



Transition to adulthood: Dynamics of disability, food security, and SNAP participation

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ABSTRACT

Introduction: This study examines how the transition to adulthood may affect food security for individuals with disabilities and estimates the effects of SNAP participation on their food security during the transition.

Methods: The study uses a repeated cross-sectional design with five years of data (2011–2015) from the National Health Interview Survey (NHIS) in the US. The difference-in-difference approach is applied to compare individuals with and without disabilities regarding their food security status in adolescence and young adulthood. Instrumental Variable analyses are conducted using state SNAP policy rules as exogenous instruments to estimate the effects of SNAP participation on food security status for youth and young adults with disabilities.

Results: Results indicate that transition into adulthood results in greater food security for individuals without disabilities but an increased risk of low food security for individuals with disabilities. The increased risk for young adults with disabilities may well put them at very low food security, the most severe category on the food security scale. SNAP participation appears to have greater impacts for youth than for young adults.

Conclusions: Since food security likely has a profound impact on the long-term development, economic independence, and self-sufficiency, we discuss a few policy strategies that may help individuals with disabilities in their transition to adulthood.

1. Introduction

Individuals face enormous economic, social and psychological challenges when they transition into adulthood (Osgood, Foster, Flanagan, & Ruth, 2007; Settersten, Furstenberg, & Rumbaut, 2005). This transition can be especially overwhelming and daunting for individuals with disabilities. Among the challenges faced by young adults with disabilities is greater risk of low food security. According to the US Department of Agriculture (USDA), food security is defined as access by all people at all times to enough food for an active, healthy life (Coleman-Jensen, Nord, & Singh, 2013). Households are classified as low food security if they report three or more food-insecure conditions on the 18-item scale to measure food security status (USDA-ERS, 2018). In the US, young adults with disabilities are more likely than those without disabilities to live in households with low food security and receiving food assistance through the Supplemental Nutrition Assistance Program (SNAP) (Brucker, 2016; Brucker & Coleman-Jensen, 2017).

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1.1. Disability and food security

Disability is an important risk factor for low food security (Cho, Ishdorj, & Gregory, 2016; Coleman-Jensen & Nord, 2013a; Huang, Guo, & Kim, 2010; She & Livermore, 2007). Studies have shown that low food security is more common in households with a member that has a disability (Coleman-Jensen & Nord, 2013a; Gundersen & Ziliak, 2014; Heflin, 2016; Lund, Holm, Tetens, Smed, & Nielsen, 2018). It is estimated that one out of three US households with a member not in the labor force due to disability experienced low food security in 2009–2010 (Coleman-Jensen & Nord, 2013b). Among these, more than half had very low food insecurity (Coleman-Jensen & Nord, 2013b). Sonik, Parish, Ghosh, and Igdalsky (2016) specifically compared households with children with disabilities to other households with children, finding the former more likely to report low household food security and low child food security.

The association between disability and food security is far from understood. While low food security is mostly caused by financial strain, disability is still found to have a strong association with food security status when factors such as income and assets are controlled for (Huang et al., 2010). Such association is thought attributable to a number of reasons, including limitations in accessing food, reduced time for food preparation because of having to care for self or others with disabilities, and financial challenges caused by higher costs of healthcare for people with disabilities (Gundersen & Ziliak, 2014).

1.2. Food security in transition to adulthood

Chances of low food security vary across the life span. Young adults with disabilities (18–25 years) have greater rates of low food security than working-age or older adults with disabilities in several disability categories (Brucker, 2016; Brucker & Coleman-Jensen, 2017). Brucker and Nord (2016) find individuals with intellectual and developmental disabilities have significantly higher rates of low food security than those without disabilities. Puzzlingly, however, as they transition into adulthood, their SNAP participation rates are not higher than low-income individuals without disabilities (Brucker & Nord, 2016).

For transitioning young adults with disabilities, the loss of Supplemental Security Income (SSI) and SNAP benefits and lack of employment income all contribute to their increasing odds of low food security. It is estimated that nearly one in every three child SSI recipients lose eligibility when turning 18 years old (Hemmeter & Gilby, 2009; Hemmeter, Mann, & Wittenburg, 2017) due to a more stringent definition of disability used for re-determination, and 40 percent of new applications made by young adults with disabilities who were not child SSI recipients are denied (Social Security Administration, 2017). The loss of this income source is likely accompanied by the loss of SNAP eligibility because in most states SSI recipients are automatically granted SNAP eligibility, meaning losing SSI eligibility may well require one to reapply for SNAP.

What adds stress to this transition is the harsh reality that young adults with disabilities are less likely than those without disabilities to participate in the labor force (Blackorby & Wagner, 1996; Janus, 2009), and even if they are employed they receive lower pay, on average, than their non-disabled peers (Erickson, Lee, & von Schrader, 2016). The lack of income not only increases risk of low food security and hinders them from seeking healthcare, but also creates a competition between food needs and healthcare needs for individuals with disabilities.

1.3. Effects of SNAP

SNAP provides assistance to nearly half of food insecure households in the US (Coleman-Jensen, Gregory & Singh, 2013a,b). About half of low-income households with a member not in the labor force due to disability and nearly two-thirds of working-age (18–64) adults who are SSI recipients receive SNAP benefits (Bailey & Hemmeter, 2015; Gundersen & Ziliak, 2014); therefore, it is important to examine the effects of SNAP on these households. The relationship between SNAP participation and food security is rather complex. Although there are reasons to expect positive effects of SNAP on food security among low-income households (Gregory, Rabbitt, & Ribar, 2016), comparisons of SNAP participants and non-participants often show lower food security among SNAP participants (Coleman-Jensen, Gregory, & Singh, 2013a,b; Gregory et al., 2016). This selection bias or endogeneity problem has several sources, including that households with lower food security are more likely to apply for SNAP benefits, and that SNAP benefits have not always kept up with the inflation of food prices (Nord, 2013; Nord & Golla, 2009).

To address the endogeneity of SNAP participation, more recent studies use matching techniques (e.g., Gibson-Davis & Foster, 2006), multivariate fixed effects methods (e.g., Greenhalgh-Stanley & Fitzpatrick, 2013; Wilde & Nord, 2005), and instrumental variables methods (e.g., Ratcliffe, McKernan, & Zhang, 2011; Yen, Andrews, Chen, & Eastwood, 2008). Results of these studies suggest that SNAP participation can improve food security, though participating households are differentially affected (Gregory et al., 2016). It is found that the prevalence rate of very low food security increased to around 20% a few months prior to program entry and declined to 12% a few months after program entry (Nord & Golla, 2009). SNAP shows a moderate effect by reducing the prevalence of very low food security by nearly one-third (Nord & Golla, 2009).

Due to higher prevalence of low food security among individuals with disabilities, it is not surprising that their SNAP participation rates are also higher (Coleman-Jensen & Nord, 2013a), with variation in different sub-groups of disability (Brucker, 2016). SNAP has special provisions for individuals with disabilities to improve program accessibility (Coleman-Jensen & Nord, 2013a). With aforementioned self-selection bias, SNAP recipients with disabilities have a higher prevalence of low food security than those without disabilities (Brucker, 2016; Coleman-Jensen & Nord, 2013a). Yet it remains unclear what effects SNAP has on food security of individuals with disabilities.

2. Present study

Since individuals with disabilities may lose eligibility for SSI, SNAP, and Medicaid due to a more stringent disability definition used for eligibility redetermination at age 18 (Davies, Rupp, & Wittenburg, 2009; Hemmeter, Kauff, & Wittenburg, 2009; Hemmeter et al., 2017), it is important to understand how the transition to adulthood may affect food security and what effects that SNAP has on this group in these turbulent years.

To address the gap in the literature, this study uses a repeated cross-sectional design with five years of data to compare the food security status of two age groups: youth (ages 13–17) vs. young adults (ages 18–25). We apply difference-in-difference and instrumental variable approaches to a sample of low-income individuals with disabilities and their families. We also examine the role of SNAP in protecting individuals in transition and whether the role of SNAP varies for individuals with and without disabilities. Specifically, this study examines the following hypotheses:

- (1) Young adults with disabilities are more likely than youth with disabilities to experience low food security.
- (2) SNAP participation has a greater impact on food security for young adults with disabilities than for youth with disabilities.

Testing these hypotheses will help us understand SNAP effects for young adults with disabilities and provide insights into the dynamics of SNAP participation and other related public assistance programs.

3. Methods

3.1. Data and sample

The study uses a repeated cross-sectional design with five years of data (2011–2015) from the US National Health Interview Survey (NHIS) to examine the relationship between SNAP participation and food security among young adults and youth with disabilities. The NHIS is a cross-sectional and nationally representative household survey collected by the Centers for Disease Control, National Center for Health Statistics annually since 1957. It offers publicly-available information on demographic background and public program participation, as well as restricted geographic residence data. Since 2011, the NHIS has added the Family Food Security section (the 10-item scale) sponsored by the US Department of Agriculture to assess whether families have sufficient food for healthy lives (USDA-ERS, 2017). The restricted NHIS data provide information on each household's state and county of residence. Following a multi-stage area probability design, each annual NHIS has a sample size of approximately 35,000 households containing about 87,000 individuals. The survey oversamples ethnic minority groups of Black, Asian, and Hispanic individuals.

Provided with access to the public and restricted NHIS data at the Census Research Data Center in Columbia, MO, we created a sample of low-income individuals ages 13–25 and their families. This age range broadly represents the life stage of transition from adolescence to young adulthood. Families in the sample have an income at or below 150 percent of the federal income poverty line, slightly higher than the SNAP's global income test rule (130 percent). The final analytical sample includes 31,483 low-income individuals ages 13–25.

3.2. Measures

3.2.1. Dependent variables

The dependent variables measure monthly household food security status generated from the USDA's 30-day Food Security Supplement (10 items; Connell, Nord, Lofton, & Yadrick, 2004). This scale is widely adopted as a standard measure of household food security in the US. The questions included in this valid and reliable scale ask respondents whether they worried that food would not last, did not eat balanced meals, ate less than they should, lost weight due to insufficient food, and so on. Each question has three categories of responses, including “often true,” “sometimes true,” and “never true.” The first two are considered affirmative responses and coded as “1,” while the category of “never true” is coded as “0.” Based on the responses to these questions, we created four measures of monthly household food security status. The first is a raw score counting the number of positive responses to the ten questions (0–10). The second measure is a dichotomous indicator of food security: households with a raw score higher than 2 are defined as having “low food security” and the others are having “food security.” The other two measures are binary indicators of “marginal food security” and “very low food security,” with a cut-off value of 1 and 6 on the raw scale, respectively. The cutoffs used in this study are consistent with national reporting.

3.2.2. Independent variables

The study has three independent variables. Transition into adulthood is indicated by the age range from 13 to 25 years old. Those ages 13 through 17 are assigned a value of “0” (youth) and those ages 18 through 25 are assigned a value of “1” (young adults). The second independent variable of interest is disability status. The NHIS survey has a series of questions regarding activity limitations for all individuals including children, such as work limitations, limitations in play activities, receiving Special Education or Early Intervention Services, difficulty in walking, climbing, standing, or carrying a ten-pound object, and the needs for personal assistance with eating, bathing, dressing, and other activities of daily living. Individuals with disabilities are those who reported a positive response on any of these functional limitations. The third independent variable of interest, family SNAP participation status, is a dummy variable with “1” for participants and “0” for non-participants.

3.2.3. Control variables

Multiple demographic and socioeconomic characteristics were controlled for in our analyses. These variables include gender (1 = male and 0 = female), race/ethnicity (1 = Hispanic, 2 = Non-Hispanic White, 3 = Non-Hispanic Black, 4 = Asian, and 5 = Others), education (1 = less than high school, 2 = high school, 3 = more than high school, and 4 = missing), marital status (1 = married and 0 = otherwise), employment status (1 = employed and 0 = otherwise), household income, household size, and state of residence. It should be noted that the education variable refers to the highest education level of the household head. We included this variable because education is an important socio-economic determinant of food security but most of the youth and young adults in the sample are still in school.

3.3. Analyses

3.3.1. Research hypothesis 1

To examine whether individuals with disabilities have a greater risk of low food security when entering adulthood, we used a difference-in-difference (DID) approach in linear models to compare individuals with and without disabilities regarding their food security status in adolescence and young adulthood. We used individuals without disabilities as the comparison group, and evaluated additional changes in food security status across adolescence and young adulthood for individuals with disabilities:

$$F = \alpha + \beta_1 D + \beta_2 T + \beta_3 (D \times T) + X\lambda + \varepsilon \quad (1)$$

where F is food security status, D refers to disability status, T indicates young adulthood, and X is a vector of control variables. The regression coefficient of β_3 shows additional changes in food security among individuals with disabilities from adolescence to young adulthood, relative to the comparison group.

3.3.2. Research hypothesis 2

To test the second hypothesis, we limited the sample to low-income individuals with disabilities to assess the potential impacts of SNAP participation on youth and young adults, respectively. Following previous literature (Borjas, 2004; Miller & Morrissey, 2015; Ratcliffe et al., 2011), we used the variation in state SNAP policy rules (recorded in 1996–2014 SNAP State Rules Database; Miller & Morrissey, 2015; Ratcliffe et al., 2011; Yen et al., 2008) as exogenous instruments to estimate the effects of SNAP participation on food security status for youth and young adults with disabilities in the models of instrumental variables (Miller & Morrissey, 2015).

More specifically, we merged the NHIS data of each year with the SNAP state rules in the previous year (e.g., the 2015 NHIS data with the 2014 SNAP state rules) because changes in state rules may have delayed effects on program participation. The study selected multiple potential policy instrumental variables which may affect SNAP participation rates at the state level. These variables include states' broad-based categorical eligibility, elimination of the asset test, operation of a combined application for both SNAP and SSI, requirement of fingerprinting of SNAP applicants, eligibility of legal noncitizen adults for SNAP assistance, online program application, outreach spending per capita, and the simplified reporting option for program certification.

4. Results

4.1. Descriptive statistics

Table 1 presents descriptive statistics of the dependent, independent, and control variables for the full sample ($N = 31,483$, column 1) and by disability and age status (column 2–4). Among low-income individuals ages 13–25, nearly 10% had at least one disability condition, and two-thirds were age 18 and above. Nearly 30% of the sample respondents were Hispanic and another 20% were Black. About one third of the respondents were employed, and less than 10% were married at the time of the interview. Only 3% of respondents received SSI assistance; over 30% were covered by Medicaid. It is also noted that the youth sample includes a number of individuals who are not yet old enough for formal employment (although no one was employed at the time of the interview), while the young adult sample includes only individuals who are legally able to work.

Regarding family characteristics, one quarter of families with which these respondents lived had at least one member with some college experience or a college degree. The mean family income was about \$17,000, and these families had fewer than four members, on average. About 45% of the families were SNAP recipients, and, as expected, these families had high risk of low food security. The mean food security raw score was 1.7, close to the cut-off of 2 ("low food security"). Nearly half of these families had marginal food security, meaning they had one or more positive responses on the 10-item food security scale. In addition, more than one quarter of the families had low food security (i.e., two or more positive items), and more than 10% of the sample respondents reported very low food security (i.e., six or more positive items). The rates of low food security and very low food security are more than doubled compared to those of all American households in 2015 (12.7% with low food security and 5% with very low food security; Coleman-Jensen, Rabbitt, Gregory, & Singh, 2016).

About 20% of youth and young adults with disabilities received support from SSI, whereas less than 2% of those without disabilities did. Young adults with disabilities (25%) had a higher SSI participation rate than youth (20%) in the sample. Medicaid coverage dropped from 62% to 42% for individuals with disabilities from adolescence to young adulthood, and from 50% to 20% for those without disabilities.

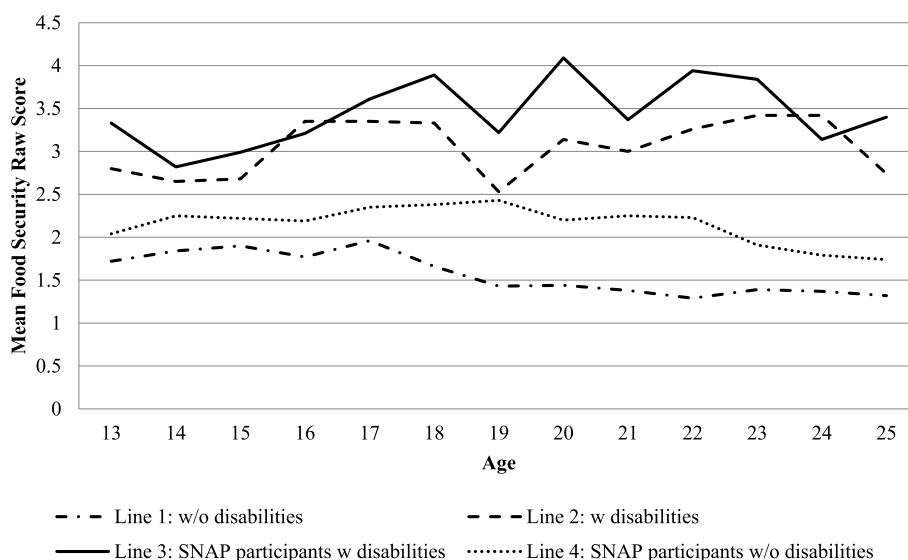
Table 1

Descriptive statistics of youth (ages 13–17) and young adults (ages 18–25) in the sample (N = 31,483).

	Full sample (N = 31,483)	Youth w/disabilities (n = 1,432)	Young adults w/ disabilities (n = 1,325)	Youth w/o disabilities (n = 10,280)	Young adults w/o disabilities (n = 18,446)
<i>Individual Characteristics</i>					
Disability (%)	8.89				
Young adults (%)	66.65				
Male (%)	48.71	63.26	47.37	49.59	46.99
<i>Race and Ethnicity (%)</i>					
Hispanic	28.84	25.09	17.49	38.53	25.41
Non-Hispanic White	44.59	47.44	56.35	33.82	48.55
Non-Hispanic Black	20.35	24.13	22.69	22.23	19.03
Non-Hispanic Asian	4.75	0.90	1.90	3.60	5.60
Non-Hispanic Others	1.48	2.45	1.58	1.47	1.41
Married (%)	8.60	0.19	7.97	0.44	13.08
Employed (%)	32.02	0.00	21.01	0.00	49.99
SSI participation (%)	3.03	20.01	24.63	1.65	0.91
Medicaid participation (%)	30.94	61.88	41.60	50.06	19.07
<i>Family Characteristics</i>					
<i>Family members' highest education (%)</i>					
High school and below	76.79	79.02	81.26	77.70	75.89
Some college	10.58	11.85	10.54	11.92	9.87
Four-year college/above	12.63	9.13	8.19	10.38	14.24
Family income (mean)	16937.14	19518.49	14263.36	21477.67	14832.65
Family size (mean)	3.55	4.45	3.00	4.72	2.98
Family SNAP participation	44.71	68.16	56.95	56.91	36.48
<i>Family food security</i>					
Raw score (mean)	1.68	2.89	3.07	1.84	1.42
Low food security (%)	27.92	47.82	47.01	31.17	23.61
Very low food security (%)	11.52	23.69	26.81	12.06	9.31
Marginal food security (%)	43.43	62.67	61.64	48.98	38.16

4.2. Food security across adolescence and young adulthood

Figs. 1–2 further illustrate changes in food security status across adolescence and young adulthood. Fig. 1 shows the mean food security raw score by age, disability, and SNAP participation. First, the food security raw score, indicated by Line 4, shows a downward trend for individuals without disabilities across ages, and it is relatively stable after the age of 19. For individuals with disabilities (Line 2), however, the score is much higher after age 16 except for ages 19 and 25. Second, probably due to the small



* Note: A higher raw score means lower food security.

Figure 1. Food Security Raw Score by Age, Disability, and SNAP Status*.

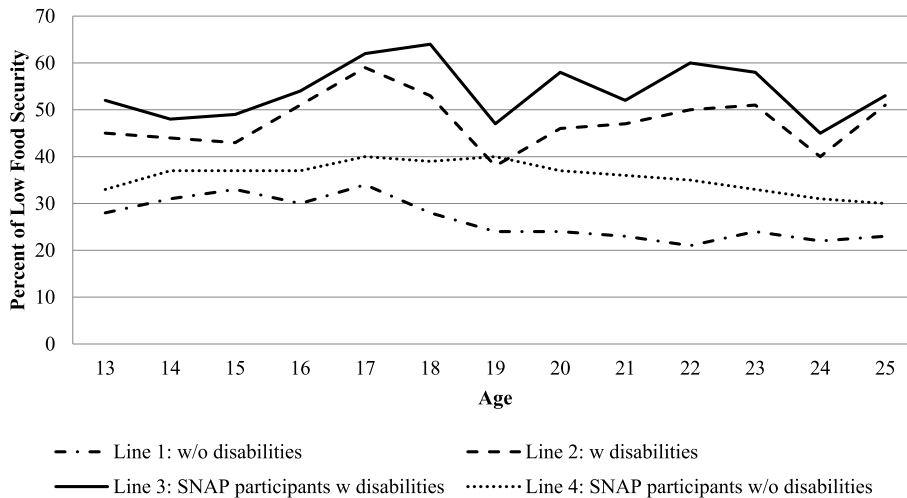


Fig. 2. Low food security status by age, disability and SNAP status.

sample size of individuals with disabilities at each age, Line 2 exhibits greater fluctuation than Line 1. Third, SNAP participants without disabilities (Line 4) and with disabilities (Line 3), respectively, show patterns across ages similar to their counterparts in the general population, but have higher mean food security scores. This is because those with greater risk of low food security are more likely to self-select into the SNAP program.

We identified similar trajectories using the measures of low food security, very low food security, marginal food security, and each individual item in the 10-item food security module. A plot of low food security is presented in Fig. 2.

4.3. Regression results on disability, transition to adulthood, and food security

Table 2 reports results from Equation (1) for the DID estimation of food security. It not only compares food security status (1) between youth with and without disabilities (β_1) and (2) between youth and young adults (β_2), but focuses on young adults with disabilities because their disadvantage in food security status compared to those without disabilities could be exacerbated as a result of the transition. These speculations are supported by the results from the DID analyses where the reference group is youth without disabilities. For example, controlling for demographic and socioeconomic characteristics, youth with disabilities are more disadvantaged in food security compared to youth without disabilities (with a mean food security raw score of 1.66) by 0.98 ($p < .001$). Young adults without disabilities are better off than their youth counterparts by a decrease of 0.20 in the food security raw score ($p < .001$) whereas young adults with disabilities become less food secure compared to youth with disabilities by 0.33 (0.53–0.20; $p < .001$). This suggests that food security improves for individuals without disabilities but declines for those with disabilities as a result of transition from adolescence to young adulthood.

Table 2 shows similar results for the other indicators of food security. The low food security variable indicates whether a household is food secure or not in the national reports (such as Coleman-Jensen et al., 2016). Results show the rate of low food security for youth without disabilities is 16 percentage points ($p < .001$) lower than that for youth with disabilities, and four percentage points ($p < .001$) higher than that of young adults without disabilities. In other words, those without disabilities become more food secure when entering young adulthood. This, however, does not happen for individuals with disabilities, as shown by the regression coefficient of the interaction term of disability status and young adulthood ($\beta_3 = 0.05$, $p = .032$). Instead, the rate of low food security shows an increment of one percentage point (0.05–0.04) for individuals with disabilities when entering young adulthood. In other words, the risk of experiencing low food security is one percent higher for young adults with disabilities than for youth with disabilities. Analyses using the measures of very low food security and marginal food security yield similar results.

4.4. Results of instrumental variable analyses

To examine the impact of SNAP participation on food security, we used the instrumental variable approach to correct the potential selection bias. The first step was to identify valid instrumental variables. We used each of the policy variables discussed above as a regressor in simple regression models to predict SNAP participation. With a model F value greater than the cut-off ($F > 10$) suggested by Staiger, Stock, and Watson (1997), three of them appeared to have a statistical association with SNAP participation. These variables are eligibility of legal noncitizen adults (all legal noncitizen adults (age 18–64) who satisfy other SNAP eligibility requirements such as income and asset limits are eligible for federal SNAP benefits or state-funded food assistance) ($F = 23.28$), outreach spending (the sum of federal, state, and grant outreach spending in nominal dollars) ($F = 20.63$), and simplified reporting option (for households with earnings, the state uses the simplified reporting option that reduces requirements for reporting changes in household circumstances) ($F = 48.01$). However, analyses of the models with the instrumental variables yielded poor results, with

Table 2

Food security, disability, and transition to young adulthood: DID estimation (N = 31,483).

Variable	Food Security Raw Score	Low Food Security	Very Low Food Security	Marginal Food Security
Intercept (α)	1.66*** (1.42, 1.91)	.28*** (.24, .32)	.12*** (.09, .15)	.43*** (.37, .48)
Disability (Yes; β_1)	.98*** (.75, 1.22)	.16*** (.12, .19)	.11*** (.08, .14)	.13*** (.09, .16)
Young Adulthood (Yes; β_2)	-.20*** (-.31, -.09)	-.04*** (-.06, -.02)	-.01* (-.03, -.00)	-.06*** (-.08, -.04)
Disability \times Young Adulthood (β_3)	.53*** (.22, .83)	.05* (.00, .10)	.05** (.01, .09)	.08*** (.03, .13)
Female	-.10** (-.18, -.03)	-.02* (-.03, -.00)	-.01** (-.02, -.00)	-.01 (-.03, .00)
Race and Ethnicity (ref: Hispanic)				
Non-Hispanic White	-.05 (-.16, .07)	-.03** (-.05, -.01)	.01 (-.00, .03)	-.06*** (-.08, -.04)
Non-Hispanic Black	.41*** (.30, .52)	.05*** (.03, .07)	.05*** (.03, .06)	.06*** (.04, .08)
Non-Hispanic Asian	-.58*** (-.74, -.41)	-.11*** (-.14, -.08)	-.04*** (-.06, -.02)	-.14*** (-.18, -.10)
Non-Hispanic Others	.54** (.20, .88)	.09* (.02, .16)	.05* (.00, .10)	.07 (-.00, .14)
Married	-.14 (-.29, .00)	-.03* (-.05, -.01)	-.01 (-.03, .01)	-.01 (-.04, .02)
Employed	-.04 (-.13, .05)	-.01 (-.02, .01)	-.00 (-.01, .01)	-.00 (-.02, .02)
Family members' highest education (ref: High school and below)				
Some college	.13 (-.02, .29)	.01 (-.02, .04)	.03** (.01, .05)	.01 (-.02, .04)
Four-year college/above	-.50*** (-.64, -.37)	-.09*** (-.12, -.07)	-.03*** (-.05, -.02)	-.11*** (-.14, -.08)
Family income (per \$10,000)	-.14*** (-.19, -.09)	-.02*** (-.03, -.01)	-.01*** (-.02, -.00)	-.02*** (-.03, -.01)
Family size	.14*** (.10, .17)	.02*** (.01, .03)	.01*** (.00, .01)	.03*** (.02, .04)

Analyses of Equation (1). Regression coefficients and 95% CI are reported in Table.

*p < .05, **p < .01, ***p < .001.

the model F values of 5 indicating a problem of weak instruments.

We further tested various combinations of these three policy measures as instrumental variables for the endogenous regressor of SNAP participation in predicting food security status, and then compared these combinations regarding their performance on overidentifying restrictions (Sargan-Hansen test) and the weak instruments problem (the Cragg-Donald F statistic and the Kleibergen-Paap F statistic; [Stock & Yogo, 2005](#)). Of all the combinations examined, outreach spending turned out to be the strongest, although it is still a weak instrument according to the Kleibergen-Paap F statistic given that it fails to reject the null hypothesis that the maximum relative bias compared to the OLS caused by the weak instrument is 25%. Nonetheless, it was chosen as the instrumental variable for subsequent analyses.

Table 3 reports the results of the instrumental variable approach. This approach was applied to examine the four food security outcomes for youth and young adults with disabilities. Adjusted by the instrumental variable, SNAP participation now shows an expected direction in all the analyses. It is negatively correlated with food security. The results revealed that SNAP participation is statistically significant only in predicting food security raw scores for youth with disabilities.

5. Discussion

This study examines the risk of low food security for individuals with disabilities in the transition to adulthood. Overall, we find that, compared to individuals without disabilities, those with disabilities have a greater risk of low food security when transitioning to adulthood. However, contrary to the expectation, SNAP participation does not seem to have statistically significant impacts on food security for this group, which is likely due to the estimation bias not adequately addressed by the weak instrumental variable used in the analysis. Nonetheless, these impacts, although insignificant, yield expected directions (i.e., improving food security), which is different from the results often found in the OLS estimation that does not address the selection bias.

Second, there seems a clear pattern that young adulthood is associated with an increased risk of low food security for individuals with disabilities, regardless of how different the four food security measures are from the technical perspective. Specifically, the increase is eight percentage points counted by marginal food security and five percentage points by low food security or very low food security ([Table 2](#)). Given that three of these measures are on the same continuum of food security, the results indicate that nearly three percentage points fall in the range of marginal food security and low food security, and the other five percentage points fall in the category of very low food security. In other words, for young adults with disabilities, the increased risk of low food security may

Table 3

SNAP participation and food security for individuals with disabilities: An instrumental variable estimation.

Models	Intercept	SNAP Participation
<i>DV1: Food security score</i>		
Youth with Disabilities	14.09*** (4.67, 23.53)	– 8.30* (–13.68, – 2.92)
Young Adults with Disabilities	4.52** (1.21, 7.82)	– 4.38 (–12.92, 4.17)
<i>DV2: Low food security</i>		
Youth with Disabilities	1.28 (–1.29, 3.84)	– 1.02 (– 2.54, .50)
Young Adults with Disabilities	0.62 (–.073, 1.96)	– 1.23 (–3.83, 1.37)
<i>DV3: Very low food security</i>		
Youth with Disabilities	1.85 (–0.33, 4.02)	– 1.03 (– 2.34, .28)
Young Adults with Disabilities	0.60 (–0.42, 1.60)	0.19 (–1.85, 2.23)
<i>DV4: Marginal food insecurity</i>		
Youth with Disabilities	2.30 (–0.47, 5.06)	– 1.08 (–2.81, 0.64)
Young Adults with Disabilities	0.34 (–1.21, 1.88)	– 1.97 (–5.02, 1.08)

Regression coefficients and 95% CI are reported in Table.

*p < .05, **p < .01, ***p < .001.

well put them at very low food security, the most severe category on the food security scale. The effect size of this increased risk – a 12%–17% increase in the low food security rate and very low food security – is beyond modest for individuals with disabilities. By contrast, individuals without disabilities become more food secure in young adulthood. These findings suggest that in young adulthood individuals with disabilities fall further behind their counterparts without disabilities. Apparently, the transition is a stage that amplifies the developmental disparity. While this study is not able to answer why the two groups show an increasing divergence on these indicators, it is suspected that employment opportunity and consumption priority may play a large part in it.

We also tested the potential impacts of SNAP participation on food security for youth and young adults with disabilities, respectively. Constrained by the weak instrumental variables, our analyses show SNAP participation is a statistically significant predictor of youth's food security status measured by the food security raw score only. While it is still unclear and needs further investigation, the current instrumental variable results seem to imply that SNAP participation has greater impacts for youth than for young adults, which is somewhat different from our hypothesis.

As is mentioned earlier, policies applied to youth with disabilities and adults with disabilities are different. Although SNAP rules make it easier for SSI/Medicaid recipients with disabilities to access SNAP (for example, some state agencies use the same application form for SNAP and Medicaid to streamline the application; SNAP allows medical expense deduction and higher asset limits; SNAP grants individuals with disabilities longer certification periods and uses change reporting for recertification, [Center on Budget and Policy Priorities, 2014, 2015a, 2015b; Gundersen & Ziliak, 2015](#)), they no longer apply when young adults lose SSI and/or Medicaid. Given these policy differences, our initial hypothesis is that SNAP participation has greater marginal effects for young adults than for youth. The instrumental variable results, however, seem to suggest the opposite – the protective effects of SNAP declined for young adults, perhaps because they have greater barriers than when they were young in accessing SNAP.

The study has several limitations. First, our repeated cross-sectional design used in this study is not able to fully capture the complex phenomenon of disability, which is defined differently by public programs serving different age groups. For example, those identified in the repeated cross-sectional design as young adults with disabilities could be different from those who have had disabilities since childhood (the theoretical population of this study). Longitudinal analyses based on panel data could resolve this problem and better capture the changes in the transition process. Second, to evaluate the impacts of SNAP participation, we tried a number of variables but were not very successful in identifying strong instrumental variables. Also, the DID analysis has an overly strong assumption that the dynamics of food security is similar for youth with and without disabilities.

6. Conclusions

The findings of this study have several important implications for policy. Young adults with disabilities face a greater risk of low food security, which may affect other aspects of their well-being (e.g., health). What they experience in the transition to adult services will likely impact their long-term development, economic independence, and self-sufficiency. Therefore, it is important to improve accessibility of food assistance programs. Better access to public food assistance will improve food security. A few strategies may be considered. For example, special outreach services could be created to target both young adults and youth with disabilities and encourage participation in food assistance programs. For youth with disabilities receiving nutrition assistance, an alert system embedded in the state administrative processes and case management services may serve to bring awareness of the upcoming transition

to adulthood and potential risk of low food security. Then, additional resources (e.g., information regarding reapplication and/or private nutrition assistance) may be provided accordingly to prevent low food security. Moreover, nutrition assistance could be included in transition planning for youth with disabilities and become an integrated part along with other transition goals and services, such as independent living, vocational training, post-secondary education, and employment. Since individuals with disabilities often participate in multiple public programs, they would benefit from a coordinated and streamlined system that optimizes accessibility and benefits.

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