursdays and very warm Thursdays in the pre/post and Cosby eras. The regressions also include birth year fixed effects and the same set of city-level controls as in the main regressions; the total number of NBA/very warm Thursdays (at any age) occurring during Cosby and through the whole period; the total number of NBA/very warm nights (on any night of the week) occurring during Cosby and through the whole period; and the number of total NBA/very warm nights that occurred between age 5-19, during Cosby and through the whole period. The latter two groups of measures are also interacted with birth year fixed effects. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

Table 15—Placebo test: conflicting vs. non-conflicting games

	Dependent variable: years of education		
	Non-conflicting	Conflicting	Difference
NBA Thursdays x Post	-0.002	-0.004*	-0.001
	(0.002)	(0.002)	(0.002)
N	3,267	3,267	3,267
R^2	0.490	0.490	0.490

This table shows the results from a regression of years of education on the number of NBA Thursdays and very warm Thursdays, and these measures interacted with an indicator for being born after 1960, for the black sample. In column (1), I show the results for NBA Thursdays that did not conflict with *The Cosby Show* because of their timing. In column (2), I show the results for conflicting games. Column (3) shows the difference between the two sets of estimates. These results are derive from the same regression, which simultaneously includes the number of conflicting and non-conflicting NBA Thursdays. The regressions also include birth year fixed effects and the same set of city-level controls as in the main regressions. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

Table 16—Robustness: alternative estimates

	Baseline	Excluding group quarters	Incl. movers	Just games	Just weather	No population restriction	Population weights
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: years of education						
Games x post	-0.004*	-0.003	-0.002*	-0.004**		-0.004**	-0.003**
	(0.002)	(0.002)	(0.001)	(0.002)		(0.001)	(0.001)
Weather x post	-0.019**	-0.017*	-0.010		-0.017*	-0.014**	-0.011*
	(0.008)	(0.010)	(0.006)		(0.010)	(0.007)	(0.007)
N	3,267	3,258	3,288	3,267	3,267	4,009	4,531
	Dependent variable: exposure						
Games	-0.031			-0.037		-0.043	-0.007
	(0.038)			(0.037)		(0.035)	(0.031)
Weather	-0.082				-0.040	-0.100	-0.087
	(0.104)				(0.099)	(0.082)	(0.081)
N	94			94	94	119	119

This table shows how the results vary when using different sample constructions and regression specifications. The top panel shows the reduced form results, using the indicator "post" to indicate cohorts born after 1960. The bottom panel shows how the first stage varies, where appropriate. The first column replicates the baseline results. The second column excludes individuals living in group quarters; the third includes people living outside of their state of birth, and immigrants who arrived prior to 1984. The fourth and fifth columns use just the NBA instrument and just the weather instrument, respectively. The sixth column removes the population restriction of 250,000 that is applied in the main regressions; the sixth removes this restriction and weights each city by its black population in 1980. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

Table 17—Time trends in racial attitudes

	Dependent variable:	
	Government spending too little to help blacks	Against inter-racial marriage
	(Proportion agreeing: time trend)	
1972-1984	0.007***	-0.024***
1985-1992	0.004***	-0.015***
1992-2002	-0.001**	-0.007***

This table shows the time trends in two measures of racial attitudes from the 1972-2002 General Social Surveys. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 18—CHANGES IN BLACK-WHITE WAGE GAPS, WORKERS AGED 41-50

	Dependent variable: black-white wage gap	
	High school only	Bachelor's degree
	(1)	(2)
NBA Thursdays:		
Baseline (1980)	67.81**	197.90**
	(28.98)	(94.36)
x 1990	-21.52	-129.50
	(44.25)	(161.50)
x 2000	-111.80**	-78.73
	(49.52)	(129.90)
Very warm Thursdays:		
Baseline (1980)	55.86	9.33
	(126.70)	(300.3)
x 1990	-99.10	349.10
	(162.90)	(428.0)
x 2000	-96.10	-336.90
	(162.90)	(320.20)
N	2,233	1,660
R^2	0.471	0.591

This table examines whether the black-white wage gap changed differentially in cities with high values of the instruments. It shows the results from a regression of the black-white gap among high school graduates (column (1)) and college graduates (column (2)) on the instruments and the instruments interacted with year fixed effects. The sample is the set of black and white, non-Hispanic individuals in the 1980, 1990 and 2000 Census samples who have non-zero wage income and who are aged 41-50 years of age at the time of the survey (i.e., were born from 1930-1959.) All other regression details are the same as in earlier tables. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

Table 19—Adjusted first stage regressions

	Dependent variable: Cosby Show exposure (hours)			
	(1)	(2)	(3)	(4)
NBA Thursdays				
Baseline	-0.006**	-0.007**	0.252	0.723
	(0.002)	(0.003)	(0.722)	(0.802)
x % black		0.015		-10.770**
		(0.019)		(5.250)
x % under 20			-0.225	-0.681
			(0.720)	(0.793)
x % black and under 20				10.614**
				(0.5.292)
Very warm Thursdays				
Baseline	-0.006**	-0.004	-0.986	-0.993
	(0.003)	(0.005)	(1.231)	(1.418)
x % black		0.016		-0.219
		(0.030)		(8.572)
x % under 20			0.802	0.783
			(1.224)	(1.398)
x % black and under 20				0.059
				(8.674)
Implied coefficients:				
Games, black sample	-0.006**	0.008	0.027	-0.114
Games, white sample	-0.006**	-0.007**	0.027	0.042
Weather, black sample	-0.006**	-0.021	-0.184	-0.369
Weather, white sample	-0.006**	-0.004	-0.184	−0.209*
N	2,143	2,143	2,143	2,143
R^2	0.762	0.763	0.764	0.767

This table shows the monthly-level first stage regressions, allowing the impact of the instruments to vary with i) the proportion of a city's population that was black in 1980; ii) the proportion of a city's population that was under age 20 in 1980; and iii) the proportion of a city's population that was black and under 20 in 1980. All other regression details are the same as in Table 8. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

TABLE 20—THE IMPACT OF COSBY EXPOSURE ON EDUCATIONAL ATTAINMENT: 2SLS ESTIMATES

	Dependent variable: years of education					
	White sample:			Black sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure	-0.036	-0.013	0.001	-0.162**	-0.063**	-0.002**
	(0.058)	(0.022)	(0.001)	(0.065)	(0.025)	(0.001)
Exposure x Post	0.020	0.008	0.000	0.155***	0.061***	0.002**
	(0.023)	(0.009)	(0.000)	(0.059)	(0.023)	(0.001)
N	3,290	3,290	3,290	3,267	3,267	3,267
R^2	0.764	0.764	0.769	0.489	0.489	0.488
First stage adj.	None	Cross-month only	Cross-month & demographic	None	Cross-month only	Cross-month & demographic

This table shows the results from a two-stage least squares regression of years of education on predicted Cosby Show exposure. In columns (1) and (3), I construct this prediction using the first-stage results from Table 8. In columns (2) and (5), I correct for the impact of the instruments in unobserved ratings months. In columns (3) and (6), I additionally allow the first-stage coefficients to vary by race, using the implied coefficients from Table 19. The calculation of the adjusted first stage coefficients is described in the text. The variable "post" is an indicator for cohorts born after 1960. All other regression details are the same as in Tables 10 and 9. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

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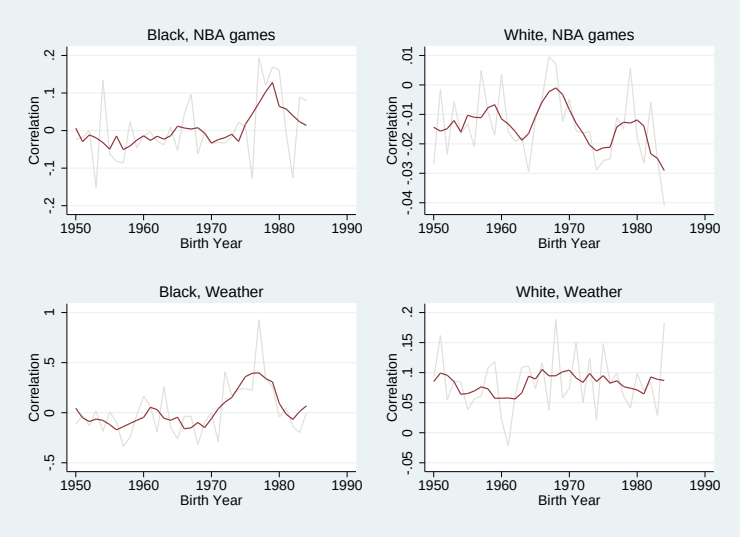
Appendix

Table A1—Television viewership and education

	Hours of television per day
Highest grade completed	-0.180***
	(0.010)
Observations	5,728

This table shows the results of a regression of hours of television per day on highest grade completed. Data come from the General Social Surveys, 1986-1992. The sample is the set of respondents over 21 years of age, who are either black or white. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

FIGURE A1. RELATIONSHIP BETWEEN THE INSTRUMENTS AND HIGH SCHOOL INCOMPLETION, BY COHORT



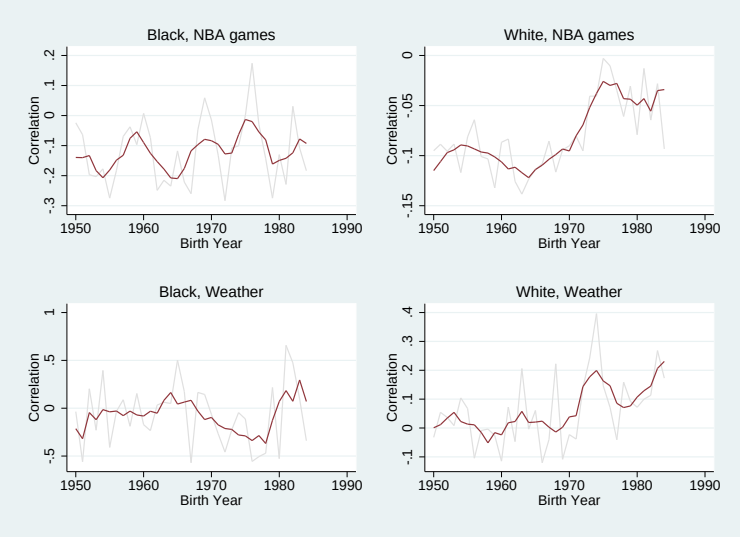
This figure plots the coefficients from city-level regressions of the fraction of the population without a high school diploma on the instruments and controls, where the regressions are run separately by birth year and race. The gray lines represent the coefficients, while the red lines are smoothed versions of the same data. Details of the underlying regressions can be found in the notes for Tables 9 and 10.

TABLE A2—RELATIONSHIP BETWEEN INSTRUMENTS AND EDUCATIONAL ATTAINMENT FOR PRE-COSBY COHORTS

	Dependent variable: years of education	
	White sample 1950-1959	Black sample 1950-1959
NBA Thursdays	-0.201	-0.665
	(0.244)	(1.128)
NBA Thursdays x birth year	0.000	0.000
	(0.000)	(0.001)
Very warm Thursdays	-0.591	1.100
	(0.918)	(3.354)
Very warm Thursdays x birth year	0.000	-0.001
	(0.001)	(0.002)
N	940	931
R^2	0.785	0.498

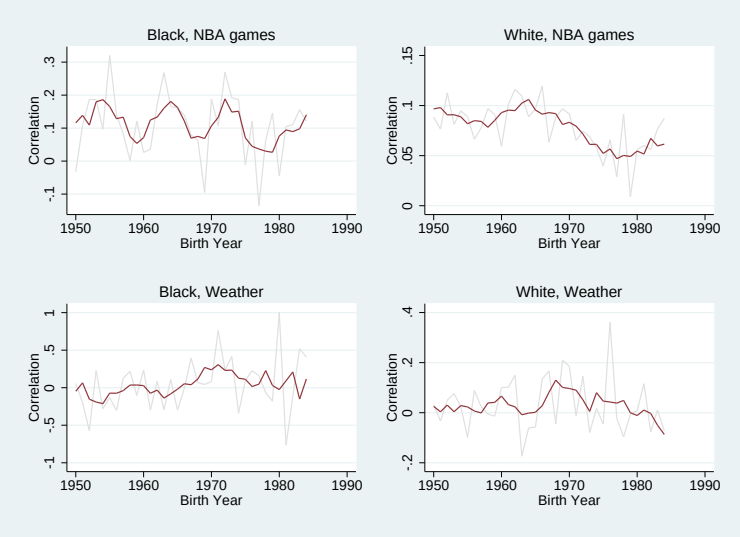
This table shows the results from regressions of years of education on the instruments and the instruments interacted with birth year, for cohorts born between 1950-1959. The sample is the set of black or white, non-Hispanic individuals in the 1990, 2000 and 2010 public use Census samples and the 2015 5-year American Community surveys who lived in their state of birth and who lived in cities with a population of at least 250,000 as of the 1980 Census. The variable "NBA Thursdays" is the total number of Thursday over the period 1984-1992 on which either of a city's two closest NBA teams was playing. The variable "Very warm Thursdays" is the number of Thursdays over the period 1984-1992 (in the months between October and May) on which the temperature was at least 1 standard deviation above the norm for that month and city. Controls include the total number of NBA games and very warm days over the same time periods; birth year fixed effects; Census region indicators; variables capturing the age and racial composition of the city in 1980; the city's population and mean household income in 1980; and all of the latter controls interacted with birth year fixed effects. Standard errors are clustered at the city level. $*$ denotes statistical significance at the 10% level, $**$ denotes statistical significance at the 5% level and $***$ denotes statistical significance at the 1% level.

FIGURE A2. RELATIONSHIP BETWEEN THE INSTRUMENTS AND HIGH SCHOOL ATTAINMENT, BY COHORT



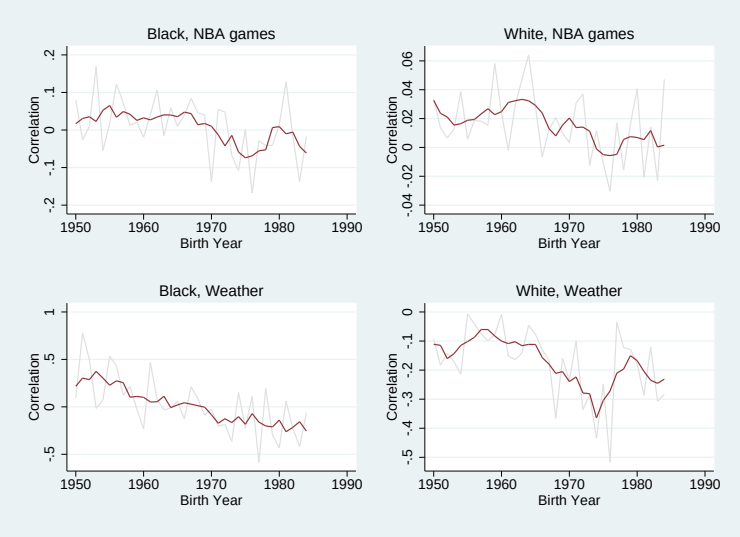
This figure plots the coefficients from city-level regressions of the fraction of the population with a high school diploma only on the instruments and controls, where the regressions are run separately by birth year and race. The gray lines represent the coefficients, while the red lines are smoothed versions of the same data. Details of the underlying regressions can be found in the notes for Tables 9 and 10.

FIGURE A3. RELATIONSHIP BETWEEN THE INSTRUMENTS AND SOME COLLEGE ATTAINMENT, BY COHORT



This figure plots the coefficients from city-level regressions of the fraction of the population with some college on the instruments and controls, where the regressions are run separately by birth year and race. The gray lines represent the coefficients, while the red lines are smoothed versions of the same data. Details of the underlying regressions can be found in the notes for Tables 9 and 10.

FIGURE A4. RELATIONSHIP BETWEEN THE INSTRUMENTS AND COLLEGE ATTAINMENT, BY COHORT



This figure plots the coefficients from city-level regressions of the fraction of the population with a college degree on the instruments and controls, where the regressions are run separately by birth year and race. The gray lines represent the coefficients, while the red lines are smoothed versions of the same data. Details of the underlying regressions can be found in the notes for Tables 9 and 10.