Research Brief

# Risk Modeling of Student Post-School Employment Outcomes: Analysis of Stage I Variables

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A recent Issue Brief described a risk modeling study being implemented by the Center on Transition to Employment for Youth with Disabilities. Risk modeling can be loosely defined as the identification, aggregation and quantification of risksto individuals, organizations, etc., as the result of adverse events or circumstances. For the purposes of this study, we will be studying static risk factors that contribute to poor post-school employment outcomes for students with disabilities using the National Longitudinal Transition Study (NLTS-2) database.

This Research Brief reports on the methodology and initial findings from a prescreening logistic regression using Stage I variables. Stage I variables are static, unable to be modified by a research intervention. Examples include the research participant’s age, sex, race, family income, etc. Stage II variables are mitigating or resiliency factors that are modifiable by interventions.

**Summary of the Findings**

Fifteen of 19 risk factors (See Table 1) were found to be marginally related to post-school employment. The top level risk factor was the student’s inability to get around by him/herself, which is likely a surrogate measure of severity of disability and limited functionality

**Research Methods**

The data were drawn in five waves, biyearly starting in 2001 and ending in 2009. From this sample, all students who had graduated high school before the second wave (e,g., 2003-2004) school year were considered. Students who reported they did not have a disability during the original data collection period were excluded from the data. This sample was then restricted to all participants that had non-missing response values. The final sample size was 2,260 young adults with disabilities, of whom 1,720 (76.1%) were reported as having been employed within the previous two years of Wave 5.

A set of potential predictor variables was selected by their relationship to employment and those found to be either important marginal or conditional predictors of employment in the literature (Carter et al., 2011a,b). Additionally, scores were computed for a participant's Classroom Social Scale, Classroom Behavior Scale, and Household Responsibility Score. See Carter et al. (2011a,b) for definitions of these variables. Categories of these scores were created using the first and third quartiles of the scores. Furthermore, some variables had a low cell count in some of the categories. In these situations, categories were merged so that the sample sizes were sufficient.

A classification and regression tree (CRT) algorithm using the Gini Index was used to build a classification tree using SPSS v.20 (IBM SPSS Statistics). The CRT uses a systematic algorithm to detect the strongest association between predictors and the response variable (i.e., employed vs. not employed within the past two years) through a comprehensive search of the potential predictor variables by identifying subgroups that show the most variation/differentiation in the outcome variable. The degree of differentiation is depicted sequentially in a decision tree format to show the optimally split predictors.

The distribution of the outcome variable was summarized using frequencies and percents for each potential predictor variable. Each of the potential predictor variables was screened using a bivariate logistic regression model (independent of any other predictor variable). Odds ratios and 95% confidence intervals are reported for each logistic regression model.

**Description of the Findings**

Table 1 shows the distribution of the outcome variable for each predictor and summarizes the results from the logistic screening process. Fifteen of the 19 variables were found to be related to employment (P<.001). Using CHAID, the primary split (i.e., top-level risk factor) was the student’s ability to get around by him/herself. This is likely a surrogate measure for severity of disability. Those who cannot get around well overall tend to have a low two-year employment status, although this is moderated by participant’s ability to feed oneself, their age, and Household Responsibility Score. Conversely, those who are able to get around well were considered to have a less severe disability and have better employment outcomes. This branch of the tree is augmented by mostly socio-economic variables such as whether the family has received any benefits and household income, as well as race/ethnicity and gender of the student.

**Table 1**

“Stage 1” variable (Risk Factor) is first, followed by level of risk factor, and then by the statistical details on employment status.

Note: CI (Confidence Interval) is 95%

1. Disability
   1. Cognitive
      1. N = 660
      2. 29.6%
      3. OR = 0.98 (CI 0.76, 1.27)
      4. Sig \*\*\* (P<0.001 )
   2. Emotional
      1. N = 240
      2. 10.7%
      3. OR = 2.42 (CI 1.41, 3.21)
      4. Sig –
   3. Sensory
      1. N = 770
      2. 34.4%
      3. OR = 1.03 (0.80, 1.32)
      4. Sig –
   4. Physical
      1. N = 570
      2. 25.4%
      3. OR, CI –
      4. Sig –
2. Sex
   1. Male
      1. N = 1440
      2. 63.5%
      3. OR = 1.64 (CI 1.35, 2.00)
      4. Sig \*\*\* (P<0.001)
   2. Female
      1. N = 830
      2. 36.5%
      3. OR, CI –
      4. Sig –
3. Race
   1. White
      1. N = 1590
      2. 70.3%
      3. OR = 2.10 (CI 1.31, 3.38)
      4. Sig \*\*\* (P<0.001)
   2. African American
      1. N = 360
      2. 16.6%
      3. OR = 1.41 (CI 0.84, 2.36)
      4. Sig –
   3. Hispanic
      1. N = 230
      2. 9.8%
      3. OR = 0.87 (CI 0.51, 1.48)
      4. Sig –
   4. Other
      1. N = 80
      2. 3.2%
      3. OR, CI –
      4. Sig –
4. Community Type
   1. Suburban
      1. N = 1090
      2. 54.7%
      3. OR = 1.04 (CI 0.72, 1.51)
      4. Sig \*\*\* (P<0.001)
   2. Urban
      1. N = 710
      2. 35.5%
      3. OR = 0.69 (CI 0.47, 1.00)
      4. Sig –
   3. Rural
      1. N = 200
      2. 9.8%
      3. OR, CI –
      4. Sig –
5. Household Income Level
   1. ≤$25,000
      1. N = 570
      2. 26.5%
      3. OR = 0.36 (CI 0.28, 0.46)
      4. Sig \*\*\* (P<0.001)
   2. $25,001-50,000
      1. N = 660
      2. 30.8%
      3. OR = 0.60 (CI 0.47, 0.77)
      4. Sig –
   3. >$50,000
      1. N = 920
      2. 42.7%
      3. OR, CI –
      4. Sig –
6. Single Parent Household
   1. Yes
      1. N = 430
      2. 20.1%
      3. OR = 0.68 (CI 0.54, 0.86)
      4. Sig \*\*\* (P<0.001)
   2. No
      1. N = 1690
      2. 79.9%
      3. OR, CI –
      4. Sig –
7. Living Situation
   1. 2 parents
      1. N = 1440
      2. 69.2%
      3. OR = 1.92 (CI 1.31, 2.83)
      4. Sig \*\*\* (P<0.001)
   2. 1 parent
      1. N = 510
      2. 24.7%
      3. OR = 1.42 (CI 0.94, 2.15)
      4. Sig –
   3. Other
      1. N = 130
      2. 6.1%
      3. OR, CI –
      4. Sig—
8. Family Received any Benefits
   1. Yes
      1. N = 470
      2. 78.0%
      3. OR 0.37 (CI 0.29, 0.46)
      4. Sig \*\*\* (P<0.001)
   2. No
      1. N = 1680
      2. 22.0%
      3. OR, CI –
      4. Sig –
9. Age
   1. <23
      1. N = 220
      2. 9.7%
      3. OR = 0.71 (C 0.50, 1.02)
      4. Sig –
   2. 23
      1. N = 660
      2. 29.2%
      3. OR = 0.85 (CI 0.71, 1.20)
      4. Sig –
   3. 24
      1. N = 870
      2. 38.4%
      3. OR = 0.93 (CI 0.71, 1.20)
      4. Sig –
   4. 25
      1. N = 22.8
      2. 22.8%
      3. OR, CI –
      4. Sig –
10. Household Responsibility Score
    1. High
       1. N = 530
       2. 24.2%
       3. OR = 1.82 (CI 1.41, 2.36)
       4. Sig \*\*\* (P<0.001)
    2. Medium
       1. N = 820
       2. 37.8%
       3. OR = 1.91 (CI 1.52, 2.40)
       4. Sig –
    3. Low
       1. N = 820
       2. 37.9%
       3. OR, CI –
       4. Sig—
11. Household Education
    1. College Degree
       1. N = 470
       2. 21.6%
       3. OR = 1.61 (CI 1.24, 2.10)
       4. Sig \*\*\* (P<0.001)
    2. Some College
       1. N = 740
       2. 34.1%
       3. OR = 1.61 (1.28, 2.02)
       4. Sig –
    3. HS/GED
       1. N = 960
       2. 44.3%
       3. OR, CI –
       4. Sig –
12. Classroom Behavior Scale
    1. High
       1. N = 750
       2. 58.3%
       3. OR 1.23 (CI 0.82, 1.84)
       4. Sig –
    2. Medium
       1. N = 380
       2. 29.5%
       3. OR 0.92 (CI 0.55, 1.28)
       4. Sig –
    3. Low
       1. N = 160
       2. 12.2%
       3. OR, CI –
       4. Sig –
13. Classroom Social Scale
    1. High
       1. N = 200
       2. 15.5%
       3. OR = 1.06 (CI 0.72, 1.56)
       4. Sig --
    2. Medium
       1. N = 590
       2. 45.4%
       3. OR = 0.90 (CI 0.68, 1.18)
       4. Sig –
    3. Low
       1. N = 500
       2. 39.1%
       3. OR, CI –
       4. Sig –
14. Communication Ability
    1. No Trouble
       1. N = 1400
       2. 65.2%
       3. OR = 3.92 (CI 2.60, 5.92)
       4. Sig \*\*\* (P<0.001)
    2. Little Trouble
       1. N = 640
       2. 30.1%
       3. OR = 2.84 (CI 2.60, 4.08)
       4. Sig –
    3. Not at all/Lot of Trouble
       1. N = 100
       2. 4.7%
       3. OR, CI –
       4. Sig –
15. Feeds Self
    1. Very Well
       1. N = 1850
       2. 85.0%
       3. OR = 4.47 (CI 3.50, 5.72)
       4. Sig \*\*\* (P<0.001)
    2. Not Very Well
       1. N = 330
       2. 14.9%
       3. OR, CI –
       4. Sig –
16. Dresses Self
    1. Very Well
       1. N = 2010
       2. 92.2%
       3. OR = 4.73 (CI 3.43, 6.52)
       4. Sig \*\*\* (P<0.001)
    2. Not Very Well
       1. N = 170
       2. 7.8%
       3. OR, CI –
       4. Sig --
17. Mobility
    1. Very well
       1. N = 1400
       2. 66.8%
       3. OR = 5.27 (CI 4.02, 6.91)
       4. Sig \*\*\* (P<0.001)
    2. Pretty Well
       1. N = 140
       2. 19.6%
       3. OR = 3.26 (CI 2.36, 4.50)
       4. Sig –
    3. Not at all Well/Not Very Well
       1. N = 290
       2. 290% (???)
       3. OR, CI –
       4. Sig –
18. Understanding
    1. No Trouble
       1. N = 1360
       2. 63.6%
       3. OR = 1.42 (CI 1.16, 1.74)
       4. Sig \*\*\* (P<0.001)
    2. Some Trouble
       1. N = 780
       2. 36.4%
       3. OR, CI –
       4. Sig –
19. Transportation Availability
    1. Yes
       1. N = 870
       2. 82.8%
       3. OR = 0.69 (CI 0.46, 1.03)
       4. Sig –
    2. No
       1. N = 180
       2. 17.2%
       3. OR, CI –
       4. Sig –

Frequencies may not sum to n=2,260 because of missing values. Logistic regression p-values are for the overall effect, and NOT for the individual odds ratios. \* P<0.05 \*\* P<0.01 \*\*\* P<0.001

**Implications for the Field**

These results confirm findings of prior research regarding variables that predict post-school employment of students with disabilities, including disability type, sex, race, household income, and receipt of government benefits. This study also included other potential risk factors, including measures of the student’s functional abilities, including the top level factor, ability to get around. Other significant factors related to functional abilities included communication, self-feeding, and self-dressing.

**Further Research**

This analysis represents the first analytical step in this research project. Similar analyses will be undertaken with Stage II variables, those that are amenable to intervention. Following that, the Stage I risk groups will be treated as separate populations. Logistic regression using the Stage II variables will be conducted for each of those populations to determine which of the Stage II variables could potentially mitigate risks of poor employment outcomes for those groups.

One limitation of this analysis is the definition of employment status. The outcome measure used in this work considers any work in the two years prior to Wave 5 ending to be gainful and competitive employment. However, this may not be true. Incorporating hours worked and wage rates into an employment variable may be useful in creating a better and more meaningful outcome measure.

**References**

Carter, E. W., Austin, D., & Trainor, A. A. (2011a). Factors associated with the early work experiences of adolescents with severe disabilities. *Intellectual and Developmental Disabilities*, 49, 233-247.

Carter, E. W., Austin, D., & Trainor, A. A. (2011b). Predictors of postschool employment outcomes for young adults with severe disabilities. *Journal of Disability Policy Studies*, 23, 50-63.

**Resources**

Additional information regarding the NLTS-2 study methodology, survey design, and other findings: SRI International ([http://www.nlts2.org](http://www.nlts2.org/)).

Additional information regarding transition from school to work: National Center on Secondary Education and Transition ([http://www.ncset.org](http://www.ncset.org/)).

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