Learning from My Environment

How social environment predicts teens beliefs about the future

Sergio Ernesto Barrera

Virginia Tech

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Abstract

I investigate how a teen's social environment is related to their beliefs of future outcomes by merging the NLSY97 with census tract characteristics from the 2000 Decennial Census. Holding ability, family resources, and traumatic events constant, I find more exposure to risky outcomes like crime or young sex is positively correlated with belief of death, arrest, and early parenthood and negatively correlated with belief of bachelor's attainment. While more exposure to college education is positively correlated with belief of education attainment. Furthermore, holding the same controls and social environment constant, beliefs strongly predict teen's later outcomes, suggesting beliefs role in decision making under uncertainty.

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1 Introduction

In the US there is tremendous socioeconomic inequality in education, labor market, criminal justice and early parenthood outcomes. For individuals born in the early 1980s from the top third of the family wealth distribution, 2.6% are high school dropouts, 4.4% have been incarcerated, and 4.9% are parents by age 20. These outcomes are worse for the same birth cohort from the bottom third of the family wealth distribution where 22.9% are high school dropouts, 11.6% have been incarcerated, and 22.7% are parents by age 20.[1]

Recent research has suggested that a teen's social network can be an important determinant for many of these outcomes, where each additional year of exposure to different neighborhood level outcomes increases the probability of similar own outcomes occurring in adulthood (Chetty, Friedman, Hendren, Jones, and Porter 2018, Chetty and Hendrin 2018). Additionally, much work in the education and occupation choice literature has shown that exposure to positive role models of the same race or gender increases the probability that youth have better outcomes (Dee 2005, Carrell, Page, and West 2009, Rocha and Hawes 2009; Fairlie, Hoffmann, Oreopoulos 2014, Bell, Chetty, Jaravel, Petkova and Van Reenan 2019; Card, Domnisoru, Sanders, Taylor and Udova 2022).

Could one mechanism for these role model and social network effects be through aspirations or beliefs of one's own future? For instance, youth may form beliefs of the future based off of what they observe and experience in their local environment. Given their abilities and resources, what happens to peers, parents, and people like them from their neighborhood may signal to teens the returns and risks associated with study, work, crime, and sex. More college graduates like them may signal study is a route of success for them, or worse schooling outcomes and more incarceration of people like them may signal higher relative returns to crime or sex at young ages. This exposure would naturally effect beliefs of

[1]These statistics were calculated using the 1980-1982 cohort of the NLSY97. See Table 1 for source of statistics.

future outcomes related to these activities and may effect decisions on the type of behavior teens engage in.

In this paper I explore to what extent a teen's social environment influences their beliefs of their own future education, labor market, criminal justice, and early parenthood outcomes, while holding academic ability, past risky behavior, family resources, and exposure to traumatic events constant. I then investigate to what extent these beliefs predict actual future realizations of these outcomes, holding the same controls and social environment constant.

I accomplish this by merging individual level longitudinal data from the NLSY97 to census tract level outcomes from the 2000 Decennial Census. The NLSY97 includes socio-behavioral measures, family resources, academic ability measures, parent characteristics, peer characteristics and beliefs about future education, early parenthood, and criminal justice outcomes reported in 1997 when respondents were the between ages of 15 and 16 years old. While the 2000 Decennial Census provides tract level outcomes for adults of the same gender, race, and ethnicity living in the same tract as NLSY97 respondents did in 1997. The longitudinal aspect of the NLSY97 allows us to see whether later life education, criminal justice, and early parenthood outcomes correspond to beliefs from teenage years.

First by regressing beliefs on social environment measures and other important economic variables, I find that a teen's social environment is strongly correlated with a teen's beliefs of their future. Specifically, compared to teens with similar academic measures, past risky behavior, and family wealth, I find that teens that are more exposed to risky behavior in their social environment like crime and early parenthood believe that negative outcomes like parenthood, incarceration and death by age 20 are more likely to occur to them. These same teens also believe that positive outcomes like bachelor's attainment by age 30 are less likely for them. Additionally, compared to teens with similar academic measures, past risky behavior, and family wealth, teens that are more exposed to positive outcomes in their so-

cial environment like high school completion and bachelor's attainment are more likely to believe they will continue high school next year, graduate high school by age 20, and obtain a bachelor's degree by age 30.

Then after using OLS to regress own outcomes on beliefs, social environment, human capital measures and other controls, I find that a teenager's beliefs about the future are strong predictors of their own outcomes. For instance, holding social environment, family resources, and measures of ability constant a ten percentage point increase in a teen's belief of being a parent young is associated with a 1.5 percentage point increase in probability of actually being a parent by age 20, while a ten percentage point increase in belief of high school completion is associated with a 4.2 percentage point increase in graduating high school. Additionally there is some evidence of beliefs of positive outcomes like degree attainment being negatively correlated with negative outcomes like early parenthood, as well as evidence of beliefs of negative outcomes like early parenthood or arrest being negatively correlated with positive outcome realizations like high school completion and working more hours around age 30.

Overall my results suggest that a teen's social environment does influence their perceptions of the future and that these beliefs are strongly related to choices teens make with lifelong consequences. This relationship between social environment, beliefs, and future outcome realizations could exists for two reasons. The first is that teens rationally respond to systemic inequities and environmental conditions that effect people like them including not only themselves, but also their peers, parents, and other adults of the same race, ethnicity, and gender. The second possible reason is that agents beliefs are biased and self fulfilling, where agents place excessive weight on social factors rather than their own skills and resources. Although none of the results are causal, the descriptive evidence in this paper suggests future work should seek to distinguish between these two different belief mechanisms.

2 Literature Review

This paper builds on two strands of the literature. First there is the literature examining the relationship between an adolescent's neighborhood environment and their later life outcomes. Second is the literature studying the formation of subjective beliefs. I contribute to these two strands of the literature by establishing strong evidence for a relationship between local environment, beliefs, and later life outcomes. Specifically, my findings are consistent with teens incorporating the actions of their peers and the outcomes of similar adults into their subjective beliefs about the risks and rewards they face regarding study, work, crime, and sex at young ages. This influences their beliefs of future outcomes related to these activities and influences their own decisions with respect to these behaviors.

2.1 Social Environment and Later Life Outcomes

The social environment literature has demonstrated how outcomes of adults from an adolescent's social environment effects a wide variety of adolescent's later life outcomes. For instance, Chetty and Hendrin 2018 documented childhood exposure effects, where every additional year that youth live in a neighborhood with slightly better adult outcomes like higher earnings, more college attendance, or less teen pregnancy increases the likelihood of similar positive outcomes occurring for these youth in the future. Additionally, Bell et al. 2019 showed that young girls who's families move to a high innovation area are more likely to invent in the same technology class as inventors in that neighborhood, but only if there are more women inventing in that specific class.

Additionally, in the education context many studies have found the presence of similar adults in positions of seniority positively effects academic outcomes like performance, persistence, and completion. These similar adults range from teachers of the same gender as students (Dee 2005; Carrell, Page, and West 2009; Card et al. 2022), to teachers of the same

race (Fairlie, Hoffmann, Oreopoulos 2014), as well as instructors who aren't necessarily of the same race but also racial or ethnic minorities (Rocha and Hawes 2009).

There are many different explanations for how local exposure to similar adults effects outcomes. It is possible that similar adults in positions of seniority or authority may better facilitate the transfer of resources or skills to youth due to less bias or more knowledge of specific needs of youth from similar backgrounds. However, Bell et al. 2019 reject a human capital or resource explanation for their results and suggest that their findings of young women choosing to invent within the same technology class but not similar technology classes as other female inventors is more consistent with a role model effect, where youth seek to imitate their mentors.

A role model effect that does not operate through skills or resources can operate through aspirational effects where similar adults increase youth's utility from making similar decisions as themselves as in the identity and stratification economics literature (Akerloff and Kranton 2000; Darity, Mason, and Stuart 2006). Another way role models can effect outcomes is through overcoming information frictions, were agents learn that they can also succeed and have a good life by making similar decisions as their role models. If this role model effect operates through aspirations or information frictions then we would expect exposure to different degrees of positive or negative role models to effect beliefs of the future. Specifically youth more exposed to positive choices like bachelor's attainment would believe they are more likely to have more years of schooling. While youth more exposed to negative choices like crime or sex at young ages would believe potential consequences of that behavior arrest or early parenthood are more likely.

The connection between adolescent's later life outcomes and adult outcomes, especially those of the same race and gender outcomes, could also be due to local systemic inequities that are not observed by researchers. For instance, the social environment literature has established how discrimination can negatively impact neighborhoods, especially

for black youth. Previous work has documented 'White Flight' following inflows of black, Mexican-origin, or Asian American residents to neighborhoods or schooling districts (Card, Mas, and Rothstein 2008; Boustan 2010; Cascio and Lewis 2012; Boustan, Cai, and Tseng 2023). This 'White Flight' can lead to decreased economic mobility in effected neighborhoods as a result of increased segregation, declining public school revenue, increased police spending, and higher incarceration rates (Derononcourt 2022; Kulkarni and Mulmendier 2022). As a result, we would expect adolescents and adults from these neighborhoods to have similar outcomes.

2.2 Subjective Beliefs and Outcomes

The beliefs literature has focused mostly on education, which studies subjective beliefs of own college outcomes, academic ability, and the net returns to schooling, or specific major choice. Much work is focused on subjective biases, where students from less affluent backgrounds are presumed to be underestimating their own returns and ability.

This theory was famously proposed in Streufort 2000 and Wilson 1987, where it was argued that since youth from lower income backgrounds are more socially isolated from higher earning college educated adults, they will underestimate the returns to college and hence have lower college attendance rates. Consistent with this theory, Horn, Chen, and Chapman 2003 found that students from lower income backgrounds overestimate the costs of attending college. Similarly, Bleemer and Zafar 2018 find that youth from lower income and non college educated backgrounds exhibit more bias in the perceived net returns to college.

Much work has shown that subjective biases are related to education outcomes. For instance Stinebrickner and Stinebrickner 2013 showed that differences in beliefs about ability and learning through grades can explain up to 45% of college dropout at Berea College.[2]

[2]It's important to note that Berea College is a private liberal arts school that primarily serves low income

Similarly, self-efficacy, or a student's beliefs for how well they will perform, has been shown to be strongly correlated with STEM enrollment and can explain gender STEM gaps, even when controlling for measures of academic ability (Stinebrickner and Stinebrickner 2014; Saltiel 2021). Additionally, Wiswall and Zafar 2015 show that providing students with more correct information on returns to college majors causes students to revise their intended major choice.

Systematic differences in beliefs may not always be due to biases however. There can be real differences in returns to different activities for youth from different neighborhoods or demographic groups. For instance, despite discrimination and that the average black youth comes from a lower socioeconomic background than white youth, black youth are on average equally optimistic about education attainment as white youth. In fact compared to similar white youth, black youth are actually more optimistic about education outcomes (Cook and Ludwig 2007). However, what may appear as excess optimism may rationally reflect that the returns to college versus non-college are higher for black youth than white youth, and that black youth have higher rates of college attendance compared to white youth of similar academic readiness, socio-behavioral skills, and socioeconomic status (Goldsmith, Darity, and Veum 1998; Carneiro, Heckman and Masterov 2005; Lang and Manove 2011).

Just as the relationship between adult outcomes and future adolescent's outcomes can be driven by systemic inequities that effect adults and youths future outcomes, relationships between adult outcomes and beliefs can also be driven by rational incorporation of systemic barriers in youths information sets. Consistent with rational responses to systemic inequities, Deluca et al. 2021 combine the NLSY97 with qualitative interviews to determine how exposure to adverse events effect beliefs and outcomes. They find that youth who experienced adverse events like homelessness, witnessing a shooting, being a victim of violence, parental death or divorce, and family hospitalizations are less likely to believe they

students at little cost to the students, so social alienation and financial costs are likely not causes of dropout

will earn a bacheolor's degree by age 30. These youth are also more likely to believe they will experience negative events like death, pregnancy, or arrests. These beliefs in turn lead youth from these backgrounds to seek shorter more flexible education programs that allow them to complete their studies in case any of these negative events were to occur again.

2.3 Contribution

In this paper, I will build on this literature by showing how social environment relates to beliefs and how beliefs can predict future outcomes and inequality. Specifically, I show holding family resources, adverse shocks, academic ability and past risky behavior constant, that teens who are more exposed to positive outcomes in their social environment like more years of schooling are more likely to be optimistic about education outcomes. Additionally, teens that are more exposed to risky behavior in their environment like early pregnancy or crime are less optimistic about education outcomes and believe they are more likely to be parents, incarcerated, or die by the age of 20.

Finally, I show that these beliefs are important determinants of future outcomes because youth who believe they are more likely to have more schooling and who believe they are less likely to be arrested or parents young are in fact more likely to have better education, criminal justice, parenthood, and labor market outcomes than more pessimistic youth with the same ability measures, past risky behavior, family resources, exposure to adverse events, and social environment.

This paper differs from other papers in the literature in important ways. First, this paper is the first paper to analyze more than just the relationship of beliefs to education outcomes, but the relationship of a wide range of beliefs with other future outcomes like arrest, incarceration, early parenthood, and work hours. Second, this is the first paper to examine the relationship between beliefs and a wide range of social phenomenon while also controlling for important covariates like family wealth, adverse events, academic ability,

risky behavior at a young age, and demographic variables. By doing this I provide strong evidence that in addition to other important economic variables social environment also strongly influences beliefs, and that these beliefs in turn strongly predict future outcomes.

Although this paper does not show causal effects or distinguishes between biased beliefs and rational responses to systemic inequities it does suggest future areas of research that can improve economic analysis or adolescent outcomes. If beliefs are rational responses to systemic inequities, then this suggests that beliefs may serve as important controls to capture unobserved factors that effect economic outcomes. If beliefs are biased and due to excessive weight placed on social factors, then this suggest cost effective ways to promote better economic outcomes for youth from disadvantaged backgrounds. The next step to distinguish these two theories would be to evaluate the effect of salient information campaigns or mentoring programs that provide better information or update social networks while leaving local economic opportunities unchanged.

3 Data Description

The data set used for this analysis is the 1997 National Longitudinal Study of Youth (NLSY97), merged with census tract level characteristics from the year 2000 Decennial Census. The NLSY97 is a longitudinal data set that follows individuals from 1997 to 2021 and is designed to be representative of youth born in the continental United States between 1980-1984[3]. The NLSY97 also has a relatively large share of black and Hispanic respondents, due to these populations being over sampled.

The NLSY97 collects data on human capital measures, beliefs about the future, family and school environment, as well as participation in activities like work, crime, sex, and school. The Decennial Census files include tract level outcomes of adults by gender, race, and

[3]The last year used for analysis in this study is 2017

ethnicity. These outcomes include employment, unemployment, median full time earnings, military service history, as well as educational attainment by race, ethnicity, and gender [4]. The tract level outcomes from the 2000 Decennial Census used in the analysis are for tracts that NLSY97 respondents lived in during the initial 1997 interview, when respondents were between 15 and 16 years old.

The main categories of variables used in the analysis are later life outcomes, beliefs about the future, social environment characteristics, academic ability, past risky behavior, adverse shocks, as well as demographic variables. Further details and summary statistics of these variables follow in section 3.1 and 3.2.

The sample is restricted to the 1980 and 1981 birth cohorts since these cohorts were asked more detailed belief questions than later ones. The sample size was further restricted to respondents who did not have missing values for variables used in the analysis and who had no incarceration or arrest history prior to 1997 to avoid perfect certainty in reporting beliefs about criminal justice outcomes[5]. For further details on sample selection effect on sample size see Table A.1 in the appendix.

3.1 Dependent Variables

This study will examine two groups of dependent variables. One is positive outcomes like high school completion, bachelor's attainment, and working more than 20 hours in 2010 and negative outcomes like parenthood by 20, ever being arrested, or ever being incarcerated.

The second group of dependent variables are beliefs related to these outcomes. These include beliefs about short term outcomes like probability of staying in high school next year, being arrested next year, or working more than 20 hours a week while in high school.

[4]Labor market and military outcomes are for adults 18 and up, educational attainment is for adults 25 and up.

[5]Teens with prior pregnancies were not excluded since a negligible amount of teens who were already parents are included in the analysis

These also include beliefs about longer term outcomes like probability of being a parent[6], in jail, or dead by age 20 as well as probability of having a bachelor's degree and working more than 20 hours a week at age 30.

Summary Statistics of the two sets of dependent variables, outcomes and beliefs are shown in Table 1. Table 1 presents mean values of the dependent variables by parental wealth tercile in Columns 2-4, and for the sample as a whole in Column (1). Table 1 shows a monotonic relationship between parental wealth tercile and outcome realizations. That is more parental wealth is associated with a higher occurrence of positive outcomes like education attainment, and a lower occurrence of negative outcomes like early pregnancy, arrests, and incarceration. There is also a monotonic relationship between parental wealth and beliefs. Specifically, more parental wealth is associated with teen's believing positive outcomes like education atttainment is more likely, and believing negative outcomes like being a parent young, dying, and having negative contact with the criminal justice system is less likely.

Table 2 shows the correlation between positive outcome and negative outcome realizations in the first panel. The top panel of Table 2 shows that education attainment is positively correlated with working more than 20 hours in 2010, when most respondents are 29-30 years old. Negative outcomes like early parenthood and arrest or incarceration are also positively correlated with each other. However, positive outcomes are negatively correlated with negative outcomes. This means teens that avoid early parenthood are less likely to be arrested or incarcerated, and more likely to obtain a bachelor's degree and work more than 20 hours around age 30.

[6]parenthood is reported as being pregnant for female respondents, and getting someone pregnant for male respondents

Table 1: Means of Dependent Variables

VARIABLES	(1) All	(2) Low	(3) Middle	(4) Top
HS Graduate	87.6	77.1	87.6	97.42
Bachelor's or Higher	10.9	4.77	8.09	19.1
Work Avg 20 hours in 2010	70.4	61.6	71.3	77.8
Parent by age 20	14.1	22.7	15.4	4.86
Ever Arrested	27.8	34.6	30.2	19.3
Ever Incarcerated	8.31	11.6	9.21	4.39
Prob HS Grad by 20	96.07	91.82	96.91	99.21
Prob Deg by 30	76.10	68.49	74.01	85.14
Prob Work 20+hrs at 30	94.32	92.46	94.24	96.10
Prob Parent by 20	15.40	19.52	16.87	10.18
Probability Arrested Next Year	8.740	9.702	9.378	7.244
Prob in Jail by 20	4.367	5.109	4.830	3.240
Prob Die by 20	19.92	23.84	20.23	16.00
Sample Size	1501	594	494	413

Table 1: Displays mean values of the two sets of dependent variables: outcome realizations and beliefs about these outcomes when respondent are 15-16 years old. Columns (2)-(4) show mean values within parental wealth tercile, while Column 1 shows mean values for the whole sample. All statistics are calculated using longitudinal survey weights.

Table 2: Correlation Matrix Outcomes and Beliefs

Outcomes	Work 20+ hrs 2010	HS Grad	Bachelor's	Parent by 20	Arrested	Incarcerated
Work 20+ hrs 2010	1.0	0.4642	0.2358	-0.3318	-0.2091	-0.3827
HS Grad	-	1.0	1.0	-0.4831	-0.3629	-0.3983
Bachelor's	-	-	1.0	-0.3738	-0.3747	-0.5089
Parent by 20	-	-	-	1.0	0.2378	0.2023
Arrested	-	-	-	-	1.0	1.0
Incarcerated	-	-	-	-		1.0

Beliefs:	Work 20+ hrs 30	HS Grad 20	Bachelor's 30	Parent by 20	Arrested Next Year	Incarcerated by 20
Work 20+ hrs 30	1.0	0.2635	0.2300	-0.0784	-0.0981	-0.1420
HS Grad 20	-	1.0	0.3091	-0.2292	-0.1018	-0.1837
Bachelor's 30	-	-	1.0	-0.2492	-0.1570	-0.1999
Parent by 20	-	-	-	1.0	0.3151	0.3102
Arrested Next Year	-	-	-	-	1.0	0.4665
Incarcerated by 20	-	-	-	-		1.0

Table 2: Each entry shows correlations between the corresponding row and column variable. The first panel shows tetrachoric correlations between outcome realizations for respondents while the second panel shows correlations between beliefs about these outcomes.

The second panel of Table 2 shows the correlation between beliefs related to positive outcomes and negative outcomes. Similar to the first panel of Table 2, beliefs about positive outcomes are correlated with each other. Beliefs about negative outcomes are also positively correlated with each other. However, beliefs about positive outcomes are negatively correlated with beliefs of negative outcomes. This means teens that are more pessimistic about college completion tend to be pessimistic about high school completion and work hours at age 30. They also believe that they are more likely to be parents young, arrested, or incarcerated. They also may rightly intuit the negative correlation between positive and negative outcomes.

3.2 Independent Variables

The independent variables used in the analysis include controls for social environment, academic ability, risky behavior before the start of the survey, adverse events, race, ethnicity, gender, as well as year of birth. With the exception of social environment and adverse events, the independent variables were recorded in 1997 during the first wave of the NLSY97.

Social environment characteristics include peer attributes, parent attributes, tract level outcomes for demographically similar adults, and county level outcomes recorded in 1990. For tract level outcomes, I use outcomes for adults of the same race, ethnicity and gender as the respondent, since past studies have shown role model effects to be race and gender specific. Less than 5% of youth lived in neighborhoods where tract level outcomes for adults of the same race or ethnicity where not available. For these youth I used neighborhood level outcomes for all adults of the same gender and for the analysis I included an indicator for whether pooled rather than racially and ethnically similar adult statistics were used. Youth for which race, ethnicity, and gender specific outcomes were not available also tended live in neighborhoods that had a much larger share of same gender adults with a different racial and ethnic identity.

Since crime and early parenthood at the tract level were not available in the Decennial Census files, I used county level crime rates and percentage of births to young mothers from the year 1990 in the geocoded version of the NLSY97. Other geographical controls include state fixed effects, county level rates of black and Hispanic identity, and categorical variables for whether the individual lived in an urban or rural area at the start of the survey.

Peer measures used are respondent reports of percentage of students in the same grade at school that have college plans, are having sex, belong to a gang, or that cut class. The peer variables are measured on a scale of 1-5 where each unit increase corresponds to approximately a 25 percentage point increase of peers with the reported characteristic. Parent outcome measures used are respondent reports of years of parents schooling, mother's age at first birth, and indicators for whether parents served in the military or were incarcerated. I also used household net worth as a measure of parents wealth[7].

The NLSY97 also has a rich set of controls for human capital measures including academic or cognitive measures, and past risky behavior or socio-behavioral measures. In this study academic ability is an index that is defined as the first principal component of a principal component analysis performed on 8th grade GPA, as well as Armed Services Vocational Aptitude Battery (ASVAB) Math Knowledge, Arithmetic Reasoning, Paragraph Comprehension and Word Knowledge scores. I also control for past risky behavior that controls for socio-behavioral skills as recommended by Hai and Heckman 2017. Past risky behavior is defined as the count of the following events occurring before the first wave of the NLSY97; had sex by age 15, stole more than $50 before 1997, intentionally attacked someone before 1997, and was suspended from school between the ages of 10-15.

[7]For household net worth, parental reports were used and if not available imputed parental reports based on regressing parental reports on youth reports and other control variables.

Table 3: Means of Independent Variables

VARIABLES	(1) All	(2) Low	(3) Middle	(4) Top
Avg Years of Parents Schooling	12.86	11.74	12.63	14.12
Tract: Pct HS Dropout	20.64	28.39	21.02	13.08
Tract: Pct HS Diploma Only	30.43	30.61	32.30	28.50
Tract: Pct College Edu	48.93	41.00	46.68	58.42
Pct Peers College Plans	64.3	57.5	63.5	71.3
HH Net Worth ($1000s)	190.57	15.94	119.84	419.18
Tract: Unemployment Rate	5.977	8.133	5.856	4.094
Tract: FT Med Earnings ($1000s)	45.34	39.06	43.62	52.78
Mom's Age at First Birth	23.15	21.73	22.42	25.15
County: Pct Births Under 20	12.59	13.66	12.88	11.32
Pct Peers had Sex	45.3	51.4	48.3	36.9
Parent Ever in Jail	4.71	9.54	3.79	1.12
County: Crime Per 100k	5,241	5,728	4,923	5,092
Pct Peers Cut Class	45.2	48.8	45.2	41.9
Adverse Family Shock	1.608	2.189	1.613	1.065
Adverse Victim Shock	0.727	0.961	0.708	0.527
Suspended 10-15 years old	23.3	31.3	26.1	13.2
Reported 8th grade GPA	2.953	2.714	2.881	3.242
Black	14.6	25.5	15.7	3.59
Hispanic	13.3	22.3	13.5	4.96
County: Pct Black 1990	11.31	14.55	11.13	8.490
County: Pct Hispanic 1990	7.236	9.082	7.374	5.393
Tract: Pct Same Race/Ethnic	77.6	69.1	77.4	85.5
Sample Size	1501	594	494	413

Table 3: Displays mean values of the independent variables grouped by variable type. Columns (2)-(4) show mean values within parental wealth tercile, while Column 1 shows mean values for the whole sample. All statistics are calculated using longitudinal survey weights. Dollar figures are calculated at 2017 values.

I use a similar index for adverse individaul and family shocks as Deluca et al. 2021[8]. For individual shocks I use an index that ranges between 0-6 and counts how many of the following traumatic events occurred; felt unsafe before 1997, home broken into by age 18, seen a shooting by age 18, been bullied by age 18, was a victim of violence between 1997-2002, and experienced homelessness between 1997-2002. For family shocks I use a similar index ranging between 0-6 that counts how many of the following events occurred; not living with both parents in 1997, parents divorced by 1997, mother not employed in 1997, father not employed in 1997, any parent dead by 1997, and a member of the household hospitalized between 1997-2002. [9]

Table 3 shows mean values of many of the independent variables used in the analysis. Column 1 shows mean values for the whole sample, while Columns 2-4 show mean values within parental wealth terciles. Similar to outcomes and beliefs, many of the independent variables exhibit a monotonic relationship with respect to parental wealth. Teens from a lower parental wealth background are more likely to live in neighborhoods with worse education and labor market outcomes. They are are more likely to come from families with less years of schooling, an incarceration history, younger mother's age at first birth, as well as more adverse shocks. They are also more likely to have experienced traumatic events as demonstrated by the higher mean value of the adverse victim shock. Teen's from these backgrounds also have lower academic measures and engage in more past risky behavior.

Together Table 1-3 demonstrate that teen's from lower socioeconomic backgrounds have plenty of reason to be more pessimistic about education attainment while also believing negative outcomes are more likely. This can be due to differences in own academic performance, less education attainment among adult role models, as well as less college aspirations

[8]My index differs in that I use Parental Incarceration as a seperate independent variable rather than as part of the family shock index. I also do not use ever changed schools in my index for individual shocks since many of these youth had changed schools going from middle to high school.

[9]Since some of these events occurred after beliefs were recorded, any strong correlations between these and the belief variables could reflect anticipation of these events occurring.

among their peers. This can be due to differences in past risky behavior that may be a result of being exposed to more trauma. This can be due to less family economic security and worse neighborhood labor market conditions. Finally, individuals that have less education attainment are also more likely to work less hours, become parents young, and be arrested. Because of this it is important to control for all of these covariates when performing the analysis of the relationship between beliefs and social environment, as well as between future outcomes and beliefs.

4 Methodology

In this section I explain the methodology that will be used to analyze the relationship between social environment and beliefs, as well as beliefs and later life outcomes.

The relationship between beliefs and social environment will be analyzed by using OLS to estimate equation (1.1) below. Beliefs to be analyzed were recorded when respondents were 15-16 years old and concern short term (within 1 year) and longer term (occurring between 3 to 14 years later) outcomes related to education, work, parenthood, criminal justice outcomes, and mortality.

$$(1.1) \qquad Belief_{i,j} = \gamma_0 + \vec{\gamma}_{SI,j} \vec{SocialIndex}_i + \vec{\beta}_j \vec{X_{i,j}} + \vec{\varepsilon_{i,j}}$$

The vector $\vec{X_{i,j}}$ includes controls for academic ability, past risky behavior, adverse shocks, parental wealth, and demographics. The vector $\vec{SocialIndex}_i$, is a vector of social indices constructed using the first component of a principal component analysis performed on sets of similar outcomes occurring among peers, parents, and same race and gender adults from the census tract that teens lived in around 15-16 years old. Results for the principal component analysis are shown in Table A2-A8 in online Appendix A.1.[10]

[10]The index is constructed by summing the product of each variable with its corresponding first component.

For the social crime index, I use parent incarceration, peers cutting class, peers in a gang, and the 1990 serious crime level in the respondent's county. For the social bachelor's index, I use an indicator for parents with a bachelor's degree, percent of same race and gender adults with a bachelor's or more, and peers with college plans. For the social high school index I use an indicator for parents having a high school degree only, percent of same race and gender adults with high school only, and percent of same race and gender adults with some college but no bachelor's degree. For the sex at young ages index I use percent of peers having sex, mother's age at first birth, and percent of births to young mothers in the respondent's county in 1990. For the economic index, I use the unemployment rate and full time median earnings of same race and gender adults. Finally, for the military service index, I use percent of same race and gender adults with military service, and an indicator for whether parents have served in the military.

$$(1.2) \quad Belief_{i,j} = \alpha_0 + \vec{\alpha}_{peer,j}\vec{Peer}_i + \vec{\alpha}_{par,j}\vec{Parent}_i + \vec{\alpha}_{T,j}\vec{Tract}_i + \vec{\alpha}_{C,j}\vec{County}_i + \vec{\delta}_{oj}\vec{X}_{i,j} + \vec{\varepsilon}_{i,j}$$

I also estimated an alternative specification shown in equation (1.2) disaggregating the social indices to the vectors $\vec{Peer}_i$, $\vec{Parent}_i$, $\vec{Tract}_i$, and $\vec{County}_i$, for peer, parent, census tract, and county level characteristics. Additionally, I disaggregate past risky behavior into indicators for each type of behavior in the vector $\vec{X}_{i,j}$. For equation (1.2) only graphical representations of the statistically significant coefficients at the 10 percent level are reported in the appendix. These results provide further context to which specific components of social environment influence beliefs, whether that be peers, parents, or other adults.

$$(2.1) \quad Outcome_{i,j} = \alpha_0 + \vec{\alpha}_{belief,j}\vec{Belief}_i + \vec{\alpha}_{SI,j}\vec{SocialIndex}_i + \vec{\delta}_{oj}\vec{X}_{i,j} + \vec{\varepsilon}_{i,j}$$

The relationship between outcomes and beliefs will be analyzed using OLS to estimate equation (2.1). The vector $\vec{Belief}_i$ includes belief of graduating high school by age 20, having a degree by age 30, probability of becoming a parent by age 20, probability of arrest within the next year, probability of working more than 20 hours a week at age 30, probability of arrest if one were to steal a car, and probability of death by age 20. The vectors $\vec{X_{i,j}}$ and $\vec{SocialIndex}_i$ are defined the same as in equation (1.1)[11].

None of the coefficients are interpreted as causal effects, but instead measures of the strength of the relationship between dependent and independent variables. The analysis also does not take any stance on whether beliefs are rational responses to local conditions or biased beliefs based off of excessive weight placed on non-economic factors. The results suggest that even when controlling for traditional economic variables like human capital measures, access to resources, exposure to adverse shocks, and demographics, unexplained variation in social environment is strongly related to teen's beliefs about the future. Furthermore controlling for the same measures and social environment, unexplained variation in beliefs is strongly related to teen's later life education, early parenthood, and criminal justice outcomes. These results hold when using indices or disaggregating all indices to their individual parts.

5 Results

In this section I present results for the main analysis. In section 5.1, I examine the relationship between 15-16 year old's beliefs about their future and their social environment. In section 5.2, I examine the relationship between teen's beliefs of the future and later life outcomes.

[11] A specification of the analsis of outcomes on belief was performed with disaggregated social characteristics similar to equation 1.2. Results are shown in online appendix section A.3

5.1 Belief Analysis Results

In this section I examine the relationship between a teen's beliefs of both short term and long term future outcomes with social environment. I control for important economic variables including past risky behavior like violence,theft, and sex; academic ability measured by 8th grade gpa and math-verbal scores on the ASVAB aptitude test; family resources measured by household net worth, exposure to adverse family shocks like divorce, unemployment, and hospitalization; and individual victim shocks of traumatic events like witnessing a shooting, being homeless, or being a victim of violence. This means that the associations with beliefs and social environment captured here is due to correlations in the variation of beliefs with the variation in social environment that is not related to academic ability, past risky behavior, family resources, demographics or exposure to adverse events.

Table 4 presents belief results for respondent's short term beliefs including probability of staying in high school next year in Column 1, probability of working more than 20 hours next year conditional on being in school in Column 2, and the probability of being arrested next year in Column 3. Table 4 also examines a teen's perceived risk of crime as measured by probability of being arrested if one were to commit car theft in Column 4.

Table 4 shows that holding other controls constant, short term beliefs are strongly correlated with positive and negative social outcomes. For instance, holding all other controls constant a one standard deviation increase in the social bachelor's index is associated with a 1.5 percentage point increase in a teen's perceived probability of staying in school. Additionally, a one standard deviation increase in exposure to crime is associated with a 2.4 percentage point increase in belief of being arrested. Likewise, more exposure to better labor market outcomes for adults of the same race and gender is also negatively associated with belief of arrest next year.

Table 4: Beliefs about Short Term Outcomes

VARIABLES	(1) Prob School Next Year	(2) Prob Work 20+hrs if School Next Year	(3) Prob Arrest Next Year	(4) Prob Arrest If Stole Car
Social Crime (1sd)	0.3575	1.2911	2.3809***	-0.3540
	(0.4556)	(1.0842)	(0.5313)	(1.2987)
Social Young Sex (1sd)	-0.5984	2.6967**	0.2493	1.4022
	(0.4727)	(1.2689)	(0.6519)	(1.3342)
Social Bachelor's (1sd)	1.4709*	-2.8816**	1.7763***	1.1987
	(0.7621)	(1.3674)	(0.6187)	(1.5461)
Social HS Non BA (1sd)	0.8723**	1.0155	0.4341	1.6386
	(0.4406)	(0.6777)	(0.4887)	(1.1679)
Social Military (1sd)	-0.2537	1.7316	0.3300	-0.9218
	(0.4827)	(1.0631)	(0.4909)	(1.0077)
Social Labor Market (1sd)	-0.7090	2.3470*	-1.6616**	-1.6789
	(0.6961)	(1.2005)	(0.8215)	(1.2284)
HH Net Worth ($10k)	0.0274	-0.1197***	0.0618**	0.0491
	(0.0184)	(0.0439)	(0.0248)	(0.0579)
Family Shocks	-0.0464	1.1969***	0.3442	0.8174
	(0.3614)	(0.4444)	(0.2919)	(0.8047)
Victim Shocks	-1.0304**	0.1562	0.8844*	-0.3183
	(0.4987)	(0.7514)	(0.4925)	(1.3519)
Academic Index (1sd)	2.3726***	-1.6090	-0.9374*	3.8636***
	(0.6182)	(1.3379)	(0.5496)	(1.3654)
Past Risky Behavior	-1.3753*	3.1848***	3.0721***	-2.7399***
	(0.7554)	(0.8160)	(0.6461)	(1.3208)
Rural 1997	-4.0352***	-0.4244	-0.5023	-4.3627
	(1.1922)	(4.3266)	(1.9785)	(7.2533)
Urban 1997	-5.2050***	1.1592	-0.9360	-5.8555
	(1.1645)	(4.7405)	(2.1709)	(6.9361)
Female	-0.9574	4.6668***	-6.1535***	-2.3082
	(1.0706)	(1.7825)	(1.4344)	(2.0485)
Hispanic	-0.1152	-0.9885	0.9382	-2.0543
	(1.3457)	(2.0349)	(1.2856)	(3.7296)
Black	4.7363***	-0.8193	1.0963	-3.1181
	(1.1854)	(2.8126)	(1.3217)	(4.3403)
Constant	98.8251***	59.1531***	9.0351***	68.7975***
	(1.5757)	(4.9983)	(2.3371)	(7.5451)
Observations	1,501	1,501	1,501	1,501
Number of state	41	41	41	41
R-squared	0.0638	0.0826	0.133	0.0431

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: OLS regressions of beliefs on social environment and other controls. All beliefs are reported in percentages of event occurring between 1-100. All regressions use robust standard errors. Regressions also control for whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county.

These relationships between social environment and beliefs of education and criminal justice outcomes can be due to youth following in their role models footsteps for better or for worse. They can also signal unobserved factors in one's local environment that impact education outcomes such as school quality or the value placed on education among one's community. Similarly, more exposure to crime along with worse labor market outcomes may signal higher relative returns to black market activities versus legal labor market activities. Column 4 suggests there is no statistically significant evidence that higher expectation of arrest for youth from high crime, worse labor market areas is driven by a higher belief of getting caught conditional on having committed a crime. This suggests higher arrest belief is due to anticipation of committing risky behavior or perhaps being wrongly accused of a crime.

Social environment also strongly predicts teen's beliefs of working while in high school as seen in Column 2 of Table 4. Holding all other independent variables constant, a one standard deviation increase in exposure to sex at young ages and better labor market outcomes is associated with a 2.7 and 2.4 percentage point increase in belief of working more than 20 hours while in high school respectively. While more exposure to bachelor's attainment is negatively correlated with belief of working more than 20 hours while in high school.

This suggest teens who live in areas with strong labor markets for mostly non college educated workers may perceive the relative returns to work versus study as higher and thus be enticed to enter the labor market instead of pursuing more education. This is consistent with the statistically significant positive coefficient on social bachelor's index and negative coefficient for social labor market index on belief of staying in school next year in Column 1.

The positive coefficient of the social index for sex at young ages on belief of working more than 20 hours in high school may be due to teen's from these area's believing they must work to financially assist family or other community members. The familial obligations interpretation is strengthened by the statistically significant negative coefficients for

household net worth, and statistically significant positive coefficients for family shocks, past risky behavior, and being female on belief of working while in school.

Teens who's families have less wealth and that have experienced more negative shocks like lack of employment or hospitalization may believe they have to assist their parents financially or at least compensate for their lack of resources. The positive correlation with past risky behavior that includes having sex before age 15, as well as the positive correlation with being female suggest teens who expect to be or are young parents believe they must work to provide for their own children. This may be more the case for young mothers themselves and may even be to assist family members who became parents young.

Figures 1 and 2 in Appendix A.2 present graphs of coefficients from the specification that disaggregates the social indices by including separate covariates for each peer, parent, census tract and county characteristic. The results are consistent with Table 4 and show that parent, peer , tract, and county level characteristics all influence short term beliefs. Reoccurring covariates include parent's schooling, peers with college plans, county crime rates, and percent of similar adults from one's census tract with only a high school diploma.

Table 5 examines the relationship between social environment and other controls with beliefs about positive more longer term outcomes like high school graduation by the age of 20, bachelor's attainment by age 30, and working more than 20 hours by age 30. For beliefs about education outcomes there is a strong correlation with social environment. However, this is not the case for belief of working more than 20 hours at age 30.

Table 5:Longer Term Beliefs about Positive Outcomes

VARIABLES	(1) Prob HS Grad by 20	(2) Prob Deg by 30	(3) Prob Work 20+hrs at 30
Social Crime (1sd)	-0.0606	-1.5853*	-0.5201
	(0.4712)	(0.8745)	(0.5998)
Social Young Sex (1sd)	0.3184	-1.0559	-0.2129
	(0.6712)	(1.1660)	(0.8503)
Social Bachelor's (1sd)	1.0856*	4.8707***	-0.0537
	(0.6531)	(1.1673)	(0.6305)
Social HS Non BA (1sd)	0.5622	1.0386	-0.2172
	(0.3941)	(0.7125)	(0.5042)
Social Military (1sd)	1.0030***	0.4010	-0.1846
	(0.3546)	(0.9025)	(0.3783)
Social Labor Market (1sd)	-1.0337	-1.3680	0.4055
	(0.7852)	(0.8459)	(0.6174)
HH Net Worth ($10k)	0.0251	0.0779**	-0.0232
	(0.0160)	(0.0332)	(0.0246)
Family Shocks	-0.3549	-0.3937	0.1926
	(0.2538)	(0.4531)	(0.3006)
Victim Shocks	-0.5161	-0.7788	-0.1981
	(0.5593)	(0.8830)	(0.4186)
Academic Index	3.7565***	9.8277***	3.0799***
	(0.6185)	(0.8782)	(0.5775)
Past Risky Behavior	-0.7746	-2.0299**	0.2391
	(0.6954)	(1.0130)	(0.6658)
Rural 1997	-3.2191*	-1.8858	-1.1353
	(1.7980)	(3.0097)	(2.2992)
Urban 1997	-2.9496**	1.0112	-0.6494
	(1.4013)	(3.0268)	(2.0559)
Female	1.0338	5.3729***	0.4627
	(0.8559)	(2.0828)	(1.2371)
Hispanic	-1.4526	3.5047	-0.4592
	(1.8083)	(3.2857)	(1.1556)
Black	1.4055	10.0736***	-0.7875
	(1.1010)	(2.8468)	(1.2741)
Constant	98.4258***	64.4942***	94.9796***
	(1.7169)	(4.1654)	(2.7295)
Observations	1,501	1,501	1,501
Number of state	41	41	41
R-squared	0.104	0.220	0.0563

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Reports coefficients from OLS regressions of outcomes on beliefs and other controls. All regressions use robust standard errors. Regressions also control for social environment, academic ability, risky behavior before 1997, race, ethnicity, gender, whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county

Table 5 shows more exposure to bachelor's attainment is positively correlated with optimism regarding education attainment overall. For instance, a one standard deviation increase in the social bachelor's index is associated with a 1.09 and 4.9 percentage point increase in teen's beliefs of graduating high school and obtaining a bachelor's degree respectively. Additionally, more exposure to risky behavior like crime is negatively associated with belief of bachelor's attainment.

Figure 3 in appendix A.2 presents marginally significant coefficients for disaggregated social characteristics on the three beliefs analyzed in Table 5. The results are consistent with Table 5, except for the presence of marginally significant social characteristics for belief of working hours at age 30. Figure 3 shows that peer's college aspirations are important determinants of all three beliefs. Parent's schooling is an important determinant of belief of education attainment overall, including belief of staying in school next year in Figure 1. Additionally, more exposure to negative events like parent incarceration and young births in one's county is negatively associated with belief of working more than 20 hours at age 30.

Overall these findings are consistent with the previous interpretation of Table 4. Teen's who are more exposed to bachelor's attainment may have more social pressure to attend college or perceive the returns to schooling as higher. Although not statistically significant, the negative coefficient of labor market conditions and the statistically significant positive coefficient of social bachelor's attainment on belief of high school completion and degree attainment, may suggest teens from environments with good labor market outcomes for high school only adults perceiving the relative return to work versus college as higher.

Table 6: Longer Term Beliefs about Risky Outcomes

VARIABLES	(1) Prob Parent by 20	(2) Prob Jailed at 20	(3) Prob Die by 20
Social Crime (1sd)	2.0206***	0.7579**	2.5283***
	(0.7217)	(0.3166)	(0.8284)
Social Young Sex (1sd)	2.2386***	0.6056	1.9942**
	(0.6912)	(0.4305)	(0.8506)
Social Bachelor's (1sd)	-0.5020	1.0799**	1.5501**
	(0.9677)	(0.4211)	(0.7331)
Social HS Non BA (1sd)	-0.0309	-0.0674	0.9852
	(0.8122)	(0.2782)	(0.6610)
Social Military (1sd)	-0.0163	-0.0368	-0.1018
	(0.5869)	(0.2929)	(0.5840)
Social Labor Market (1sd)	0.2404	-0.4358	-1.7958*
	(1.1268)	(0.4046)	(1.0706)
HH Net Worth ($10k)	0.0016	0.0187	-0.0383
	(0.0293)	(0.0127)	(0.0350)
Family Shocks	0.2992	0.3204	0.6008
	(0.4986)	(0.2167)	(0.4055)
Victim Shocks	0.0238	0.6317	2.3960***
	(0.9826)	(0.3904)	(0.6839)
Academic Index (1sd)	-3.9053***	-1.9110***	-0.2202
	(0.6799)	(0.3148)	(0.6310)
Past Risky Behavior	4.8688***	1.0995***	0.3192
	(0.7774)	(0.3616)	(0.5107)
Rural 1997	5.5655**	1.6691	1.0781
	(2.5220)	(1.5068)	(3.0912)
Urban 1997	2.6388	0.8660	0.3847
	(2.6111)	(1.2694)	(3.2593)
Birth Year	0.8070	0.2596	1.3154
	(1.3620)	(0.5364)	(0.8715)
Female	-0.6869	-3.1241***	1.0863
	(1.8618)	(0.6176)	(1.3511)
Hispanic	1.2262	0.5100	-0.7594
	(2.5705)	(1.1898)	(1.4874)
Black	-3.1822	-0.9169	-2.1400
	(2.4439)	(0.8916)	(1.8497)
Constant	10.2516***	3.5774**	17.9920***
	(3.4459)	(1.4512)	(3.6519)
Observations	1,501	1,501	1,501
Number of state	41	41	41
R-squared	0.142	0.0928	0.0612

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: OLS regressions of beliefs on social environment and other controls. All beliefs are reported in percentages of event occurring between 1-100. All regressions use robust standard errors. Regressions also control for whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county.

Table 6 examines the relationship between social environment and other controls with beliefs about more risky longer term outcomes like parenthood, incarceration, and dying by age 20. Table 6 and Table 4 also exhibit similar relationships between social environment and beliefs about negative outcomes.

For instance, More exposure to risky behavior like crime and sex at young ages is associated with teen's believing more negative outcomes like young parenthood, incarceration, and death are more likely for them. For instance, a one standard deviation increase in teen's exposure to crime is associated with a 0.76, 2.02, and 2.5 percentage point increase in a teen's belief of being jailed, a parent, and dying by age 20 respectively. While a one standard deviation increase in teen's exposure to sex at young ages is associated with a 1.9 and 2.2 percentage point increase in belief of dying and being a parent by age 20 respectively. Finally a one standard deviation increase in exposure to better labor market outcomes of demographically similar adults is associated with a 1.8 percentage point decrease in belief of death by age 20.

Figure 4 in Appendix A.2 shows marginally significant coefficients for disaggregated social characteristics on beliefs of longer term negative outcomes. The results are consistent with Table 6 and show peer, county, and parental characteristics are important determinants for beliefs of negative outcomes. More risky peer behavior is associated with a higher probability of being a parent, jailed, and dead by age 20. Matching the coefficient on social bachelor's index in Table 6, there is a surprising positive association with peers college plans and belief of being incarcerated or dead by age 20.

The results in Table 6 and Figure 4 suggests a similar story as short term beliefs analyzed in Table 4 and Figures 1-2. Teens that are more exposed to risky behavior like crime or sex at young ages may perceive the returns to risky behavior versus school or work as higher. This is consistent with the negative coefficient of social crime on probability of having a bachelor's degree in Table 5. This may be more the case for teens who live in

neighborhoods with worse labor market conditions for adults like them.

The positive correlation of social bachelor's attainment with belief of arrest next year, jailed by 20, and dead by 20 is surprising. Figure 2 suggest this may be driven by teens from better education outcomes believing crime is more risky. However, it is also possible that this is driven by teens who deviate from their communities' values regarding education, perhaps due to poor performance or lack of interest in education. These youth may believe their lack of conformity to expectations may make them vulnerable to negative outcomes, or becuase of the disconnect with their community they may be more tempted to rebel by engagin in risky behavior as hypothesized by Akerlof and Kranton 2000.

Tables 4-6 also show interesting relationships between academic ability, past risky behavior, adverse shocks, household net worth, demographics and beliefs about schooling and arrest. For instance, holding all other independent variables constant, teens with lower measures of academic ability, more past risky behavior or who have experienced more traumatic victimization shocks are more pessimistic about education attainment and work hours at age 30. They also believe they are more likely to experience negative events like arrest, incarceration, early parenthood, and death. Additionally, holding all else constant teens with lower measures of academic ability and more past risky behavior also believe that they are less likely to be arrested after stealing a car.

This suggests teens may rationally incorporate their own abilities and history in their expectations of the future. Since teens with these characteristics will likely gain lower returns from schooling and more returns from risky behavior, even if this return includes psychic value of retaliation for inflicted trauma. Additionally, these teens may have more accurate expectation of arrest risk, since they have a history of committing risky behavior without experiencing arrest. This would contribute to even higher returns for risky behavior.

Other results more directly related to demographics are interesting. Similar to Cook and Ludwig 2007, Table 4 and Table 5 show black teens are more optimistic about education

outcomes than similar white youth, which suggests racial education attainment gaps are likely not driven by differences in beliefs or attitudes. Additionally, teens who come from households with more wealth are more optimistic about bachelor's attainment, which suggest teen's rationally intuiting the importance of access to credit for higher education. Finally, teens from rural areas believe they are more likely to be parent's by age 20, which may reflect a higher value placed on family formation in more isolated communities.

Overall the results from Tables 4-6 show that holding financial resources, academic ability, past risky behavior, and exposure to adverse shocks constant, social environment is strongly correlated with beliefs about the future. Teen's that have more exposure to risky behavior like sex at young ages and crime, are less likely to believe they will have a degree by age 30 and more likely to believe they will be arrested, incarcerated, a parent young, or die by the age of 20. Teen's who have more exposure to better education outcomes are also more likely to believe they will stay in school, graduate high school, and attain a bachelor's degree by age 30. Surprisingly, more exposure to bachelor's attainment is also positively correlated with belief of negative outcomes like death and arrest.

Additionally, holding social environment constant, teen's access to resources, academic ability measures, and past experiences with risky behavior are also strongly correlated with beliefs about both positive and negative outcomes. These results are consistent with teens incorporating their social environment as well as their own abilities, history, and access to resources in their beliefs about the relative returns to school, work, and risky behavior.

5.2 Outcomes Analysis

In this subsection we analyze the relationship between actual outcome realizations and beliefs recorded when respondents were ages 15-16 years old, holding academic ability, past risky behavior, access to resources, and social environment constant. Outcomes analyzed are high

school graduation, bachelor's attainment, working 20 plus hours a week in the year 2010,[12] parent by age 20, ever arrested, and ever incarcerated before 2017.

Beliefs included in the analysis are belief of working more than 20 hours at age 30, belief of graduating high school by age 20, belief of having a degree by age 30, belief of being a parent by age 20, belief of being arrested next year, and belief of dying by age 20. Additionally, belief of being arrested if one were to steal a car is also included to distinguish between arrest risk conditional on a crime being committed from probability of arrest driven by anticipation of committing a crime[13].

Table 7 shows the relationship between positive outcome realizations like high school completion, bachelor's attainment, and working more than 20 hours in 2010 while holding traditional economic variables like academic ability and family resources constant. Table 7 shows that beliefs regarding education attainment strongly predict actual education attainment. For instance, a ten percentage point increase in belief of having a degree by age 30 is associated with a 1 percentage point increase in actual probability of graduating high school and 2.2 percentage point increase in actual probability of obtaining a bachelor's degree. Additionally, belief of graduating high school by age 20 is associated with a 4.2 percentage point increase in actual probability of graduating high school and a surprising 1.2 percentage point decrease in actual probability of obtaining a bachelor's degree. The negative coefficient on belief of high school attainment on bachelor's attainment may reflect that variation in belief of graduating high school while controlling for belief of obtaining a bachelor's degree captures belief of having only a high school education.

[12]This year was chosen because it was close to the age of 30 corresponding to the belief of working 20 plus hours at age 30, while also maintaining a large sample size that would have been reduced if age 30 were actually used.

[13]If Prob Arrest = Prob Commit Crime x Prob Arrest Conditional on Crime Committed. It is also possible this belief includes probability of being arrested without having committed a crime.

Table 7: Positive Outcomes Regressed on Beliefs as Teens

VARIABLES	(1) HS Grad	(2) Bachelor's	(3) Work 20+ hrs 2010
Prob Work 20+hrs at 30 (10 ppts)	-0.0023	-0.0004	0.0065
	(0.0076)	(0.0056)	(0.0080)
Prob HS Grad by 20 (10 ppts)	0.0418***	-0.0124***	0.0035
	(0.0085)	(0.0045)	(0.0072)
Prob Deg by 30 (10 ppts)	0.0100***	0.0217***	0.0042
	(0.0036)	(0.0027)	(0.0046)
Prob Parent by 20 (10 ppts)	-0.0138***	-0.0009	0.0041
	(0.0040)	(0.0035)	(0.0049)
Prob Arrested if Stole Car (10 ppts)	-0.0027	-0.0011	-0.0065**
	(0.0020)	(0.0023)	(0.0028)
Prob Arrest Next Year (10 ppts)	-0.0010	-0.0039	-0.0193**
	(0.0048)	(0.0064)	(0.0081)
Prob Die by 20 (10ppts)	0.0050	-0.0023	0.0054
	(0.0038)	(0.0053)	(0.0040)
Constant	0.398***	0.2390***	0.6553***
	(0.1117)	(0.0862)	(0.1236)
Observations	1,501	1,501	1,501
Number of States	41	41	41
R^2	0.279	0.369	0.110

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Reports coefficients from OLS regressions of outcomes on beliefs and other controls. All regressions use robust standard errors. Regressions also control for social environment, academic ability, risky behavior before 1997, race, ethnicity, gender, whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county.

Table 7 also shows that beliefs about negative outcomes are negatively correlated with education attainment and working more than 20 hours in 2010. For instance, holding all other controls constant, a ten percentage point increase in belief of being a parent by age 20 is associated with a 1.4 percentage point decrease in actual probability of graduating high school. Holding all other controls as well as arrest risk following car theft constant, a ten percentage point increase in belief of being arrested next year is associated with a 1.9 percentage point decrease in actual probability of working more than 20 hours in 2010.

Table 8 shows the relationship between negative outcome realizations like arrest, incarceration, and early parenthood while holding traditional economic variables like academic ability and family resources constant. Table 8 shows that beliefs about negative outcomes like early parenthood and arrest are strongly correlated with realizations of negative outcomes.

For instance holding all controls constant, a ten percentage point increase in belief of being a parent by age 20 is associated with a 1.2 percentage point increase in actual probability of being arrested and 1.5 percentage point increase in actual probability of being a parent by age 20. While holding arrest risk after car theft and other controls constant, a ten percentage point increase in belief of being arrested next year is associated with a 2.4 percentage point increase in actual probability of being arrested and 1.8 percentage point increase in actual probability of being incarcerated during one's lifetime. Table 8 also shows beliefs about education are negatively correlated with negative outcomes, since holding all other controls constant a ten percentage point increase in belief of bachelor's attainment is associated with a 0.8 percentage point decrease in actual probability of being a parent.

Table 8: Negative Outcomes Regressed on Beliefs as Teens

VARIABLES	(1) Incarcerated	(2) Arrested	(3) Parent by 20
Prob Work 20+hrs at 30 (10 ppts)	0.0082*	-0.0012	0.0014
	(0.0045)	(0.0055)	(0.0092)
Prob HS Grad by 20 (10 ppts)	0.0034	0.0045	-0.0078
	(0.0055)	(0.0077)	(0.0086)
Prob Deg by 30 (10 ppts)	-0.0038	-0.0031	-0.0082**
	(0.0033)	(0.0039)	(0.0032)
Prob Parent by 20 (10 ppts)	0.0019	0.0121**	0.0147***
	(0.0040)	(0.0050)	(0.0048)
Prob Arrested if Stole Car (10 ppts)	0.0030**	0.0015	0.0012
	(0.0014)	(0.0025)	(0.0021)
Prob Arrest Next Year (10 ppts)	0.0180***	0.0235***	-0.0045
	(0.0054)	(0.0079)	(0.0063)
Prob Die by 20 (10ppts)	-0.0032	-0.0013	-0.0004
	(0.0034)	(0.0055)	(0.0045)
Constant	0.0235	0.2556***	0.1251
	(0.0619)	(0.0895)	(0.1212)
Observations	1,501	1,501	1,501
Number of States	28	28	28
R-squared	0.141	0.203	0.189

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Reports coefficients from OLS regressions of outcomes on beliefs and other controls. All regressions use robust standard errors. Regressions also control for social environment, academic ability, risky behavior before 1997, race, ethnicity, gender, whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county

Overall Table 7 and 8 provides evidence that compared to teen's with similar social environments, past risky behavior, academic ability, and family resources, teens who are more optimistic about education attainment are more likely to have better education outcomes and delay parenthood. While teens who believe parenthood and arrest are more likely are actually more likely to be parents young, have negative contact with the criminal justice system, and drop out of high school.

These findings are consistent with teens that are more optimistic about higher education outcomes putting more effort in their studies while also avoiding behavior that could derail their studies like unprotected sex at young ages. While teens who believe parenthood or arrest is more likely may be more likely to engage in behavior that leads to early parenthood and arrest. The consequences of this behavior may make it harder for them to complete school and may result in less labor market opportunities when they are much older.

Appendix Tables A2-A5 provides further information on the coefficients of other relevant variables like academic ability, social environment, family resources, and past risky behavior on outcomes. These tables also show how including beliefs in the outcomes analysis changes these coefficients. For the most part including beliefs in the outcome regressions shrinks the magnitude of these coefficients. For example, the coefficients of academic ability on high school completion and bachelor's attainment shrink by 20 and 10 percent respectively after including beliefs.

Including beliefs also shrinks the coefficients on social environment as well. This includes shrinking the coefficient on social bachelor's attainment by 11 and 20 percent for bachelor's attainment and being a parent by age 20 respectively. This attenuation effect on social environment coefficients is consistent with beliefs being part of the mechanism for how social environment influences outcomes, perhaps due to biased beliefs were teen's place excessive weight on social outcomes. However the remaining correlation between social environment and outcomes may be due to unobserved systemic inequities that lead to worse

outcomes for both teens and the generation of adults that preceded them.

6 Conclusion

In summary, this paper shows that teens beliefs about the future are strongly correlated to their social environment, while holding wealth, academic ability, exposure to adverse shocks, and past risky behavior constant. First of all holding important economic controls constant, teens who are more exposed to negative outcomes like crime or sex at young ages believe they are more likely to be arrested, parents, and die at young ages. They also believe they are less likely to obtain a bachelor's degree. Similarly, holding important economic controls constant, teens that are more exposed to better education outcomes believe they are more likely to stay in school, graduate high school, and obtain a bachelor's degree.

Additionally these beliefs are also strong predictors of future outcomes. Compared to teens from similar social environments, with similar academic measures, family resources, and past risky behavior, teens with more optimism regarding education attainment are more likely to graduate high school, obtain a bachelor's degree, and avoid pregnancy before the age of 20. While teens who believe negative outcomes like arrest or early parenthood are more likely are more likely to be arrested, incarcerated, and parents by the age of 20 while also being less likely to work more than 20 hours a week around age 30.

Overall, these results suggest teens beliefs about the future incorporate not only their own skills, history, and resources, but also what happens to people like them including their peers, parents, and adults of the same race, ethnicity and gender. Furthermore these beliefs effect teen's behavior that either increases the probability that positive outcomes like more education attainment or more work hours happen to them, or that negative outcomes like early parenthood and contact with the criminal justice system happen to them.

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A Appendix

A.1 Sample Selection and Variable Creation

Table A1: Sample Selection Criterion

Sample Criterion	Dropped	Sample Remaining
Whole Sample		8984
Not Missing Demographics	346	8638
Not Missing Outcomes	1975	6663
Not Missing Parent Measures	1345	5318
Not Missing Peer Measures	139	5179
Not Missing Tract Measures	1811	3368
Not Missing Shocks	349	3019
Not Missing Academic	32	2987
Not Missing Risky Behavior	2	2985
Born in 1980-1981	1249	1736
Not Missing Beliefs or Peer Sex Measure	112	1624
No Criminal Justice History Pre-1997	123	1501

Table A1: Shows criterion used to construct sample. 1980 and 1981 cohort were selected since many of the belief variables and some peer characteristics were only available for these cohorts. Only one observation reported any children by the start of the survey, so no further restriction on prior children was required.

A.2 Disaggregated Social Environment Results

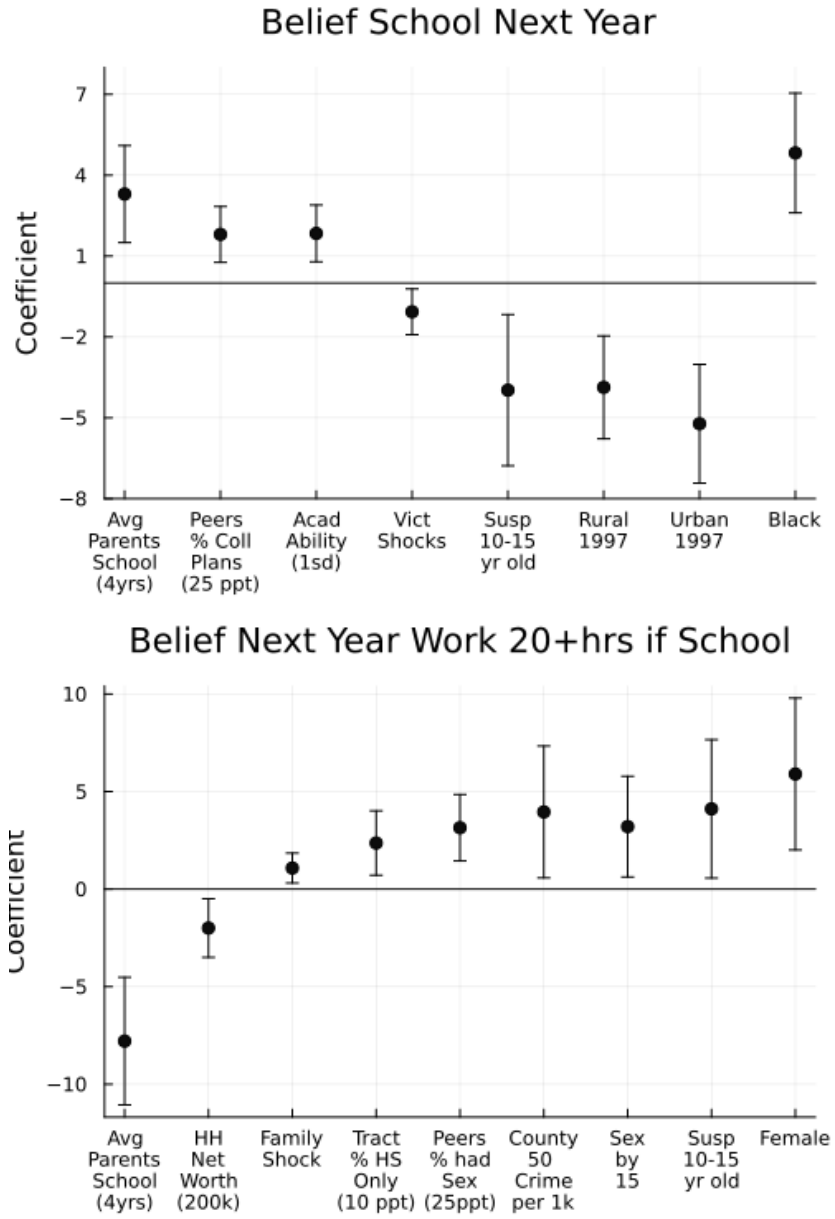

Figure 1: Presents statistically and marginally significant coefficients with 10% significant level confidence intervals from OLS analysis of beliefs. Full specification includes peer measures, parent measures, neighborhood outcomes, county attributes, demographics, parental wealth, academic ability, risky behavior, and adverse shocks as independent variables. Standard errors are robust standard errors.

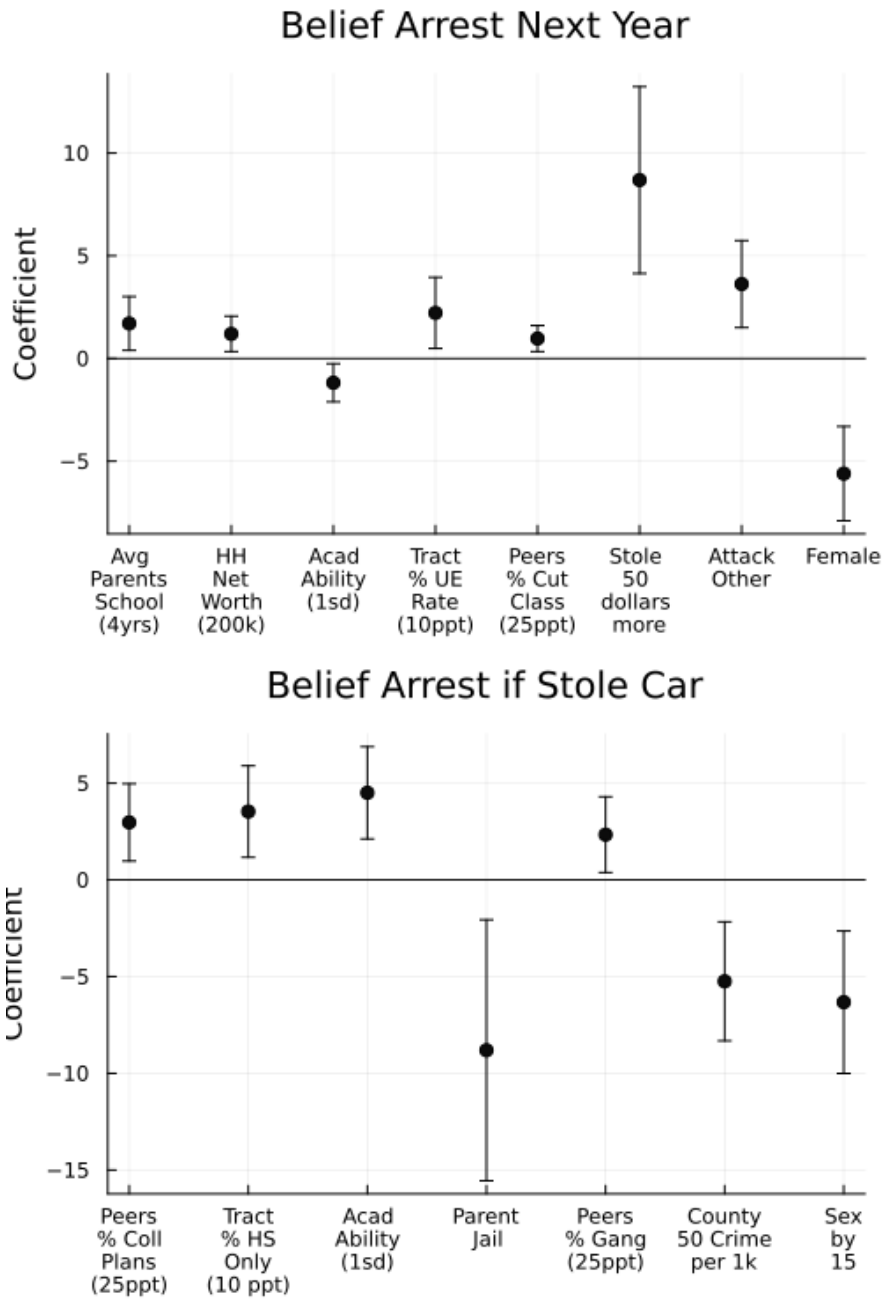

Figure 2: Presents statistically and marginally significant coefficients with 10% significant level confidence intervals from OLS analysis of beliefs. Full specification includes peer measures, parent measures, neighborhood outcomes, county attributes, demographics, parental wealth, academic ability, risky behavior, and adverse shocks as independent variables. Standard errors are robust standard errors.

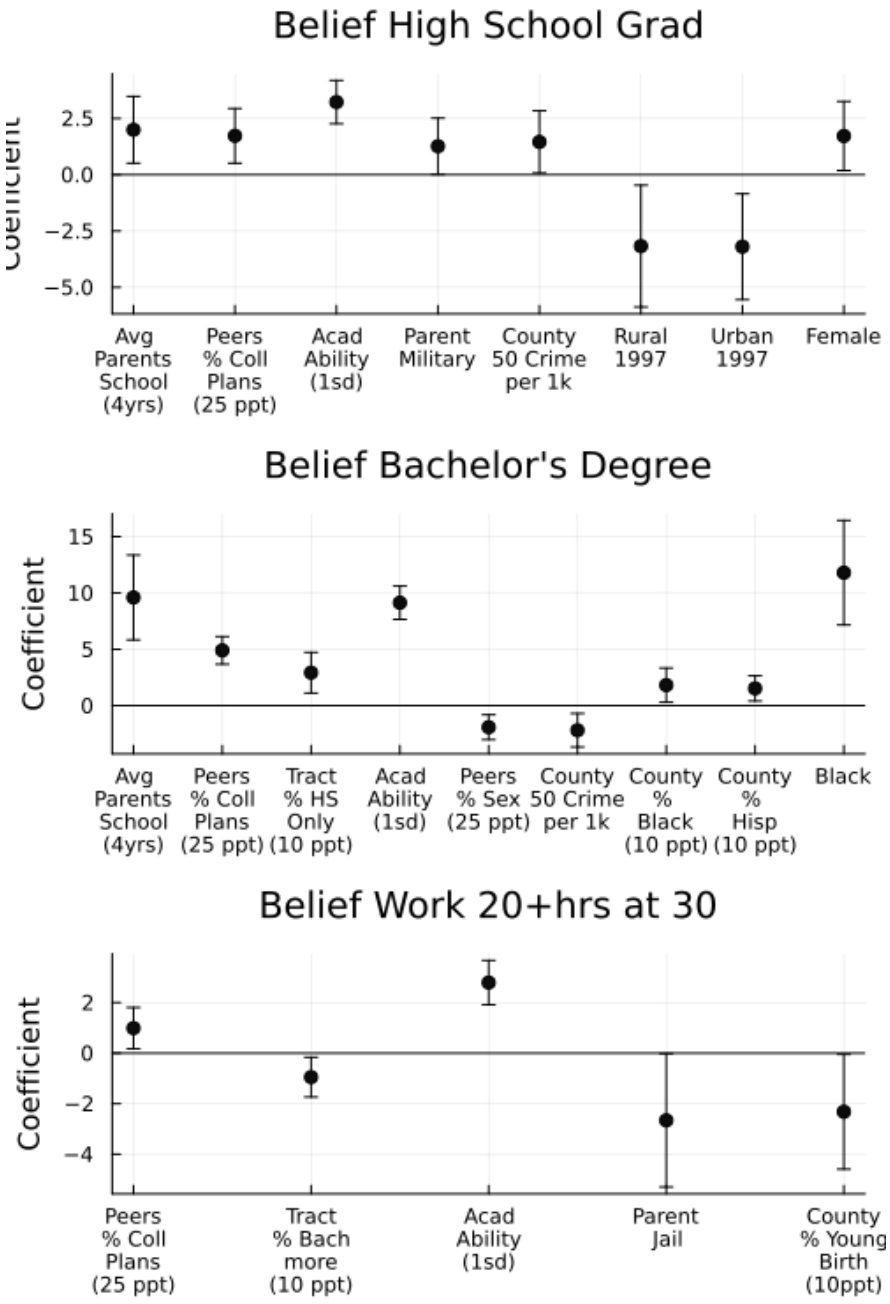

Figure 3: Presents statistically and marginally significant coefficients with 10% significant level confidence intervals from OLS analysis of beliefs. Full specification includes peer measures, parent measures, neighborhood outcomes, county attributes, demographics, parental wealth, academic ability, risky behavior, and adverse shocks as independent variables. Standard errors are robust standard errors.

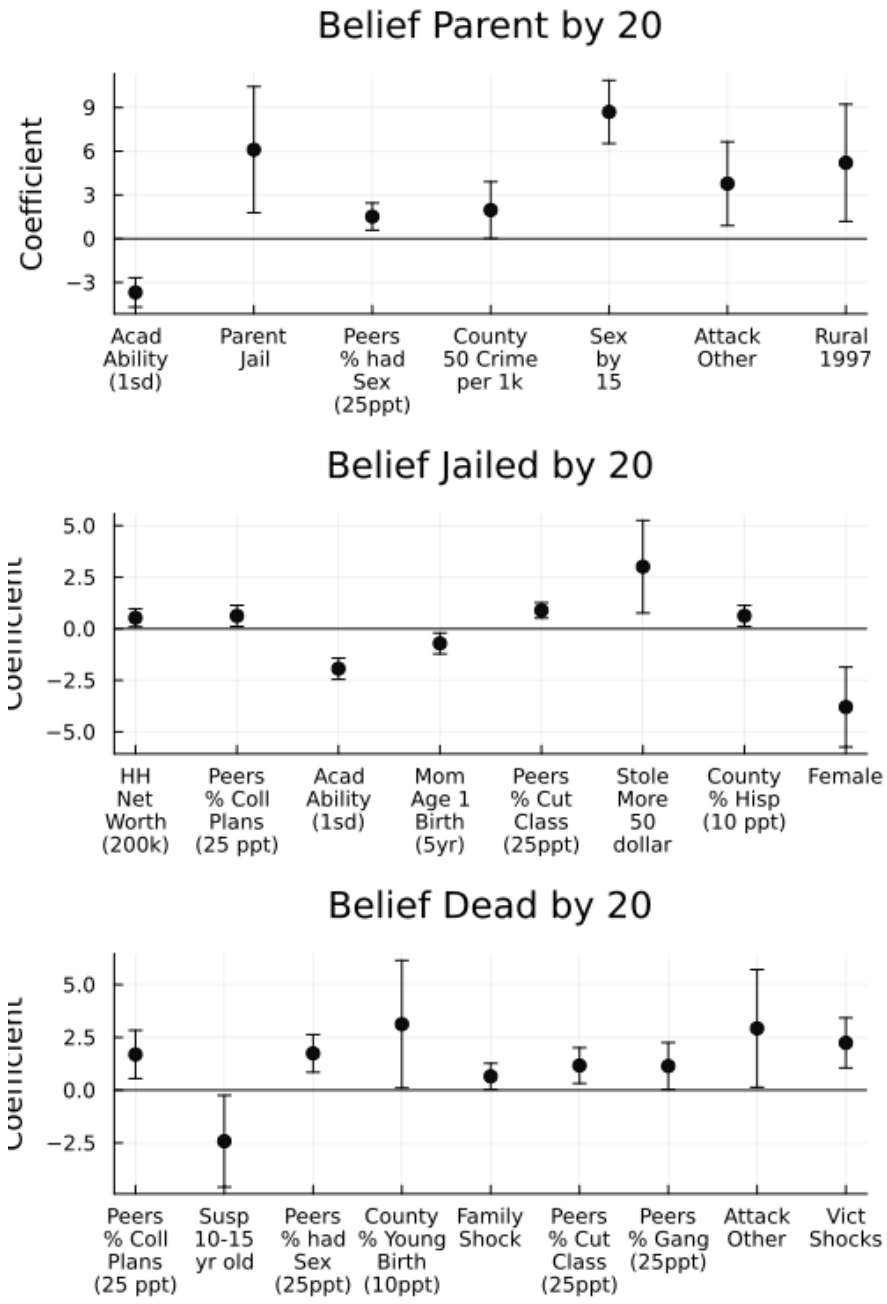

Figure 4: Presents statistically and marginally significant coefficients with 10% significant level confidence intervals from OLS analysis of beliefs. Full specification includes peer measures, parent measures, neighborhood outcomes, county attributes, demographics, parental wealth, academic ability, risky behavior, and adverse shocks as independent variables. Standard errors are robust standard errors.

A.3 How Beliefs Change Other Coefficients in Outcome Regression

Table A2: How Beliefs Change Coefficients on Schooling

VARIABLES	(1) HS Dropout	(2) HS Dropout	(3) %Change	(4) Bachelors	(5) Bachelors	(6) %Change
Crime Index	0.0274***	0.0241***	-12	-0.0048	0.0002	-104.2
	(0.0093)	(0.0093)		(0.0119)	(0.0122)	
Young Sex Index	0.0147	0.0126	-14.3	-0.0200	-0.0164	-18
	(0.0120)	(0.0099)		(0.0183)	(0.0183)	
Bachelor's Index	-0.0105	-0.0002	-98.1	0.0768***	0.0687***	-10.5
	(0.0093)	(0.0098)		(0.0173)	(0.0169)	
HS Non BA Index	-0.0186*	-0.0152	-18.3	-0.0170*	-0.0180*	5.9
	(0.0108)	(0.0108)		(0.0099)	(0.0102)	
Military Index	-0.0026	0.0022	-184.6	-0.0162	-0.0159	-1.9
	(0.0106)	(0.0108)		(0.0124)	(0.0116)	
Neg Economic Index	0.0016	0.0080	400	0.0250	0.0245	-2
	(0.0155)	(0.0146)		(0.0162)	(0.0161)	
HH Net Worth ($10k)	-0.0004	-0.0002	-50	0.0027***	0.0026***	-3.7
	(0.0003)	(0.0003)		(0.0007)	(0.0008)	
Family Shocks	0.0052	0.0030	-42.3	-0.0412***	-0.0403***	-2.2
	(0.0066)	(0.0065)		(0.0089)	(0.0089)	
Victim Shocks	0.0015	-0.0002	-113.3	-0.0153*	-0.0133	-13.1
	(0.0137)	(0.0125)		(0.0089)	(0.0087)	
Academic Index	-0.1255***	-0.0964***	-23.2	0.1726***	0.1557***	-9.8
	(0.0112)	(0.0098)		(0.0114)	(0.0124)	
Past Risky Behavior	0.0520***	0.0406***	-21.9	-0.0432***	-0.0383***	-11.3
	(0.0122)	(0.0115)		(0.0101)	(0.0100)	
Beliefs	No	Yes		No	Yes	
Observations	1,501	1,501		1,501	1,501	
Number of state	41	41		41	41	
R^2	0.225	0.279		0.353	0.369	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A2: Reports coefficients from OLS regressions of outcomes on covariates. All regressions use robust standard errors. For each outcome, the first column does not include belief variables while the second column does. The third column reports the percentage change in coefficients after including beliefs. Regressions also control for whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county.

Table A3: How Beliefs Change Coefficients on Work Hours

VARIABLES	(1) Work 20+ hrs 2010	(2) Work 20+ hrs 2010	(3) %Change
Crime Index	-0.0115	-0.0083	-27.8
	(0.0124)	(0.0122)	
Young Sex Index	-0.0180	-0.0181	0.6
	(0.0147)	(0.0155)	
Bachelor's Index	-0.0082	-0.0070	-14.6
	(0.0172)	(0.0181)	
HS Non BA Index	0.0169	0.0178	5.3
	(0.0123)	(0.0127)	
Military Index	-0.0120	-0.0123	2.5
	(0.0131)	(0.0134)	
Neg Economic Index	-0.0295*	-0.0267	-9.5
	(0.0172)	(0.0171)	
HH Net Worth ($10k)	-0.0000	0.0001	-50
	(0.0006)	(0.0006)	
Family Shocks	-0.0275***	-0.0266***	-3.3
	(0.0074)	(0.0070)	
Victim Shocks	-0.0278*	-0.0270*	-2.9
	(0.0161)	(0.0157)	
Academic Index	0.0978***	0.0927***	-5.2
	(0.0120)	(0.0121)	
Past Risky Behavior	-0.0169	-0.0140	-17.2
	(0.0122)	(0.0127)	
Beliefs	No	Yes	
Observations	1,501	1,501	
Number of state	41	41	
R^2	0.102	0.110	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3: Reports coefficients from OLS regressions of outcomes on covariates. All regressions use robust standard errors. For each outcome, the first column does not include belief variables while the second column does. The third column reports the percentage change in coefficients after including beliefs. Regressions also control for whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county.

Table A4: How Beliefs Change Coefficients on Parenthood

VARIABLES	(1) Parent by 20	(2) Parent by 20	(3) %Change
Crime Index	0.0264**	0.0233*	-11.7
	(0.0127)	(0.0131)	
Young Sex Index	0.0241**	0.0202*	-16.2
	(0.0110)	(0.0107)	
Bachelor's Index	-0.0314***	-0.0250**	-20.4
	(0.0104)	(0.0108)	
HS Non BA Index	-0.0228*	-0.0214*	-6.1
	(0.0117)	(0.0117)	
Military Index	-0.0137	-0.0123	-10.2
	(0.0125)	(0.0123)	
Neg Economic Index	0.0234***	0.0264***	12.8
	(0.0088)	(0.0096)	
HH Net Worth ($10k)	-0.0007**	-0.0006*	-14.3
	(0.0003)	(0.0003)	
Family Shocks	0.0039	0.0029	-25.6
	(0.0068)	(0.0065)	
Victim Shocks	-0.0072	-0.0077	6.9
	(0.0139)	(0.0132)	
Academic Index	-0.0272**	-0.0118	-56.6
	(0.0116)	(0.0113)	
Past Risky Behavior	0.0705***	0.0628***	-10.9
	(0.0109)	(0.0118)	
Beliefs	No	Yes	
Observations	1,501	1,501	
Number of state	41	41	
R^2	0.175	0.189	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A4: Reports coefficients from OLS regressions of outcomes on covariates. All regressions use robust standard errors. For each outcome, the first column does not include belief variables while the second column does. The third column reports the percentage change in coefficients after including beliefs. Regressions also control for whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county.

Table A5: How Beliefs Change Coefficients on Criminal Justice Outcomes

VARIABLES	(1) Incarcerated	(2) Incarcerated	(3) % Change	(4) Arrested	(5) Arrested	(6) %Change
Crime Index	0.0252***	0.0213**	-15.5	0.0107	0.0025	-76.6
	(0.0095)	(0.0093)		(0.0167)	(0.0170)	
Young Sex Index	0.0009	-0.0001	-111.1	-0.0016	-0.0054	237.5
	(0.0097)	(0.0094)		(0.0137)	(0.0136)	
Bachelor's Index	0.0023	0.0009	-60.9	0.0291	0.0266	-8.6
	(0.0102)	(0.0098)		(0.0201)	(0.0201)	
HS Non BA Index	0.0020	0.0014	-30	0.0085	0.0075	-11.8
	(0.0071)	(0.0071)		(0.0122)	(0.0122)	
Military Index	0.0024	0.0020	-16.7	0.0167	0.0157	-6
	(0.0110)	(0.0111)		(0.0138)	(0.0135)	
Neg Economic Index	0.0067	0.0043	-35.8	0.0273	0.0236	-13.6
	(0.0111)	(0.0103)		(0.0184)	(0.0178)	
HH Net Worth ($10k)	0.0002	0.0001	-50	-0.0003	-0.0004	33.3
	(0.0003)	(0.0003)		(0.0005)	(0.0005)	
Family Shocks	0.0032	0.0023	-28.1	0.0177*	0.0166	-6.2
	(0.0048)	(0.0048)		(0.0106)	(0.0108)	
Victim Shocks	0.0021	0.0014	-33.3	0.0386**	0.0368**	-4.7
	(0.0103)	(0.0102)		(0.0151)	(0.0152)	
Academic Index	-0.0339***	-0.0328***	-3.2	-0.0567***	-0.0486***	-14.3
	(0.0095)	(0.0092)		(0.0130)	(0.0121)	
Past Risky Behavior	0.0522***	0.0460***	-11.9	0.1130***	0.1001***	-11.4
	(0.0073)	(0.0089)		(0.0121)	(0.0133)	
Beliefs	No	Yes		No	Yes	
Observations	1,501	1,501		1,501	1,501	
Number of state	41	41		41	41	
R^2	0.127	0.141		0.190	0.203	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5: Reports coefficients from OLS regressions of outcomes on covariates. All regressions use robust standard errors. For each outcome, the first column does not include belief variables while the second column does. The third column reports the percentage change in coefficients after including beliefs. Regressions also control for whether pooled tract level outcomes were used, birth year, and racial/ethnic composition of county.