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Youth disconnection during the COVID-19 pandemic☆

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A B S T R A C T

We estimate a model of labor market transitions to understand the surge in youth disconnection and subsequent decline in school enrollment that occurred over the course of the COVID-19 pandemic. We highlight three observations. First, the collapse in full-time work during the spring of 2020 drove the rise in disconnection; however, in addition to the large number of young people becoming disconnected from full-time employment, the transition into full-time work also became more challenging. While transitions to full-time work from full-time work fell by 14 percent, transitions from part-time work and school fell by 43 percent and 28 percent, respectively. Second, transitions from full-time work and school into disconnection remain elevated through 2021 even as the unemployment rate reached historic lows. Finally, comparing the pandemic labor market transitions to the Great Recession, school no longer works as a safe harbor for those who are already enrolled: the surge in persistence in schooling that occurred during the Great Recession is not observed during the pandemic. These compositional changes illustrate the value of measurement of the youth labor market that goes beyond the unemployment rate.

Economic downturns disproportionately affect young people in negative ways (Forsythe, 2022; Hoyanes et al., 2012). Unemployment rates among young people rise during recessions, often more than the unemployment rate among prime-aged adults. Understanding youth experience over the business cycle, however, requires different measures than understanding adult experiences, primarily because of the importance of schooling for this demographic. In this paper, we explore the impact of the 2020–2021 COVID pandemic on young people’s transitions among work, school, and disconnection. Disconnected youth, also known as opportunity youth or NEET (not in education, employment, or training), refers to those young adults who are disconnected from school or the labor market. These young adults are less likely to accumulate human capital than those who stay connected with school and the labor market, and the reduction in education or work experience at crucial ages can potentially damage their long-term success.1

Compared to the unemployment rate, transitions associated with youth disconnection rate can be more relevant measures for young people. The unemployment rate is incomplete in that it does not capture youth who drop out of the labor force completely—a decision with different motivations and consequences compared to older workers. The importance of flows in and out of education also complicates analyses of employment and labor force non-participation for this group.

Fig. 1 illustrates these points. Although the disconnection rate tracks with the unemployment rate, the composition between the other two states—school and work—can be very different. In particular, the fluctuations in aggregate measures such as unemployment can mask the upward trends in schooling and the downward trends in work. This division is especially important during recessions, because, for example, a sizable share of young people can flow into school during recessions, mitigating the impact of the recession on the youth labor market. The compositional changes in non-employment and transition patterns can help target policy interventions by identifying the sub-populations most affected by economic changes, as those transitioning from school to work during the pandemic. Further, our evidence shows that these sub-populations differ across recessions and require remedies specific to each recession, creating a need for policy that responds to transition-based measures of the labor market.

Our analysis is based on labor market flows measured in the Current Population Survey (CPS). Although the CPS has certain limitations during the pandemic, the data are still particularly useful for this

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1 Youth disconnection has been an issue of rising concern in the United States (Belfeld et al., 2012). In 2019, approximately four million, or 13.8 percent, of young adults between 18 and 24 were reported to be neither in school nor at work. Disconnection rates are higher among minorities: 19.3 percent for blacks and 15.2 percent for Hispanics. We exclude the data from June, July, and August when calculating these statistics.

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Fig. 1. Disconnection, school, and work rates. Note: These figures plot the share of young people disconnected (panel A), in school (panel B), and at work (panel C). Summer months are excluded when calculating these rates. In each figure, trends for the civilian unemployment rate are added as dashed lines. The unemployment rate is calculated by the BLS, and it includes civilians above 16.

At a basic level, the CPS allows us to measure the impact of the pandemic on youth disconnection by analyzing the same labor force survey used to calculate the unemployment rate. More importantly, the panel structure of the data allows us to link individuals over time and investigate within-individual changes. The within-individual analysis reveals young people’s choices during the pandemic conditional on their labor market status over the previous year, making it possible to identify changing transition patterns.

This COVID-19 recession, as with other economic downturns, is a particular challenging time for most young people. Two years into the pandemic, the United States has experienced multiple outbreaks, but nonetheless, the unemployment rate has steadily returned to the pre-pandemic level. And yet, despite historically low unemployment rates, entering this labor market is increasingly difficult for young people, and remaining in school appears similarly challenging due to the frequent interruption of in-person instruction. The main results of the paper can be summarized as follows:

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2 We discuss issues with CPS response during the pandemic and address these issues in our empirical analysis.
The disconnection rate nearly doubled during the pandemic from 13.4 percent in February 2020, to 25.3 percent in April 2020. The collapse in full-time work (above 35 hours per week) drove the rise in disconnection; however, in percent terms, we see a larger reduction in flows of new full-time workers from part-time work and school than in persistence among those who were originally in full-time employment. For those who were in school in 2020, the transition into both types of work a year later remained below the pre-pandemic level, suggesting barriers to entry to full-time work during the pandemic were present. A similar pattern was also observed during the 2007 recession, though the persistence in full-time work was stronger then.

(2) Flows from full-time work and school into disconnection remain elevated through 2021 even as the unemployment rate has reached historic lows. This elevated outflow from school and full-time work to disconnection suggests higher turnover and decreased job security during this period of time. Consistent with labor market entry literature, our findings suggest that the unlucky cohorts of labor market entrants are less likely to find full-time employment during the pandemic. These findings are likely to be documented again in future recessions too, absent policy intervention.

(3) Flows into school have mitigated employment to disconnection flows in past recessions, however, unlike previous downturns, there is no large increase in the flow into or increased persistence in school during the pandemic, except for from part-time work. Extending the model back to the Great Recession, flows from work and disconnection to school increased markedly, absorbing a significant share of youth non-employment between 2007 and 2010. Once enrolled, students in the Great Recession were more likely to persist in school compared to the pre-recession period (before 2007). These patterns that led to increased school enrollment during the Great Recession are weak or absent during the pandemic. These findings imply that education policy during recessions will depend on labor market flows (more than the unemployment rate), with capacity constraints in schooling playing a smaller role in the pandemic compared to access and retention, possibly through financial aid.

This paper contributes to the measurement and understanding of the impact of COVID-19 on the labor market, which has identified young people as disproportionately exposed to the damage resulting from labor market fluctuations during the pandemic (Cortes and Forsythe, 2020). In April 2020, when the economy started to shut down because of the pandemic and government mandates, the unemployment rate spiked at 14.7 percent, the highest rate since 1948, according to a Bureau of Labor Statistics (BLS) news release.3 As the businesses reopened, employment recovered slowly, but younger people were among those who had the lowest reemployment rate (Cheng et al., 2020; Chetty et al., 2020).

Based on the unique nature of the pandemic and broader exposure to youth disconnection, long-term effects of lost employment and schooling may differ from previous recessions. Specifically, as the school rate declined during this pandemic, one concern is that ending school early can potentially reduce these young people’s long-term income as they lose the premium of additional education or degrees.

We also contribute more generally to the literature on the youth labor market during economic downturns. Youth disconnection and NEET are a topic of growing importance among researchers and policy makers around the world (Belfield et al., 2012; ILO, 2020; Mascherini et al., 2012). An influential literature documents the impact of recessions on young people during labor market entry years. For example, Kahn (2010) and Oreopoulos et al. (2012) show that the negative effects on the earnings of young people who enter the labor market during a recession persist. Schwandt and von Wachter (2020) and Von Wachter (2020) show that these effects may influence an individual’s life course, including employment and earnings, as well as marriage, fertility, and health. While this paper does not discuss the long-term impact of the pandemic, it documents the extensive disruption the pandemic made in the education and labor market entry process of young people, many of which implicate causal forces documented to damage long-run labor market prospects.

The rest of the paper is organized as follows. In Section 1, we discuss our measure for disconnection. Then we present our main results in Section 2, and show how this pandemic is different from the 2007 recession in Section 3. Finally, Section 4 discusses the limitations of the study and concludes the paper.

1. Measuring youth disconnection during the pandemic

Our empirical work addresses two problems in the measurement of the labor market which arose during the pandemic. In this section we summarize the measurement of disconnection and the problems with labor force survey data during the pandemic.

Regarding the measurement of disconnection, we rely on the Current Population Survey (CPS), the monthly labor market survey in the United States. In the CPS, the Bureau of Labor Statistics collects information regarding an individual’s school and work status for a reference week, usually the week that contains the 12th day of a month, so we know if a person is enrolled in school or work for that week. Those who are in school or at work are not disconnected. Those who are unemployed or not in the labor force, conditional on not in school are categorized as disconnected.

The CPS categorization of those who have jobs but do not work became more complicated during the pandemic. One challenge that arose is that the CPS categorized a proportion of unemployed to be those who are employed but absent from work, so a clear demarcation line between unemployed and employed but does not work is not available during the pandemic.4 Those who were not able to work because of the pandemic but not because of their own illness were supposed to be categorized as unemployed, but many of them were categorized in the “absent from work” category. In addition, a large share of the absence category is assigned to “other reasons” for the question regarding “reasons for absence.” To maintain a consistent measure for disconnection, we categorize individuals who had jobs but did not work for “other reasons” as disconnected. In addition, we categorize those workers on vacation as disconnected, while the rest of the reasons were categorized as non-disconnected.5 Thus, the available survey codes map into disconnection more cleanly than the classic measures of unemployment.

Another challenge is that during the onset of the COVID pandemic, the response rate to the CPS fell to levels below the pre-pandemic years. The response rate is much lower among those who were interviewed for the first time. The probability of not responding to the survey is correlated with individual characteristics, such as income. Because non-response rate is negatively associated with income, and young people from low-income families are more likely to be disconnected, we expect that our estimated disconnection rate using cross-sectional data to be downward biased at the beginning of the pandemic. Fortunately, the response rate recovered substantially after September 2020, so the later estimates towards the recovery periods of the pandemic are less subject to non-response bias.

In our empirical analysis, we model survey non-response as an outcome. Specifically, we take advantage of the individual-level panel structure in the CPS and investigate within-individual changes. In the CPS, a sampled individual is interviewed eight times: four consecutive months after sampled (rounds 1 to 4), and then the individual is out of the sample for eight months; after that, the person is interviewed again for another four consecutive months (rounds 5 to 8). Among the individuals who were supposed to be re-interviewed, the response rates

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3 See https://www.bls.gov/news.release/archives/empsit_05062020.htm.

4 See for example: https://www.census.gov/newsroom/blogs/research-matters/2020/09/pandemic-affect-survey-response.html.

5 Table A1 provides a detailed description of our characterization.
did not drop as much as the respondents who had just entered the sample. We separate the analysis for 2019–2020 and 2020–2021 panels. For the 2019–2020 panel, we restrict the sample to individuals whose fifth round interview started after April 2020 and calculate the probability of the people being interviewed at least once in 2020, conditional on being interviewed in 2019. We use April as the starting point so all the data points in 2020 are affected by the pandemic. For the 2020–2021 panel we use a similar sample and include everyone who is interviewed after April 2020 and then again in 2021 up to December 2021.

We report the probability of being re-interviewed from these two panels in Table 1 by age group, gender, and race. We also report the results from the 2018–2019 panel for comparison. The re-interviewed rate was lower in 2020 among those who were first interviewed in 2019 than in 2019 among those were first interviewed in 2018, but the differences are not as striking as the 10 percentage points that are reported in the cross-sectional data. Among prime-aged individuals who were between 25 and 54 years old when entering the sample in 2019, 77.2 percent were re-interviewed in 2020. The number is 0.8 percentage points lower compared to the 2018–2019 panel. Individuals who were between 18 and 24 when entering the sample were less likely to be re-interviewed compared to prime-aged individuals. The re-interviewed probability decreased by 2.1 percentage points in the 2019–2020 panel compared to the 2018–2019 panel. The decline in the re-interviewed probability is similar across gender and race. The re-interview rate for the 2020–2021 panel recovered to the pre-pandemic level. Because of the lower re-interview rate, in the within-individual analysis in Section 2.3, we treat “not re-interviewed” as a stand-alone destination state when discussing how young people transitioned from the four states we examine—school, part-time work, full-time work, and disconnection.

### 2. The impact of the COVID-19 pandemic on youth disconnection

In this section, we start by presenting the overall impact of the COVID-19 on individuals between the ages of 18 and 24 years. Then we discuss the differential impact across demographic groups. Finally, we utilize the panel structure of the CPS data to investigate within-individual changes.

#### 2.1. Overall impact on youth labor market

Since the beginning of the pandemic, researchers and policy-makers have been following its impact on the labor market closely. One key measure these groups rely upon is the unemployment rate. Fig. 2 Panel A shows the trends of the unemployment rate for young adults and prime-aged individuals from January 2019 to December 2021. In 2019, the average unemployment rate among prime-aged individuals between 25 and 54 was 3.1 percent. For young people between 18 and 24, the average unemployment rate in 2019 was higher at 7.9 percent. The

![Unemployment rate](image)

Fig. 2. Unemployment rate and labor force participation rate (LFPR) by Age Groups. Note: This figure plots the unemployment rate and the labor force participation rate among young and prime-aged people. Young people refer to those individuals who are aged between 18 and 24 years, and prime-aged individuals are those aged between 25 and 54 years. Data source: Current Population Survey.
unemployment rate nearly quadrupled in April 2020, when the pandemic started. The unemployment rate among prime-aged individuals increased from 3.4 percent in February to 12.8 percent in April, and the unemployment rate among young people rose from 7.8 percent in February to 26.8 percent in April. During this time, the impact of the pandemic on the unemployment rate was larger for young people in terms of percentage points changes. In both cases, the unemployment rate dropped steadily after April. Towards the end of 2021, the unemployment rates decreased to the pre-pandemic level.

Another key measure is the labor force participation rate (LFPR, Panel B of Fig. 2). LFPR is higher among the prime-aged individuals than the young people, because some young people are in school. In 2019, average LFPR was 82.7 percent among the prime-aged and 65.7 percent among the young. The COVID-19 pandemic negatively affected the LFPR for both groups. The impact was, however, smaller for the prime-aged individuals at the beginning: the LFPR dropped slightly from 83.0 percent in February to 79.7 percent in April; then it increased and remained over 80 percent thereafter. For young people, the LFPR dropped from 65.1 percent in February to 56.8 in April. Compared to April 2019, the LFPR was 7.0 percentage points lower. Two years into the pandemic, LFPR among young people recovered, and even exceeded, the pre-pandemic level, but the LFPR among the prime-aged was still lower compared to December 2019.

As mentioned earlier, unemployment is not consistently defined in the CPS data during the pandemic. The disconnection measure we use takes care of this inconsistency. The unemployment rate also does not distinguish the unemployment of those who are enrolled in school and those who are not, although these two states may be different for young people in terms of human capital accumulation. Similarly, the LFPR for young people does not carry the same meaning as for the prime-aged because young people have the option of being in the labor force, or school, or both. In an extreme case, for example, the decline in LFPR that we observe in April 2020 could simply be an artifact of young people going back to school. Therefore, neither unemployment nor LFPR provides a complete description of the youth labor market. Due to both the survey implementation and conceptual issues, the disconnection rate is a useful complement to those two measures, even when setting aside our interest in labor market transitions.

The disconnection rate followed the trends in the unemployment rate during the pandemic, nearly doubling from 13.4 percent in February to 25.3 percent in April 2020 (Panel A of Fig. 3). The number of disconnected young people increased from 3.9 million in February to 4.3 million in April. Compared to April 2018 and 2019, the disconnection rate in April 2020 was approximately 10 percentage points higher. The disconnection rate then decreased over time. The disconnection rate is mechanically higher during summer months when young people who enrolled in school are on summer vacation.

To isolate the impact of the pandemic, we regress the disconnection rate on dummy variables for months ($y_m$) and pre-pandemic years ($\delta_t$), and then on a set of indicators for months in 2020 and 2021 ($I(month = t)$ $\times$ $I(year = 2020/2021)$):\[
DR_{ny} = \alpha_0 + y_m + \delta_t + \sum_{t=2}^{12} \beta_{t-1} I(month = t) \times I(year = 2020)
+ \sum_{t=2}^{12} \beta_{t-1} I(month = t) \times I(year = 2021) + \epsilon_{ny}\]

Panel B of Fig. 3 plots the coefficients on the interaction terms, which represent seasonally adjusted impact of the pandemic. This figure suggests that the disconnection rate increased in April 2020 by over 10 percentage points and fell gradually. By the end of 2021, the disconnection rate had declined to the pre-pandemic level.

To provide a more complete picture of the impact on young people, we next examine the changes in school and work. Fig. 4 plots the share of people in school or at work. When looking at work, we further categorize the work types as part-time (<35 hours/week) and full-time (≥35 hours/week) work. There is evidence that young people use school to shield themselves against adverse labor market shocks. During this pandemic, however, the school rate barely increased except for in the summer months. In fact, not counting the summer months, the school rate fell below the pre-pandemic level starting from end of 2020.

The share of young people who worked part time did not change much over the two-year period. Full-time workers, however, did not follow the same trend. After accounting for seasonality, the percent of young people working full time dropped by 11.2 percentage points from 7. When constructing the unemployment rate statistics in Fig. 2, we use the definition that is consistent with the public released numbers discussed above.

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\footnotesize

\[7\] We construct four mutually exclusive states: full-time work, school, part-time work, and disconnection. In the case of ties, we use the following ordering: full-time work $>$ school $>$ part-time work $>$ disconnection.

\[8\] Note that those who are in school and work part time at the same time are categorized to be in school, so this share captures those who work part-time conditional on not in school.
February to April 2020—with the actual share dropping from 33 percent in February to 22 percent in April—and stayed low during the summer and early fall. Full-time work then started to recover in October 2020. By the end of 2021, full-time work had exceeded the level prior to the pandemic. Because of the difference in the trends between part-time and full-time work, we consider them as two different states when we investigate within-individual changes in Section 2.3.

In summary, Fig. 4 suggests that the increase in the disconnection rate at the beginning of the pandemic was mostly driven by a reduction in full-time work—those who worked for more than 35 hours per week. Over time, the disconnection rate dropped, but among those who were not disconnected, a larger proportion of youths were out of school and entered the labor force compared to previous years.

2.2. The impact of the pandemic across demographic groups and states

Before we present the results for within-individual transitions, we briefly discuss the impact of the pandemic on disconnection across demographic groups. In Panel A and Panel B of Fig. A1, we plot the impact of the pandemic across gender and race. The trends were similar across these groups, but the pandemic, on average, had a larger negative effect on young minorities in 2020. By the end of 2021, the disconnection rates had declined to the pre-pandemic level for all subgroups.

Panel C of Fig. A1 shows the trends for different age groups. At the beginning, the impact of the pandemic on disconnection increased with age. One explanation for this pattern is that young people are less likely to be in school when they grow older, and they become more vulnerable to adverse labor market shocks when they are in the process of transitioning from school to labor market. In this sense, schools provide a certain level of protection for young people who were enrolled and appear to have prevented them from being disconnected during the pandemic.

Next, we examine the impact of the pandemic on youth disconnection across different states. In Panel A of Fig. A2, we plot a map for the change in the disconnection rate for each state in 2020.

Among all states, Nevada saw the largest increase in the disconnection rate. Considering the industry composition in Nevada, this observation suggests that industry composition plays a major role in driving the disconnection rate. Panel B of Fig. A2 shows the change from 2019 to 2021. In 2021, most states experienced declines in the disconnection rate from 2020, but several states—such as Michigan, Colorado, and Arkansas—still experienced elevated disconnection rates.

To sum up, these cross-sectional patterns reveal that young people were vulnerable to the pandemic labor market fluctuations. The compositional changes in terms of school and work were masked by labor market measures of unemployment rate and labor force non-participation rate. This background motivates a disconnection-based analysis of labor market transitions during the pandemic and subsequent recovery.

2.3. Transitions among disconnection, school, and work

We now turn to our main analysis on within-individual transitions. Based on the discussion in Section 2.1, four states are of interest: disconnection, school, part-time work, and full-time work. In addition, we investigate the transition to “not interviewed” due to the rapid rise in CPS non-response during the pandemic. Using the four-eight-four-panel structure of the CPS, we first estimate the probability of the transitions from the states in 2019 to the states in 2020, and use the estimates from the 2018–2019 panel for comparison. We then estimate the transitions from 2020 to 2021 separately.

To capture the individuals who were surveyed during the COVID months that started in April 2020, we restrict the sample to those respondents whose scheduled fifth-round survey happened after April 2020, so that all the individuals in the sample were exposed to the pandemic in their initial survey round after the eight-month break. For the 2019–2020 transitions, the sample includes those whose eighth-round survey happened before December 2020. Similarly, for the 2020–2021 transitions, we include everyone whose first round happened after April 2020 and eighth round before December 2021, so everyone was exposed to the pandemic in both 2020 and 2021.

We define an individual’s state in the first four-month and the second four-month panels using the individual’s predominant activity, that is, what the person was doing during most of the observed time. For example, if a person was observed three times in the 2019 four-month panel, and the person was in school for two months and worked full time for one month, then we define them to be in school. This measure allows us to preserve as many observations as possible. In the case of ties among the non-missing values, we use the following ordering: full-time work > school > part-time work > disconnection. For example, if a person worked part-time and was in school in the same month, we assign the person to school. Similarly, if a person worked part time for two months and worked full time for another two months, then the person is assigned to full time work.

Fig. 5 plots the transition probability from disconnection to each of the destination states by each of the rotating samples. The three lines in each sub-figure represent three panels. The figures demonstrate that...
among those youth who were disconnected in 2020, there was a decline in the persistence in disconnection, and the transition from disconnection to both types of work increased in 2021 compared to the previous years. This observation suggests that some of the people who were disconnected were able to find a path out through the labor market. Regarding schooling, Fig. 6 highlights two results. First, the transition from school to disconnection increased, suggesting that labor market entry is more challenging during the pandemic. Second, we do not observe an increase in persistence in schooling. In fact, during the two pandemic years, school-to-school fell below the pre-pandemic level in the fall semesters, as indicated by the numbers in September. These figures provide some intuition regarding the transition patterns that underlie our analysis.\(^\text{13}\)

We now turn to the estimation of a multinomial logit model to summarize the transition patterns. The latent utility of individual \(i\) in year \(t\) and in state \(j\) in \(J = \{\text{full-time work, school, part-time work, disconnection, missing}\}\) is given by:

\[
y_{ijt} = \sum_{k \in K} \delta_{jk} I(y_{it-1} = k) + X_i \beta_j + \epsilon_{ijt}. \tag{2}
\]

Individuals choose the state in year \(t\) to maximize utility. The key explanatory variable is the state in the previous year \(t-1\), \(I(y_{it-1} = k), k \in K = \{\text{full-time work, school, part-time work, disconnection}\}\). In the analysis, we include dummy variables for male, black, and Hispanic, represented by \(X_i\). The exponential of the \(\delta\) coefficients will provide estimates for the key results of interest, but we transform our estimates into marginal effects for ease of interpretation.

The error term \(\epsilon_{ijt}\) is assumed to be i.i.d. and extreme value type-I distributed. The probability of individual \(i\) being in state \(j\) can be written as:

\[
P(y_{it} = j | y_{i(t-1)} = k, X_i) = \frac{e^{\delta_{jk} + X_i \beta_j}}{1 + \sum_{k \neq j} e^{\delta_{jk} + X_i \beta_j}}. \tag{3}
\]

We estimate the model and report the transition probabilities in Table 2. The transition probabilities are evaluated at the mean of the covariates. Panel A reports the results for the 2018–2019 panel, which is the pre-pandemic panel. The rows represent starting states, and the columns represent destination states. The numbers show, among those individuals who are in a given starting state, what percent is predicted to end up in each of the destination states. The numbers in the same row add up to one by construction.

Table 1 shows that approximately 40 percent of young people between 18 and 24 were not re-interviewed. The estimation results further reveal that among the four starting states, those who were in school in 2018 had the lowest non-response rate in 2019, at 31.1 percent. There is no perfect way to overcome the data attrition problem, so we explicitly estimate the impact of COVID-19 pandemic on attrition from the panel. The model assumes that attrition is conditionally missing at random, i.e., once we account for an individual’s initial state and covariates, attrition is random. Compared to the 2018–2019 panel, the non-response rate in the 2019–2020 panel increased by 0.2–3.7 percentage points across the four starting states (Panel B). In the 2020–2021 panel, an obvious pattern is that the missing rate among those who were disconnected in 2020 decreased. This decrease is most likely the result of disconnected youth transitioning from disconnection to other labor market status, and are thus more likely to be interviewed in 2021.

With these caveats regarding data attrition in mind, we continue to discuss the transitions among the other states. Among those who were disconnected in 2018, 33.2 percent remained disconnected in the 2019 survey. This share is larger than the other three non-missing destination states combined, suggesting that disconnection is persistent.\(^\text{14}\)

Other than disconnection or not interviewed, 12.0 percent transitioned to full-time work, 8.1 percent to school, and 5.7 percent to part-time work. The onset of the pandemic in 2020 increased the transition to disconnection by 7.4 percent and reduced the transition to the other three non-missing states. Almost all the reduction in transitions to either type of work mapped to the increase in transition to disconnection. A year later, the pattern reversed: The transition into disconnection decreased, and the transition to full-time work increased by nearly 50 percent.

Among those who were in school in 2018, 43.7 percent remained in school in 2019, the largest among the four non-missing categories. This pattern reflects mostly the feature of the school system: it takes multiple years to acquire a diploma or a degree. The second largest category is full-time work, 14.4 percent. This shows that among those who left the school system, a large share ended up working full time, compared to the 5.9 percent that ended up in disconnection and the 4.9 percent that ended up with a part-time position. In both years, the pandemic made it hard for the cohorts who entered the labor force to find full-time jobs. In addition, the persistence in schooling did not increase, so the reduction in labor market entry solely mapped into the increase in the disconnection. While the cross-sectional evidence suggests that the disconnection rate returned to its original level soon enough, the new graduates were still entering a difficult labor market. The challenge of labor market entry can potentially discourage young workers, the ones with the least experience, and negatively affect their careers and even mental health. Any policies that aim to mitigate the impact of the pandemic on young workers need to pay special attention to this group.

For those who started out from part-time work in 2018, 29.3 percent transitioned to full-time work, followed by 20.3 percent to part-time work, 7.7 percent to disconnection, and 5.9 percent to school. The pandemic increased the transition to disconnection in 2020, but the increase stopped in 2021, as people became more likely to transition to school and full-time work. In both years, we see a large increase in the transition into school.

Compared to the youth who started out from part-time work in 2018, those who started out from full-time work were much more likely to remain in full-time work (48.0 percent) and much less likely to transition to part-time jobs (3.6 percent) in 2019. Approximately 5.3 percent of the individuals transitioned from full-time work to school; this number is similar to those who were in part-time work. The pandemic increased the transition from full-time work to full-time work, and reduced the transition from full-time work to full-time work in both years. Part of the reduction in the full-time work in 2020 can be explained by an increase in part-time work, but this was no longer the case in 2021. In 2021, the reduction in all three states—school, part-time, and full-time work—mapped to an increase in disconnection rate (or missing).

During the pandemic, the school-to-school transition barely changed. Schools are often thought to provide a shield against negative labor market shocks, and students tend to stay in school longer during recessions (Stange, 2012). In this downturn, however, we do not observe an aggregate increase in the school enrollment rate. Those who were already in school did not seem to take advantage of the school option to delay labor market entry. We discuss how this pattern is different from the 2007 recession in the next section.

In summary, those who left school during the pandemic, as well as full-time workers, were affected the most over the two years of the pandemic. Transitions from school to disconnection increased, while school to full-time work showed a notable decline compared to the previous year. At the same time, the retention in full-time work declined. The persistence in disconnection, however, did not increase much—the fluidity

\(^{13}\) Figures A5 and A6 show the transitions out of part-time work and full-time work respectively.

\(^{14}\) In this paper, we do not explore the source of the persistence, but two possible reasons can explain the persistence. One reason is that an individual has a preference toward disconnection: those who enter the disconnection state value leisure time or flexibility in working schedules more than others. Another reason is that other forces, in particular negative labor market shocks drive these people into the state and retains people there. These two reasons have different policy implications, but distinguishing between these two reasons is beyond the scope of the paper.
Fig. 5. Rotating panel—transition from disconnection to each destination state (modal state in each of the four months). Note: This figure shows the transition probability from disconnection to each of the destination states. We use three one-year panels: 2018–2019, 2019–2020, and 2020–2021. For each panel, we categorize individuals to the month when they first enter the sample, regardless of whether they were interviewed or not in the first month, and plot the transition probability for that sub-group of individuals. The definition of the states is based on the predominant activity in each of the four-month period, conditional on being interviewed.
Fig. 6. Rotating panel—transition from school to each destination state (modal state in each of the four months). Note: This figure shows the transition probability from school to each of the destination states. See the notes of Fig. 5 for more details.
the labor market allowed young people to transition out of disconnection, only to face higher probabilities of returning to disconnection later. In the second year, the persistence in disconnection (disconnection to disconnection transitions) decreased 4.2 percentage points, reversing the trend of the previous year.

3. Is this time different?

As with any recession, the pandemic increased the unemployment rate dramatically, however, the pandemic-driven increase was fundamentally different from the trends of any of the previous recessions in terms of the speed of its development and the industries that were affected. In this section, we discuss what this difference means for the youth labor market by comparing this pandemic with the 2007 recession.

Fig. 1 shows the trends for the share of youth aged between 18 and 24 years who are disconnected, in school, or at work.15 The trends in disconnection rate almost overlap with the national unemployment rate: the disconnection rate is higher during economic recessions and lower during booms. During the 2007 recession, the disconnection rate increased from 15.4 percent in 2006 to 19.1 percent in 2010 at the highest.

The increase in the disconnection rate during the 2007 recession was mostly driven by the reduction in work, as in this pandemic. From 2006 to 2010, the share of young people at work dropped from 61.5 percent to 52.7 percent, and the level of working young adults never recovered to the pre-recession level. The share of young people in school increased steadily between 1990s and early 2010s, with a slightly steeper increase during the recession.

Unlike the 2020 pandemic, the 2007 recession affected young men and young women differently. Fig. A7 plots the trends in disconnection by gender. The trends for males overlap with the trends for the national unemployment rate, but the trends are different for females. The disconnection rate among females is on average higher than the disconnection rate for males: it dropped from approximately 24 percent in early 1990 to 18 percent in early 2000. Surprisingly, the 2007 recession had only a small impact on the disconnection rate among females, though the share of females who worked dropped.16

In Fig. A9, we plot the trends for the share of individuals in school and at work by gender. The percent of young men and young women at work dropped during the 2007 recession, but the decline from 2006 to 2010 was slightly greater for males than for females, 11.5 percentage points versus 5.9 percentage points. The percent of young men in school had been increasing since the early 1990s, but the increase was faster during the 2007 recession. By comparison, this pattern of a faster increase in school rate is not observed among females. This suggests that

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15 We average the rates across months within each year. When calculating the shares for disconnection, work, and school, we dropped the observations in June, July, August.

16 Figure A8 further breaks down the data by race. The pattern that the disconnection rate among young males increased and the disconnection rate among young females barely increased during the 2007 recession holds across race groups.
Table 3
Transition matrix from the multinomial logit regressions of the 2007 recession and recovery.

|          | Panel A: 2003–2006 | Panel B: 2008–2010 (Difference: p.p./percent) | Panel C: 2011–2013 (Difference: p.p./percent) |
|----------|---------------------|------------------------------------------------|-----------------------------------------------|
| Percent in starting state | Disconn. | PT Work | School | FT Work | Missing | Disconn. | PT Work | School | FT Work | Missing | Disconn. | PT Work | School | FT Work | Missing |
| Disconn. | 12.3% | 0.216 (0.004) | 0.057 (0.002) | 0.063 (0.002) | 0.137 (0.003) | 0.527 (0.005) | 0.04 (0.001) | 0.014 (0.001) | 0.011 (0.001) | -0.027 (0.003) | 0.037 (0.004) |
| PT Work | 8.8% | 0.064 (0.003) | 0.161 (0.005) | 0.068 (0.003) | 0.244 (0.006) | 0.463 (0.007) | 0.043 (0.001) | 0.045 (0.001) | 0.03 (0.001) | -13.4% (0.003) | 10.2% (0.003) |
| School | 34.5% | 0.043 (0.001) | 0.045 (0.001) | 0.410 (0.003) | 0.138 (0.002) | 0.364 (0.003) | 0.028 (0.001) | 0.038 (0.001) | 0.045 (0.001) | -1.1% (0.003) | -5.9% (0.003) |
| FT Work | 41.4% | 0.028 (0.001) | 0.038 (0.001) | 0.435 (0.003) | 0.454 (0.003) | 0.017 (0.001) | 0.014 (0.001) | 0.008 (0.001) | -0.005 (0.003) | -0.027 (0.003) | -5.9% (0.003) |

Note: This table reports the estimated transition probabilities. The rows represent the starting states, and the columns represent the destination states. For Panel A, the numbers in each row add up to one. The missing category includes those respondents who were not re-interviewed and those respondents whose status was undetermined. Panels B and C report the change in the transition probabilities compared with Panel A. Percentage point changes are reported in the top row, and percent changes are in italics. Delta-method calculated standard errors are in parenthesis.

young men are more likely to take advantage of the school system during a recession. In this pandemic, however, we do not observe an increase in the school rate; in fact, if anything, the school rate decreased.17

Finally, Panel A of Table 3 reports the transition probabilities before the 2007 recession, and Panels B and C show the impact of the 2007 recession. We highlight two observations regarding full-time work and schooling due to their importance in human capital accumulation.

First, during the onset of the pandemic, the impact on full-time work was larger in the pandemic labor market time than the 2007 recession: the full-time to full-time transition decreased more and the full-time work to disconnection transition increased more during this pandemic. Towards the end of 2020, the full-time employment has greatly recovered. How this large decline in full-time work will affect young people in the longer run is worth exploring, but we do not yet have sufficient data to answer the question.

Second, during the 2007 recession, we see an increase in the transition from all states to school; however, this transition to school is not observed during the pandemic. In particular, during the 2007 recession, we notice an increase in school-to-school transition, that is, young people stayed in school longer, or they continued to pursue a higher degree. This increase in school-to-school transition is not observed during the pandemic. One explanation for the lack of school-to-school transition is that the online courses, compared to in-person instruction, are less attractive to those who are already enrolled. It is also likely that the development of the pandemic happened so quickly that young people were not able to adjust, or they expected this pandemic to be a short-term event so that adjusting their plans was not necessary. Further research is needed to evaluate these explanations.

4. Discussion and limitations

This COVID-19 pandemic has negatively affected young people. Over the course of the pandemic, young people rapidly became disconnected from the labor market and school. Full-time work collapsed. School enrollment declined. Labor market entry became harder for young people, as evidenced by high rates of transition into disconnection and depressed rates of transitions from school to full-time work. These challenges are apparent in the disconnection-based analysis of labor market transitions, even as the unemployment rate reached historic lows. The transition-based analysis also reveals opportunities for targeted policy responses.

During the pandemic, the Pandemic Unemployment Assistance (PUA) program provided additional income support to those young people who lost their jobs but did not have a long enough work history to qualify them for regular unemployment insurance. Despite the effectiveness of this program in income assistance to young workers (Greig et al., 2021), the program was not applicable to new labor market entrants, a group that our analysis reveals is especially hard hit, unless they worked...
when in school. For these new entrants, active labor market policies, such as job search assistance and programs to improve labor market matching, are important to prevent young people from falling into a cycle of disconnection. While the impact of job search assistance can be limited when labor demand is low, as in April 2020, for example, the existence of such programs could potentially be coupled with other programs to improve the speed and quality of matching between job seekers and employers when labor conditions improve. Training programs may also hold promise for this group. The pandemic featured a strong labor market and an overall decline in transitions into and retention in schooling, a pattern of transitions that suggests training programs may replace some lost education and boost long-run employment prospect and earnings. During the onset of a recession or a pandemic, the time cost (locking-in effects) of training programs is relatively small, and online options can make these programs accessible to a large population.18

Finally, we conclude with a discussion of two limitations of the paper. First, we do not evaluate the long-run impact of the pandemic on young people. Von Wachter (2020) shows that entering labor market during a recession can lead to a 10 to 15 percent lower initial income. The pandemic, however, is special in two aspects. On one hand, youth wages increased faster than adult wages, making working a more attractive option to young people.19 The higher wages benefit those youth who are able to find jobs, meaning losses during the pandemic arose due to non-employment. On the other hand, the pandemic drew young people out of school and into work. The loss in human capital accumulation associated with school is hard to recover as the return to one additional year of experience is typically smaller than the return to one additional year of school.20 As a result, in the long run, the negative long-term financial impact of the pandemic on income may appear even among those who secured employment.

Second, the CPS only allows us to observe reported work, and often times, formal work. Disconnected youth, however, can be involved in occasional paid alternative work arrangements that they do not report unless they are specifically asked. For example, based on the data from 2019 Survey of Household Economics and Decision Making, among those who were disconnected based on a similar definition as in the CPS, 25.1 percent reported that they were paid for performing some tasks.21 Due to the data limitations in the CPS, we are not able to capture these alternative work arrangements in the analysis. Alternative work arrangements, patterns of time-use, and non-market work may be particularly important for this group and remain to be investigated.

Supplementary materials

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.labeco.2022.102241.

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18 Papers discussing the impact of active labor market policies include Brown and Koettl (2015) and Card et al. (2018).
19 According to the Wage Growth Tracker at the Federal Reserve Bank of Atlanta: https://www.atlantafed.org/chcs/wage-growth-tracker.aspx.
20 The return to one year of experience is estimated to be approximately 4 percent (see Altonji et al. 2013 for details), while the return to one year of schooling is around 9 percent (Psacharopoulos and Patrinos, 2018).
21 For example, 13.9 percent reported that they earned some income from work related to house cleaning, yard work, or other property maintenance work; 8.4 percent completed some paid tasks online, such as freelance work through Fiverr or Upwork; 7.3 percent helped with dog walking, feeding pets, or house sitting; 1.8 percent provided child or elder care services; 1.8 percent provided driving or ride-sharing services such as Uber or Lyft. Another 10.3 percent reported that they performed some other paid personal tasks, such as deliveries, errands, or helping people move. The statistics are based on 584 individuals between 18 and 24-year old. The estimated disconnection rate is 13.6 percent, similar to the estimate in the CPS.