Preparing for an uncertain economy:

How occupational expectations, educational attainment, and labor market fluctuations predict death by suicide and substance abuse by midlife

Abstract:

Researchers have puzzled through the social, economic, and cultural forces that have shaped the recent increase in deaths by suicide and substance abuse in midlife. One possible explanation is that changes in the labor market structure related to limited opportunities for subbaccalaureate blue collar occupations has contributed to these deaths of despair. We take a life course perspective to investigate this hypothesis. We examine how adolescent occupational expectations and educational attainment are associated with death by suicide and substance abuse before midlife in a cohort of individuals that experienced changes in the occupational demands of the labor market during adulthood. Using the High School and Beyond dataset linked to mortality records in midlife, we find that adolescent men who expected occupations that ended up declining in labor market share during their adult lives are at increased risk of death by suicide or substance abuse by midlife. However, educational attainment appears to be protective of death by suicide. Our findings have important implications for understanding how labor market uncertainty shapes mortality.

The alarming increase in mortality rates among middle age white Americans in recent years is partially driven by an increase in suicide and substance abuse rates for this population (Case and Deaton 2015). Since the publication of these mortality trends, many have puzzled through the social, economic, and cultural explanations for the increase in these "deaths of despair" (Schmid 2016; Snyder 2016; Gelman and Auerbach 2016; Case and Deaton 2017). Educational attainment appears to be one potential correlate because these mortality increases are concentrated among non-college educated adults, but changes in patterns of educational attainment can only explain part of the increased rates of deaths from suicide and substance abuse (Case and Deaton 2017). Some researchers have argued that changes in the labor market structure in the 21st century, especially in relation to the decrease in blue-collar jobs, may play a role in these mortality rates, but analyses remain at the macro level (Case and Deaton 2017).

Little research has been able to estimate individual-level education and economic factors that contribute to risks of death by suicide and substance abuse.

We put forth such an analysis. Using the High School & Beyond dataset (HS&B), a nationally representative sample of sophomores and seniors in high school in the U.S. in 1980, matched to mortality records in midlife, we analyze the predictors of death by suicide and substance abuse by midlife. The cohort represented in the HS&B data offers a unique opportunity to investigate how serious transformations in the labor market link adolescent expectations to adult realities. During adolescence, as these individuals were developing expectations of where they will fit in the adulthood economic world, employment in blue-collar occupations that didn't require a college degree provided their parents and members of their communities with steady employment and middle-class lifestyles. However, after the introduction of computers and the shipping of many manufacturing jobs overseas, employment opportunities in these occupations decreased. Building off of recent sociological research that suggests that failure to meet expectations can play a role in suicide (Mueller and Abrutyn 2016; Abrutyn and Mueller 2018), we examine whether adolescents' occupational expectations combined with changes in occupational opportunities in labor markets have consequences for suicide and substance abuse mortality risks later in life.

In addition, we examine differences in mortality patterns for those who died by suicide and those who died by substance abuse, as reported by the death records. Most of the broad patterns described above are hypothesized to operate similarly for these types of mortality, but there may be differences in how these individuals' deaths are recorded postmortem or how their lives unfolded before their deaths (Rockett et al. 2015; Rockett et al. 2014). Some health scholars have criticized the *International Statistical Classification of Diseases and Related Health*

Problems (ICD-10) mortality codes for requiring the coroner to apply an intentionality for these deaths (Rockett et al. 2015). We investigate possible demographic, economic and educational differences between deaths by suicide and deaths by substance abuse, including drug and alcohol-related deaths.

Below, we discuss our theoretical model and literature relating economic and education factors to death by suicide and substance abuse. We hypothesize that adolescents who expect and are prepared to enter a specific sector of the labor market are at increased risk of death by suicide or substance abuse later in life if the labor market share of this employment sector declined. Given the gendered nature of employment in the blue collar jobs that decreased in labor market share during our time period of interest and of mortality patterns, we focus on men throughout our analyses. We further account for early life factors related to family background, mental health, and educational attainment in these pathways. This work has the potential to provide insights on how the link between economic downturns, expectations, and risks of death by suicide or substance abuse operates and the role of education in preparing students for the uncertainty of labor markets in adulthood.

Occupational Expectations and Labor Market Uncertainty

Our jobs define more than just where we get our salaries and benefits from; they shape who we interact with, where we choose to live, and how we define our identities. The generic question "What do you do?" can encapsulate many factors of life, but most often refers to "What do you do for work?" Our identities begin to form during adolescence, as we decide what opportunities are possible for us and within that set, what we want our lives to look like. An important aspect of this identity formation involves determining the type of job we want and can have (Fouad 2017). Of course, adolescents imagine their future occupations with little

information about how the labor market may change as they enter and progress through adulthood (Orrange 2007; Beck 1992). Instead, they rely on limited information often based on the expectations of their community, parents, schools, and peers to anticipate how their careers may unfold (Fouad 2017). Despite these limited and the fact that identities continue to shift across the life course as external and internal signals about where we belong and what we can do are received, adolescent occupational expectations can have a lasting effect. For example, research has found that adolescent occupational expectations are related to wages (Staff et al. 2010) and educational attainment (Morgan et al. 2010) later in life.

Part of forming occupational expectations is forming identities around the labor market and what type of life you anticipate having as an adult (Becker 1993). However, the types of occupations that supported middle-class lifestyles during high school may not support the same type of lifestyle later in life. The most salient recent example of this is the technological revolution that occurred between 1980 and 2000 and fundamentally changed the structure of the labor market. Jobs that required routine, manual skills largely disappeared as more highly skilled occupations increased in their labor market share (Autor et al. 2003). Thus, adolescents who expected an occupation that declined in labor market share after high school may not have achieved that expectation or the life they expected to have as an adult. Instead, they may be living drastically more economically precarious lives and experiencing the stress and strain that comes from such circumstances (Goldman et al. 2018). There are many ways these individuals may have reacted to this change—from instrumental life changes, such as returning to school for more training or migrating to parts of the country with better job opportunities, to emotional reactions, such as depression, substance abuse, and suicide.

Labor Market Changes and Mortality Risks

There is a substantial literature that supports the idea that broad labor market fluctuations are linked to suicide rates and deaths by substance abuse. For example, male suicide rates increased after an economic downturn in Portugal and during times of economic crisis in Asian countries (Pereira dos Santos et al. 2016; Chang et al. 2009). In fact, the World Health Organization warned of a potential increase in suicides after the crash in 2008 (WHO 2009). Individuals who have had negative labor market experiences are also more likely to die by suicide than those who are employed in high status jobs (Min et al. 2015; Kim et al. 2015; Schneider et al. 2011). Generalized economic insecurity, including poverty, foreclosure, and job loss, is also associated with increased risk of death by suicide and alcohol or drug related poisoning (Kerr et al. 2017). Yet, studies rarely have the ability to assess the role of expectations in individuals' reactions to economic fluctuations. We propose that individuals who expected occupations that decreased in labor market share over their life course will have higher rates of death by suicide and substance abuse than those who expected occupations that increased in labor market share.

Hypothesis 1: Adolescents who expected occupations that declined in labor market share after high school will have higher rates of suicide by midlife than those who expected occupations that increased in labor market share.

Educational Attainment and Morality Risks

In addition to changes in economic structures that make it harder to translate expected futures into realities, there is also important variation in individuals' abilities to respond to labor market changes. Specifically, individuals who go to college are more likely to possess flexible skills and credentials that facilitate their adaptation to changes in the labor market structure. Flexible skills, like analytic and communication skills, are favored over specific vocational

training because of potential fluctuations in labor market demands and occupational opportunities in the future. In this college-for-all era, a college degree is viewed of as essential to obtain jobs in the 21st century economy. Again, there is good reason to suspect that a college degree matters. In general, individuals with a college degree have lower risks of mortality, potentially due to these flexible skills that aid in improving health knowledge and behavior, as well as better opportunities for high status jobs and better financial security (Montez and Zajacova 2013; Masters et al. 2015).

Previous research has found that the increase in deaths by suicide and substance abuse is concentrated among those without a college degree, but disparities in educational attainment cannot account for the increased rates of these causes of death (Case and Deaton 2015; Case and Deaton 2017). Considering early life factors that contribute to decisions to go to college may be important to gain a better picture of what shapes mortality risks. For example, individuals who expected occupations that did not require a college degree may be less likely to enter into and persist through higher education, limiting their future labor market potential and flexible skills. Although a college degree is protective against early mortality in general, it may operate differently for death by suicide or substance abuse. Thus, we examine the role of educational attainment in predicting death by suicide or substance abuse, even when conditioning on early life background, mental health, and occupational expectations.

Hypothesis 2: Young adults with a college degree will be protected against mortality by suicide or substance abuse by midlife.

Hypothesis 3: Young adult educational attainment will be related to the increased risk of suicide or substance abuse death for adolescents who expected occupations that declined in labor market share after high school.

Dissecting the "Deaths of Despair"

One caution for understanding the role of the labor market in so-called "deaths of despair" is a careful consideration of the context of these deaths. Though in their 2015 article, Case and Deaton used the phrase "deaths of despair" to refer to deaths by suicide and substance abuse, recent research has questioned their conclusions that treat these types of mortality similarly. For example, Masters et al. (2017) finds that the only type of mortality that increased during this period was death by drug poisonings. The patterns that lead to this type of mortality, including access to and a reliance on medication as a cure for mental and physical pain (Dasgupta et al. 2018), may differ from the life course patterns that may lead to suicide. In addition, postmortem assignment of cause of death by coroners and medical examiners may be shaped by social forces and not just forensic analysis (Rockett et al. 2015; Rockett et al. 2014; Timmermans 2005; Timmermans 2006). For example, Rockett et al. (2015) found that the labeling of drug poisonings as "accidental" versus "intentional" varies across states and the structure of the medical institutions. Both of these findings suggest caution before aggregating causes of death.

As such, with this study, we examine possible differences in the early life demographic and mental health correlates of death by suicide or death by substance abuse. We examine whether individuals' background characteristics, adolescent expectations for declining occupations, and educational attainment operate similarly for these two types of mortality. To do this analysis, we leverage a unique dataset that includes longitudinal data and allows us to connect causes of death to early life social, academic, and economic factors.

Data

To examine the early-life correlates of mortality by suicide and substance abuse before midlife, we use a unique dataset comprised of a nationally representative sample of adolescents matched to mortality records. HS&B started as a survey of 60,000 sophomores and seniors nested within high schools in 1980. Respondents were followed up in 1982 and a nationally-representative panel was selected for the 1984, 1986, and 1992 (sophomore only) surveys. These data are supplemented with high school and postsecondary transcripts, as well as parent and teacher surveys. For this cohort, the jobs that decreased in labor market share are mainly male-dominated, blue-collar occupations that decreased with the increase of computers and overseas manufacturing. Thus, our analysis focuses on men, who were more likely to expect these jobs and die by suicide, than women, whose labor market plans often excluded these heavily male-dominated professions and have lower mortality risk at midlife.

Our analytic sample includes all male panel members who survived to the age of 25. We restrict our sample by age at death because we expect that there are different mechanisms driving mortality before and after early adulthood and one of our key independent variables, educational attainment, is measured during early adulthood. Our final analytic sample is 12,910[1].

Measures

Mortality by Midlife: HS&B cohort members' mortality status and cause of death was ascertained by matching records to the National Death Index and the Social Security Death Index, as well as supplementary information from internet searches, genealogical websites, credit bureau databases, and online obituaries (See Warren et al. 2017 for more details). Most sample members were around the age of 50 at the time of this data collection. Our outcome variable is a categorical variable indicating whether the respondent was alive or not found dead, died by

[1] N's rounded to nearest 10 per NCES regulations.

suicide, died by substance abuse, or died from some other cause. We categorized these deaths from ICD-9 and 10 codes, following Masters et al. (2017), Rockett et al. (2015) and Warren et al. (2018). Approximately 70 men died by suicide and 70 men died by substance abuse between age 25 and 2015. Although we combine death related to drugs and alcohol, this category is largely composed of people who died by drug poisoning.

Occupational Expectations: In their senior year of high school, the students were asked their occupational expectations for age 30. Students were given a list of 17 broad occupational categories (e.g. laborer, professional, homemaker, or service) from which to choose. We collapsed the 17 HS&B occupational categories into four larger categories using two parameters: the average educational attainment needed for the occupation and the change in labor market share of each category based on job information from the 1980 and 1990 (1%) census years. Appendix A displays which occupational categories from the survey fit into each category of our constructed variable. The four categories are subbaccalaureate jobs that decreased in labor market share, subbaccalaureate jobs that increased in labor market share, professional jobs, and expectations to not be working. Professional jobs also saw a net increase in the change in share of labor market. The no work category had no corresponding change in share of labor market.

Educational Attainment: We used each participant's highest self-reported educational attainment from the 1982 to 1992 surveys, supplemented with any degree attainment listed in the postsecondary transcript collection in 1986 and 1992. For our analysis, we reduced the educational attainment categories to high school diploma or less, some college, or Bachelor's degree or more. Those who had an associate's degree were coded in the "some college" category.

Early Mental Health: We condition on two indicators of adolescent mental health as early indicators of mental distress: depressive symptoms and locus of control. Depressive symptoms come from the following question: "During the past month, have you felt so sad, or had so many problems, that you wondered if anything was worthwhile?" We use a categorical indicator of whether the student reported having emotional distress never (the reference), once this month, or more than once this month. The locus of control scale indicates how much individuals feel they have control over what happens to them, with higher values indicating more perceived internal control.

Controls: We control on parents' educational attainment, race, cohort, and high school completion status.

Analytic Plan

Our analysis is largely descriptive to understand the early life patterns that are related to death by suicide and substance abuse by midlife. First, we analyze descriptive statistics of the full sample, and by type of mortality. Then we predict mortality with multinomial logistic regressions, where dying by suicide, dying by substance abuse, and dying by other means are compared to surviving until midlife. The results of our analyses are presented in odds ratios. We nest our models, first with background controls, then with occupational expectations, and educational attainment. Our results are weighted and use clustered standard errors at the school-level to account for the sampling design within schools. We use mean/mode imputation with flags for missing data on independent variables.

Given the small number of individuals who died by suicide or substance abuse before midlife, we present parsimonious models. We perform a number of robustness checks to understand whether the patterns we observe are driven by other observed factors related to

occupational expectations, educational attainment, and mortality risk. We describe these analyses more in depth after we present our main models.

Results

Table 1a presents the descriptive statistics of our full sample and Table 1b presents our sample distribution by mortality. Nearly half of adolescents in our sample expected a professional occupation and about one-third expected an occupation that declined in labor market share in adulthood. However, this pattern is flipped for those who died by suicide or substance abuse; nearly half expected an occupation that declined in adulthood. The majority of individuals in our sample did not attain any education past high school and about 20% had received a bachelor's degree by early adulthood. As noted by other research, educational attainment is protective against mortality in general, but the pattern differs by type of mortality. Other deaths and death by suicide have similar patterns, with about 80% of those exposed to these causes of death not receiving any education after high school. However, the pattern differs for deaths by substance abuse. Although those who died by this means have lower rates of educational attainment than those who survived to midlife, they had higher rates of college-going and bachelor's degree attainment than those who died by other causes.

There are a few notable differences among groups in the background characteristics as well. First, individuals with moderate emotional distress are at slightly higher risk of death by suicide or substance abuse than those who reported no depressive symptoms in adolescence. However, on average, adolescents with higher than average locus of control have higher risk of suicide and those with a lower than average locus of control have higher risk of death by substance abuse. In addition, those with a lower parents' education were more likely to die by suicide and those with a higher parents' education were more likely to die by substance abuse.

Lastly, white individuals are overrepresented among deaths by suicide and underrepresented by deaths by substance abuse compared with those who survived to midlife. This is largely driven by the overrepresentation of Hispanic individuals in deaths by substance abuse. We will save speculation about why this may be, and other patterns that may be different, for the discussion.

Next, we examine which of these patterns remain in regression models. Table 2 presents odds ratios from multinomial logistic regressions predicting mortality by midlife, with surviving to midlife as the reference. Our first model presents patterns of mortality with the background controls: race, parents' education, measures of mental health, and an indicator of leaving high school before senior year. Few coefficients reach statistical significance, but a few patterns we observed from the descriptive statistics remain. First, Hispanic individuals are less likely to die by suicide and more likely to die by substance abuse. Second, parents' education appears to be protective of mortality by other causes and by suicide, but positively predicts mortality by substance abuse. Adolescent locus of control negatively predicts death by substance abuse, suggesting that those with a higher belief that they can control their lives are less likely to die by substance abuse by midlife.

Conditioning on these factors in model 2, the relationship between occupational expectations and death by suicide or substance abuse we observed in Table 1b remains. Adolescents who expected an occupation that declined in labor market share in adulthood have more than twice the odds of death by suicide or substance abuse than those who expected a professional occupation. In model 3, we condition on educational attainment. Educational attainment is protective of suicide, and may account for part of the relationship between occupational expectations and death by suicide. The point estimate decreases to statistical nonsignificance with educational attainment in the model. However, educational attainment is

not significantly related to death by substance abuse and occupational expectations remain significantly related to this cause of mortality.

Robustness Checks

Our data are uniquely suited to examine the individual-level factors that predict death by suicide or substance abuse in midlife, but our analytic methods are limited by the sample size. We chose to display the most parsimonious models to display general trends in mortality in relation to educational attainment and occupational expectations. However, there are possible sources of endogeneity. Below, we summarize additional analyses we performed to consider alternative explanations for the trends we observe. These analyses are available upon request.

First, our theory suggests that unmet occupational expectations play an important role in predicting mortality by suicide or substance abuse before midlife, but we may be capturing unmet expectations instead. To test for this possibility, we have two strategies. First, we estimate whether those who expected to complete a bachelor's degree but didn't complete the degree (or enter college) by early adulthood are more likely to die by suicide or substance abuse than those who reached their educational expectations in early adulthood. For this analysis, we combined the male and female samples because the theory is not explicitly tied to the gendered nature of work. We do find some evidence that women who expected to complete a bachelor's degree, but didn't attain the degree by early adulthood, have an increased risk of suicide or substance abuse, but our sample size of women is too small to effectively estimate this alternative pathway. For men, there is no difference in mortality risk by met versus unmet educational expectations.

In addition, we examined occupational attainment in early adulthood to estimate whether the patterns we observe are capturing individuals who did not meet their expectations before the shift in labor market demands. Even when we consider occupational attainment, self-reported job

satisfaction, and unemployment in early adulthood, the patterns we observe hold. These ancillary analyses suggest that increased risk of mortality by suicide or substance abuse is not related to general unmet expectations. Rather, those who expected occupations that declined in labor market share during their adult lives are more likely to die by these causes before midlife.

Second, it is possible that the relationships we observe are due to expecting a subbaccalaureate occupation in general. Our main models compare expecting a subbaccaulaureate occupation that declined in labor market share with expecting a professional occupation. To test whether the education level of the occupation instead of the changing labor market share drives our results, we combine both subbacalaurate and professional occupations that increased in labor market share during this time into one category, and compare that to occupations that declined in labor market share. Our results are robust to this alternative model specification, but standard errors are inflated due to the heterogeneity of the reference category.

Another possible source of endogeneity is prior mental health. Mortality by suicide in particular may be linked to depression and mental disorders. We do have two measures in our models to condition on these factors, but there are other possibilities. We examined the bivariate relationship between all of the measures within the base year survey in HS&B that theoretically may be related to suicide and mental health issues (such as discipline issues, religiosity, family support, absenteeism, etc.) and suicide by midlife. None of these indicators have a significant bivariate relationship to suicide. These ancillary results suggest that patterns of mental health risk behaviors in adolescence are not associated with suicide risk after early adulthood, at least that could be detected with our sample size.

We additionally examined patterns related to community-level factors that may be related to substance abuse or suicide risk and occupational expectations. Individuals who grew up in

communities with higher labor market share of blue collar workers do have higher risk of suicide and substance abuse mortality before midlife. However, even conditioning on this community-level factor, our results hold. In fact, there is some evidence that adolescents who expected occupations that declined in labor marker share during adulthood are slightly protected against death by suicide or substance abuse if other adolescents in their school shared these expectations. Thus, individuals' occupational expectations are associated with death by suicide or substance abuse by midlife, even when accounting for the labor market structure of the community where they attended high school.

Discussion

Overall, our results suggest that expecting an occupation in adolescence that declined in labor market share during adulthood predicts suicide and death by substance abuse before midlife. Given that the occupations that declined during this period were male-dominated, we estimated this pattern on a male-only sample. As others have found, our results indicate that individuals who did not complete a college degree are at higher risk of suicide and other causes of mortality. The relationship between suicide and expecting to hold an occupation that declined in labor market share may operate through later educational attainment because those who expected these blue-collar jobs are less likely to enter higher education. These patterns were different for suicide deaths and deaths by substance abuse. Including educational attainment in the model attenuated the relationship between suicide and expecting a declining occupation to insignificance, but the relationship between expecting a declining occupation and death by substance abuse remained statistically significant when conditioning on educational attainment.

Our estimates of how occupational expectations during adolescence predicts suicide and death by substance abuse before midlife provide suggestive evidence of a possible pathway to

increased rates of these types of mortality for men in midlife. Expecting and being prepared to enter a specific type occupation that provides few opportunities in adulthood may lead to more economically precarious lives and experiencing the stress and strain that can culminate in substance abuse or suicide. We recognize that our findings are not definitive. As one of the first analyses to match individual-level economic and education factors to individual mortality, we think this paper provides an important first step to pinpointing how educational training for flexible jobs may be a key, but generally overlooked, tool for suicide and substance abuse prevention. Below, we suggest a few patterns worth exploring in more detail in future research.

First, we find that men who expected occupations that declined in labor market share during adulthood were more likely to die by suicide or substance abuse by midlife. We hypothesize that this link may be related to men not being able to live up to their expectations, both financially and in relation to their work identity. In Case and Deaton's broad analysis of suicide and substance abuse trends, they suggest a similar pathway, but include not being able to provide for a wife and family as a possible mechanism (2018). Although we do not explicitly test this possibility, we view it was an important direction for future research. These declining jobs are not only male-dominated, but also stereotypically masculine. Other research has noted that the explicitly masculine features of these occupations are what made them particularly appealing to certain men (Willis 1981). Future research should attempt to unpack how failure to meet expectations matters, and specifically, whether failure to meet certain kinds of expectations—be they gender-role expectations or occupational expectations—are more salient to predicting deaths of despair than others. This sort of knowledge is crucial to designing effective intervention strategies.

Second, we do find that educational attainment is a significant predictor of mortality in general, and suicide in particular, but our findings in regards to death by substance abuse and educational attainment run contrary to other theoretical explanations. Yes, those without a college degree are more likely to die by substance abuse than to survive to midlife, but individuals who died by this cause are more highly educated than those who died by other causes. One possible explanation is that we estimate mortality from age 25 to around age 50, whereas most research on the trends of substance abuse deaths are concentrated among those in midlife (ages 45 to 54). The earlier deaths may have occurred for those from higher status backgrounds who had more access to opioids, alcohol and other drugs earlier in life before the expansion of these drugs. In addition, pain management in older ages often is the spark for opioid use, and abuse, and so the earlier patterns we observe may not address this pathway to drug poisoning (Dasgupta et al. 2018).

On the other hand, these patterns may be driven by factors that occur postmortem; individuals from advantaged backgrounds and with a college degree may be less likely to be labeled as dying by "suicide" if they die by drug abuse than those from less advantaged backgrounds. There is evidence that families sometimes pressure medical examiners to render a certain kind of verdict (Timmermans 2005); to the extent that well educated families are better able to do this, we may see systematic bias in how deaths are ruled. The surprising difference in Hispanic deaths in relation to drug abuse and suicide brings this into question as well. Religiosity may play a role, in that those from Catholic backgrounds are less likely to want to be labeled as a suicide. We do not have the sample size to check these patterns, or to test this hypothesis, but it is an important direction for future research. Clearly, the life course processes we are investigating involve complexities that are difficult to untangle empirically. Future research

should be cautious when studying the different types of deaths of despair because of these disparities in family background and educational attainment.

Though there is certainly more to uncover about the relationship between the labor market, expectations, gender, and deaths by suicide and substance abuse, our study reveals a powerful link between early life occupational expectations and educational attainment and midlife mental health that is largely understudied in the existing literature on suicide and substance use. Additionally, because labor market changes are far from over, understanding the complex ways the economic world shapes individual's mental health and mortality risk is absolutely essential. New economic shifts, particularly from technology, are leaving new groups at risk of these deaths of despair. One particularly salient example is how the expansion of rideshare companies is decreasing the security of traditional taxicabs in New York City, which some news outlets have tied to an increase in deaths by suicide for taxicab drivers (Fitzsimmons 2018; Sadeque 2018). Additionally, as AI makes less low status jobs, including service jobs, less necessary, people whose identity and financial success relies on specific occupations may be at increased risk of suicide. Many tech companies who are on the cutting edge of these new technologies actually recognize these potentials and support a universal basic income for all Americans (Lowrey 2018). Entrepreneurial "creative destruction" within the economy may have the power to destroy people's lives as well. However, what is most needed at this time is empirical understanding of the link between occupational expectation, labor market fluctuations, and deaths of despair, both to reduce mortality risks for those in vulnerable occupations and to improve education such that all people can thrive or at least survive in an ever-changing economy.

NB: This is an early first draft for the conference proposal and it will be substantially revised.

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Table 1a. Descriptive Statistics (Before Imputation/With Weights)

	M	*S.D.*	Missing
Mortality			
Alive	94.0%		0.0%
Died: Other Causes	4.9%		
Died: Suicide	0.6%		
Died: Substance Abuse	0.6%		
Occupational Expectations			
Declining Subbaccalaureate	33.2%		7.9%
Increasing Subbaccalaureate	17.0%		
Professional	48.6%		
No work	1.2%		
Background Controls			
Senior Cohort	44.3%		0.0%
Race/Ethnicity			0.0%
White†	71.7%		
African American	10.9%		
Hispanic	11.6%		
Other	5.8%		
Parent Education			13.6%
High School or less†	45.8%		
Some college (or vocational)	27.7%		
BA/BS+	26.5%		
High school noncompleter	12.2%		0.0%
Depressive thoughts in last month			12.2%
Never	44.4%		
Once	29.9%		
More than once	25.7%		
Locus of Control	-0.057	0.69	11.4%
Early Adulthood Controls			
Highest Level of education			2.8%
High School or less†	64.7%		
Some College	15.4%		
Bachelor's Degree or more	19.8%		
N	*12,910*		

† = Reference Category

Table 1b. Descriptive Statistics by Mortality (Before Imputation/With Weights)

	Alive	Died: Other	Died: Suicide	Died: Substance Abuse
Occupational Expectations				
Declining Sub Baccalaureate	32.8%	38.0%	49.8%	48.5%
Increasing Sub Baccalaureate	17.1%	14.9%	18.6%	17.1%
Professional	49.0%	45.0%	31.6%	34.0%
No work	1.1%	2.2%	-	0.3%
Background Controls				
Senior Cohort	44.1%	47.2%	39.5%	52.7%
Race: White†	72.2%	62.0%	78.3%	66.7%
Race: African American	10.7%	16.1%	7.2%	8.4%
Race: Hispanic	11.4%	14.7%	7.1%	23.3%
Race: Other	5.7%	8.1%	7.5%	1.5%
ParED: High School or less†	45.6%	51.7%	50.3%	25.3%
ParED: Some college (or vocational)	27.5%	29.5%	32.3%	32.2%
ParED: BA/BS+	26.8%	18.7%	17.4%	42.5%
High school noncompleter	11.4%	26.4%	15.5%	28.0%
Depression: None	44.7%	42.0%	34.1%	32.0%
Depression: Once	29.9%	26.9%	34.9%	40.9%
Depression: More than once	25.4%	31.2%	31.0%	27.1%
Locus of Control	-0.051	-0.149	0.010	-0.295
(Standard Deviation)	(0.688)	(0.704)	(0.761)	(0.715)
EdAttain: High School or less†	63.8%	80.0%	79.5%	69.4%
EdAttain: Some Extended Education	15.5%	13.7%	13.7%	17.7%
EdAttain: Bachelor's Degree or more	20.7%	6.4%	6.8%	13.0%
N	*12,140*	*630*	*70*	*70*

† = Reference Category

Table 2: Multinomial logistic regressions predicting mortality before midlife, reporting odds ratios. Reference is alive in midlife.

	Model 1			**Model 2**			**Model 3**		
VARIABLES	Died: Other	Died: Suicide	Died: Substance	Died: Other	Died: Suicide	Died: Substance	Died: Other	Died: Suicide	Died: Substance
Occupational Expectations									
[ref. Professional]									
Declining Subbac				1.047	2.282*	2.333*	0.898	1.914	2.151*
				(0.154)	(0.904)	(0.836)	(0.133)	(0.796)	(0.712)
Increasing Subbac				0.896	1.590	1.556	0.826	1.479	1.470
				(0.168)	(0.799)	(0.790)	(0.155)	(0.737)	(0.709)
Educational Attainment									
[ref. High School or Below]									
Some College							0.747+	0.714	1.098
							(0.128)	(0.334)	(0.457)
Bachelor's Plus							0.292***	0.319+	0.675
							(0.0711)	(0.217)	(0.372)
Race [ref. white]									
Black	1.557**	0.573	0.857	1.515**	0.603	0.894	1.408*	0.556	0.870
	(0.232)	(0.253)	(0.454)	(0.230)	(0.266)	(0.473)	(0.215)	(0.250)	(0.457)
Hispanic	1.340+	0.544+	2.141*	1.312+	0.530+	2.065*	1.236	0.504+	2.012+
	(0.220)	(0.201)	(0.806)	(0.213)	(0.194)	(0.760)	(0.200)	(0.185)	(0.738)
Other	1.308	1.149	0.309	1.400	1.194	0.310	1.469	0.862	0.373
	(0.414)	(0.743)	(0.250)	(0.447)	(0.784)	(0.260)	(0.484)	(0.691)	(0.292)
Parents' Education [ref. High School]									
Some College	1.018	1.017	2.498*	1.025	1.106	2.689*	1.055	1.126	2.698*
	(0.152)	(0.413)	(1.060)	(0.154)	(0.436)	(1.126)	(0.159)	(0.437)	(1.127)
ParEd: Bach+	0.708+	0.536	3.930***	0.719+	0.651	4.758***	0.860	0.782	5.005***
	(0.125)	(0.269)	(1.535)	(0.129)	(0.340)	(1.891)	(0.156)	(0.380)	(1.999)
Locus of Control	0.931	1.262	0.610*	0.939	1.371	0.653+	0.995	1.452	0.662+
	(0.0907)	(0.434)	(0.132)	(0.0928)	(0.478)	(0.143)	(0.0992)	(0.509)	(0.147)

Table 2: [Continued]

Dep thoughts: once	0.901	1.552	1.773	0.904	1.527	1.736	0.886	1.477	1.723
	(0.131)	(0.639)	(0.754)	(0.131)	(0.628)	(0.739)	(0.129)	(0.605)	(0.733)
Dep thoughts: multiple	1.179	1.627	1.307	1.189	1.627	1.308	1.122	1.559	1.259
	(0.176)	(0.669)	(0.649)	(0.176)	(0.672)	(0.652)	(0.166)	(0.642)	(0.631)
High School Noncompleter	2.211***	1.977	1.991	2.096***	1.745	1.772	1.908**	1.548	1.747
	(0.447)	(1.070)	(0.893)	(0.418)	(0.983)	(0.786)	(0.378)	(0.829)	(0.771)
Constant	0.043***	0.005***	0.002***	0.042***	0.003***	0.001***	0.057***	0.004***	0.001***
	(0.005)	(0.002)	(0.001)	(0.006)	(0.001)	(0.001)	(0.009)	(0.002)	(0.001)

Note: Robust standard errors in parentheses. N=12,910. All models include flags for missing data and expecting no work in adulthood. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Appendix A: Categories of Occupational Expectations

Analytic Occupational Categories	HS&B Occupational Categories	% Change in Labor Market Share from 1980-1990 (Census)
Subbaccalaureate - Declining Share of Labor Market	Craftsman	-4.6%
	Farmer, Farm manager	-11.8%
	Laborer	-6.1%
	Military	-15.4%
	Operative	-16.0%
	Clerical	-6.1%
Subbaccalaureate - Increasing Share of Labor Market	Protective	+11.6%
	Service	+.4%
	Technical	+20.3%
	Sales	+6.8%
Baccalaureate - Professional	Manager, admin	+9.9%
	Professional 1	+13.0%
	Professional 2	+10.8%
	School Teacher	+5.3%
	Proprietor	N/A
Not Working	Homemaker	N/A
	No work	N/A