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An analysis of long-term unemployment

This article uses the National Longitudinal Survey of Youth 1979 (NLSY79) to examine long-term unemployment of men in the United States during their early careers and midcareers. Over 22 percent of men in the sample experienced at least one long-term spell of unemployment from their mid-20s through 2009. On average, the first spell lasted over 1 year. Logit estimates from hazard models showed that being black, having lower educational attainment, and having lower cognitive skills were associated with increased odds of having a long-term spell of unemployment in any given month. Hazard estimates also showed that black men had decreased odds of reemployment in any given month after onset of a long-term spell. Having a higher cognitive test score, being younger, and having been displaced on the prior job were associated with increased odds of reemployment. The wage costs of a long-term spell were persistent with wage losses found 5 years after onset of the first long-term unemployment spell.

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The Great Recession (December 2007–June 2009) and its aftermath highlighted the plight of the long-term unemployed (people unemployed for 27 weeks or more), as many of the unemployed entered the ranks of the long-term unemployed.[1] From December 2010 through November 2012, well after the recent recession ended, the long-term unemployed comprised at least 40 percent of the unemployed. In contrast, in June 1983, after the 1981–82 recession, the long-term unemployed peaked at 26 percent of the unemployed.[2]

Studies have found that workers who have been unemployed because of job displacement often experience persistent subsequent earnings losses, earnings volatility, and later periods of job loss, although not one of these studies looked specifically at the long-term unemployed.[3] When a household member is unemployed, household finances suffer: savings are often depleted, debt increases, and households may have trouble paying their rent or mortgage.[4] Long-term unemployment not only may affect finances negatively, it may also adversely affect the physical and mental health of the unemployed and negatively affect their children's schooling outcomes.[5]

As an individual's period of unemployment extends, he or she may become less employable because of depreciating job skills and decreasing search effort when the person becomes discouraged.[6] Employers may view long-term unemployment as a signal of lower worker quality, thus decreasing the likelihood that a long-term unemployed person is considered for a job.[7] Krueger, Cramer, and Cho posit that because of skill erosion, worker

discouragement, and employer discrimination, long-term unemployed individuals are less connected to the economy than those unemployed for a shorter term.[8] Using matched data from the Current Population Survey, they found that individuals who were long-term unemployed in a given month were less likely to be employed 15 months later than a comparison group of individuals who were unemployed for fewer than 27 weeks. The long-term unemployed were also more likely to withdraw from the labor market than those individuals unemployed for fewer than 27 weeks.

In the present article, I examine the long-term unemployment experience of a cohort of men from their mid-20s, after initial labor market churning occurs, until their mid- to late 40s and early 50s. Using the employment history of men in the National Longitudinal Survey of Youth 1979 (NLSY79), a cohort born in the years 1957–64, I estimate the hazards for entry into and exit from long-term spells of unemployment. I then estimate the wage loss over time associated with having had a long-term unemployment spell. For comparison, I show results for intermediate-term (unemployed 15–26 weeks) and short-term (unemployed 2–14 weeks) spells of unemployment. The rich longitudinal dataset, which includes a cognitive test score, measures of noncognitive skills, and a wide array of background characteristics, helped control for heterogeneity across individuals.

Empirical approach

This section outlines the empirical strategy used in this article for estimating the hazards for the onset of a long-, intermediate-, or short-term unemployment spell over one's early career and midcareer years and the subsequent hazards for exit through reemployment. It also describes a method for examining the wage changes over time, following a long-, intermediate-, or short-term unemployment spell.

I estimate separate reduced-form discrete-time hazard models to describe the onset of a first long-, intermediate-, or short-term unemployment spell and the subsequent exit into a job.[9] The hazard model for spell onset, which uses a logit functional form, controlled for both a set of time-invariant and -varying variables. Time-invariant variables included race; a cognitive test score; a noncognitive skill measure; and industry, region, and age at labor market entry. Time-varying variables included education, age, marital status, actual labor market experience, monthly state unemployment rate, and an indicator for whether the year is a recession or the year after.[10] Thus, the hazard gave the probability that a person enters the first long-term spell (for example) in a given month, conditional on a series of background characteristics.

Spell exit focused on those people who had at least one long-, intermediate-, or short-term unemployment spell. I converted the 27th (15th) [2nd] week of the long-term (intermediate-term) [short-term] spell into a month and considered it the starting point. The model, which again uses a logit functional form, controlled for a set of time-invariant variables. These variables included race, a cognitive test score, a noncognitive skill measure, an indicator for whether the spell began in a recession or the year after, and characteristics measured just before the first long-term unemployment spell (age and region at spell onset and hours, tenure, hourly wage, displaced [vs. quit or fired], and industry at last job). In addition, the models controlled for time-varying variables that included education, marital status, and the monthly state unemployment rate. A quartic in time was also included as a control. This second hazard gave the probability that a person obtains his or her first job after, for example, the 27th week of the first long-term unemployment spell, conditional on a series of background characteristics and time.[11]

Finally, to examine the effect of each type of unemployment spell on hourly wages, I use an econometric approach on the basis of work by Jacobson, LaLonde, and Sullivan.[12] In their approach, wages are a function of the time before and after the transition (job displacement in their case; long-, intermediate-, or short-term unemployment here). Before an unemployment spell, individuals may experience a deterioration in wages, perhaps because of declining demand conditions at their firm or because of moving in and out of employment relationships themselves after losing a job in a prior period. In the first years after the unemployment spell, wages might be lower because individuals have lost their firm-specific human capital and their general human capital may have depreciated. If they can build up human capital in their new job, their wages may increase over time. However, if individuals face additional periods of joblessness, wages may not recover over time. One could expect to see larger wage effects after long-term unemployment spells compared with shorter spells.

The equation used to model the effect of a first long-, intermediate-, or short-term unemployment spell on the log of hourly wages controlled for a set of time-invariant variables and time-varying variables. The time-invariant variables (which might influence wages) included race, a cognitive test score, and a measure of noncognitive skills. Time-varying variables included education, labor market experience and its square, annual state unemployment rate, region, and age. The equation also included a set of dummy variables indicating the onset of a first unemployment spell of a given type (long-term for example) in a future, current, or prior year, as well as a person-fixed effect.

Data

Data are from the NLSY79, a dataset well-suited for the topic of this article. The NLSY79 contains a complete work history for each respondent and differentiates between time spent unemployed and time spent out of the labor force. It also contains the Armed Forces Qualifying Test (AFQT) score for respondents, which measures math and verbal aptitudes and a rich array of background characteristics.[13] The survey began in 1979 with a nationally representative sample of 6,403 men and 6,283 women born between 1957 and 1964 and living in the United States during the initial survey. Respondents were interviewed annually through 1994 and biennially afterward. By the 2010 survey, NLSY79 respondents were ages 45 to 53. The NLSY79 includes oversamples of Blacks, Hispanics, military personnel (dropped after 1984), and low-income Whites (dropped after 1990).

The sample used in this article is restricted to men in the cross-section and black and Hispanic oversamples who completed the 2010 survey (N = 3,524), since women's labor force participation is generally more complicated because of fertility and child-care decisions.[14] The sample was reduced to 3,304 after deleting men with any active military service from the year they turned age 25 through the 2009 calendar year so that civilian labor market experiences were the focus. It is further reduced to 2,736 because of missing employment status information in the NLSY79 weekly work status main array.[15] A final sample of 2,661 was obtained after deleting 75 respondents who did not work 40 or more weeks per year for 2 consecutive calendar years from the year they turned 25 through 2009.

For the purposes of this analysis, I defined labor market entry as occurring in the year in which a respondent began a streak of working at least for 2 consecutive calendar years for at least 40 weeks per year. The earliest that I allowed this streak to begin is the January of the calendar year in which the respondent turned 25. Over two-thirds of the final sample entered in the January of the year they turned 25, and almost 93 percent entered by the January of the year they turned 29. These restrictions ensure that the men in the analysis are fully integrated into

the labor market, thus avoiding the labor market mobility (churning) that is common in the early years of work experience.

Table 1 provides descriptive statistics of the sample from labor market entry through 2009. For characteristics that have a discrete value of 0 or 1, such as race or education, the table displays the percentage of men in the sample with the characteristic. For continuous measures of characteristics, such as years employed, the table displays the mean value with its standard deviation in parentheses. Columns include descriptive statistics for the full sample of men and for the subsamples that ever had a long-term (unemployed for at least 27 weeks), intermediate-term (unemployed for 15–26 weeks), or short-term (unemployed for 2–14 weeks) unemployment spell.[16] Although the focus of the article is long-term unemployment, statistics and empirical results pertaining to intermediate- and short-term unemployment are given to show comparisons. However, as displayed in table 1, a considerable overlap exists in the samples of men who have had each type of spell.

Table 1. Descriptive statistics of a sample of men, born in the years 1957–64, by whether they ever had an LT, IT, or ST unemployment spell from labor market entry through 2009

Variable	All	No LT spell	Had LT spell	Had IT spell	Had ST spell	Had IT spell, no LT spell	Had ST spell, no LT spell
Unemployment experience							
Incidence of spells (percent)							
Had LT spell	0.223	0.000	1.000	0.458	0.334	0.000	0.000
Had IT spell	.210	.147	.433	1.000	.322	1.000	.237
Had ST spell	.503	.431	.755	.770	1.000	.696	1.000
Number of spells							
LT	.347 (.798)	.000 (.000)	1.559 (.983)	.789 (1.144)	.553 (.989)	—	—
IT	.312 (.719)	.189 (.517)	.740 (1.073)	1.481 (.850)	.322 (.467)	1.289 (.636)	.316 (.659)
ST	1.294 (1.972)	.966 (1.656)	2.436 (2.493)	2.499 (2.529)	2.571 (2.108)	1.837 (2.061)	2.242 (1.871)
Background							
Race/ethnicity (percent)							
Nonblack, non-Hispanic	.819	.852	.706	.759	.792	.813	.839
Black, non-Hispanic	.120	.091	.222	.177	.144	.126	.103
Hispanic	.061	.057	.072	.064	.064	.061	.058
Scores							
AFQT	.050 (1.037)	.187 (1.003)	–.438 (1.011)	–.310 (1.024)	–.162 (1.038)	–.142 (1.021)	.001 (1.015)
ASVAB coding speed	–.173 (.962)	–.064 (.940)	–.558 (.942)	–.519 (.946)	–.367 (.934)	–.350 (.967)	–.238 (.924)
Education at labor market entry (percent)							
Less than high school	.131	.100	.238	.198	.175	.133	.136
High school	.441	.425	.497	.519	.470	.521	.459
Some college	.195	.207	.155	.169	.191	.198	.209
Bachelor's degree or more	.233	.269	.111	.114	.163	.147	.196

See footnotes at end of table.

Table 1. Descriptive statistics of a sample of men, born in the years 1957–64, by whether they ever had an LT, IT, or ST unemployment spell from labor market entry through 2009

Variable	All	No LT spell	Had LT spell	Had IT spell	Had ST spell	Had IT spell, no LT spell	Had ST spell, no LT spell
Marital status and age at labor market entry (percent)							
Married	.398	.419	.325	.329	.362	.355	.383
Ages 24–27	.919	.936	.862	.888	.894	.914	.916
Age 28+	.081	.064	.138	.112	.106	.086	.084
Industry in first year of entry (percent)							
Agriculture/mining	.050	.049	.052	.048	.056	.051	.057
Construction	.118	.105	.164	.150	.149	.136	.141
Manufacturing	.230	.224	.254	.270	.241	.247	.236
Transportation	.070	.077	.048	.064	.066	.083	.072
Trade	.202	.201	.205	.207	.215	.229	.223
FIRE	.042	.044	.033	.032	.026	.034	.029
Business repair	.089	.085	.101	.077	.087	.062	.077
Personal services	.026	.028	.018	.028	.030	.032	.035
Entertainment/recreation	.017	.015	.021	.020	.016	.020	.013
Professional	.107	.115	.079	.077	.090	.076	.091
Public sector	.049	.056	.026	.025	.025	.029	.026
Labor market experience from entry through 2009 (years)							
Employed	21.807 (4.505)	22.746 (3.748)	18.532 (5.318)	19.515 (5.194)	20.817 (4.764)	21.228 (4.543)	22.157 (3.856)
Unemployed	.656 (1.218)	.182 (.311)	2.312 (1.671)	1.719 (1.640)	1.082 (1.438)	.716 (.408)	.373 (.370)
Out of labor force	1.192 (2.630)	.818 (2.111)	2.497 (3.649)	2.365 (3.751)	1.646 (2.950)	1.662 (3.334)	1.112 (2.287)
n	2,661	1,944	717	629	1,423	312	874

Notes: Means are reported, and standard deviations are in parentheses. All statistics are weighted. Long-term (LT) spell = unemployed for ≥27 weeks, intermediate-term (IT) spell = unemployed for 15–26 weeks, short-term (ST) spell = unemployed for 2–14 weeks, AFQT = Armed Forces Qualifying Test, and ASVAB = Armed Services Vocational Aptitude Battery, FIRE = finance, insurance, and real estate.

Source: National Longitudinal Survey of Youth 1979.

Over 22 percent of men had a long-term spell of unemployment from the time of labor market entry through 2009. About 21 percent of men had an intermediate-term spell, and over 50 percent had a short-term spell over this same period. Overall, the sample members averaged almost 22 years of employment experience from the year of labor market entry through 2009 (when the men were in their mid-40s to early 50s). They were unemployed for about two-thirds of a year and out of the labor force for almost 1.2 years over this same period.

Men who experienced a long-term unemployment spell differed from those who never experienced one. They were more likely to be Black and have lower levels of education and were less likely to be married at labor market entry; they also had over half a standard deviation lower AFQT and ASVAB coding speed scores.[17] Segal suggests that the score on the coding speed subtest of the ASVAB measures noncognitive skills, such as motivation and conscientiousness in low-stakes settings such as its administration as part of the NLSY79.[18] Men who ever had a

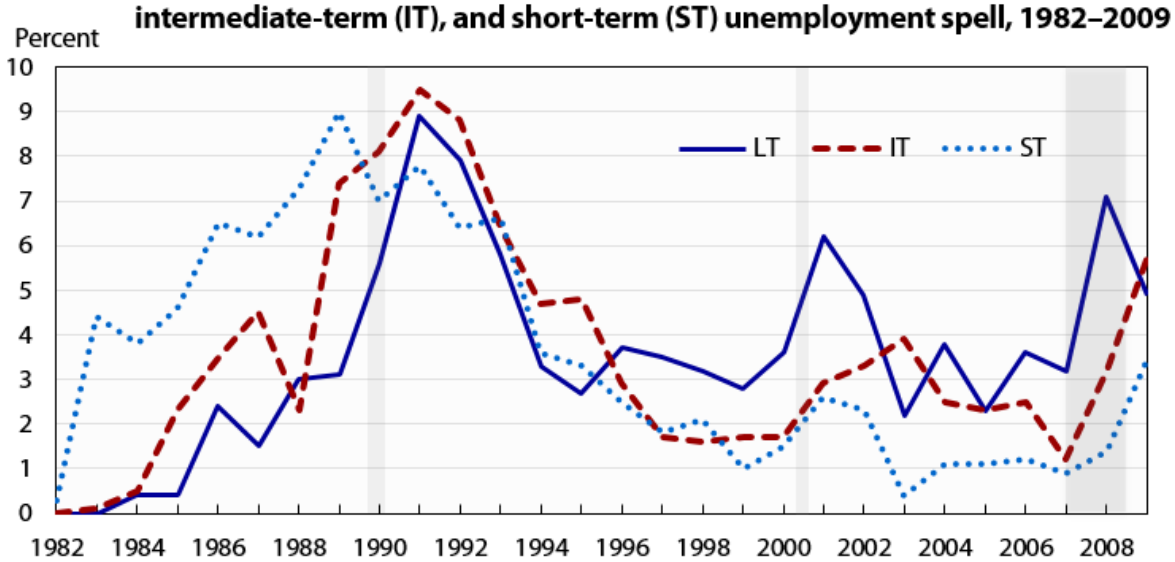
long-term unemployment spell also were more likely to have worked in seasonal industries that were prone to layoff, such as construction and manufacturing.

Of the men who never had a long-term unemployment spell, almost 15 percent had at least one intermediate-term spell and 43 percent had at least one short-term spell. Men who experienced a long-term unemployment spell were much more likely to have also experienced shorter spells—43 percent had at least one intermediate-term spell and more than 75 percent had at least one short-term spell. On average, those with a long-term unemployment spell experienced 1.6 long-, 0.74 intermediate-, and 2.4 short-term unemployment spells. Both groups accumulated significant amounts of labor market experience from labor market entry through 2009—18.5 years for men with a long-term unemployment spell and 22.7 years for men without a long-term unemployment spell.

The sample of men who ever had an intermediate-term spell, but no long-term spell, had overall higher levels of education and higher cognitive and noncognitive test scores than the levels of the sample of men who ever had a long-term unemployment spell. The same is true for the sample of men with a short-term spell but no long-term spell as compared with the sample of men with a long-term unemployment spell.

Figure 1 displays the calendar year of the onset of the first long-, intermediate-, and short-term spells of unemployment. The trend lines spiked around years of economic downturns, particularly for the first long-term spell. For example, in 1991 and 1992, when the men were early in their labor market careers, 8.9 and 7.9 percent, respectively, began their first long-term unemployment spell. In 2001, the time of another economic downturn, 6.2 percent of men began their first long-term unemployment spell. Finally, in 2008, the time of the most recent recession, 7.1 percent of men began their first long-term unemployment spell.

Figure 1. Percent distribution of calendar year of onset of first long-term (LT), intermediate-term (IT), and short-term (ST) unemployment spell, 1982–2009



Note: Shaded area represents recession as determined by the National Bureau of Economic Research.
Source: National Longitudinal Survey of Youth 1979.

Table 2 restricts the sample to men who experienced any unemployment spell. The table shows that, on average, the first long-term spell of unemployment lasted about 55 weeks, well above the 27-week definition of long-term unemployment. Note that the first long-term unemployment spell may have ended because men either found and

started a job or left the labor force.[19] Almost 89 percent of men with a first long-term spell of unemployment held a job by the end of 2009 (or sooner). An average of 38 weeks was between the 27th week of the first long-term spell and the start date of the next job.[20] Men with a long-term unemployment spell worked, on average, at least 10 years and had less than a third of a year of unemployment before the onset of that spell. About 90 percent of men had been holding a job in which they worked full-time before the spell. The average tenure on the job held before the long-term spell was over 4.5 years. About 54 percent left their prior job through no fault of their own (i.e., layoff or plant closing).[21]

Table 2. Descriptive statistics of a sample of men, born in the years 1957–64, who experienced first LT, IT, or ST unemployment spells

Variable	First LT spell	First IT spell	First ST spell	First IT spell, no LT spell	First ST spell, no LT spell
Education at onset of first spell (percent)					
Less than high school	0.200	0.178	0.158	0.118	0.118
High school	.503	.515	.473	.504	.464
Some college	.167	.168	.182	.200	.194
Bachelor's degree or more	.130	.139	.187	.178	.224
Marital status and age at onset of first spell (percent)					
Married	.485	.487	.512	.584	.563
Age ≤30	.238	.354	.591	.340	.590
Ages 31–39	.411	.393	.278	.346	.256
Age 40+	.350	.253	.131	.314	.154
Other characteristics at onset of first spell					
Monthly state unemployment rate	6.132 (1.847)	6.399 (1.792)	6.547 (2.070)	6.385 (1.814)	6.520 (2.063)
Recession or year after (percent)	.454	.414	.308	.450	.334
Employment experience up to spell onset					
Years employed	10.259 (6.617)	8.537 (6.336)	5.674 (6.160)	9.827 (6.860)	6.292 (6.708)
Years unemployed	.308 (.413)	.393 (.741)	.121 (.425)	.134 (.216)	.031 (.112)
Years out of labor force	.740 (1.512)	.452 (1.079)	.246 (.804)	.073 (.489)	.217 (.732)
Number of past LT spells	—	.245 (.581)	.083 (.346)	—	—
Number of past IT spells	.370 (.740)	—	.115 (.400)	—	.076 (.293)
Number of past ST spells	1.495 (2.045)	1.284 (1.818)	—	1.075 (1.623)	—
Job before first spell					
Hours ≥ 35 (percent)	.901	.904	.903	.904	.913
Hours < 35 (percent)	.099	.096	.097	.096	.087
Tenure (years)	4.535 (5.320)	3.782 (5.078)	3.800 (4.708)	4.744 (5.805)	4.281 (5.135)
Hourly wage (1982–84 dollars)	8.575 (8.075)	7.932 (5.806)	8.512 (7.168)	8.751 (6.833)	9.176 (8.171)
Why left job—displaced (percent)	.535	.577	.511	.614	.532
Why left job—fired or quit (percent)	.465	.423	.489	.386	.468
About first spell					

See footnotes at end of table.

Table 2. Descriptive statistics of a sample of men, born in the years 1957–64, who experienced first LT, IT, or ST unemployment spells

Variable	First LT spell	First IT spell	First ST spell	First IT spell, no LT spell	First ST spell, no LT spell
Length of spell (weeks)	54.936 (32.775)	19.749 (3.412)	5.794 (3.489)	19.740 (3.453)	5.802 (3.519)
Spell ongoing in December 2009 (percent)	.083	.033	.010	.040	.012
Employment after spell					
Ever employed ≥1 week (percent) (all observations)	.887	.953	.981	.951	.977
Weeks between 27th (15th) [2nd] week of LT (IT) [ST] spell and job start	37.963 (54.559)	12.598 (34.036)	9.560 (24.594)	9.719 (22.083)	7.549 (15.669)
n	717	629	1,423	312	874

Notes: Means are reported, and standard deviations are in parentheses. All statistics are weighted. Long-term (LT) spell = unemployed for ≥27 weeks, intermediate-term (IT) spell = unemployed for 15–26 weeks, short-term (ST) spell = unemployed for 2–14 weeks.

Source: National Longitudinal Survey of Youth 1979.

On average, the first intermediate-term unemployment spell lasted about 20 weeks and the first short-term spell lasted about 6 weeks. The men in the sample were younger at the onset of these first spells than they were at the onset of the first long-term spell. Still, average employment experience since labor market entry averaged 8.5 years at the onset of the first intermediate-term spell and 5.7 years at the onset of the first short-term spell. The men averaged 0.4 years of unemployment at the onset of the intermediate-term spell and 0.1 year at the onset of the first short-term unemployment spell. More than 95 percent of the men in each group were ever employed again. The average time between the 15th week of the first intermediate-term spell and the start of the next job was 12.6 weeks; the average time between the second week of the first short-term spell and the start of the next job was 9.6 weeks.

Table 3 provides descriptive statistics about the percentage of time employed, unemployed, and out of the labor force in the 2 years before and after the first long-, intermediate-, and short-term unemployment spells. In the first 2 years before their first long-term unemployment spell, the men spent a substantial percentage of time employed. On average, they worked 88 percent of weeks in the second year before the first spell of long-term unemployment and 81 percent of weeks in the first year before the first spell. About 77 percent of the men were working at least 90 percent of weeks in the second year before the first long-term unemployment spell, and 64 percent of the men were working at least 90 percent of weeks in the first year before the first spell. In the first year after the 27th week of the first long-term unemployment spell, the men worked, on average, 43 percent of weeks. However, in the second year after the 27th week of the spell, the men worked, on average, 70 percent of weeks, with 54 percent working at least 90 percent of weeks. The numbers after the spell were stronger for the first intermediate- and short-term unemployment spells.

Table 3. Employment experience of a sample of men, born in the years 1957–64, before and after the first LT, IT, or ST unemployment spells

Variable	First LT spell	First IT spell	First ST spell	First IT spell, no LT spell	First ST spell, no LT spell
Second year before unemployment spell					
Percentage of weeks employed	0.877	0.860	0.913	0.938	0.949
Percentage of weeks unemployed	.028	.073	.035	.015	.005
Percentage of weeks out of labor force	.095	.066	.052	.047	.045
Employed ≥90 percent of weeks (percent)	.767	.724	.847	.847	.901
Employed ≤10 percent of weeks (percent)	.059	.049	.033	.017	.016
n	698	601	945	300	595
First year before unemployment spell					
Percentage of weeks employed	.810	.829	.876	.889	.907
Percentage of weeks unemployed	.046	.070	.033	.025	.010
Percentage of weeks out of labor force	.143	.101	.091	.087	.082
Employed ≥90 percent of weeks (percent)	.641	.639	.750	.700	.794
Employed ≤10 percent of weeks (percent)	.084	.056	.037	.023	.025
n	717	622	1,069	306	677
First year after unemployment spell[(1)]					
Percentage of weeks employed	.434	.726	.805	.793	.839
Percentage of weeks unemployed	.490	.175	.126	.123	.103
Percentage of weeks out of labor force	.076	.099	.069	.082	.057
Employed ≥90 percent of weeks (percent)	.131	.316	.443	.375	.474
Employed ≤10 percent of weeks (percent)	.291	.063	.039	.033	.013
n	668	584	1,382	282	843
Second year after unemployment spell					
Percentage of weeks employed	.702	.816	.875	.897	.922
Percentage of weeks unemployed	.172	.095	.067	.033	.028
Percentage of weeks out of labor force	.125	.088	.057	.069	.049
Employed ≥90 percent of weeks (percent)	.540	.634	.740	.776	.814
Employed ≤10 percent of weeks (percent)	.173	.075	.041	.035	.017
n	627	568	1,357	271	826

Notes: Means are reported. All statistics are weighted. Long-term (LT) spell = unemployed for ≥27 weeks, intermediate-term (IT) spell = unemployed for 15–26 weeks, short-term (ST) spell = unemployed for 2–14 weeks.

See footnotes at end of table.

(1) First year after spell refers to year after 27th week of first long-term unemployment spell, year after 15th week of first intermediate-term spell, and year after 2nd week of first short-term spell.

Source: National Longitudinal Survey of Youth 1979.

Table 4 displays average real hourly wages (1982–84 dollars) in the years leading up to and following the calendar year of the onset of the first long-, intermediate-, and short-term unemployment spells.[22] I used the weekly work-history arrays in the NLSY79 to fill in hourly wages and hours worked per week of every job held in a particular calendar year.[23] The wages were deflated to 1982–84 dollars.[24] Sample size varied over the years (see table 4) because of periods of nonwork, timing of the unemployment spell, and invalid wage data.

Table 4. Hourly wages of a sample of men, born in the years 1957–64, around calendar year of first LT, IT, or ST unemployment spells (1982–84 dollars)

Years before or after spell	First LT spell		First IT spell		First ST spell	
	Hourly wage (dollars)	*n*	Hourly wage(dollars)	*n*	Hourly wage(dollars)	*n*
≥7 before	7.69	3,464	8.63	2,262	9.29	2,928
6 before	8.68	430	8.62	332	9.94	472
5 before	8.59	456	8.51	374	10.41	558
4 before	8.71	500	8.31	434	9.81	627
3 before	8.82	559	8.31	479	9.28	726
2 before	8.60	614	8.02	545	8.91	865
1 before	8.36	626	8.09	560	9.00	964
Year of spell	8.44	575	7.84	538	8.51	1,304
1 after	7.24	446	7.90	516	8.16	1,259
2 after	7.53	490	7.81	489	8.58	1,219
3 after	7.97	482	8.17	482	8.73	1,224
4 after	8.10	462	8.05	463	8.95	1,191
5 after	8.39	424	8.35	457	9.28	1,172
6 after	8.33	402	8.80	432	9.38	1,137
≥7 after	8.88	3,359	9.47	3,970	10.59	13,138
Workers with no LT (IT) [ST] spell	12.08	41,477	12.01	42,433	12.90	25,982

Notes: Means are recorded. All statistics are weighted. Long-term (LT) spell = unemployed for ≥27 weeks, intermediate-term (IT) spell = unemployed for 15–26 weeks, short-term (ST) spell = unemployed for 2–14 weeks.

Source: National Longitudinal Survey of Youth 1979.

Turning to the first long-term unemployment spell, one can see that 1 calendar year after the onset of the first long-term unemployment spell, hourly wages were 14 percent lower than the hourly wages in the year of the onset. By 5 years after the calendar year of the first long-term spell onset, real hourly wages were approximately even with real hourly wages in the year of the spell onset. However, even 7 or more years after the onset, hourly wages were still considerably lower (more than 30 percent) than the average hourly wages of workers who had never experienced a long-term spell of unemployment.

The second and third sets of columns depict hourly wages before and after the first intermediate- and short-term spells of unemployment. The columns show that hourly wages were approximately the same the year after the onset of a first intermediate-term spell as they were the year of the onset. In addition, 1 year after the onset of a

first short-term spell, hourly wages were about 5 percent lower than hourly wages at the year of the onset, but then quickly rose to above onset levels.

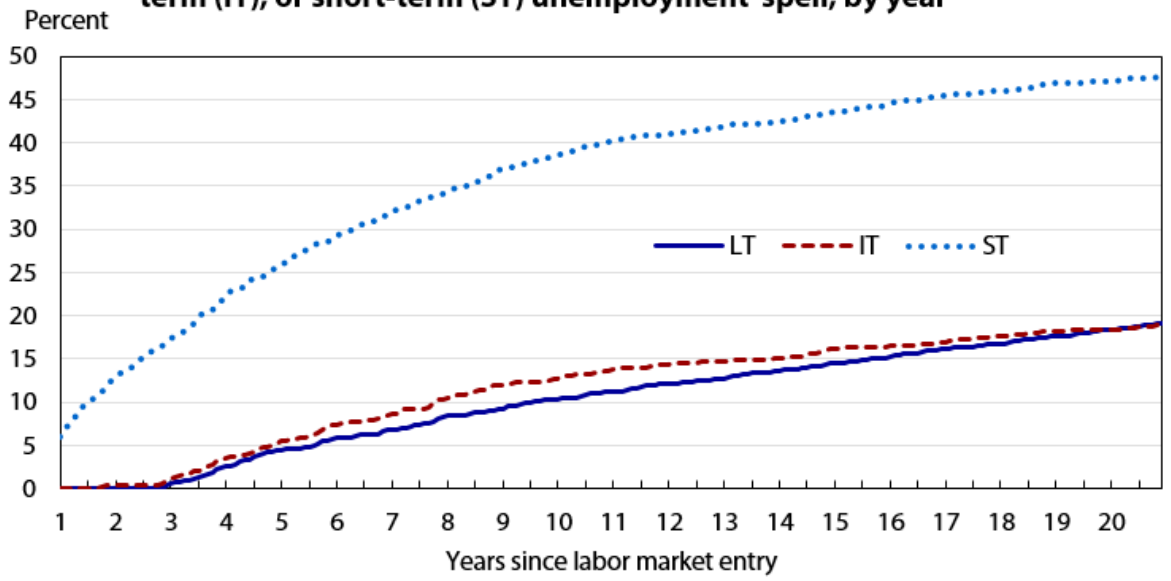
The numbers in tables 1 through 4 suggest that, at least on average, men who experienced a long-term unemployment spell were attached to the labor market before the spell. They worked full-time, had a substantial amount of job tenure, and worked a high proportion of weeks in the 2 years before the spell onset. However, their levels of education and cognitive and noncognitive test scores were lower than the levels of men without a long-term unemployment spell. On average, the men experienced a wage decrease in the year after the onset of the long-term unemployment spell, and although wages increased in subsequent years, they remained much lower, on average, than the wages of workers who never experienced a long-term spell of unemployment.

Empirical results

This section describes results from reduced-form logit models of the hazards for men entering into a long-, intermediate-, or short-term unemployment spell over their early career and midcareer years and the subsequent hazards for exit through entry into an employment relationship. It also shows estimates of wage losses over time following each type of unemployment spell.

Onset of first long-, intermediate-, or short-term unemployment spell. To begin, figure 2 displays the cumulative percentage of men who had begun a first long-, intermediate-, or short-term unemployment spell in each month.[25] Although the data are monthly, for ease of interpretation, the horizontal axis labels are displayed in yearly intervals. Note that men did not necessarily transition directly from a period of employment to the unemployment spell, although the descriptive statistics show that before each spell type, they had, on average, substantial work experience since labor market entry. For example, almost 80 percent of the long-term unemployed were employed in at least 1 of the 4 weeks before the onset of the spell.

Figure 2. Percentage of men who had begun a long-term (LT), intermediate-term (IT), or short-term (ST) unemployment spell, by year



Source: National Longitudinal Survey of Youth 1979.

The curves for the long- and intermediate-term spells are very similar, with the onset of unemployment gradually rising from 2 years after labor market entry on. The curve for short-term unemployment has a much steeper slope over approximately the first 5 years since labor market entry. Five years after labor market entry, almost 6 percent of the sample of men had begun a long-term unemployment spell, 7 percent had begun an intermediate-term spell, and nearly 29 percent had begun a short-term unemployment spell. By 10 years after entry, 11 percent, 14 percent, and 40 percent of them had begun a long-, intermediate, and short-term unemployment spell, respectively. By 20 years after labor market entry, 19 percent of men had begun a long- or intermediate-term spell of unemployment and 48 percent had begun a short-term spell of unemployment. The hazard results that follow include controls for a series of background characteristics.

Table 5 displays odds-ratio estimates and *p*-values from logit estimation of the hazard for beginning a first long-, intermediate-, or short-term unemployment spell. The *p*-values were based on robust standard errors clustered by person identifier. Rather than including year effects in the estimation, I include an indicator set equal to 1 if the year was a recession or followed a recession. Figure 1 shows spikes up in spell onset in the year of and the year that followed a recession. Monthly state unemployment rate controlled for labor market conditions as well. Estimation shown in table 5 was performed using 2,661 men and 634,643 (long-term), 632,199 (intermediate-term), and 444,608 (short-term) person months.[26]

Table 5. Logit estimates from hazard models of onset of first LT, IT, or ST unemployment spells: men born in the years 1957–64

Variable	LT unemployment		IT unemployment		ST unemployment	
	Odds ratio	*p*-value	Odds ratio	*p*-value	Odds ratio	*p*-value
Background						
Black, non-Hispanic	1.650	0.000	1.168	0.202	1.039	0.658
Hispanic	1.059	.658	.894	.409	.888	.186
AFQT score	.832	.012	.982	.812	.921	.118
ASVAB coding speed score	.885	.070	.801	.003	.846	.000
Less than high school	2.204	.000	1.987	.002	1.388	.034
High school	1.671	.004	1.763	.002	1.252	.045
Some college	1.429	.060	1.366	.120	1.091	.466
Work experience (years)	.976	.084	.958	.008	.908	.000
Monthly state unemployment rate	1.085	.002	1.148	.000	1.131	.000
Recession or year after	1.959	.000	1.671	.000	1.213	.006
Married	.518	.000	.546	.000	.712	.000
Ages 31–39	1.658	.001	1.301	.132	.841	.137
Age 40+	1.818	.019	1.173	.563	1.025	.903
n	2,661	—	2,661	—	2,661	—
n person months	634,643	—	632,199	—	444,608	—

Notes: Included in logit hazard models are age, region, and industry at labor market entry dummy variables. Data are monthly. Data are weighted. Robust standard errors clustered by person identifier used for *p*-value calculations. Long-term (LT) spell = unemployed for ≥27 weeks, intermediate-term spell (IT) = unemployed for 15–26 weeks, short-term (ST) spell = unemployed for 2–14 weeks, AFQT = Armed Forces Qualifying Test, and ASVAB = Armed Services Vocational Aptitude Battery.

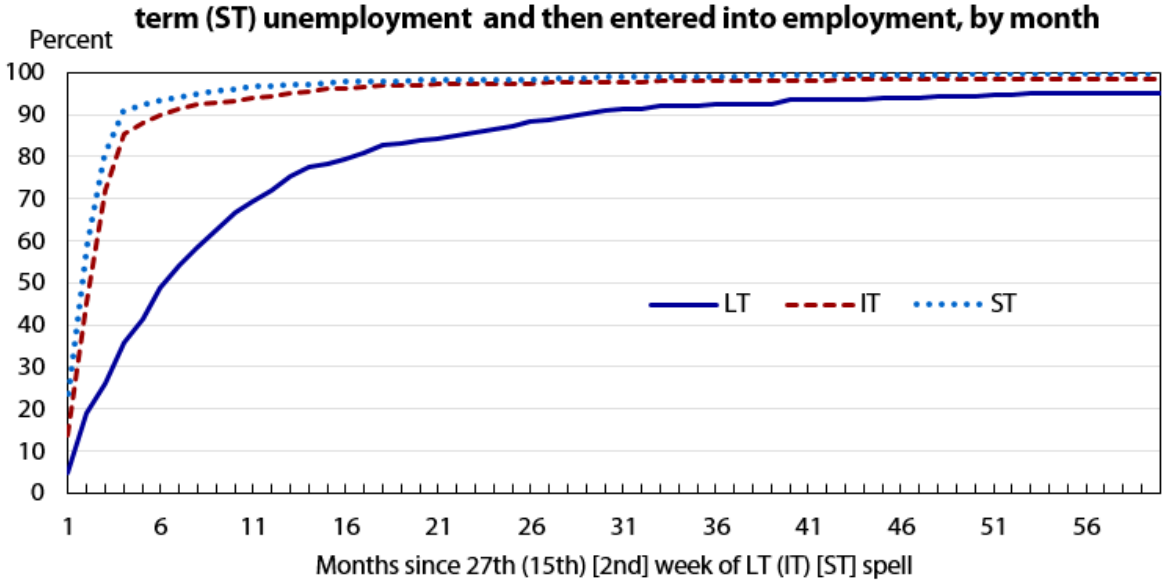
Source: National Longitudinal Survey of Youth 1979.

The second column (long-term unemployment) of table 5 indicates that non-Hispanic black men had 65-percent higher odds of an onset of a first long-term unemployment spell in any given month compared with non-Hispanic nonblack men. Education is important in the hazard for beginning a long-term unemployment spell, with lower education levels having the highest odds. For example, compared with men with a bachelor's degree or more, men with less than a high school diploma had over 120-percent higher odds of beginning a first long-term unemployment spell in any given month, and men with a high school diploma had 67-percent higher odds. Higher AFQT scores and noncognitive skills measured by ASVAB coding speed were associated with lower odds of having a first long-term spell. An increase of 0.5 in AFQT score (half a standard deviation) results in about an 8-percent decrease (0.5*(1 – 0.832) = 0.084) in the odds of beginning a first long-term unemployment spell in any given month. Married men had lower odds of having a first long-term unemployment spell than unmarried men. The year of a recession or the year that followed was associated with a 96-percent increase in the odds of beginning a long-term unemployment spell. A higher state monthly unemployment rate was also associated with increased odds of beginning a long-term unemployment spell.

In the hazard results for the first intermediate- and short-term unemployment spells, race was not statistically significant. Although education was still significant in the intermediate- and short-term spell hazards, the penalty associated with having less than a high school diploma was smaller, particularly for a first short-term spell onset.

Exit from first long-, intermediate-, or short-term unemployment spell into a job. Figure 3 displays the cumulative percentage of men who entered a job in each month following the 27th, 15th, or 2nd week of their first long-, intermediate-, or short-term spell of unemployment, respectively (or 1 minus the survival rate in their first unemployment spell). Unlike in figure 2, which shows the cumulative percentage of men who had begun a first long-, intermediate-, or short-term unemployment spell in each month, figure 3 shows the short- and intermediate-term curves overlapping, rather than the intermediate- and long-term curves. In the first 2 months or so, the short- and intermediate-term curves rose sharply, because the vast majority of men had returned to work. The long-term unemployed took longer to find work (by definition), with the curve in the figure rising for about the first 12 months, then becoming less steep and, at about 30 months, flattening out as fewer and fewer of the very long-term unemployed entered into an employment relationship. By 6 months, 41 percent of the long-term, 88 percent of the intermediate-term, and 92 percent of the short-term unemployed had returned to work. By 2 years, 87 percent of the long-term, 97 percent of the intermediate-term, and 98 percent of the short-term unemployed had found jobs.

Figure 3. Percentage of men who had long-term (LT), intermediate-term (IT), or short-term (ST) unemployment and then entered into employment, by month



Source: National Longitudinal Survey of Youth 1979.

Table 6 shows odds-ratio estimates and *p*-values from the logit estimation of the hazards for exiting from the month of the 27th week of the first long-term unemployment spell into a job, the 15th week of the first intermediate-term spell, and the 2nd week of the first short-term spell. Estimation used men from the sample of 2,661 who had a long-, intermediate-, or short-term unemployment spell. The subsamples contain 717 men with a long-term, 628 men with an intermediate-term, and 1,421 men with a short-term spell, along with 9,232 (long-term), 3,885 (intermediate-term), and 5,450 (short-term) person months. The hazard includes a quartic in time to control for the negative duration dependence in the probability of entering a job (particularly from a first long-term unemployment spell, as shown in figure 3).

Table 6. Logit estimates from hazard models of first LT, IT, or ST unemployment spells to entry into employment: men born in the years 1957–64

Variable	LT unemployment		IT unemployment		ST unemployment	
	Odds ratio	*p*-value	Odds ratio	*p*-value	Odds ratio	*p*-value
Background						
Black, non-Hispanic	0.654	0.002	0.602	0.001	0.813	0.032
Hispanic	.974	.866	.694	.014	.97	.789
AFQT score	1.212	.017	1.036	.654	1.023	.662
ASVAB coding speed score	.932	.337	.915	.159	1.016	.746
Less than high school	1.022	.933	.892	.663	.812	.183
High school	1.216	.353	.925	.725	.947	.637
Some college	1.446	.073	.839	.438	.822	.102
Monthly state unemployment rate	.924	.021	.934	.042	.989	.599
Married	1.131	.266	1.155	.227	1.207	.021
Before spell						
Work experience (years)	.979	.185	1.015	.474	.986	.365

See footnotes at end of table.

Table 6. Logit estimates from hazard models of first LT, IT, or ST unemployment spells to entry into employment: men born in the years 1957–64

Variable	LT unemployment		IT unemployment		ST unemployment	
	Odds ratio	*p*-value	Odds ratio	*p*-value	Odds ratio	*p*-value
Ages 31–39	.657	.005	.586	.000	.704	.002
Age 40+	.442	.000	.457	.007	.695	.162
Recession or year after	1.026	.835	.991	.933	.835	.027
Characteristics of last job						
Hours ≥ 35	1.176	.292	1.039	.837	1.192	.242
Job tenure (years)	1.011	.36	1.003	.821	1.000	.973
Job hourly wage	1.008	.159	.995	.566	1.003	.588
Why left job—displaced	1.198	.102	1.400	.002	1.204	.036
n	717		628		1,421	
n person months	9,232		3,885		5,450	

Notes: Included in logit hazard models are quartic in time, industry dummy variables from job before spell, and region dummy variables for year of spell onset. All statistics are monthly and weighted. Robust standard errors clustered by person identifier are used for *p*-value calculations. Time until entry is calculated from 27 weeks into the long-term unemployment spell, 15 weeks into the intermediate-term unemployment spell, and 2 weeks into the short-term unemployment spell. Long-term (LT) spell = unemployed for ≥27 weeks, intermediate-term (IT) spell = unemployed for 15–26 weeks, short-term (ST) spell = unemployed for 2–14 weeks, AFQT = Armed Forces Qualifying Test, and ASVAB = Armed Services Vocational Aptitude Battery.

Source: National Longitudinal Survey of Youth 1979.

The second column (for exit from long-term unemployment) of table 6 shows that black men had about 35-percent lower odds of exiting from their first long-term unemployment spell into a job in any given month compared with non-Hispanic nonblack men. Education is not statistically significant in the hazard. However, a 0.5 increase in AFQT score, half a standard deviation, resulted in almost an 11-percent increase in the odds of starting a job in any given month. Men who were older at the start of their first long-term spell had lower odds of finding a job compared with men 30 and under. Having a long-term unemployment spell that had begun in a recession or in the year following the recession did not significantly affect the odds of finding a job in any given month, although a higher monthly state unemployment rate was associated with decreased odds.

As shown in the next two sets of results in table 6 (for intermediate- and short-term spells), black men also had lower odds of exiting from their first intermediate- or short-term unemployment spell into a job in any given month compared with non-Hispanic nonblack men. AFQT score was not statistically significant. In addition, displaced workers were more likely to be reemployed in any given month relative to their peers who quit or were fired from their prior job.

Wage effects of long-term unemployment. I next use an unbalanced panel of NLSY79 data to examine whether hourly wages varied over the time leading up to or following the first long-, intermediate-, or short-term unemployment spell.[27] Table 7 displays coefficients for dummy variables that indicate each year leading up to and after each type of spell. The calendar year of the onset of each type of spell is the excluded dummy variable.[28] For ease of interpretation, I also convert the coefficients on the dummy variables into percentages, shown in brackets in table 7.[29] Each specification in the table includes a person-level fixed effect and time-varying controls (education, experience and its square, region, and annual state unemployment rate). Robust standard errors

clustered by person identifier are shown in parentheses. Each specification uses 54,766 annual wage observations for 2,653 men.[30]

Table 7. Effects of LT, IT, or ST unemployment spells on real log hourly wages (1982–84 dollars) of men born in the years 1957–64: individual fixed-effect specifications

Years before or after spell	First LT spell	First IT spell	First ST spell
≥7 before	0.139 (0.030) [0.149]	0.146 (0.031) [0.157]	0.131 (0.026) [0.140]
6 before	.111 (.032) [.117]	.121 (.025) [.129]	.123 (.028) [.131]
5 before	.108 (.031) [.114]	.099 (.026) [.104]	.123 (.025) [.131]
4 before	.102 (.030) [.107]	.069 (.025) [.071]	.082 (.022) [.086]
3 before	.103 (.027) [.109]	.041 (.022) [.042]	.066 (.018) [.068]
2 before	.091 (.023) [.095]	.043 (.020) [.044]	.036 (.015) [.037]
1 before	.041 (.017) [.042]	.040 (.017) [.041]	.020 (.014) [.020]
1 after	–.149 (.026) [–.138]	–.050 (.021) [–.049]	–.039 (.012) [–.038]
2 after	–.109 (.027) [–.103]	–.070 (.021) [–.068]	–.038 (.015) [–.037]
3 after	–.099 (.028) [–.094]	–.068 (.026) [–.066]	–.037 (.016) [–.036]
4 after	–.088 (.027) [–.084]	–.088 (.025) [–.084]	–.031 (.016) [–.031]
5 after	–.097 (.031) [–.092]	–.061 (.026) [–.059]	–.037 (.017) [–.036]
6 after	–.116 (.031) [–.110]	–.054 (.026) [–.053]	–.030 (.018) [–.030]
≥7 after	–.137 (.028) [–.128]	–.078 (.027) [–.075]	–.055 (.020) [–.054]

Notes: Robust standard errors clustered by person identifier are in parentheses, and coefficients are converted to percent in brackets. All statistics are weighted. Sample consists of 2,653 men and 54,766 wage observations. Controls include education, experience, experience squared, age dummy variables, regional dummy variables, and annual state unemployment rate. Long-term (LT) spell = unemployed for ≥27 weeks, intermediate-term (IT) spell = unemployed for 15–26 weeks, short-term (ST) spell = unemployed for 2–14 weeks.

Source: National Longitudinal Survey of Youth 1979.

In the long-term unemployment column in table 7, one can see that relative to the year of onset, wages were positive in the years leading up to the first long-term spell. The coefficients trend downward in the 2 years before the onset of the spell, reflecting declining wages before the spell. In the first year after the onset, hourly wages were about 14 percent lower than the wages in the year of the onset. Although hourly wages increased slightly in the second year after the onset, they remained lower than in the year of the onset. Five years after the onset of the first long-term unemployment spell, hourly wages were 9 percent lower than the wages in the year of the spell's onset. When the variables indicating time before or after a long-term unemployment spell were each interacted with a dummy variable set equal to 1 if the worker was displaced on his prior job (vs. quit or fired), the coefficients on the interaction terms were not statistically different from zero. This finding suggests that compared with the effects of a first long-term unemployment spell on wages of workers not displaced, the effects on wages of workers who left their jobs through no fault of their own (i.e., were displaced) were not different.

The third and fourth columns of table 7 display the time path of hourly wages before and after the first intermediate- and short-term unemployment spells, respectively. One year after the onset of the first intermediate-term spell, hourly wages were almost 5 percent lower than wages in the year of the onset. The comparable number was nearly 4 percent for 1 year after the onset of the first short-term unemployment spell. Both coefficients were much lower in absolute value than the decrease of 14 percent associated with a first long-term

unemployment spell. By 5 years after onset, the effects of intermediate- and short-term unemployment spells remained virtually unchanged, at –6 percent and almost –4 percent, respectively.

Compared with results from prior research using displaced workers, the estimates found in table 7 are lower. Six years after displacement, Stevens found an 11- to 12-percent decrease in wages relative to the year of displacement.[31] Jacobson, LaLonde, and Sullivan, using data for Pennsylvania, found a very large effect—a 25-percent reduction in wages 6 years later.[32] However, replicating Jacobson, LaLonde, and Sullivan using data from Connecticut and a later time, Couch and Placzek found a 13- to 15-percent reduction in wages 6 years after displacement.[33]

Conclusion

The study of long-term unemployment and its consequences has become particularly salient because of the large increase in the number of long-term unemployed during and after the Great Recession. This article focuses on long-term unemployment over men's careers. It examines the impact of their past labor market histories and background on the likelihood of experiencing a long-term unemployment spell, the odds of reemployment, and the wage trajectory before and after a first spell. Article results revealed that over 22 percent of men in the NLSY79 experienced at least one long-term unemployment spell from their mid-20s through 2009. The first spell lasted over a year, on average. Men who experienced a first long-term unemployment spell were typically attached to the labor market before the spell. They worked full-time, had a substantial amount of job tenure, and worked a high proportion of weeks in the 2 years before the spell onset. Most men found a job after a first long-term unemployment spell. By 2 years after the 27th week of the spell, the men worked an average of 70 percent of weeks in the year and 54 percent worked at least 90 percent of weeks in the year.

Hazard models for spell onset showed that black men, men with lower levels of education, and men with lower cognitive test scores had higher odds of having a first long-term unemployment spell in any given month. Black men were also less likely to be reemployed after a long-term spell compared with non-Hispanic nonblack men. Having a higher cognitive test score, being younger, and having been displaced on the prior job were found to be associated with increased odds of reemployment. Hourly wage losses after a first long-term unemployment spell persist 5 or more years after spell onset.

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NOTES

1 See, for example, Congressional Budget Office "Understanding and responding to persistently high unemployment," A CBO Study, February 2012.

2 See U.S. Bureau of Labor Statistics, historical data series LNS13025703, https://data.bls.gov/timeseries/LNS13025703.

3 Louis Jacobson, Robert LaLonde, and Daniel Sullivan, "Earnings losses of displaced workers," *American Economic Review,* vol. 83, September 1993, pp. 685–709; Ann Huff Stevens, "Persistent effects of job displacement: the importance of multiple job losses," *Journal of Labor Economics*, vol. 15, no. 1, part 1, January 1997, pp. 165–188, http://www.journals.uchicago.edu/doi/abs/10.1086/209851; and Til von Wachter, Jae Song, and Joyce Manchester, "Long-term earnings losses due to mass layoffs during the 1982 recession: an analysis using administrative data from 1974–2004," unpublished working paper, April 2009.

4 Rich Morin and Rakesh Kochhar, "The impact of long-term unemployment: lost income, lost friends—and loss of self-respect," *A social and demographic trends report*, Pew Research Center, July 2010.

5 Ibid. Also see Daniel Sullivan and Til von Wachter, "Job displacement and mortality: an analysis using administrative data," *Quarterly Journal of Economics*, 2009, vol. 124, no. 3, pp. 1265–1306; Phil Oreopoulos, Marianne Page, and Ann Huff Stevens, "Intergenerational effects of job displacement," *Journal of Labor Economics,* vol. 26, no. 3, July 2008, pp. 455–83, http://www.journals.uchicago.edu/doi/pdfplus/10.1086/588493; and Ann Huff Stevens and Jessamyn Schaller, "Short-run effects of parental job loss on children's academic achievement," *Economics of Education Review*, vol. 30, no. 2, April 2011, pp. 289–99, http://www.sciencedirect.com/science/article/pii/S0272775710001202.

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7 Kory Kroft, Fabian Lange, and Matthew J. Notowidigdo, "Duration dependence and labor market conditions: evidence from a field experiment," *Quarterly Journal of Economics*, vol. 128, no. 3, 2013, pp. 1123–1167.

8 Alan B. Krueger, Judd Cramer, and David Cho, "Are the long-term unemployed on the margins of the labor market?" *Brookings papers on economic activity* (Washington, DC: Brookings Institution Press, Spring 2014), pp. 229–300, https://www.brookings.edu/wp-content/uploads/2016/07/2014a_Krueger.pdf.

9 This methodology is also used in the article Sewin Chan and Ann Huff Stevens, "Job loss and employment patterns of older workers," *Journal of Labor Economics*, vol. 19, no. 2, 2001, pp. 484–521.

10 Actual labor market experience since time of onset and age dummy variables also control for time effects.

11 Because I am interested in factors affecting time until the unemployed obtain their next job, I do not specifically model unemployment to out-of-the-labor-force transitions.

12 Jacobson et al., "Earnings losses of displaced workers."

13 Because respondents were different ages when they took the test in 1980, I standardized the AFQT score by year of birth; the standardized score has a mean of zero and a standard deviation of 1 in the full, weighted NLSY79 sample.

14 See, for example, discussions in Francine D. Blau, Marianne A. Ferber, and Anne E. Winkler, *Economics of women, men, and work,* 7th ed. (Boston, MA: Pearson, 2014).

15 I deleted respondents from the sample if they were missing 8 weeks of employment status information in a calendar year (year they turned age 25 through 2009) or if they had 8 weeks in a calendar year in which unemployed versus out of the labor force cannot be determined.

16 Data are weighted in all tables and figures with use of round 24 survey weights.

17 I standardized the ASVAB coding speed score by year of birth as done with the AFQT; the standardized score has a mean of zero and a standard deviation of 1 in the full weighted NLSY79 sample. The full sample-weighted means are different by gender, with a mean of –0.217 for men and 0.224 for women.

18 Carmit Segal, "Motivation, test scores, and economic success," working paper (Universitat Pompeu Fabra, 2008).

19 Men with an ongoing first long-term unemployment spell in December 2009 were also used in the calculation.

20 Note that in the hazard model outlined in the “Empirical results” section, the first point that the respondent can exit a first long-term spell of unemployment into a job is, by definition, after the 27th week.

21 Individuals can have an unemployment spell during a within-job gap and, for these cases, this is the reason why the within-job gap (layoff, etc.) was used to create this variable. Note intermediate- and short-term unemployment spells were much more likely to be part of a within-job gap.

22 Calendar year refers to the year in which the unemployment spell begins. If, for example, the spell begins in 1990, wages 1 year after calendar onset refer to wages in 1991.

23 At each interview, respondents reported wages and hours for each job held since the date of the last interview.

24 Hourly wage values were excluded if they were less than $2 an hour or more than $200 an hour. Hourly wages were then averaged over all the weeks worked in the calendar year with valid wage observations. I excluded the yearly average wage observation if more than 50 percent of the wage values were missing for the weeks worked.

25 Percentages in figures 2 and 3 are Kaplan-Meier survival estimates, showing time until entry into a first unemployment spell (figure 2) and time until exit from the spell into a job (figure 3).

26 A “person month” is a person-by-month observation; the longer the person took to begin a long-term unemployment spell (for example), the larger the number of person months.

27 To the extent that the various unemployment spells were correlated, part of the estimated effects included the effects of other types of spells.

28 Each specification includes one dummy variable for spell type. For example, the results in column 2 include a dummy variable for long-term spell but no indicators for intermediate- or short-term spells.

29 The conversion formula is (exp[coefficient]–1).

30 Eight men from the 2,661 in the full sample were excluded because they had no valid wage observations.

31 Stevens, “Persistent effects of job displacement,” pp. 165–188.

32 Jacobson et al., “Earnings losses of displaced workers,” pp. 685–709.

33 Ibid. See also Kenneth A. Couch and Dana W. Placzek, “Earnings losses of displaced workers revisited,” *American Economic Review*, vol. 100, no. 1, 2010, pp. 572–589.

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