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"WHEN ANYTHING CAN HAPPEN":  
ANTICIPATED ADVERSITY AND POSTSECONDARY DECISION-MAKING

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### **ABSTRACT**

We examine how disadvantaged students make postsecondary education decisions, focusing on why they often opt for short, flexible programs that tend to have low returns in the labor market. Prior literature emphasizes information deficits and financial constraints. We draw upon qualitative data collected via open-ended interviews conducted with a sample of economically disadvantaged Black youth in Baltimore. We use these data to develop and explore a complementary narrative: students who have faced instability or hardship in the form of disruptive events, or “adverse shocks” (e.g., violence, eviction or incarceration of a family member), anticipate future shocks that could derail their educational plans. In response, they opt for shorter, more flexible educational programs that they expect they can complete despite anticipated shocks. When possible, we corroborate this narrative using publicly available, large-N data sets such as the National Longitudinal Survey of Youth (NLSY). Finally, we formalize this narrative as a simple dynamic structural model calibrated using data on education choices and returns. The model clarifies that it is impossible to identify costs of schooling without data on beliefs about the probability of non-completion, thus providing guidance on future data collection priorities. More broadly, our approach demonstrates a novel application of mixed methods research: using qualitative data to aid in the specification of a structural model. This approach could be applied in other contexts where behavior is poorly understood and extant data do not contain all of the information needed to generate and test plausible hypotheses.

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# 1 Introduction

The majority of high school students now enroll in some type of higher education after graduation (Rosenbaum et al., 2017; Rosenbaum and Rosenbaum, 2015; Bailey and Dynarski, 2011). Their modal outcome, however, is not a bachelor’s degree, nor even an associate’s degree, but “some college.” While obtaining some postsecondary education is still a better outcome than never enrolling at all (Liu et al., 2015; Jepsen et al., 2014), returns are relatively low compared to a four-year degree (Webber, 2016; Hillman, 2014; Oreopoulos and Petronijevic, 2013). Earlier literature has generally found such lower-attainment to be more common among lower-income and non-white students (Baker et al., 2018; Dahill-Brown et al., 2016; Ma et al., 2016; Bailey and Dynarski, 2011), many of whom never enroll in a four-year college at all, opting instead for shorter-duration programs at for-profit institutions like occupational colleges and trade schools (Gelbgiser, 2018; Ma et al., 2016; Deming et al., 2012). Enrollment in these types of institutions is associated with lower completion rates and, like the “some college” outcome, lower returns in the labor market, especially for those pursuing for-profit credentials (Cellini and Turner, 2019; Goodman et al., 2017). Yet relatively little is known about how these enrollment decisions are made.

Motivated by responses from qualitative interviews, we develop and explore a hypothesis that builds on the literature from both sociology and economics: that anticipation of personal and household adverse events is an important and an overlooked mechanism connecting disadvantage to diminished educational outcomes. In particular, part of what makes sub-baccalaureate pathways optimal for some low-income students, especially those with unstable home lives living in violent neighborhoods, is that they anticipate adverse shocks that could derail their education. They thus opt for shorter, more convenient, less challenging and, often, less lucrative educational programs that they expect to be able to finish and believe will lead to a job.

The path to a four-year degree can be fraught. Tiffany, a 20 year-old from Baltimore we

interviewed, described her worries about college: “What if don’t have money next month for a cell phone?...what if I ran out of soap or toothpaste?...it’s like who should I call for this? It’s so stressful to think about. I’m thinking I shouldn’t be thinking about stuff like this. I should just be in my books and trying to get good grades and that makes me sad.” Terry, who was homeless when we last interviewed him, put it another way: “I know when I get in there [college] I wanna be serious...I want to be able to really focus and not have these other things pullin’, interfering with my focus.”

The proposed link between anticipated shocks and educational investments emerged from rich qualitative data from interviews like those conducted with Tiffany and Terry. Many respondents reported having experienced adverse events (which we henceforth refer to as “shocks” or “household shocks”), such as housing instability, incarceration of a family member, or violence. Many of those who experienced shocks in childhood also anticipated future shocks that could interrupt their educational path. This influenced their postsecondary choices. We also draw on large- $N$  quantitative data from publicly available nationally representative, longitudinal studies. We corroborate, albeit indirectly, the link between household shocks and educational pathways in multiple quantitative data sets, though we focus on the National Longitudinal Survey of Youth (NLSY) in this paper. Respondents who have experienced shocks have lower expectations for their educational future and appear to make choices with this in mind. We note, though, that the variables available in the large data sets do not allow us to analyze the anticipation of shocks as fully as is possible in the smaller qualitative data set, or as deeply as we would like.

To formalize the link between anticipated shocks and educational pathways, we develop a simple dynamic structural model of postsecondary decision-making. The model envisions students maximizing their lifetime utility, which is affected by the costs and consumption value of schooling and future income. A longer degree program entails higher upfront financial costs but is more lucrative. Anticipated shocks are incorporated as a positive probability that students who choose a longer educational program do not complete it, nullifying returns.

This model captures the idea that students may expect to experience shocks that derail long-run education plans. As Tyler, another individual from Baltimore we interviewed, vividly explains, “I’m looking to you know, build. I’m young, I’m still laying my foundation for the house someday. This is lifetime, it’s like you building a house brick by brick, hand by hand...I don’t have time for nobody to come and run over my foundation with a steamroller...’cause that’s how a lot of people do, they try to ruin your life.” Anticipating such shocks, students may opt for shorter or more flexible degree programs they believe they can finish, even if doing so implies lower returns on the labor market. We calibrate the model using the median income for different educational pathways.<sup>1</sup>

Specifying this model of educational decision-making serves several purposes. First, it allows us to formalize how an anticipation of future shocks, even those that do not actually occur, affects students’ choices. This could shed light on how students who have faced instability and poverty throughout their lives make decisions about their future—in anticipation that similar instability will continue to plague them. Second, the model shows how a failure to incorporate anticipated shocks can generate incorrect conclusions. Lacking data on the subjective probability students place on non-completion means it is impossible to pin down the contemporaneous utility value of schooling. Using the calibrated model, we show that different assumptions on non-completion probabilities imply a consumption utility of schooling that varies widely with the probability of shock-related derailment, ranging from \$585 when there is no such risk to nearly \$2,000 when the annual derailment probability is 11 percent (matching the true rate). These values likely have meaningfully different implications for counterfactual policies designed to insulate students from shocks or that otherwise incentivize disadvantaged youth to choose more lucrative educational pathways (e.g., more flexible rules governing scholarships, federal grants or leaves-of-absence).

More broadly, our cohesive process of data collection, hypothesis formulation, and model building is widely applicable and merits further clarification. Our approach demonstrates a

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<sup>1</sup>The model is highly stylized. A more elaborate model would allow us to evaluate specific counterfactual policies, a point we discuss in Sections 4 and 5.

novel application of mixed methods research: using qualitative data to aid in the specification of a structural econometric model. The model we develop is rooted in economic theories of dynamic decision-making, but crucial insights come from qualitative interviews with actual decision-makers (a rare sight in economics, but utilized frequently by sociologists). Moreover, the process of data analysis and model development is iterative. Open-ended interviews provide narratives used to specify a model of decision-making, and large- $N$  data are used to corroborate the basic narrative and calibrate model parameters. Meanwhile, appeals to economic theories of dynamic decision-making generate novel hypotheses about how people make choices, leading to fresh analyses of qualitative data. Finally, the narrative-driven model highlights data needs, i.e., what cannot be verified in larger data sets due to missing variables, thus informing priorities for future data collection efforts, which will further shape the model and our understanding of relevant policies. Such an approach could be applied in other contexts where behavior is poorly understood and where extant data sets do not contain the information needed to generate and test hypotheses.

This study contributes to several strands of existing research on factors affecting educational decisions and educational attainment gaps. Increasingly, studies in economics examine returns sub-baccalaureate pathways (often subsumed into the category “some college”). A challenge when estimating returns is to construct the appropriate comparison group, but in general, findings suggest that benefits to even some postsecondary coursework outweigh costs (Liu et al., 2015; Jepsen et al., 2014). Still, individuals with “some college” but no degree resemble people with high school only (versus those with bachelor’s degree) along multiple dimensions (Hillman, 2014), which means it is important to continue increasing our understanding of who chooses these pathways and why. Traditional explanations of educational choices have emphasized information, family background and resource constraints (Dynarski et al., 2021; Hoxby and Turner, 2015; Bettinger et al., 2012; Attewell et al., 2011; Perna and Li, 2006; Keane and Wolpin, 2001) and are generally focused on four-year college enrollment or degrees.

While resource or information constraints surely play a role, research from sociology (and more recently from economics) has pointed to a number of other factors. Together, many constitute what in sociology is known as the *social context* within which students make their decisions. Some could be subsumed into the broader concept of family background and resource constraints, such as neighborhood quality and characteristics (Wodtke et al., 2011; Sharkey, 2010; Sampson et al., 2008) or school-based inputs like guidance counselors (Ilic et al., 2020). Additional research, mostly from sociology, shows that inadequate housing, exposure to violence, food insecurity or lack of access to books can derail a students' educational plans (Jack, 2019; Goldrick-Rab, 2016; Desmond, 2016; Roderick et al., 2011; Harding, 2010; Jones, 2010). These factors are often overlooked (Iloh, 2018; Iloh and Tierney, 2014), perhaps because their monetary costs pale in comparison to the cost of tuition. However, these costs can be an insurmountable barrier to disadvantaged students. Indeed, a field experiment carried out at a large community college campus in Texas found that access to individual case managers who helped students navigate "life barriers" significantly increased persistence and degree completion among female students, while financial assistance alone had no effect (Evans et al., 2020). Also relevant are the less easily measured factors that comprise *social capital*, including social ties and networks as well as social norms surrounding education.

Such barriers can be lowered if educational institutions were designed for disadvantaged students, but many are not (Jack, 2019; Roderick et al., 2011; Persell and Peter W. Cookson, 1985). A perverse consequence is that the shorter, more flexible degree programs frequently offered by for-profit institutions become more attractive to students from low-income backgrounds. Students facing instability may (correctly or not) perceive a higher likelihood of success at such institutions due to their greater flexibility and shorter time to degree than what is found on traditional college campuses (Rosenbaum et al., 2006).

This principle also links our work to research that considers the role of beliefs and expectations in educational decisions (Belzil and Leonardi, 2013; Wiswall and Zafar, 2015;



Bozick et al., 2010). Raley et al. (2012) show an association in the NLSY97 between higher subjective probabilities of young pregnancy and reduced enrollment in and persistence at postsecondary programs. As Jacob and Wilder (2010) note, a great deal of literature dating back to the 1970's shows that parents' and students own educational expectations are a strong predictor of final attainment even conditional on many background characteristics, while Pageorge et al. (2020) show that high school teachers' expectations affect youths' attainment as well. However, the exact mechanisms through which these effects operate remains an open question. We examine a specific set of expectations—anticipation of shocks—that is shaped by the social context in which students make decisions.

Finally, a wealth of prior work explores mixed-methods research in the social sciences (Hesse-Biber and Johnson, 2015; Small, 2011; Tashakkori and Teddlie, 2003; Axinn and Pearce, 2006). The method that most closely resembles ours is the use of qualitative data to generate a theory or formulate a question that is then addressed with population-representative quantitative data (e.g., Myers and Oetzel (2003)). Our approach integrates methods more thoroughly—we treat the structural econometric model as a tractable, estimable representation of a conceptual model that emerges directly from the gathering and synthesis of qualitative data. This is a manifestation of the insight of Moffitt (2000) that theoretical economic rationales are necessarily qualitative. If a structural econometric model is an attempt to quantify a qualitative story, then that story itself can and should have support in qualitative data. The descriptions decision-makers provide of their own processes provide a richer informational foundation on which to build an economic *model*—not just a research question—than a researcher's guess.

The rest of the paper proceeds as follows. Our data analysis is reported in two sections: Sections 2 and 3 present findings using qualitative data and quantitative data, respectively. Section 4 provides a simple theoretical model of educational decision-making based on our data analysis and includes a discussion of how model parameters could be estimated. It also provides results from a further simplified version of the choice model that hint at the

importance of adverse events and expectations in decision-making. Section 5 concludes.

## 2 Qualitative Data: Analysis and Findings

### 2.1 Introduction to the Data Set and Preliminary Analysis

The anticipation of negative shocks and its relationship with postsecondary decision-making is an inductive finding that emerges from the stories of youth who participated in in-depth, semi-structured interviews as part of an evaluation of the impacts of the Moving to Opportunity (MTO) housing mobility experiment in Baltimore, Maryland. We use data from a mixed-methods study of families and children in the Baltimore site of MTO, a nationwide housing mobility project implemented across five cities in the U.S. in the late 1990's. A total of 636 families in Baltimore participated in this program; all of these families were African-American. In 2010, a qualitative interview component was added to the study with the goal of understanding the transition to adulthood for the MTO participants and for disadvantaged youth more broadly. A stratified random sample of 200 youth (ages 15 and 24) were chosen from the Baltimore MTO sample, and 75 percent of these youth agreed to participate in the qualitative portion of the study ( $N=150$ ).

We draw on qualitative interview data from these 150 low-income youth and young adults, all of whom initially lived in Baltimore's highest-poverty neighborhoods, concentrated mostly in high- and mid-rise public housing developments.<sup>2</sup> Although the interviews focused on youths' experiences changing neighborhoods as a result of MTO, they covered a wide range of topics concerning respondents' transition into adulthood (for more information on sample and interview design, see DeLuca et al. (2016)). These semi-structured, in-depth interviews

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<sup>2</sup>A potential limitation of these data is that the sample consists only of Black youth. The addition of a sample of disadvantaged non-Black students would help us to understand whether some of the patterns in these data generalize to other racial or ethnic groups (or, alternatively, whether there are patterns arising from constraints, contexts and circumstances particular to disadvantaged Black youth that these data shed light on). Our quantitative analyses reported in Section 3, using nationally representative data (which include respondents of different races), represent an initial step in assessing generalizability.

covered open-ended questions about employment, education, neighborhoods, friends and family, risky behavior, and mental health. Youth were asked about their college and career preparation, postsecondary decision-making process, and, for youth who were interviewed after high school, their experiences in postsecondary institutions. Most interviews were conducted in respondents' homes, and 96% of respondents still lived in the Baltimore area at the time of the interview. All names used in this paper have been changed to pseudonyms chosen by the respondents themselves.

The interview approach used to collect this data builds on long-standing methods in urban sociology used to observe social life and the ways in which individuals make meaning of their everyday routines (Becker et al., 1961; Edin and Lein, 1997; Liebow, 1967; Anderson, 1990; Burawoy, 1979). Specifically, we used *narrative interviewing*, a semi-structured approach to interviews that employs open-ended questions that allow for a wide range of responses to emerge along with targeted follow-up probes that ensure all interviews cover the same material.<sup>3</sup> Interviews conducted with this approach tend to create natural, in-depth conversations, rather than a clinical series of short questions and answers. Interviewers focus on empathetic, non-judgmental listening in order to signal to study participants that they, not the research team, are the experts on the topics of the study, and invite them to tell their own stories within semi-structured question modules. When successful, this invites descriptive narratives about social processes, such as educational decision-making, to emerge naturally.

Rather than asking detailed probes or highly structured questions up-front—which runs the risk of leading respondents or closing off unanticipated themes (Becker, 1990)—interviewers posed open-ended prompts such as “tell me how you ended up at the community college,” using verbal cues, eye contact, and body language to signal interest. Respondents therefore answered at length with detailed and often unsolicited information, in an order that made sense to them. This approach thus generated stories and insights that informed both pre-

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<sup>3</sup>See DeLuca et al. (2016) and Boyd and DeLuca (2017) for more on this approach.

existing research aims and topics unanticipated by the researchers, many of which would have been missed by standard survey questions with pre-ordained (also called “forced choice”) answer sets.

Once respondents had a chance to reply to open-ended prompts, interviewers followed with more detailed “probes” to support less talkative respondents and ensure systematic topic coverage. Probes were typically questions about “how,” rather than “why,” events happened. This allowed us to collect data on processes while avoiding the perception that interviewers would judge respondents’ answers. Alternating open-ended questions and detailed probes, interviews took on the form of extended conversations, usually lasting two or more hours.

In this way, data collection via narrative interviews provides a setting in which respondents reveal how they see things, what they feel is important, how they make decisions, and how they have made sense of their past and imagine their future. By conducting interviews with empathy and non-leading, non-judgmental questions, interviewers can often put respondents at ease and make them feel less scrutinized. If respondents have control over the way they can answer questions and feel that the interviewer is truly interested in them and will let them speak at length, they are more likely to open up and speak candidly, potentially providing new and unexpected insights into their experiences and actions.

This interview style is based upon the idea that decision-makers themselves may have necessary, untapped insight about how decisions are made. The question is not whether young people make decisions *for some specific reason or not*, with the reason determined *a priori*. Instead, we want to know how the decision-making process works, broadly speaking. To find this answer, we need to acknowledge that many of the reasons students choose certain educational paths might not readily occur to any one researcher (or indeed any eight researchers). Our goal is to take lessons from narrative interview data that inform further examination on a generalizable scale in both data collection and modeling, each of which we address in later sections of the paper.

For the present analysis, interview transcripts were systematically coded for the following:

negative shocks, anticipation of negative shocks, postsecondary plans (including four-year, two-year, and for-profit schools, employment, military enlistment, and illicit activity), rationales for adopting specific postsecondary plans, any discussion of the costs, benefits, and tradeoffs of postsecondary plans, and youths' beliefs about the future. In addition, respondents described a number of specific negative shocks, including whether they had ever experienced housing instability (due to foreclosure, eviction, loss of income, or another unforeseen shock), witnessed or been the victim of violent crime, lived without their parents as a child, experienced the unexpected deaths of family members or parental incarceration, witnessed illegal activity, as well as whether the respondent themselves had ever been arrested. The authors read full interview transcripts and field notes for all respondents in the sample and reviewed coded segments concerning postsecondary decision-making, adverse life events, and any specific language around respondents' anticipation of future negative shocks. In the next few sections we leverage the interviews to describe: the prevalence and experience of adverse shocks and how they derail educational pathways; the anticipation of future shocks; and how some youth explicitly connected their anticipation of shocks to their postsecondary decisions, especially sub-baccalaureate programs.

## **2.2 Findings in the Qualitative Data**

### **2.2.1 Adverse Shocks: Experiences and Derailments**

To begin, we examine respondents' previous experiences of shocks along with negative shocks leading to *actual* disruption of their long-term educational plans. Observed disruption among subsets of students helps to explain why students deciding among postsecondary programs would anticipate a disruptive shock. This link between expected and observed shocks is not limited to the sample of 150 respondents discussed here; as we detail in the next section, many students in the NLSY who anticipate adverse events in their lives but pursue a bachelor's degree anyway end up unable to achieve their goal, suggesting that anticipation of derailing

shocks is a rational expectation for many students.

Accounts of unexpected adverse life events were pervasive among the 150 youths that were interviewed. Nearly all reported experiencing significant shocks in their childhood and adolescence, as shown in Table 1. Almost half of the youth interviewed (49.3%) described having a parent who had been incarcerated or was involved in illegal activity, often drug sales or other illicit employment. About 30 percent of respondents had experienced a period of parental absence during their childhood, and the same proportion of respondents had been arrested or were put in jail or on probation. More than one third of youth interviewed had experienced a sudden death in the family (36.7%), including parents, siblings, cousins, and other family members. Notably, this figure does not include the deaths of grandparents due to natural causes, which several respondents had experienced as well. Housing shocks—unplanned residential mobility or housing precarity resulting from events such as evictions, foreclosures, fire, housing voucher inspection failure, and financial insecurity—were also experienced by approximately one-third of respondents (32%). Of all the shocks considered, the least common was being personally victimized by violent crime (15.3%), though over twice as many respondents had witnessed acts of violence (35.3%).

Many youth described having experienced multiple such shocks, as shown in Table 2. Indeed, only 19 of the 150 youths interviewed (about 13%) had experienced none of these negative shocks, and only 31 youths (about one-fifth) had experienced only one shock. By contrast, 100 youths (or two-thirds of respondents) had experienced two or more negative shocks in their childhood or adolescence. In other words, these types of shocks, often considered important sources of childhood trauma and instability (Kalmakis and Chandler, 2013), were commonplace in the lives of our respondents. As twenty-one-year-old Karen told interviewers, “it’s like, when you wanna move one step forward, it’s like you getting knocked back five more steps, and it’s driving me insane.” Given the prevalence of adverse shocks among our respondents, it is no surprise that educational derailments were common as well: roughly 1/3 who enrolled in PSE left before finishing, most in trade schools, though this

may be an under-estimate due to right-censoring.

The need to care for family contributed to Chanel's decision to change her postsecondary pathway. After high school, Chanel enrolled in a nearby university and started working towards a bachelor's degree in psychology. After two and a half years at the university, though, Chanel's mother suffered an injury that necessitated knee replacement surgery, which meant she had to leave work for "a while" to recover. Chanel explained, "She hadn't been workin' for a while so that's why, you know, she needed like some extra income." As the only sibling still living at home, Chanel took on the responsibility of caring for her mother. She left the university and instead enrolled in a for-profit institution to focus her training in the medical field. She explains the appeal of the occupational credential given her family's situation: "I wanted to start immediately so I could have some money to help out." Having a credential in the medical field after a few months meant that Chanel was able to both help care for her mom and enter the workforce sooner than she would have done had she finished her bachelor's degree. Thus, despite the time and effort that Chanel had already invested in her bachelor's degree, the sudden onset of caretaking responsibilities and financial need meant that the rational choice was to pursue a quicker credential and, in turn, earlier access to jobs.

Chanel's sudden transition into a for-profit institution suggests the value of short-term credentialing programs in a context of uncertainty and instability. Sierra, 20, echoed the sentiment that unpredictability and family instability might affect her postsecondary educational trajectory when she described her initial plans to attend college after graduating from high school: "I mean times get hard. One day times get, you know, they be good, everything paid on time then next time we might have a downfall." She also talked about how her family was currently experiencing such a "hard time" that was disrupting her postsecondary plans. As Sierra was graduating from high school, her mother lost her job and her sister became pregnant, so she began work in the service industry instead of going to school for the sake of supporting her family:

[W]e had like this little downfall in our family whereas I had to wait a while [to go to school], I had to wait...I remember my mother had got laid off and my sister was pregnant so, you know, my mother was like, you know, she gotta pay the bills. She was all looking forward, we were all looking forward so much.

Sierra and her family had been “looking forward” to a future in which she followed through on her original plans to go to college. Sierra identifies family events as a major factor, though, in pushing her off track. Sierra still wanted to pursue some sort of college, but, as of her interview, remained hesitant about the path forward: “So I mean I waited and I waited but now I feel as though I’m ready. So now I’m looking into it—like should I take a all year-round school or should I just take some classes? You know, I’m looking into it. I wanna make sure.”

The onset of familial responsibilities for Sierra, then, was accompanied by a significant change in her college-going plans: rather than pursuing the bachelor’s degree that she and her family had been anticipating, she was tentative about her path forward in a context in which a family “downfall” was always possible.

Isaac’s story shows how different kinds of negative shocks can happen in quick succession and compound the difficulties students face in their postsecondary educational trajectories. As Isaac finished high school, he received scholarship opportunities from multiple four-year schools to play basketball. But he wanted to remain close to his family and ultimately chose to attend a junior college in South Bend, Indiana (his family left Baltimore after our study began). He managed to stay on this track despite getting arrested after high school and spending six months in jail. However, just as Isaac was preparing to finish his two-year program, his sister was diagnosed with a rare disease and fell into a coma. Isaac explained how this unforeseen development in his family caused him to leave school, just on the verge of getting his degree:

She was in a coma for about two months and she passed away in 2007, which,



I would have almost—I would have almost finished my Associate’s Degree, but I came back here. So she had my nephew, she passed away, and right now it’s just me. I had a scholarship, and that’s when my sister was still alive, you know, everything went downhill from there.

In this recollection, Isaac revisited his choice to stay close to family instead of taking advantage of one of the basketball scholarships he was offered with some regret. As of our last conversation, he had not returned to school after leaving his two-year program and had instead cycled through jobs, working in warehouses, with temp agencies, and in security for a hotel in order to provide for his nephew. Despite the planning and significant effort that Isaac put into his two-year programming, the sudden shift in his caretaking responsibilities made it increasingly unlikely that he would return to earn any postsecondary credential.

In addition to instability within one’s immediate family, relationships with romantic partners also come with the possibility of unexpected caretaking responsibilities and shocks. For example, Vicky’s boyfriend had been living with her and her family for a handful of years when he was involved in a violent altercation that put him in a coma and left him with lasting cognitive impairments. As a result, Vicky became his full-time caregiver, helping him bathe and feed himself. Vicky’s mother remained unemployed and struggled with alcoholism, which Vicky said caused her to feel that she was “the responsible one” in the house. The sudden shift to this role of caregiver left Vicky feeling uncertain about the future. As she described it, “Some nights I go to sleep wondering like what’s goin on, what’s gonna happen the next day.” She had been attending a nearby community college but left to instead enroll in a medical certificate program at a for-profit school, in a manner similar to Chanel. She preferred this to the community college because it is more focused on the medical field, in which she hoped to get a job quickly so that she could bring more money into the household. In a context of uncertainty and substantial extra responsibilities at home, the horizon of possibility for continuing her education shifted, leaving Vicky struggling to find any path forward—even one that was not the original educational goal she had hoped to pursue.

In other cases, experiences with death caused adolescents to abandon postsecondary education not because they lost interest, but because the impact of loss derailed their daily lives. After graduating from high school, for instance, Tiara eventually enrolled at a community college, but dropped out due to several unanticipated deaths in her family. When we last spoke with her, she had personally arranged a funeral for one of her cousins. She explained, “Just, people kept dying. Every month I done had somebody in my family that died or somebody that was real close to my family. I actually dropped my classes because I kept having a death in family like, even like, if you miss too many days you automatically fail, so instead of failing, I just withdrew from the classes.” Here, Tiara points directly to the way that traumatic events affected her postsecondary progress, particularly in conflict with institutional attendance policies.

Given the pervasiveness of parental incarceration, absence, and death in their lives (see Tables 1 and 2), a number of youths in our sample experienced a sudden onset of new responsibilities as they prepared to leave high school or shortly thereafter. As scholars have previously noted, it is not uncommon for children and youth living in highly disadvantaged contexts to undergo a process of “adultification,” where they prematurely take on more adult roles and responsibilities (Burton, 2007; Roy et al., 2014). Many adolescents in this study similarly found themselves unexpectedly thrust into such roles, which affected their educational paths. Such experiences also left respondents with the sense that they would continue to be called upon to provide caregiving or financial resources for their family members in the future, limiting their postsecondary options and affecting their decision-making process. We examine this anticipation next.

### **2.2.2 Expectations: Reasoned Unease**

Many youths we interviewed associated their experiences of adverse shocks with the expectation that similar events would happen again in the future. Taniya’s childhood was tumultuous because of her father’s drinking, and she described how these experiences had

primed her to anticipate her father’s early death: “[I]f he started drinking again, I see him drinking I’m just gonna have to prepare [...] like one day he’s just not gonna be here. I guess I just got mentally prepared for that.” Taniya was not alone in expressing these feelings: over 90 percent of the youth in our sample spoke of their own accord about anticipating future adverse shocks, including all of the 65 youth who had already experienced three or more negative shocks during their adolescence (see Table 2).

Some respondents reported that experiencing and anticipating these events made them feel out of control and uncertain about their futures. Erica, 21, described experiencing the deaths of several aunts and uncles, her father, and a classmate in a brief span of time. She explained that these losses left her feeling anxious about death, including her own: “I really don’t take death well. I have anxiety [...] my grieving process is not so much ‘Oh, I miss the person,’ it’s ‘Oh, will I die from that,’ or death, facing death, yeah.” Matthew felt he could not anticipate when his life might end. At 21, he had been arrested multiple times starting at age 14 and lived in a neighborhood where, as he describes it, violence is a part of everyday life. Asked where he thought he would be in five years, Matthew responded, “I ain’t going to call it. I can’t call it. Not when anything could happen.” In response to questions about his goals for the future, he replied, “I’m trying to live right now [...] I ain’t thinking about the future. I might not even make it to the future, so.”<sup>4</sup>

Death and violence, in particular, appeared frequently in respondents’ discussions about their neighborhoods and families. They described violence and death as being a regular occurrence and yet still unpredictable. Some of their friends or acquaintances died over minor disagreements, or even for seemingly no reason at all. As Sierra noted, “Nowadays you fight, you either getting stabbed, shot up, you losin’ your life over a little argument, over a little argument.” A junior in high school, Bridget commented: “You just wake up and hear someone just got killed. Like, DANG can’t people go one day without killing?” Christopher, 21, described the violence in his former public housing neighborhood, and the

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<sup>4</sup>As we show in the next section using NLSY data, this concern about dying in the near future is much more common among young people, especially disadvantaged youths, than might be expected.

potential for responding to such violence if it affected his family, “Every day you would hear a gunshot, or every day you would see somebody fighting, and you never know, like, when is that going to happen to you, or when, you know, it was gonna be your family member, or when you was gonna have to bear it all, just go out there and just fight a war or whatever.” Witnessing death caused some respondents to turn inward and ask themselves if they might be the next victim of arbitrary violence. Many respondents made comments such as “life is short” and “you can die today or tomorrow.” Certainly such concerns loom large in youths’ decision-making about the future.

### **2.2.3 Choices: Anticipation of Shocks and Decision-Making**

Shock-induced derailment of the kind experienced by Tiara and other respondents illustrates how youths’ educational plans were thrown off course by unexpected family needs and the loss of friends and relatives. However, youths’ experiences affected their education not just directly via interruption, but also indirectly through shifts in how they thought about their future, including the plausibility of longer-term plans.

For example, Elijah’s experiences with instability led him to continuously re-optimize his educational decision-making. Elijah took a year off after graduating from high school and worked with his cousin, which inspired a professional interest in the auto industry. Yet, despite his interest in working with cars, his postsecondary strategy was to pursue multiple, distinct educational options so that if one career possibility did not work out, he would have an alternate plan: “Like I thought about givin’ like, like getting in the automotive industry and get a couple big, get a couple years in here and then go back to school for the heating and ventilation, so I could have two certificates.” Elijah described his educational decisions as if they were backup plans. He explained, “Just do what you can and if it [something bad] happen, it happen, just make sure you know what to do for it not to happen next time.” Rather than pursuing a longer degree, Elijah sought multiple short-term programs to obtain credentials focused on specific skills, and thus serve as an insurance policy against any

instability that he might encounter in the future. This perceived need to try to accumulate multiple credentials quickly or to develop educational or professional back-up plans may have diverted some youth like Elijah off the pathway to a four-year degree.

Few stories, though, could be as stark an example of uncertainty-induced postsecondary choice as that of Rhiannon, 22. When she was in 11th grade, her older brother was murdered, the victim of a random shooting while out with friends. As a result, her mother became very protective of Rhiannon and her younger brother. Rhiannon told us, “I wasn’t able to be in high school and do much of anything, my mom was always worried that something would happen to me.” Nevertheless, as a high school senior, at one of the best high schools in Baltimore, she applied to ten colleges and was accepted to all of them, some with substantial scholarship offers. Ultimately, though, she decided she would choose the school closest to home because, as she explained, “I had never really been outside of Baltimore and I was just *afraid that something would happen while I was away*, and [this school] was close enough to home but far enough away to get away from Baltimore” (emphasis added). In this instance, the negative shock of losing her brother did not create a concrete obstacle to college-going for Rhiannon; instead, it shaped her thinking about what kind of school was reasonable, given her competing desires to leave home and to be nearby in case some kind of tragedy befell her family again.

These experiences, and the choices that rationally follow them, make the educational trajectories of so many of our respondents fraught, but also leave their conclusions utterly uncertain. At 21 years old, Tony had experienced a somewhat stable childhood in comparison to other respondents. This is true only relatively, of course—he had witnessed several incidents of violence throughout his childhood as well as periods of anxiety and depression, and had two brothers who sold drugs and lived with him sporadically between stints in jail. However, Tony benefitted from a solid support system and an older sister whom he considered a role model. Still, he worried about making the same mistakes as his brothers. Although Tony hoped to pursue a bachelor’s degree and become a pharmacist, he was con-

cerned about his ability to finish his current program at community college. As he put it, “I’m just tryin’ to, I want everything to stay like it is now. I really don’t want no changes until I get my degree.”

When asked where he expected to be in five years, he responded, “[f]ive years, I still don’t think that’s enough time, but I’ll probably still be here, still be in school, chasing my education, yep.” Thus, even Tony—enrolled in a degree program, planning to pursue a bachelor’s degree, and feeling that “everything is good”—still struggled to predict how long his educational trajectory would take, or whether unanticipated circumstances might derail it. As with other adolescents who we spoke to, Tony internalized the lack of consistency and predictability in his daily life and the possibility that negative shocks might happen at any time in ways that fundamentally shaped his approach to thinking about his education.

These experiences are emblematic of a larger narrative that emerges from the 150 interviews—a narrative that we examine further and model more explicitly in the rest of this paper: disadvantaged youths anticipate that the instability to which their lives are subject may make it impossible or unreasonable to complete a bachelor’s degree, and they rationally opt for other types of educational programs, abandon certain goals, and collect backup-plan credentials in order to avoid such a dire outcome. The impact on outcomes is clear in these stories, and the picture becomes sharper with the inclusion of quantitative analysis. It is important to note, though, that it is on the foundation of the qualitative interviews that we are able to propose a novel narrative of postsecondary decision-making among disadvantaged youth, which we corroborate using another data set and formalize as a model.

## 3 Quantitative Data: Analysis and Findings

### 3.1 Introduction to the Data Set and Preliminary Analysis

Given the essentially unexpected emergence of our conceptual narrative in a set of interviews not collected for that purpose, we hope to verify its relevance for a wider, nationally-representative non-MTO population. We therefore utilize data from the National Longitudinal Survey of Youth of 1997 (NLSY) to further examine our findings regarding anticipation of negative shocks and postsecondary derailment. The results we report are all qualitatively replicable in the Education Longitudinal Study (ELS) given variable availability, and we supplement our results with that data where necessary below. However, the NLSY has the advantages of reporting GPA on a yearly basis in publicly available files and (significantly for our purposes) including a few questions about students' expectations regarding some types of adverse shocks in their own futures, so we focus a majority of our analysis there.

Table 3 summarizes key background and academic variables for the full NLSY sample, as well as for subsamples by actual final educational attainment. The "Some Coll" column includes individuals who start a postsecondary program but never earn any credential as well as certificate earners, while associate's degree holders appear in a separate column. Mother's education, high school GPA, and test scores bear the expected relationships with attainment overall. It is clear that in both panels, minority and low-income students are more highly concentrated in the low-attainment groups and, in particular, only end up with half their proportional representation in the degree-earning group. The some-college and associate's degree groups appear to be similar to one another and on all characteristics intermediate between those who stop school after high school and those who earn college degrees. The some-college students who do not earn associate's degrees are, like high school graduates, more likely to be non-white, but have higher test scores and grades than those who never attend postsecondary school. What explains their educational outcomes?

## 3.2 Findings Using Quantitative Data

In this section, we provide evidence of the following relationships. First, we establish that many respondents encounter adverse shocks in their youth just like our qualitative interview participants, and that such shocks may often derail educational trajectories just as they did the paths of Chanel, Vicky, Isaac, and Tiara. Second, we show that a personal history of adverse shocks appears to affect a student's beliefs about the future just as it did for Erica, Taniya, and Matthew. Further, we demonstrate that beliefs (expectations) are related to outcomes in the same ways our interviews would suggest. Finally, we explore an explanation for the connection between expectations and outcomes: students' decisions about where and how to attend postsecondary school are affected by their beliefs about the future, like the choice Rhiannon made to stay near her family.

### 3.2.1 Adverse Shocks: Histories and Paths Forward

Table 4 summarizes the rates of a wide variety of adverse shocks among NLSY respondents for the full sample, by final educational attainment and by race and family income. Outside of a few parental issues (hospitalization, divorce, and unemployment), respondents with lower educational attainment are more likely to have reported each of these problems during their teen years. In particular, having an absent father, changing schools, seeing someone shot, parental incarceration, and ever experiencing homelessness correlate most strongly with final attainment. These same shock event indicators also correlate with respondent race and socioeconomic context, with Black and low-income individuals more likely to experience these issues. NLSY respondents resembling our interview participants, then, experience adverse shocks at notably higher rates than others.

Do students actually have to worry about such events derailing their educational paths? This is difficult to verify in the NLSY data, though as we have seen above there is certainly an association between adverse shocks in general and lower attainment. However, in this



instance the ELS, for which summary statistics are supplied in Table 5, can provide more conclusive results. Respondents to that survey supplied information regarding events that occurred in their lives in the period just *after* their expected date of graduation from high school, when those who attended postsecondary schools would have been enrolled. This information is not available in the NLSY. Relevant shock events include whether their parents divorced, became unemployed, or died, whether another loved one died, whether the student or an immediate family member fell seriously ill, or whether the student was the victim of violence. We sum these indicators (labeled “shocks in college”) and treat this sum as representative of the level of instability in a college student’s life. This sum is visibly correlated with final attainment in Table 5. Now we can more formally analyze the effect of such instability among only those students who actually enroll in some kind of postsecondary program and look for evidence of adverse-shock-related derailment.

In Table 6, we report results from estimation in the ELS of an ordered probit model of final educational attainment, with the possible outcomes being (in the following order) no credential, a certificate, an associate’s degree, and a bachelor’s degree or more. Adverse shock events have a significant negative relationship with final attainment given enrollment, even in the presence of controls for demographic and socioeconomic background as well as high school academic performance and standardized test scores. Similarly significant relationships can be found in a linear probability model of bachelor’s degree attainment. It would appear, then, that adverse shocks—typically subsumed into an error term and thus treated as unobserved heterogeneity—likely help to derail educational paths. Any young person who is concerned about life-altering negative events happening in their futures might further reason that such events would make it difficult to complete a bachelor’s or other degree. Do they in fact reason this? The results in the next section suggest that they do.

### 3.2.2 Expectations: Causes and Effects

Next, we consider NLSY respondents' beliefs about the future that were formed in high school. Table 7 summarizes expectations responses for the full sample and subgroups. The top panel in the table shows the proportions of NLSY respondents in each column group who said in high school that they believed their probability of earning a bachelor's degree by age 30 was in the quartile specified by the row. First, note that while attainment expectations are positively correlated with outcomes, many appear to be overly optimistic. For instance, over 30 percent of those who never attended any postsecondary school, as well as 60 percent of those who did but never earned a bachelor's degree, assigned a probability over 75 percent to earning such a degree. Many expressed 100 percent certainty. Explaining why these individuals fall short of their own expectations is key to determining the role of expectations in decision-making.

The second panel of Table 7 summarizes expectations with regard to the occurrence of other events in the year following the first survey, for which respondents also supplied subjective probabilities on a 0-100 scale. These events include being the victim of a crime, being arrested, dying, and becoming pregnant.<sup>5</sup> The most obvious trend is that those who eventually complete a bachelor's degree report much lower subjective probabilities of all these events.<sup>6</sup>

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<sup>5</sup>There are large spikes, for this and any question requiring a probabilistic response, at 50 percent, but even removing individuals giving this response leaves an average subjective probability of death of over 10 percent, as many students supply round values like 5, 10, and 20 percent at the low end. This raises concerns about numeracy and students' ability to accurately characterize their expectations in percentages as noted previously; however, the concentration of expectations for adverse shocks at higher percentages is correlated with other variables we would expect to generate such expectations, like low income and a history of adverse shocks, so we believe the relative values of these expectations represent useful, if noisy, information. Moreover, these subjective probabilities do comport with the high frequency of references to fear of death or uncertainty that the future will even happen found in the qualitative interviews.

<sup>6</sup>Interestingly, eventual degree earners assign just as high a probability to getting drunk in the next year, the other adverse event the NLSY asks about, as those with lower educational attainment (that is, unless race is controlled for). High-income and white students are both more likely to earn a bachelor's degree and more likely to expect drunkenness in the year after the survey, so there is some correlation between these two measures. However, after dividing the sample by race or income group, we find that an expectation of drunkenness displays the same pattern as the shocks reported here (increased adverse expectations among those with lower eventual attainment).

However, it is also valuable to compare the trends in both types of expectations across attainment groups. Specifically, in terms of expectations for educational attainment, the “some college” group closely resembles the “college” group. In general, their subjective probability distribution is roughly the average of that of the “high school” and college groups. However, their expectations regarding adverse shocks are nearly identical to those of the high school group, and quite different from those of students who eventually earn a bachelor’s degree.

This suggests that, among those with greater concern about future adverse shocks, those who start a postsecondary program are the most optimistic about their ability to complete it, but they often fail to do so. It may well be that the very adverse shocks to which these students assigned a high probability eventually did hinder their educational progress, and students who instead revised their educational expectations downward were in fact “correct” in this sense. Chanel had to abandon a four-year program to supplement family income, and transitioned to a short-term credentialing program; is it possible that Chanel’s neighbor saw this, forecast a similar problem in their own future, and never enrolled at a university in the first place? With the following analysis, we assess this possibility more rigorously.

In Table 8, we report results from regressions of various kinds of expectations on covariates including shock indicators. In the first three columns, the outcome variable is the student’s subjective probability of earning a bachelor’s degree; in the final two columns, the outcome is each student’s average subjective probability assigned to all the future shocks we have discussed. In columns 1, 2, and 4, our adverse shock indicators are collected into sums within large categories: family shocks (absent mother or father and changing schools) and victimization shocks (feeling unsafe, high neighborhood crime rates, and being the victim of various crimes). Conditional on our control variables, victimization shocks during high school predict significantly lower attainment expectations. Family shocks predict lower expectations in a way that becomes statistically significant when victimization shocks are removed from the model. Both types of childhood shock are associated with statistically

significant increases in respondents' expectations regarding future shock events.<sup>7</sup>

Columns 3 and 5 of Table 8 show which adverse shocks in particular appear to have a dampening effect on attainment expectations and an inflating effect on shock expectations. Changing schools, feeling unsafe at school, the absence of a father, and the death of a parent are significantly correlated with lower attainment expectations. Other than the absence of the father, these same events increase respondents' expected probability of future adverse events. Other crime-related shocks including the incarceration of a parent, having the family home broken into, and witnessing a shooting also increase these negative expectations. We thus have evidence from nationally-representative data that beliefs about the future are affected by adverse shock events in the way those of our interview participants appeared to be. Next, we explore the importance of these beliefs themselves.

Jacob and Wilder (2010) show that ELS respondents who expect to complete college are more likely to enroll in college. Yet our interest is also in *where* they enroll and whether they are more likely to *complete* college. As we saw previously, educational expectations are strongly correlated with attainment. In order to at least suggest causality (that is, to suggest that students' expectations with regard to graduation influence their enrollment and persistence decisions), we control for growing sets of covariates, including demographics, socioeconomic background, adverse shock history, and academic performance, in linear probability models of college completion. The results can be found in Table 9, where the subjective percentages supplied by respondents are again collapsed into quartiles. The introduction of control variables reduces the magnitude of the estimated relationship between expectations and graduation probabilities. However, that estimate remains significant even after the inclusion of all the above-noted covariates. Believing one has at least a 50 percent chance of earning a bachelor's degree appears to be something of an inflection point. These results lend credence to the idea that expectations have some causal effect on eventual attainment.

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<sup>7</sup>This is true for each type of shock expectation individually as well.

To assess the role played in this process by expectations regarding adverse shocks, we further estimate a linear probability model of college completion including expectations regarding both adverse shocks and attainment as covariates, along with demographics, shocks, and high school performance. Results are reported in Table 10. Greater expectations regarding adverse shocks predict a lower probability of graduation, but this relationship is significantly attenuated by the introduction of attainment expectations themselves to the model. Attainment expectations thus appear to adjust, appropriately, for concerns about future instability.

We have provided evidence that adverse shocks likely affect expectations with regard to future instability as well as educational attainment, and that in turn these expectations likely affect educational outcomes, in part mediating the relationship between shocks and ultimate attainment. This represents a new way of thinking about youths' educational decision-making—an addition to the information set we consider relevant for individuals like Sierra, Chanel, and Rhiannon.

### **3.2.3 Choices: Institutions and Outcomes**

One specific mechanism through which expectations may translate into educational outcomes is the choice of what kind of postsecondary institution to attend. In fact, the main way in which expectations regarding attainment seemed to manifest themselves in our interview participants' stories is through their choice of educational institution after high school, as with Elijah and Rhiannon. The multinomial logit estimates in Table 11 demonstrate the connection between attainment expectations and students' choice of postsecondary school type in the NLSY. Those with higher expectations regarding final attainment in the first interview are significantly less likely to later attend public two-year programs, and significantly more likely to start their postsecondary education at a public four-year school, even after demographics, socioeconomic status, and academic performance have been accounted for.

We can supplement these results with some analysis of the High School Longitudinal Study (HSLs) incorporating variables which are not available in the NLSY. Summary statistics for the HSLs sample on essential demographic characteristics are shown in Table 12, while the unique variables are summarized in Table 13. The latter include students' own beliefs regarding their ability to earn a bachelor's degree as well as whether they expect to do so, whether they anticipate qualifying for financial aid after high school, and even whether and why they would eventually take a break from postsecondary school. When we estimate the relationship between these variables and what kind of institution students eventually graduate from, these other new kinds of expectations do not eliminate a statistically significant estimated link between attainment expectations and outcomes. Students who expect to earn a bachelor's are more likely to end up at four-year programs of the public and non-profit varieties, and less likely to get a credential from a two-year school. These results demonstrate that students' predictions regarding their own academic ability and financial aid eligibility do not drive the relationship between attainment expectations and institution choice we found in the NLSY, enhancing the case for a direct causal link.

Back in the NLSY, we can also examine the degree to which postsecondary institution choice accounts for the relationship between expectations and final attainment. Table 15 reports results from estimation of a multinomial logit model for attainment, given enrollment in some kind of postsecondary program. Expectations are included as a predictor of attainment along with demographics, background, and high school GPA. Initially, a higher subjective probability of college graduation has a positive relationship with the final true probability that an individual will earn a bachelor's degree. Any graduation expectation over 50 percent increases the probability of completion in a statistically significant way and reduces the probability of never attaining any credential.

When we incorporate institution type, however, the estimated relationships between attainment expectations and outcomes are halved and insignificant—the kind of postsecondary school one attends appears to account for a large proportion of the connection between ex-

pectations and outcomes. The estimated relationships between demographics and outcomes are not altered nearly as much by the inclusion of institution type. Meanwhile, attending a public or non-profit four-year school significantly increases the probability of earning a degree. It thus appears that institution type selection is a main mechanism through which attainment expectations affect outcomes.<sup>8</sup> This may be what underlies the fact that so many of our interview respondents ended up at short-term credentialing institutions—their choice of postsecondary institution was an expression of their beliefs about, or fears for, the future.

The foregoing evidence aligns with a story of high school students who form expectations about their futures based on past experiences and make different, but fundamentally rational, choices regarding education based on those expectations. However, it is somewhat indirect, and it does not provide us with a way to predict the effects of any policy we might use to address the educational attainment gaps that result. We address the former issue in Appendix A, where we estimate by two-stage least squares models of the way that attainment expectations, shock expectations, and institution choice affect attainment. It turns out that these estimates align with our story—heightened shock expectations lower attainment expectations; both sets of expectations negatively affect enrollment institution choice; and all these factors contribute to lower final attainment. But these results can only be produced if we make assumptions about instrumental variables that are unrealistic, such as that adverse shock expectations are not influenced by attainment expectations. These necessary but concerning assumptions point to the insufficiency of both this modelling approach and the available data. In the next section, we begin to formulate a solution to both problems.

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<sup>8</sup>In results available by request, we also demonstrate that postsecondary institution type choice is associated with a history of adverse shock events. In particular, having an absent father or an incarcerated parent, having witnessed a shooting or been the victim of a crime, and feeling unsafe in the home neighborhood make enrolling in a two-year program more likely and a four-year enrollment less likely, controlling for demographics and background.

## 4 Structurally Modelling Educational Decision-Making

Our narrative interviews show that not only are adverse shock events common in the lives of disadvantaged youth, but these shocks frequently derail educational trajectories and force students to drop out or transfer into less lucrative programs. Moreover, many youths discussed the way these events affected how they thought about the future, increasing their concerns about economic crisis, family tragedy, and death.

However, because these interviews were not formulated with this research question in mind, for most individuals the effects of expectations on decision-making can only be inferred. Many youths say that getting a job quickly to contribute to family income or a similar motivation is behind their choice to enroll in a sub-baccalaureate postsecondary program. However, fewer make the direct connection between this and “subjective probabilities of future adverse shocks” or other kinds of expectations—Rhiannon is one of the only students to say specifically and explicitly that her choice of postsecondary school was influenced by her concerns about adverse events at home. While one such story is enough to spark an investigation, it requires further corroboration.

We have provided some corroboration from NLSY data. We find a high frequency of adverse shocks in the disadvantaged population, though we are not able to conclusively demonstrate a direct connection between these events and educational derailment. This connection is important—in our story, it is the threat of shock-induced derailment that causes students to alter their educational paths. We infer the connection from our qualitative data, which are abundant in this area, and from the fact that the adverse shock variables available in the NLSY are associated with lower educational expectations. We can produce more explicit evidence of expectations’ effects on postsecondary institution choice and eventual attainment, but as we explore below, the expectations variables are imprecise and causality is unclear.

In the end, each data set has its strengths and can fill in gaps left in our argument



by the other. Together they paint a picture in which concerns about future shocks affect youths’ rational educational choices. To move beyond a suggestive story, though, we must specify a structural econometric model that nests many proposed explanations—finances, information, adverse shocks, expectations, etc.—that conform to the narrative generated by both our qualitative interviews and our reduced-form analysis.

Ideally, such a model would nest the many forces that may significantly impact students’ decisions: financial and informational constraints, risk attitudes, family and social background, and the possibility of dropping out of school. Due to deficiencies in the data which we discuss below, it is difficult to estimate such a model and get valid estimates regarding the impact of shock-induced derailment. However, we can calibrate a model that can *suggest* the effect that youths’ expectations regarding derailment could have—the potential size of their effect on decision-making as well as the risk of ignoring these expectations in models of choice. To be sure, the model in this section is extremely simplistic, and its numerical results only gesture at reality. But they quantify, to a degree, the potentially important contribution that an attention to qualitative evidence can make to research in this area.

For this purpose, we write a simple model supposing that students are infinitely-lived agents attempting to maximize the present-discounted value of the stream of their future income less any student loan debt payments and ignoring income growth and debt elimination, while also having some (positive or negative) consumption value of education. Assuming that students all enroll in some sort of postsecondary institution, have only two choices—enrolling in a “long” bachelor’s degree program which yields the consumption value or a “short” sub-baccalaureate program which does not—and begin earning income at the same time, we can express their problem at the end of high school as a choice between the value of the short program,

$$V_S = \phi(1 + \beta) + \frac{\beta^2}{1 - \beta} \times \ln(I_S - D_S) + \varepsilon_S, \quad (1)$$

and the value of the long program,

$$V_L = \phi(1 + \beta + \beta^2 + \beta^3) + \frac{\beta^4}{1 - \beta} \times \ln(I_L - D_L) + \varepsilon_L, \quad (2)$$

where  $\beta$  is the annual discount factor which we assume to be equal to .95,  $\phi$  is the annual contemporaneous utility of being in school,  $I_j$  is the annual income a student can expect to earn with a degree of type  $j$ ,  $D_j$  is the annual student loan debt payment students can expect to make thereafter, and  $\varepsilon_i$  is the idiosyncratic individual value of enrolling in program  $i$ .

Assuming further that the  $\varepsilon_i$  are distributed type-I extreme value, the probability a student will choose the long program is

$$P(L) = \frac{\exp(\bar{V}_L)}{\exp(V_S) + \exp(\bar{V}_L)}, \quad (3)$$

where  $\bar{V}_S$  equals  $V_S - \epsilon_S$  and  $\bar{V}_L$  equals  $V_L - \epsilon_L$ . The utility of being in postsecondary school,  $\phi$ , is a value of interest so we supply the other values from data. NLSY data tell us that among respondents in their late twenties and early thirties, mean incomes were approximately \$31,000 per year for associate's degree holders and \$48,000 per year for bachelor's degree holders. In the ELS (since no such values are recorded in the NLSY), average annual student loan debt payments for those who graduated were \$648 for associate's degree holders and \$1836 for bachelor's degree holders.<sup>9</sup> For simplicity we assume that students project these values accurately.

In the model as currently specified,  $\phi$  must explain the actual rate at which postsecondary enrollees attend long programs in each group, which is approximately 47 percent in the NLSY. It turns out that to explain this choice probability, it must be that  $\phi = 6.4$ , indicating that students positively value education as consumers. If we take the exponential of this

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<sup>9</sup>These averages include all those respondents who attained the given level of education but say they make zero student loan payments. Annual payments for those who actually pay are two to four times larger depending on various characteristics.

to (crudely) translate  $\phi$  into dollars, the consumption value estimated is \$585. In this simple model, this consumption value is making up for foregone earnings not recouped by (discounted) larger incomes in later years. The numerical result, and even its sign, depends greatly on the use of the natural log utility function; a utility function that is linear in dollars, for instance, returns a negative consumption value of education that amounts to the opposite of the present discounted value of the income gap, a value of over two hundred thousand dollars for two extra years in school.<sup>10</sup> As a part of our method of data-gathering for future work on this question, we plan to gather information on students' risk attitudes to better specify utility, since its functional form is clearly of importance.

However, even in the present model, we would obviously not want to assume that future income and contemporaneous schooling utility are the only things students consider when deciding whether to attend various programs. As the model is specified, the schooling choice is solely a result of expected future income increases and the current-period utility of the chosen action. Assuming the college wage premium is at least as large for disadvantaged students as it is for advantaged ones, such a model would translate the fact that fewer disadvantaged students end up in bachelor's programs into the result that those students simply dislike four-year degree programs. As noted above, many forces are absent in this model—financial concerns, informational issues, risk due to the distribution of income results, etc.—but here we introduce just one: the possibility of dropping out of the long educational program at random. Thus final income is not purely a function of individuals' choices, but also of events and circumstances beyond their control, for which they rationally account when enrolling.

Specifically, we suppose that there is some probability  $\alpha$  each year that a student in either type of program will be derailed somehow and become a college dropout. These students

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<sup>10</sup>This is visible in Figure 2 at 0 on the x-axis. The true underlying utility value of education is not our focus in this case, but we note for context that Keane and Wolpin (1997) estimated in their extended model that the dollar equivalent of the contemporaneous utility of one additional year of education for their least school-loving type of student would be equal to \$5,763 at age 16 but fall to -\$5,379 by age 21, a range into which the log-utility estimate falls.

receive  $\phi$  for the years up to and including the one in which they drop out, but do not earn a degree. Dropouts without a degree in our NLSY sample face annual income of approximately \$24,000 per year on average. Dropouts have also incurred student loan debt while in school, and we assume for simplicity that they pay a fraction of the payment made by students who complete the degree they attempted based on the number of years they attended before being derailed. In this case, if  $D$  denotes dropout results, the value of the short program is

$$\begin{aligned}\tilde{V}_S &= \alpha \left[ \phi + \frac{\beta}{1-\beta} \times \ln \left( I_D - \frac{D_S}{2} \right) \right] \\ &+ (1-\alpha)\alpha \left[ \phi(1+\beta) + \frac{\beta^2}{1-\beta} \times \ln(I_D - D_S) \right] \\ &+ (1-\alpha)^2 \bar{V}_S + \tilde{\epsilon}_S,\end{aligned}\tag{4}$$

and the value of the long program is

$$\begin{aligned}\tilde{V}_L &= \alpha \left[ \phi + \frac{\beta}{1-\beta} \times \ln \left( I_D - \frac{D_L}{4} \right) \right] \\ &+ (1-\alpha)\alpha \left[ \phi(1+\beta) + \frac{\beta^2}{1-\beta} \times \ln \left( I_D - \frac{D_L}{2} \right) \right] \\ &+ (1-\alpha)^2\alpha \left[ \phi(1+\beta+\beta^2) + \frac{\beta^3}{1-\beta} \times \ln \left( I_D - \frac{3D_L}{4} \right) \right] \\ &+ (1-\alpha)^3\alpha \left[ \phi(1+\beta+\beta^2+\beta^3) + \frac{\beta^4}{1-\beta} \times \ln(I_D - D_L) \right] \\ &+ (1-\alpha)^4 \bar{V}_L + \tilde{\epsilon}_L,\end{aligned}\tag{5}$$

where, as before, the disturbance (denoted  $\tilde{\epsilon}_L$  and  $\tilde{\epsilon}_L$ ) are distributed type-I extreme value. Since we cannot see values of  $\alpha$  or  $\phi$  in the data, we generate pairs. We assign values of  $\alpha$  at intervals of .01 from 0 to .8, with  $\alpha = 0$  being the case in which graduation from the long program is guaranteed given enrollment, and derive the corresponding necessary values of  $\phi$ .

Figure 1 depicts the estimated relationship between  $\alpha$  and  $\phi$ . The utility value of education that we estimate depends strongly on the probability of derailment—for instance, if we assume  $\alpha$  is equal to the true annual rate at which NLSY respondents enroll in four-year

programs but fail to earn a degree—which, based on four-year dropout rates, is approximately 11 percent— $\phi$  is estimated to equal 7.5, and the utility from schooling is just under two thousand dollars annually, or nearly four times that estimated when  $\alpha = 0$ . As students' perceived probability of dropping out grows larger than this, the estimated utility value of education necessary to maintain their enrollment rates continues to increase dramatically.<sup>11</sup> Of course, the students we expect to have larger subjective probabilities of being derailed are precisely those with more disadvantaged and unstable personal histories.

The subjective probabilities represented by  $\alpha$  that students actually assign to this kind of choice-failure are objects of great interest, but unfortunately are not available in the data. The NLSY contains a subjective probability of degree attainment, as we have seen, but this is too imprecise. For example, suppose a student assigns a 40 percent probability to their own attainment of a bachelor's degree. It could be that this respondent has relatively little interest in going to college and places just a 40 percent probability on enrolling, though they are sure they would graduate if enrolled. But it could also be that this student plans to enroll, but fears adverse shock events, which they believe will derail their educational pathway with 40 percent probability. These two students have very different  $\alpha$  in mind when making enrollment decisions. More specifically, there are no measures available of the subjective probability that adverse shock events will affect educational outcomes. For this reason, we plan on further work in data collection and more precise structural modelling.

The precision of our present estimates aside, the results of the model make clear that we should not expect to reliably infer the contribution of contemporaneous educational utility, or any other factor in the postsecondary decision-making process, from a model that does not

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<sup>11</sup>As depicted in Figure 2, the dollar values follow a more extreme and interesting path in the linear-utility case. At  $\alpha = .11$ , the annual dropout rate predicted by the NLSY data, students whose income utility is linear are still estimated to value school negatively, at a rate of approximately -\$90,000 per year. Estimates of  $\phi$  fall in the Keane and Wolpin (1997) estimated range noted above in the  $\alpha \in [.37, .41]$  range, and transition from negative to positive at an annual dropout rate around  $\alpha = .39$ . The rising estimate of  $\phi$  actually begins to fall again at extremely high values of  $\alpha$  (above .6) because the probability of dropping out in the first two years is now so high that the foregone short-program-graduate income in years 3 and 4 is very unlikely to come, and the long-program income is financially worth the risk again. However, an annual dropout probability of 60 percent is far above the true value.

incorporate concerns students have about their educational paths being derailed by adverse events. If such concerns are significant, as we have demonstrated using both qualitative and quantitative evidence above, this omission from models of educational choice requires attention and remedy.

## 5 Discussion

This paper examines the idea that anticipated future adverse events affect students' choices of postsecondary pathways. The idea emerged from the analysis of qualitative data based on interviews with disadvantaged Black youth in Baltimore describing how they made choices about postsecondary education. To the degree possible, we corroborated the generalizability of this narrative using nationally representative survey data. Finally, we formalized the narrative as a simple dynamic choice model of educational decisions wherein students not only face a tradeoff between shorter educational investments and larger long-run returns, but must also acknowledge that longer investments may be derailed by future shocks. These shocks were operationalized in the model as a non-zero probability that returns to education are nullified but upfront costs are still incurred. Using the model, we show that different assumptions about probabilities of completion imply vastly different upfront utility costs of education, which is a relevant quantity for counterfactual policy analysis. Put another way, absent data on students' perceived likelihood of non-completion, which may be far from zero for many, it is difficult to identify utility costs associated with school. Our approach thus sheds light on what data might be missing and help to set priorities for future data collection

The model we posit is highly stylized. A more elaborate and useful model would include heterogeneity across students, a richer set of degree program options, differences in unemployment rates for each type of educational outcome, and the possibility of returning to school at a later point in the lifecycle. Such a model could explicitly tie anticipation of shocks to earlier-life instability. In this manner, anticipation of future shocks becomes

an indirect channel through which shocks witnessed or experienced during childhood and adolescence negatively affect future educational outcomes and another mechanism through which disadvantage affects educational outcomes. Even if no future shocks occur, earlier shocks can shift how students perceive the future and how they view the plausibility of different educational options. Finally, a more useful model would explicitly incorporate factors that could help break the link between anticipated shocks and educational attainment. For example, modeling scholarship or federal grant rules would allow the researcher to experiment with policies that loosen rules to assess whether doing so shifts expectations about the impact of shocks and thus encourages disadvantaged students to choose longer and more lucrative programs.

More broadly, our approach using mixed methods builds directly on qualitative data to characterize a particular discrete choice model designed to approximate the emergent narrative. This is the essence of what structural modeling is often after: an internally consistent framework that quantifies a particular set of tradeoffs that can help to explain behavior. We propose that qualitative evidence from narrative interview data can help in the development of such models in a variety of contexts where behavior is not fully understood and extant data do not contain all of the information needed to generate and test plausible hypotheses. Examples include housing, migration, crime and health decisions, some of which seem puzzling to researchers. This is particularly important when studying behavior among disadvantaged groups, i.e., individuals who have little say in large- $N$  data collection efforts. Such data sets are often designed to collect information that prior research has deemed important, but which may not fully reflect the barriers, circumstances and constraints that disadvantaged groups face. This can lead to model misspecification—including inappropriately labeling disadvantaged individuals as irrational since they appear to make poor decisions according to models specified using extant data. Seeking insight from decision-makers themselves could improve model specification and thus help to generate more useful policy proposals.

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## 6 Tables

**Table 1:** NEGATIVE SHOCKS AMONG INTERVIEW RESPONDENTS

	Family Death	Parent Jailed	Witness Violence	Arrested or Probation
Count	55	74	53	44
Percent	36.7	49.3	35.3	29.3
	Absent Parent	Victimized	Housing Shock	
Count	44	23	48	
Percent	29.3	15.3	32	

Number of narrative interview respondents who reported various types of adverse shocks, by raw count and percent of sample.

**Table 2:** EXPECTATION OF SHOCKS AMONG INTERVIEW RESPONDENTS

	0 Shocks	1 Shock	2 Shocks	3 or More	Total
Count	19	31	35	65	150
% Anticipating Shocks	79	87.1	88.6	100	92

Number of narrative interview respondents who anticipated adverse shocks in the *future*, by raw count and percent of subsample. Columns represent subsamples of respondents who mentioned zero, one, two, or more adverse shocks in their *histories*.

**Table 3: NLSY SUMMARY STATS BY ATTAINMENT**

	All	No Deg	HS	Some Coll	Assoc	College
White	0.49	0.38	0.45	0.43	0.53	0.63
Black	0.26	0.29	0.29	0.30	0.23	0.17
Hispanic	0.21	0.31	0.23	0.23	0.20	0.14
Low income	0.40	0.61	0.50	0.39	0.37	0.20
Mid income	0.39	0.21	0.34	0.39	0.44	0.50
High income	0.07	0.02	0.04	0.07	0.05	0.16
Mother: No degree	0.23	0.46	0.31	0.20	0.18	0.08
Mother: HS diploma	0.36	0.34	0.42	0.39	0.40	0.25
Mother: Some coll	0.24	0.15	0.20	0.25	0.27	0.29
Mother: Bachelor's	0.18	0.05	0.07	0.16	0.16	0.38
GPA 0-1	0.01	0.06	0.02	0.00	0.00	0.00
GPA 1-2	0.08	0.22	0.14	0.08	0.05	0.01
GPA 2-3	0.50	0.60	0.64	0.56	0.56	0.27
GPA 3 and up	0.41	0.12	0.20	0.35	0.40	0.72
Math score	-0.12	-0.81	-0.54	-0.26	-0.23	0.26
Verbal score	-0.09	-0.44	-0.60	-0.33	-0.25	0.19
Observations	8984	969	2897	2028	703	2355

NLSY means for group indicator variables and standardized test scores. Test scores have themselves been statistically standardized. The “Some Coll” column includes all individuals who attended some kind of postsecondary institution but never earned an associate’s or bachelor’s degree.

**Table 4: NLSY ADVERSE SHOCK RATES**

	All	No Deg	HS	Some Coll	College	Black	White	Low Inc	Mid Inc
No mother in HH	0.03	0.05	0.04	0.03	0.02	0.03	0.04	0.04	0.03
No father in HH	0.28	0.37	0.33	0.28	0.19	0.47	0.19	0.46	0.14
Changed schools	0.11	0.17	0.14	0.11	0.05	0.11	0.11	0.15	0.08
Break-in by 18	0.10	0.12	0.11	0.11	0.07	0.13	0.09	0.11	0.10
Bullied by 18	0.10	0.11	0.11	0.10	0.09	0.08	0.12	0.11	0.10
Seen shooting by 18	0.12	0.21	0.16	0.13	0.05	0.21	0.08	0.16	0.10
Parent died	0.03	0.04	0.04	0.04	0.02	0.05	0.03	0.05	0.03
Other family died	0.51	0.52	0.54	0.50	0.48	0.57	0.50	0.52	0.50
Parent hospitalized	0.09	0.07	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Parent jailed	0.02	0.04	0.03	0.02	0.01	0.02	0.02	0.03	0.02
Parents divorced	0.08	0.08	0.08	0.08	0.07	0.07	0.09	0.08	0.09
Parent unemp	0.08	0.08	0.08	0.09	0.08	0.10	0.07	0.09	0.07
Victim of crime	0.07	0.07	0.08	0.07	0.04	0.07	0.07	0.08	0.07
Ever homeless	0.02	0.03	0.03	0.01	0.00	0.02	0.02	0.02	0.01
Sibling count	1.45	1.71	1.56	1.43	1.24	1.65	1.24	1.65	1.31
Observations	8984	969	2897	2731	2355	2334	4413	3588	3478

NLSY means for various adverse shock indicators in the full sample, by final attainment group, by race, and by family income.

**Table 5: ELS SUMMARY STATS BY ATTAINMENT**

	All	No Deg	HS	Some Coll	Bachelor
White	0.54	0.31	0.52	0.51	0.64
Black	0.12	0.19	0.12	0.15	0.07
Hispanic	0.14	0.28	0.17	0.16	0.08
Low income	0.28	0.49	0.42	0.31	0.15
Mid income	0.53	0.38	0.46	0.54	0.56
High income	0.15	0.02	0.04	0.10	0.27
Mother: No degree	0.13	0.38	0.23	0.13	0.05
Mother: HS diploma	0.27	0.33	0.40	0.29	0.18
Mother: Some college	0.33	0.20	0.28	0.37	0.31
Mother: Bachelor	0.27	0.09	0.09	0.21	0.45
GPA: 0-1	0.02	0.17	0.04	0.02	0.00
GPA: 1-2	0.17	0.59	0.36	0.20	0.02
GPA: 2-3	0.41	0.22	0.47	0.51	0.25
GPA: 3-4	0.40	0.02	0.13	0.28	0.73
Math score	50.71	40.73	44.36	49.04	56.87
Reading score	50.53	40.85	44.66	49.17	56.39
Composite score	50.66	40.16	44.13	49.04	57.08
No degree	0.03	1.00	0.00	0.00	0.00
HS diploma	0.10	0.00	1.00	0.00	0.00
Some college	0.48	0.00	0.00	1.00	0.00
Bachelor	0.38	0.00	0.00	0.00	1.00
Shocks in college	0.93	1.05	1.04	1.00	0.80
Observations	16197	356	1388	6406	5100

ELS means for group indicator variables, standardized test scores, and a count of adverse shock events during college. Test scores have themselves been statistically standardized. The “Some Coll” column includes all individuals who attended some kind of postsecondary institution but never earned an associate’s or bachelor’s degree.



**Table 6:** ELS: ORDERED PROBIT FOR ATTAINMENT GIVEN PS ENROLLMENT

	(1)	(2)	(3)	(4)
Black	-0.53***	-0.51***	-0.41***	0.04
Hispanic	-0.49***	-0.48***	-0.32***	-0.07*
Asian or PI	0.08**	0.07*	0.15***	0.08*
Native American	-0.66***	-0.63***	-0.49***	-0.15
Multiple races	-0.26***	-0.24***	-0.22***	-0.12**
Male	-0.12***	-0.13***	-0.17***	-0.09***
<b>Shocks in college</b>		<b>-0.10***</b>	<b>-0.09***</b>	<b>-0.06***</b>
Low income			-0.42***	-0.29***
Mid income			-0.22***	-0.17***
Mother: no degree			-0.62***	-0.34***
Mother: HS diploma			-0.49***	-0.29***
Mother: some college			-0.38***	-0.24***
GPA: 3-4				1.25***
GPA: 2-3				0.56***
GPA: 1-2				0.13
Reading score				0.01***
Math score				0.02***
HS Cutoff	-0.61***	-0.71***	-1.21***	1.19***
Associate Cutoff	-0.33***	-0.42***	-0.92***	1.52***
Bachelor Cutoff	-0.09***	-0.18***	-0.67***	1.81***
Observations	9239	9239	9239	9239

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Ordered probit for final attainment in ELS data. “Shocks in college” refers to the count of adverse events that happen to respondents while they are in postsecondary school, including parental divorce, unemployment, and death, the death of other loved ones, serious illness befalling the student or a family member, and violent victimization. A significant negative effect suggests that college-period shocks do reduce eventual attainment, even in the presence of increasing sets of covariates.

**Table 7: EXPECTATIONS BY ATTAINMENT**

	All	No Deg	HS	Some Coll	College
Coll exp 0-25	0.13	0.31	0.23	0.08	0.01
Coll exp 25-50	0.18	0.30	0.25	0.17	0.05
Coll exp 50-75	0.13	0.09	0.13	0.15	0.11
Coll exp 75-100	0.56	0.30	0.39	0.60	0.83
Observations	3546	370	1164	1069	930
Exp: crime victim	14.70	16.64	15.91	15.53	11.43
Exp: arrest	10.22	15.08	11.80	10.51	6.06
Exp: death	18.64	21.06	20.20	19.04	15.30
Exp: pregnancy	7.90	15.24	9.50	6.96	3.97
Observations	3531	367	1156	1068	926

Average expectations responses from the NLSY. Educational expectations are stated as a percent chance of completing a bachelor's degree, and are sorted into quartiles. Expectations over other adverse events are stated as a percent chance for the event to occur in the next year. The "Some Coll" column includes all individuals who attended some kind of postsecondary institution but never earned a bachelor's degree (but may have a lesser credential like an associate's degree).

**Table 8:** ATTAINMENT AND SHOCK EXPECTATIONS' RELATIONSHIP TO PAST SHOCKS

	Exp Coll	Exp Coll	Exp Coll	Exp Shocks	Exp Shocks
Black	0.08***	0.07***	0.09***	0.03***	0.03***
Hispanic	0.02	0.02	0.03*	0.03***	0.03***
Asian or PI	0.11***	0.11***	0.11***	-0.01	-0.01
Native American	0.04	0.01	0.03	-0.04	-0.04
Multiple races	-0.02	-0.04	0.00	0.09***	0.08***
Male	-0.08***	-0.08***	-0.08***	0.03***	0.02***
Low income	-0.11***	-0.12***	-0.10***	0.01	0.01
Mid income	-0.04**	-0.05***	-0.04**	0.00	0.00
Mother no degree	-0.22***	-0.22***	-0.21***	-0.00	-0.01
Mother HS diploma	-0.15***	-0.15***	-0.14***	-0.00	-0.00
Mother some college	-0.08***	-0.08***	-0.08***	-0.01	-0.01
Family shocks	-0.01	-0.02**		0.01***	
Victimization	-0.03***			0.02***	
No mother in HH			0.00		0.00
No father in HH			-0.03**		0.01
Changed schools			-0.05***		0.04***
Parent died			-0.07**		0.03**
Other family died			0.00		0.00
Parent hospitalized			0.04**		-0.01
Parent jailed			-0.06		0.06***
Parents divorced			-0.02		-0.01
Parent unemp			0.02		-0.00
Sibling count			-0.01*		-0.00
Break-in by 18			0.01		0.02**
Bullied by 18			-0.00		0.01
Seen shooting by 18			-0.01		0.05***
Feels unsafe			-0.06***		0.02***
Victim of crime			-0.03		0.02
Ever homeless			-0.02		-0.00
Constant	1.03***	0.97***	1.06***	0.04***	0.05***
Observations	2586	2586	2586	2584	2584

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Regressions of NLSY subjective probability of earning a bachelor's degree (Exp Coll) and average subjective probability of future shocks including pregnancy, arrest, and death (Exp Shocks) on various covariates. In columns 1, 2, and 4 indicators of past shocks are summed to arrive at two summary measures, "family shocks" (such as parental incarceration or unemployment or a death in the family) and "victimization" (such as seeing a shooting or being the victim of a crime). In columns 3 and 5 individual shock indicators are included as covariates.

**Table 9:** LPM FOR COLLEGE ATTAINMENT WITH SHOCKS AND EXPECTATIONS

	(1)	(2)	(3)	(4)	(5)
	College grad	College grad	College grad	College grad	College grad
Coll exp 25-50	0.05**	0.04	0.04	0.04	0.10
Coll exp 50-75	0.24***	0.16***	0.14***	0.14***	0.20***
Coll exp 75-100	0.42***	0.28***	0.25***	0.25***	0.26***
Black		-0.06**	-0.02	-0.02	0.14***
Hispanic		-0.11***	-0.11***	-0.11***	-0.11**
Asian or PI		0.15**	0.15**	0.14*	0.05
Native American		-0.04	0.06	0.05	0.13
Multiple races		-0.12	-0.11	-0.11	-0.13
Male		-0.06***	-0.06***	-0.06***	-0.07**
Low income		-0.16***	-0.11***	-0.11***	-0.02
Mid income		-0.06*	-0.04	-0.04	0.02
Mother has no degree		-0.31***	-0.30***	-0.30***	-0.12**
Mother has HS diploma		-0.28***	-0.28***	-0.28***	-0.19***
Mother has some college		-0.18***	-0.18***	-0.18***	-0.11***
Break-in by 18			-0.06**	-0.06**	-0.06
Bullied by 18			-0.04	-0.04	-0.02
Seen shooting by 18			-0.07**	-0.06**	-0.06
Feels unsafe			-0.08***	-0.08***	-0.06***
Victim of crime			-0.01	-0.01	-0.04
Ever homeless, 1997-2002			-0.14***	-0.15***	-0.42**
No mother or female guardian in HH			0.00	0.00	0.00
No father or male guardian in HH			-0.03	-0.03	-0.03
Changed schools			-0.09***	-0.08***	-0.05
Parent died			-0.07	-0.07	-0.14
Other family died			-0.03	-0.02	-0.04
Parent hospitalized			-0.03	-0.03	-0.06
Parent jailed			-0.09	-0.08	-0.08
Parents divorced			-0.04	-0.04	-0.09
Parent unemp			-0.00	-0.00	0.05
Sibling count			-0.01	-0.01	-0.02
Expect: victim of crime				0.00	-0.00
Expect: arrest				-0.00	-0.00
Expect: death				-0.00*	-0.00
Expect: pregnancy				0.00	0.00
Expect: get drunk				-0.00*	0.00
GPA 3 and up					0.67***
GPA 2-3					0.51***
GPA 1-2					0.28*
Verbal score					0.05**
Math score					0.07***
Constant	0.04***	0.49***	0.69***	0.72***	0.03
Adjusted $R^2$	0.12	0.23	0.26	0.26	0.26
Observations	1954	1954	1954	1954	1028

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Linear probability model in NLSY with bachelor's degree completion as the outcome.

**Table 10: LPM COLLEGE ATTAINMENT ON EXPECTATIONS FOR OTHER EVENTS**

	(1)	(2)	(3)	(4)	(5)
	College grad	College grad	College grad	College grad	College grad
Expect: victim of crime	-0.04	-0.06	-0.05	0.01	0.01
Expect: arrest	-0.22***	-0.09	-0.06	-0.04	0.01
Expect: death	-0.10*	-0.07	-0.07	-0.08*	-0.06
Expect: pregnancy	-0.23***	-0.11*	-0.00	0.02	0.04
Expect: get drunk	0.00	-0.01	-0.06*	-0.06*	-0.03
Coll exp 25-50		0.06**	0.04	0.04	0.04
Coll exp 50-75		0.23***	0.16***	0.14***	0.12***
Coll exp 75-100		0.40***	0.27***	0.25***	0.20***
Black			-0.06**	-0.02	0.02
Hispanic			-0.11***	-0.11***	-0.09***
Asian or PI			0.14*	0.14*	0.10
Native American			-0.05	0.05	0.02
Multiple races			-0.12	-0.11	-0.08
Male			-0.06***	-0.06***	-0.03
Low income			-0.16***	-0.11***	-0.10***
Mid income			-0.06*	-0.04	-0.04
Mother has no degree			-0.31***	-0.30***	-0.25***
Mother has HS diploma			-0.28***	-0.28***	-0.24***
Mother has some college			-0.19***	-0.18***	-0.16***
Break-in by 18				-0.06**	-0.03
Bullied by 18				-0.04	-0.04
Seen shooting by 18				-0.06**	-0.05*
Feels unsafe				-0.08***	-0.07***
Victim of crime				-0.01	-0.00
Ever homeless, 1997-2002				-0.15***	-0.13**
No mother or female guardian in HH				0.00	0.00
No father or male guardian in HH				-0.03	-0.01
Changed schools				-0.08***	-0.06*
Parent died				-0.07	-0.08*
Other family died				-0.02	-0.03
Parent hospitalized				-0.03	-0.03
Parent jailed				-0.08	-0.04
Parents divorced				-0.04	-0.04
Parent unemp				-0.00	0.02
Sibling count				-0.01	-0.01
GPA 3 and up					0.38***
GPA 2-3					0.14***
GPA 1-2					0.04
Constant	0.40***	0.10***	0.54***	0.72***	0.41***
Adjusted $R^2$	0.02	0.13	0.23	0.26	0.32
Observations	1954	1954	1954	1954	1954

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Linear probability model in NLSY with bachelor's degree completion as the outcome. Expectations for future shocks are the initial 5 covariates; in column 2, attainment expectations are added; thereafter, demographics, past shocks, and GPA. Attainment expectations account for shock expectation effects, and are not accounted for by other variables.

**Table 11:** MNL FOR FIRST PS SCHOOL TYPE

	(1)	(2)	(3)	(4)	(5)
	Pub2	FP2	Pub4	NP4	FP4
Coll exp 25-50	-0.01	0.03	0.10	-0.08	-0.03**
Coll exp 50-75	-0.21***	0.02	0.21**	0.01	-0.03**
Coll exp 75-100	-0.28***	0.00	0.26***	0.04	-0.03***
Black	-0.05	0.01	0.05*	-0.01	-0.00
Hispanic	0.07**	0.02	-0.03	-0.06*	0.00
Asian or PI	-0.11	0.04	0.04	0.00	0.02
Native American	1.50	0.22	1.70	-3.50	0.09
Multiple races	0.69	-0.63	0.12	0.01	-0.19
Male	-0.01	-0.02	0.03	0.00	-0.00
Low income	0.07*	0.03	-0.05	-0.07***	0.03
Mid income	0.03	0.02	-0.02	-0.06***	0.03
Mother no degree	0.14***	0.05*	-0.10**	-0.08**	0.00
Mother has HS diploma	0.09***	0.05**	-0.08**	-0.06***	0.01
Mother has some college	0.07**	0.02	-0.05	-0.04*	-0.00
GPA 3 and up	-0.34	-0.09	0.26	-0.03	0.20
GPA 2-3	-0.16	-0.04	0.08	-0.10	0.21
GPA 1-2	0.09	-0.02	-0.23	-0.04	0.20
Adjusted $R^2$					
Observations	1645	1645	1645	1645	1645

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Multinomial logit model in NLSY of students' choice of postsecondary institution type. Columns of coefficients represent the effects of covariates on the probability of choosing, in order: public two-year programs, for-profit two-year programs, public four-year programs, non-profit private four-year programs, and for-profit four-year programs. Excluded program type is private non-profit two-year.

**Table 12: HSLs BASIC SUMMARY STATISTICS**

	All	No Deg	HS	Some Coll	College
White	0.51	0.44	0.50	0.51	0.53
Black	0.10	0.12	0.13	0.12	0.03
Hispanic	0.16	0.23	0.19	0.17	0.14
Asian, HI, PI	0.09	0.04	0.05	0.06	0.14
Male	0.51	0.56	0.57	0.49	0.27
Low income	0.20	0.34	0.30	0.22	0.08
Mid income	0.30	0.18	0.29	0.36	0.32
High income	0.21	0.05	0.08	0.16	0.31
Mother no degree	0.09	0.25	0.16	0.09	0.00
Mother HS only	0.46	0.54	0.59	0.50	0.39
Mother Assoc.	0.18	0.13	0.15	0.22	0.27
Mother Bachelor	0.27	0.08	0.10	0.20	0.33
Math score	0.03	-0.76	-0.42	-0.04	0.48
Observations	23503	747	3670	3935	59

HSLs means for group indicator variables and standardized test scores. Test scores have been statistically standardized. The “Some Coll” column includes all individuals who attended some kind of postsecondary institution but never earned an associate’s or bachelor’s degree.

**Table 13: HSLs UNIQUE VARIABLE SUMMARY STATISTICS**

Exp Bachelor’s	0.62
Thinks capable of BA	0.49
Fin aid: will qual	0.43
Fin aid: won’t qual	0.26
Fin aid: unsure	0.31
Plans 4yr enroll, 2009	0.53
Break: Academic	0.00
Break: Family	0.03
Break: Financial	0.02
Break: Work	0.02
Break: Unknown	0.01
Observations	23495

HSLs means for postsecondary school type indicator variables, adverse shocks, and expectations. “Shocks” variables are sums of various types of adverse shocks over the relevant time period (2009-2011 or 2012-2016). Expected earnings are in thousands of dollars per year. Standard deviations included below means in parentheses where relevant.

**Table 14:** MNL FOR FIRST PS PROGRAM TYPE GIVEN PLAN TO ENROLL IN FOUR-YEAR: HSLs

	Pub2	FP2	Pub4	NP4	FP4
Exp Bachelor's	-0.09***	-0.01**	0.06*	0.05*	0.01
Break: Academic	0.68	-0.19	2.07	-1.86	0.04
Break: Family	0.08**	0.02***	0.00	-0.12	-0.00
Break: Financial	0.10**	0.01	-0.13	-0.03	0.02***
Break: Work	0.03	0.01	0.04	-0.13	0.01
Break: Unknown	0.07	0.00	-0.12	0.07	-0.10
Thinks capable of BA	-0.02	-0.00	0.02	0.01	-0.00
Fin aid: will qual	0.00	0.00	0.00	0.00	0.00
Fin aid: won't qual	-0.01	-0.00	0.05**	-0.04**	0.00
Fin aid: unsure	-0.02	-0.00	0.01	-0.01	0.00
Black	-0.09***	-0.00	0.04	0.07***	0.01*
Hispanic	0.00	0.00	-0.03	0.02	0.00
Asian, HI, PI	-0.10***	0.01	0.11***	-0.03	0.00
Native American	-0.00	-0.14	0.15	0.07	-0.09
Multiple races	0.01	0.01	-0.02	-0.02	0.01**
Male	0.01	-0.02***	0.05***	-0.02*	-0.00
Low income	0.09***	0.01	-0.05*	-0.05**	0.00
Mid income	0.07***	0.02**	-0.07***	-0.03*	0.00
Mother no degree	0.12***	0.01	-0.00	-0.11**	-0.00
Mother HS only	0.05***	0.01*	-0.03	-0.03**	-0.00
Mother Associate's	0.07***	-0.00	-0.04*	-0.03*	-0.01
GPA: Academic	-0.09***	-0.01***	0.08***	0.06***	-0.01*
GPA: CTE	-0.02*	-0.00	0.04**	-0.01	-0.00
Math score	-0.05***	-0.01**	0.04***	0.03***	0.00
Observations	3768	3768	3768	3768	3768

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . "Break" variables indicate that the respondent took a break from school for the stated reason. "Fin aid" variables regard respondents' expectations for educational financial aid qualification. "CTE" indicates Career and Technical Education; "HI" and "PI" indicate Hawaiian and Pacific Islander, respectively.



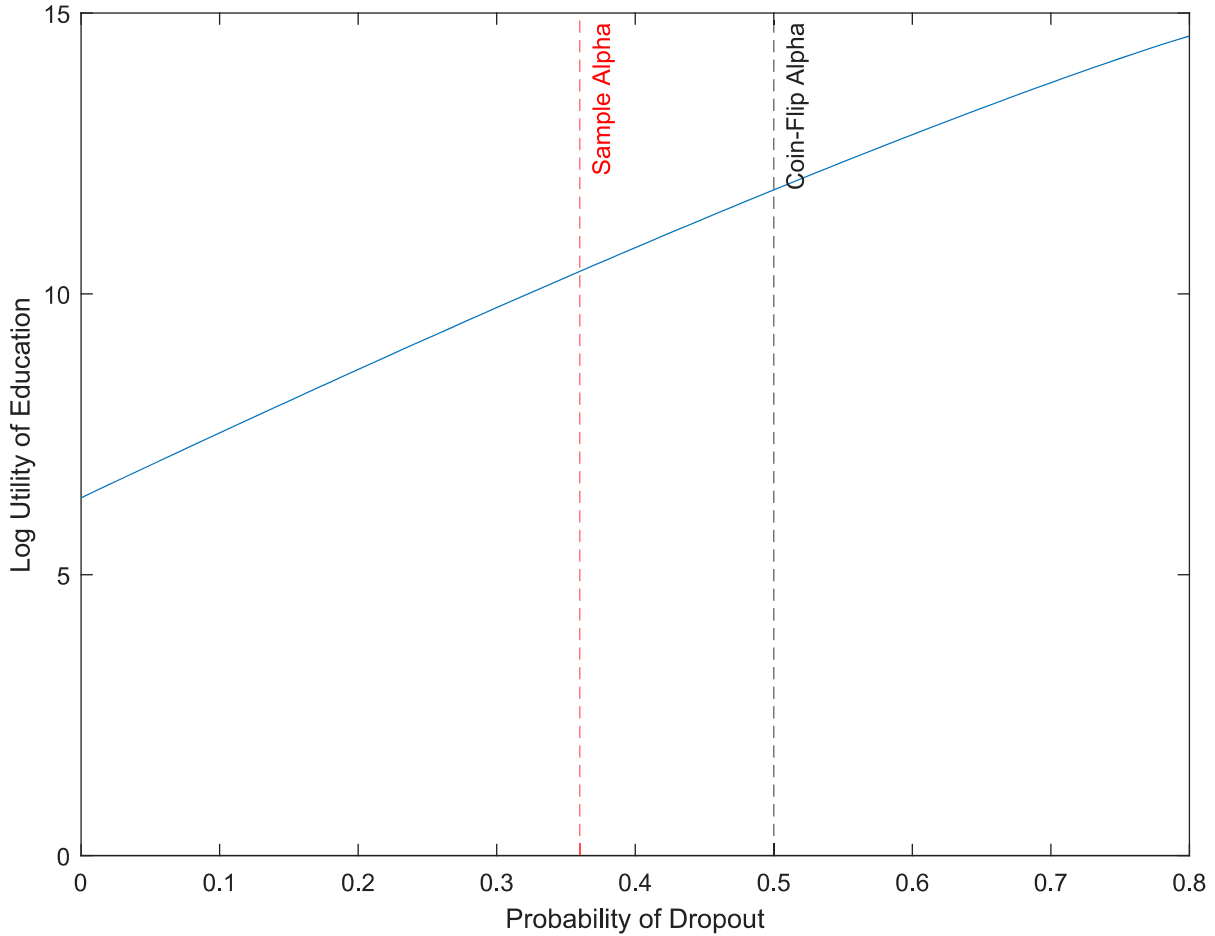
**Table 15:** MNL FOR ATTAINMENT WITH FIRST PS SCHOOL TYPE

	(1)	(2)	(3)	(4)
	Att Coll	Associates	Bachelors	Adv Deg
Black	0.12***	-0.03**	-0.09***	-0.01
Hispanic	0.07***	-0.04**	-0.01	-0.02
Asian or PI	-0.03	-0.05	0.02	0.06**
Native American	0.01	-0.02	0.10	-0.09
Multiple races	-0.00	-0.02	0.03	-0.00
Male	0.09***	-0.01	-0.03**	-0.05***
Low income	0.04**	0.04***	-0.05**	-0.03*
Mid income	-0.01	0.03**	-0.02	0.00
Mother has no degree	0.14***	0.03*	-0.07***	-0.10***
Mother has HS diploma	0.12***	0.03**	-0.05***	-0.10***
Mother has some college	0.05***	0.01	-0.01	-0.05***
PrivNP2 school	-0.07	0.04	0.09	-0.06
PrivFP2 school	0.03	0.10***	-0.06	-0.07
Pub4 school	-0.16***	-0.16***	0.19***	0.12***
PrivNP4 school	-0.23***	-0.14***	0.22***	0.14***
PrivFP4 school	0.02	-0.04	0.11*	-0.09
Adjusted $R^2$				
Observations	4478	4478	4478	4478

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

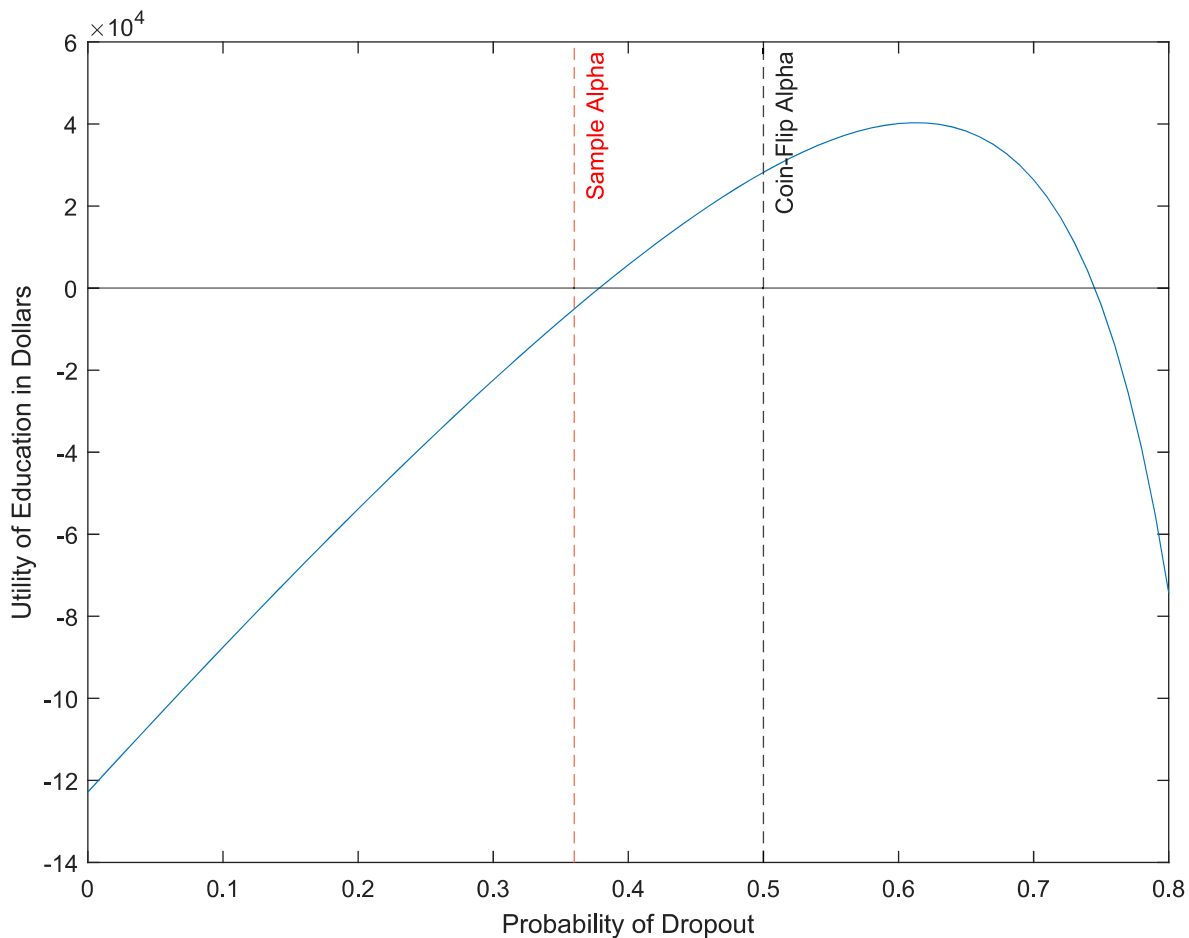
Multinomial logit model in NLSY of final attainment; column 1 coefficients affect probability of stopping education without any degree despite attending postsecondary school. Last 5 covariates are postsecondary school types as in Table 11, with for-profit two-year the excluded type.

**Figure 1:** DERAILMENT PROBABILITY AND ESTIMATES OF LOGARITHMIC UTILITY



Curve depicts the utility value of education required to explain actual educational choice probabilities as a function of the probability of being derailed that students assume when making the choice. Derailement probability is exogenously varied from 0 to 80 percent. Periodic income utility function is logarithmic.

**Figure 2:** DERAILMENT PROBABILITY AND ESTIMATES OF LINEAR UTILITY



Curve depicts the utility value of education required to explain actual educational choice probabilities as a function of the probability of being derailed that students assume when making the choice. Derailed probability is exogenously varied from 0 to 80 percent. Periodic income utility function is linear.

## Appendix A: Two-Stage Least Squares

In attempting to demonstrate that attainment expectations affect outcomes, we have several concerns: unobserved heterogeneity may govern both beliefs and outcomes; students may already have made decisions about their futures at the time they are asked to assess their probability of college graduation and answer based on this (reverse causality); and our data on attainment expectations are also less exact than we would prefer, as we discuss in the next section. We would therefore like to apply a more rigorous econometric approach. If a valid instrument for attainment expectations in a model of actual attainment could be found, such concerns could be alleviated. But this is not a simple exercise, as Jacob and Wilder (2010) note. The evidence we provide suggests that the subjective probabilities students assign to future adverse shocks have some promise as an instrument for attainment expectations, for example. But issues and questions remain.

The argument for shock expectations as an instrument for attainment expectations could proceed as follows. Much of the relationship between expectations regarding adverse shocks and actual attainment seems to be explained by expectations regarding attainment itself, and subjective probabilities of adverse shocks are otherwise strongly related to attainment expectations. We might also think that subjective probabilities placed on things like being arrested or experiencing a pregnancy are likely to be less correlated with unobserved academic ability than subjective probabilities placed on college graduation (though admittedly not entirely uncorrelated). In this case, we have something resembling an instrument for a two-stage model regressing attainment on those expectations. However, we must consider in detail the assumptions necessarily being made.

First, we must assume that attainment expectations are sufficiently strongly predicted by the instability-related expectations variables we use as exclusions in the final model. Given our results, this is certainly true, particularly with respect to subjective probabilities regarding arrest and pregnancy.

Second, in a two-equation model of attainment and attainment expectations, we must

assume that everything included in the second equation is exogenous with regard to the error in that equation. Here, this means that once we control for demographics, background, and past instances of instability, expectations regarding future instability (arrest and pregnancy) are not correlated with omitted variables that pertain to educational expectations. This is unlikely to be strictly true; most importantly, it is possible that a respondent’s expectation regarding whether they will graduate (or attend) college causally impacts expectations with regard to instability. It is easy to think of an individual who would not predict impending arrest or pregnancy if they believed they were about to enroll in college, but since they do not anticipate this educational event, the subjective probability they assign to these other events increases. Without more detailed information about the process by which each respondent formulates their set of expectations, it will be difficult to alleviate this issue.

Third, we must assume that, controlling for demographics and past instability, expectations regarding future instability (specifically the ones which will appear only in the attainment expectations equation, those regarding pregnancy and arrest) do not have an impact on final attainment except through their influence on attainment expectations. We have some mixed evidence with regard to this assumption, which we cannot test perfectly. In Table 15 we also showed that the coefficients on arrest and pregnancy expectations are greatly reduced in size and significance by the inclusion of categorical attainment expectations in a model of college attainment, which may serve to lessen our concern with regard to this third assumption—though not entirely.

If we make these assumptions, we can estimate a two-equation model like that reported in Table 1. Specifically, we estimate the two-equation system

$$\begin{aligned}
 Y &= X\beta_{4X} + I\beta_{4I} + E\beta_{4E} + \varepsilon_4 \\
 E &= X\beta_{5X} + I\beta_{5I} + F\beta_{5F} + \varepsilon_5,
 \end{aligned}$$

where  $Y$  is the outcome (college graduation),  $X$  are demographic and background variables,

$I$  are reported instances of past instability in the respondent's life,  $F$  is our average subjective probability variable which represents expectations regarding future instability, and  $E$  is the raw subjective probability assigned to college attainment.

Taking a look at the first two columns of Table 1, we see that expectations regarding college attainment are negatively impacted by expectations regarding pregnancy and arrest and in turn have a significant positive effect on graduation probabilities, which is the essential relationship we have hypothesized. For good measure, we estimate two additional similar models: the first demonstrates that *enrollment in a four-year program* is positively related to attainment expectations modeled as the result of adverse shock expectations; the second shows that to the degree that four-year enrollment is a result of such shock expectations, it positively influences the probability of bachelor's degree *completion*.

The results from these estimations (in the last four columns of Table 1) serve as further suggestive evidence that our model of forward-looking decision-making applies to high school students in the NLSY: expectations about adverse shocks affect educational expectations and enrollment choices, which in turn affect completion. However, the above econometric concerns remain. Furthermore, as we explore in the paper, our qualitative evidence can serve a much more immediate purpose than simply suggesting what questions to examine with least-squares models—it can be used to directly shape a structural model.

**Table 1:** 2SLS: COLLEGE ATTAINMENT, EXPECTATIONS, AND INSTITUTION TYPE

	(1)		(2)		(3)	
	College grad	Expect: college (cat.)	College grad	fouryear2	Expect: college (cat.)	fouryear2
Expect: college (cat.)	0.14**					0.24***
Black	-0.04	0.30***	-0.01	-0.01	0.13**	-0.04
Hispanic	-0.08***	0.07	-0.05	-0.14***	-0.05	-0.13***
Asian or PI	0.05	0.35**	0.03	0.03	0.20	-0.03
Native American	-0.03	0.05	0.07	-0.21	-0.13	-0.20
Multiple races	-0.06	0.04	-0.06	-0.10	0.31	-0.17
Male	-0.06***	-0.21***	-0.06***	-0.02	-0.13***	0.00
Low income	-0.10***	-0.35***	-0.07	-0.14***	-0.21***	-0.09**
Mid income	-0.03	-0.15**	-0.01	-0.07**	-0.11*	-0.04
Mother no degree	-0.26***	-0.72***	-0.16**	-0.23***	-0.43***	-0.13**
Mother has HS diploma	-0.25***	-0.54***	-0.16**	-0.24***	-0.36***	-0.16***
Mother has some college	-0.17***	-0.34***	-0.10*	-0.16***	-0.23***	-0.10***
No mother in HH	0.00	0.00	0.00	0.00	0.00	0.00
No father in HH	-0.02	-0.08*	0.00	-0.05**	-0.06	-0.04
Changed schools	-0.07**	-0.10	-0.07	-0.10***	-0.23***	-0.05
Parent died	-0.06	-0.13	-0.06	-0.06	-0.06	-0.04
Other family died	-0.03*	0.01	-0.05**	0.03	0.04	0.03
Parent hospitalized	-0.06*	0.19***	-0.04	-0.01	0.12	-0.05
Parent jailed	-0.05	-0.17	-0.04	-0.08	-0.34**	-0.00
Parents divorced	-0.04	-0.03	-0.03	-0.05	-0.01	-0.05
Parent unemp	0.01	0.05	0.02	0.00	-0.03	0.00
Sibling count	-0.01	-0.04**	-0.01	-0.01	-0.05***	-0.00
Break-in by 18	-0.05**	0.10	-0.05	-0.02	0.05	-0.03
Bullied by 18	-0.02	0.00	0.01	-0.10***	0.03	-0.10***
Seen shooting by 18	-0.07***	-0.02	-0.08**	-0.04	-0.03	-0.03
Feels unsafe	-0.06***	-0.19***	-0.04	-0.11***	-0.20***	-0.06**
Victim of crime	-0.01	-0.07	-0.02	-0.02	0.00	-0.02
Ever homeless, 1997-2002	-0.13**	-0.10	-0.13	-0.18*	-0.19	-0.14
Expect: death	-0.09**		-0.08			-0.16***
fouryear2			0.50			
Expect: arrest		-0.58***		-0.18**	-0.60***	
Expect: pregnancy		-0.59***		-0.19**	-0.49***	
Constant	0.36	4.35***	0.52	1.02***	4.37***	0.01
Adjusted $R^2$						
Observations	2509		1784		1786	

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$