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Mental Health of Female Adolescents With Disabilities: Considerations for Career Development

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Abstract

Female adolescents with disabilities are at an increased risk for mental health concerns, which can negatively impact their self-determination, making transition to postschool opportunities difficult. We analyzed two waves of survey data from 366 female adolescents with disabilities, recruited from 26 U.S. public high schools, as part of a randomized controlled trial of a career development intervention. Participants with mental health concerns evidenced a slower increase in self-determination over the follow-up period than those without such concerns. Individuals assigned to the intervention condition experienced significant gains in self-determination compared with the control. Findings suggest that mental health concerns can operate as a barrier to growth in self-determination skills among this population, though targeted interventions can help in boosting these skills.

Keywords

high school, disability groups, group experimental, research methodolgy, self-determination, transition, mental health

Mental health concerns among adolescents are a serious public health issue. Compared with previous cohorts, the current generation of adolescents has significantly higher rates of mental health concerns, including greater psychological distress, anxiety, depression, and suicidal behaviors (Mojtabai, Olfson, et al., 2016; Twenge et al., 2019). National surveillance data from 2017 indicate that 17.2% of U.S. high school students seriously considered attempting suicide in the past year—the rates being almost double among females (22.1%) compared with males (11.9%) (Kann et al., 2018). Youth with disabilities, who comprise 14% of U.S. public high school students (National Center for Education Statistics [NCES], Institute of Education Sciences, U.S. Department of Education, 2020), have an even higher prevalence of mental health concerns (Moses, 2018). In a meta-analysis including 51 studies with school-age children, Nelson and Harwood (2011) found that students with learning disabilities had higher mean levels of anxiety, effect size (d) = 0.61, compared with students without learning disabilities. In another study of individuals ages 6 to 18 years with autism spectrum disorder (ASD), almost half of the participants were at borderline or clinical levels of anxiety and depression regardless of their age, intelligence quotient (IQ), or ASD symptoms (Strang et al., 2012). These findings are corroborated by teacher reports of high prevalence of mental health concerns among students with disabilities, which are typically not addressed through an Individualized Education Program (IEP) and typical transition planning services, thus highlighting a critical need to better understand and address the barriers posed by mental health concerns for youth with disabilities (Poppen et al., 2016).

Mental health concerns can interfere with successful postsecondary transition for youth with and without disabilities (Mojtabai, Stuart, et al., 2016). This is especially true in the case of female adolescents with disabilities, who are uniquely disadvantaged given the higher rates of mental health concerns (Gotham et al., 2015) and gender discrimination (Lindstrom et al., 2012) compared with their male peers with disabilities. Given the unique challenges experienced by female adolescents with disabilities, it is important to examine the effects of mental health concerns for this population on career and college readiness, which is often defined as a specific set of skills, knowledge, and

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behaviors that show a student is ready to meet expectations in a postsecondary education or career setting (Lindstrom, Lind, et al., 2020). We address this research gap by: (a) examining the longitudinal effects of mental health concerns on self-determination skills, specifically in the domains of autonomy and self-realization that are uniquely predictive of college and career readiness among female youth with disabilities (we elaborate on these associations in the section below); and (b) evaluating the effects of a career development intervention on change in self-determination skills, both as a direct effect and as a moderating effect, buffering the potential negative impact of mental health concerns on self-determination.

Self-Determination

Self-determination, defined as the ability to take agency and volitional action in the pursuit of intrinsically valued goals free from external influence or interference, is a critical predictor of postsecondary success among youth with disabilities (Shogren et al., 2015). It includes aspects of decision-making, goal-setting/planning, engaging in steps to meet those goals, and taking responsibility for one's actions (Rowe et al., 2014), all of which support adolescents in developing and achieving goals related to postsecondary transition. Among female adolescents with disabilities, high levels of self-determination are positively associated with postsecondary expectations (Doren & Kang, 2016), postsecondary educational attainment (Petcu et al., 2017), and gainful employment and independent living (Shogren et al., 2015). However, given their unique experiences, female adolescents with disabilities have significantly lower levels of self-determination compared with their male peers with disabilities (Shogren et al., 2016) and youth without disabilities (Shogren et al., 2018b). Lower self-determination may be one reason why female adolescents with disabilities are less likely to enroll in and graduate from postsecondary education and are paid lower hourly wages than their male peers without disabilities (Doren et al., 2011; Sanford et al., 2011). Social and institutional bias, based on stereotypes of women and people with disabilities, also leads high school girls with disabilities to limit their career options (Doren & Kang, 2016). They are more often engaged in personal care and service work (e.g., child care) than male youth with disabilities (Newman et al., 2011) and experience a starting wage gap that persists over time (Ji et al., 2015). Given the critical role of self-determination in promoting postsecondary transition outcomes among female adolescents with disabilities, it is important to identify factors that promote or hinder the development of these skills.

Self-determination consists of four key aspects: autonomy, self-realization, self-regulation, and empowerment (Shogren et al., 2015). Of these domains, prior research conducted with female youth with disabilities (Doren & Kang, 2016) has found that the domains of autonomy (i.e., making independent decisions) and self-realization (i.e., self-awareness and motivation to take steps toward achieving goals) tend to be strongly and consistently related to postsecondary transition outcomes in this population. This may be related to the relevance of autonomy and self-realization during late adolescence when youth are typically making decisions about postsecondary education and employment. These domains of self-determination have also been linked to emotional well-being (Shogren & Shaw, 2016), making them especially relevant for promoting college and career readiness among female youth with disabilities, who experience greater negative self-perceptions and mental health concerns than their male counterparts (Gotham et al., 2015; Trainor, 2007). As such, in the current study, we focused on the domains of autonomy and self-realization, and we evaluated whether mental health concerns and participation in a career development intervention influenced these specific self-determination skills. That said, the domains of self-regulation and empowerment are equally important aspects of self-determination and have been associated with mental health problems among youth in foster care settings (Lee et al., 2018).

Mental health concerns are found to negatively impact both autonomy and self-realization. Specifically, high levels of anxiety (Van Petegem et al., 2013), perceived stress (Raufelder & Kittler, 2014), and depression (Duineveld et al., 2017) can interfere with autonomous decision-making. Anxiety (Maldonado et al., 2013) and depression (Gayman et al., 2011) have also been linked to lower levels of self-realization. Studies with samples of female adolescents with disabilities, in particular, have also found that mental health concerns tend to be negatively correlated with self-realization and negatively impact postsecondary aspirations (Pham et al., 2020). Despite the negative impact of mental health concerns on self-determination and postsecondary transition and higher prevalence of mental health concerns among female youth with disabilities, no study to date has examined the longitudinal impact of mental health concerns on self-determination skills among this population.

Career Development Interventions

Targeted career development interventions have shown promising gains in self-determination and related career readiness skills among youth with disabilities (Wehmeyer et al., 2011). In a randomized controlled trial of a transition-to-adulthood intervention with 293 foster care youth (16.5–18.5 years old), both with and without disabilities, Blakeslee et al. (2020) found significant intervention-related improvements in self-determination, regardless of disability status, at postintervention and 1-year follow-up. Furthermore, they

found that baseline levels of traumatic stress moderated the effect of the intervention, such that significant improvements in self-determination were only observed for youth with low levels of traumatic stress. Although this study focused on youth in foster care, 50% to 60% of youth in foster care are identified with disabilities (Cheatham et al., 2020; Slayter, 2016), making the findings in this study relevant to the current examination, which also focused on youth with disabilities.

In this study, we examined the effects of an evidence-based, gender-specific career development intervention, known as Paths 2 the Future (P2F; Lindstrom, DeGarmo et al., 2020; Lindstrom & Post, 2015), on self-determination skills both as a direct effect and as a moderating effect, buffering the potential negative influence of mental health concerns on self-determination. P2F has shown promising results in improving college and career readiness among female adolescents with disabilities (Lindstrom, DeGarmo, et al., 2020). The gender-specific, group-based format of this intervention can provide a safe context to explore mental health difficulties and promote social connectedness among participants (Lindstrom et al., 2019). These experiences, in turn, can help mitigate the negative impact of mental health concerns on the ability to engage in autonomous and self-determined behaviors. It is, therefore, possible that interventions, such as P2F, can offset the negative impact of mental health concerns on self-determination skills among female youth with disabilities; however, this has not yet been tested.

Considering that female adolescents with disabilities are especially vulnerable to mental health concerns (Gotham et al., 2015) and lower self-determination skills (Trainor, 2007), understanding the impact of mental health concerns is critical to developing interventions that can promote self-determination skills and postschool outcomes in this population. Mental health concerns can attenuate the protective effect of transition-focused interventions on self-determination skills (Blakeslee et al., 2020); however, these relationships have not been examined longitudinally in a sample of female youth with disabilities. To address this gap, we examined the effect of mental health concerns on change in self-determination (specifically autonomy and self-realization) in a sample of 314 female adolescents with disabilities. We also evaluated whether participation in a gender-specific career development intervention (i.e., P2F) operated as a protective effect, both by directly promoting self-determination skills and by buffering the negative impact of mental health concerns on self-determination. Our research questions and hypotheses were as follows:

Research Question 1: Are mental health concerns associated with lower rates of growth in self-determination in a sample of female adolescents with disabilities?
Hypothesis 1: On average, there will be an increase in self-determination in our sample. Participants with mental health concerns will experience a slower rate of growth in self-determination compared with those without mental health concerns.
Research Question 2: Is participation in the P2F intervention associated with an increase in self-determination (pre- to postintervention)?
Hypothesis 2: Participants in the intervention condition will report a significant increase in self-determination (pre/post) compared with control group participants.
Research Question 3: Does participation in the P2F intervention buffer the potential negative influence of mental health concerns on self-determination?
Hypothesis 3: The potential negative effect of mental health concerns on self-determination will be weaker in magnitude in the intervention group participants compared with the control group participants.

Method

Participants and Procedure

Female adolescents with disabilities ($N = 366$; M age = 16.5 ± 1.1 years) from 26 public high schools in the U.S. Pacific Northwest participated in this study as part of an efficacy trial of a gender-specific career development intervention (Lindstrom, DeGarmo, et al., 2020). Participants were in Grades 9 (14%), 10 (34%), 11 (30%), and 12 (22%), with the majority identifying as non-Hispanic White (60.93%) and 19.40% reporting Latina ethnicity. Most participants were receiving special education services under the Individuals with Disabilities Education Improvement Act (IDEA; 2004) category of specific learning disability (55%) or other health impairment (14.8%). About half (52.8%) had at least one parent with a bachelor's level college degree. For additional details related to study sample characteristics and procedures, see Lindstrom, DeGarmo, et al. (2020). Prior to data collection, institutional review board and school district board approvals were received. Participating adolescents provided written assent for participation in the study and their parents/guardians provided informed consent.

Propensity score matching procedures were used to randomly assign schools to the intervention and control conditions (see Lindstrom, DeGarmo, et al., 2020, for a full description). Control ($n = 230$, 59.6%) and intervention ($n = 156$, 40.4%) group participants completed a web-based survey at four time points: (a) baseline/pre-intervention, (b) halfway through the academic year (for schools implementing a full-year schedule), (c) post-intervention, and (d) 6-month follow-up. While 386 participants were originally assigned to intervention and control conditions, 20 participants did not complete surveys and/or participate after initial recruitment. Current analyses are based on 314 participants (Intervention, $n = 131$; Control, $n = 183$) for

whom both teacher reports and student survey data were available. Research staff facilitated the administration of student surveys at school. The survey included measures of self-determination and demographic information such as age, race, ethnicity, and family socioeconomic status (SES). Teachers reported on participants' disability type and presence of mental health concerns at baseline. For this analysis, we used baseline data for all variables, except self-determination, which was assessed at both baseline (T1) and post-intervention (T2).

Intervention

Paths 2 the Future. P2F is a gender-specific, evidence-based career development curriculum. Prior research has demonstrated growth in self-efficacy, self-realization, and career development for adolescent females who participated in the P2F intervention (Lindstrom et al., 2013; Lindstrom et al., 2019). The curriculum is taught daily in classrooms by trained educators over 18 weeks and includes 75 lessons (approximately 50 min each). The lessons are categorized in modules that focus on self-awareness, disability knowledge, gender awareness, and career and college readiness (see Lindstrom et al., 2019, for a full description of the curriculum). Examples of activities within the self-awareness module included promoting self-confidence and motivation for future careers, building self-awareness and autonomy, developing and understanding individual strengths and goals, and learning strategies for communication and emotion regulation. Delivery of a P2F lesson may include the facilitator teaching a skill to students (e.g., considering career goals) and then students proceeding with discussion and scaffolded activities together to practice or implement the skill (e.g., reflect with each other and write down career goals). Activities include independent exercises (e.g., using a website to explore career options) and paired or small-group activities (e.g., mock interview practice); students also create permanent products to use in their postsecondary college/career pursuits (e.g., filled out job application).

Measures

Teacher survey (presence of mental health concerns question). Teachers indicated whether adolescents had a mental health concern by answering, "Does this student experience the following health challenges?" Response options included the following: "Mental health issues (e.g., anxiety, depression)," "Chronic health condition (e.g., diabetes, asthma)," "Don't know," and "No, this student does not experience any of these health challenges." Using this information, we created a new variable, which was coded "1" if the teacher selected that the student had "mental health issues" and "0" if the teacher did not select this response. Of the participants, 51.60% ($n = 162$) were coded 1. Teachers identified if the students had a mental health issue based on the information they had available. More comprehensive mental health evaluations were not conducted as part of this study. Reliability and validity are not available for this measure. Prior research supports accuracy of teacher assessments of mental health risk in school samples (De Los Reyes et al., 2015) and teachers often serving as points of disclosure for students with disabilities (Phillippo & Kelly, 2014).

Self-determination. To measure self-determination, adolescents completed two subscales of the Arc's Self-Determination Scale–Adolescent Version (SDS-A; Wehmeyer & Kelchner, 1995) at T1 and T2. Subscales used included Self-Realization (15 questions) and Autonomy (14 questions). Adolescents rated how much they agreed with each statement on a scale from 0 ("Not even if I have the chance") to 3 ("Every time I have the chance"). To measure self-realization, statements included the following: "I like myself" and "I do not feel ashamed of any emotions." To measure autonomy, statements included the following: "I work to earn money" and "I volunteer in things that I am interested in." Total scores were used for each subscale, where higher scores represented a greater degree of self-realization or autonomy. Reliability was acceptable with Cronbach's alpha of .62 for the Self-Realization subscale and .87 for the Autonomy subscale (Cronbach, 1951). Each of these subscales have moderate–strong criterion-related validity with previously developed measures of self-determination (Wehmeyer, 1995). Subscales were averaged to create a self-determination score, both at T1 ($M = 2.69$, $SD = 0.37$, range = 1.73–3.80, $\alpha = .80$) and T2 ($M = 2.75$, $SD = 0.41$, range = 1.44–3.80, $\alpha = .84$). If adolescents only completed one subscale, then this value was used for the self-determination score.

Covariates. The following covariates were included to account for potential confounding effects: adolescent age, race/ethnicity, disability type, and family SES. Prior studies have found that younger adolescents have lower self-determination scores, with self-determination increasing over time, except for African American students with intellectual disability (Shogren et al., 2018b). Similarly, students from lower SES families have lower self-determination scores (Shogren et al., 2018a). Self-determination differences have also been observed based on racial ethnic minority status and specific disability type (Shogren et al., 2018a). Shogren et al. (2018a) found significant differences in a student's self-determination score depending on the interaction of the student's race/ethnicity and disability type. Specifically, White youth without disabilities had higher self-determination scores than youth without disabilities who were identified as African American or Black, Latino or Hispanic, or in the "other" category. White youth had similar self-determination scores if they had no disability or a specific learning disability, and White youth had similar scores if they had an intellectual disability, ASD, or other health impairment. When comparing students within the same disability group, White students tended to score higher than students from

other race/ethnicity categories, except for the ASD group, where White students scored the lowest. In the final sample, due to low frequencies in specific racial ethnic groups, race/ethnicity was recoded into two categories, including non-Hispanic White (56.3%), which was omitted as the reference group, and racial ethnic minority (43.7%), which included African American, Asian American, Native American, Pacific Islander, Other/Unknown, and/or European American with Latina ethnicity. Disability type was recoded into two categories: specific learning disability (56.08%) and other disabilities (43.92%), which included ASD, other health impairment, intellectual disability, visual and hearing impairments, and others. The other disability type also included 22 students with emotional disturbance. Thus, there was a range of disability categories within this group. The "other disabilities" group was omitted as the reference group.

Analytic Plan

A two-level hierarchical linear model (HLM; Raudenbush & Bryk, 2002) was estimated, where participant characteristics and self-determination at Level 1 were nested within schools at Level 2. Multilevel modeling was used to partition the variance in self-determination attributable to nesting within schools. Due to the nested structure of the data, the one-way analysis of variance (ANOVA) model—or unconditional means model—was used to calculate the intraclass correlation coefficient (ICC), or the degree of dependence at the school level, and the multilevel design effect (*deff*), or the degree of deviation from a simple random sample (B. O. Muthén & Satorra, 1995). In the current study, although the ICC was $<.0001$ and *deff* <1.1, as random assignment was done at the school level, we used two-level modeling to get unbiased standard errors (Lai & Kwok, 2015). Data were analyzed using an intent-to-treat approach (i.e., the participant data were analyzed based on assignment to intervention or control group, regardless of whether the participants received any intervention sessions). Our model accounted for effects of age, racial and ethnic minority status, disability type, and family SES. We used SPSS (IBM Corp., 2019) for descriptive statistics and bivariate analyses. Multilevel modeling was conducted in Mplus v8 (L. K. Muthén & Muthén, 2017), accounting for clustering within schools. Missingness was an issue only in case of family SES (43.8%). We used full information maximum likelihood (FIML) to account for missing data.

Results

Descriptive Statistics

Means, standard deviations, and ranges of study variables along with their bivariate associations are included in Table 1, and descriptive statistics for mental health concerns by group assignment at baseline (T1) are included in Table 2. As expected, self-determination (T1) was positively correlated with self-determination at T2 ($r = .65, p < .001$). Presence of mental health concerns (T1) was negatively correlated with self-determination at T1 ($r = -.15, p = .01$) and at T2 ($r = -.18, p < .01$). Intervention group assignment was positively correlated with the presence of mental health concerns ($r = .16, p < .01$) such that those in the intervention condition reported higher levels of mental health concerns compared with those in the control condition at T1. Intervention group assignment was not significantly correlated with self-determination at T1 ($r = -.03, p = .59$) or at T2 ($r = .07, p = .21$).

Results of the multilevel modeling indicated that, consistent with our first hypothesis, the presence of mental health concerns at T1 was negatively associated with self-determination at T2, B (SE) $= -0.08$ (0.0), $p = .04$, accounting for self-determination at T1, B (SE) $= 0.68$ (0.05), $p \leq .001$, and study covariates. We also found support for our second hypothesis, that is, assignment to the intervention condition was positively associated with self-determination at T2, B (SE) $= 0.07$ (0.03), $p = .03$, accounting for self-determination and covariates at T1 (see Figure 1). The model had good fit to the data, $\chi^2(31) = 263.99$, $p \leq .001$, comparative fit index (CFI) $= 0.93$, and root mean square error of approximation (RMSEA) $= 0.048$, $\chi^2/df = 8.52$. Our third hypothesis, however, was not supported by the data. There was no evidence of moderation, B (SE) $= 0.07$ (0.15), $p = .65$, that is, the effects of mental health on self-determination change did not vary based on group assignment (see Figure 2). See Table 3 for the regression estimates from the final models.

Discussion

This study examined the effects of mental health concerns on self-determination skills in a sample of 314 female adolescents with disabilities. We also tested if participation in a female-only, group-based intervention with an emphasis on promoting career development skills had a protective effect, either by directly promoting self-determination or by buffering the negative impact of mental health on self-determination. Consistent with our hypotheses, participants with mental health concerns evidenced slower growth in self-determination than those without such concerns. Furthermore, assignment to the P2F intervention was associated with a significant increase in self-determination (from T1 to T2) compared with control group assignment. Contrary to our hypothesis, assignment to the P2F condition did not buffer the impact of mental health on self-determination change. Overall, our findings show that mental health concerns can have a significant negative impact on self-determination skills of female adolescents with disabilities. Future research should examine the effects of targeted, gender-specific interventions on self-determination skills in adolescents with and without underlying mental health concerns. Although our initial

Table 1. Correlation Matrix of Study Variables.

Variable	1	2	3	4	5	6	7	8	9	10
1. Self-determination (T1)	—									
2. Self-determination (T2)	.65***	—								
3. P2F intervention	–.03	.07	—							
4. Mental health concerns (T1)	–.15*	–.18**	.16**	—						
5. Family SES (T1)	.01	.02	–.18***	.01	—					
6. Age (T1)	.14*	.14*	.06	.09	–.07	—				
7. Race/ethnicity (minority)	.06	–.02	<.01	–.16**	–.15*	.02	—			
8. Disability type (specific learning disability)	.08	.07	–.09	–.16**	–.18*	–.07	–.05	—		
9. Disability type (other)	–.08	–.07	.09	.16**	.18*	.07	.09	–1.00	—	
10. Duration (in days) between T1 and T2	.08	–.01	.14	–.03	–.31*	.03	.10	–.10	.10	—
Range, *M* (*SD*)	1.73–3.80, 2.69 (0.37)	1.44–3.80, 2.75 (0.41)	0–1, 41% Yes	0–1, 52% Yes	16–66, 38.77 (12.27)	14.17–20.38, 16.55 (1.10)	0–1, 43% Yes	0–1, 56% Yes	0–1, 44% Yes	51–252, 162.42 (67.75)

Note. Disability type (other) includes autism, deaf–blindness, deafness, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, speech or language impairment, traumatic brain injury, visual impairment, or no disability specified. Race/ethnicity (minority) includes African American, Asian American, Native American, and Pacific Islander or European American and Latina. P2F = Paths 2 the Future; SES = socioeconomic status.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. Descriptive Statistics for Mental Health Concerns by Group Assignment at Baseline (T1).

	Mental health concerns		
Condition	Yes	No	$\chi^2(2)$
Intervention (n = 131)	80 (61.1%)	51 (38.9%)	8.08*
Control (n = 183)	82 (44.8%)	101 (55.2%)	

Note. There was some missingness in teacher reports; hence, the n reported is less than the actual number of participants in the intervention (n = 156) and control (n = 230) groups.
*$p < .01$.

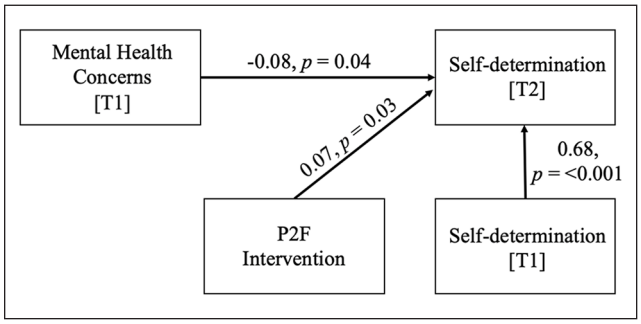

Figure 1. Main effects of mental health concerns and the P2F intervention on self-determination change.
Note. The effect of P2F is between groups. Unstandardized coefficients are reported. The effects of family SES, age, race, ethnicity, disability type, and duration between T1 and T2 assessment were covaried out. P2F = Paths 2 the Future; SES = socioeconomic status.

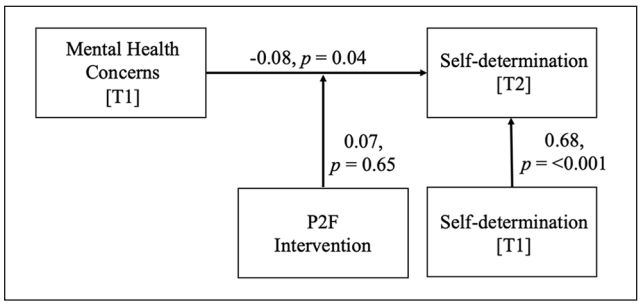

Figure 2. Moderating effect of P2F intervention on the relationship between mental health concerns and self-determination change.
Note. The effect of P2F is between groups. Unstandardized coefficients are reported. The effects of family SES, age, race, ethnicity, disability type, and duration between T1 and T2 assessment were covaried out. P2F = Paths 2 the Future; SES = socioeconomic status.

findings warrant further replication with stronger measures and larger study samples, current results have implications for interventions targeting self-determination and related college and career readiness skills among young women with disabilities.

Close to half of our sample (51.6%) had mental health concerns, as reported by their teachers, highlighting the disturbingly high rates of mental health concerns among female youth with disabilities. These numbers are consistent with other studies that have documented high levels of anxiety and depression as well as other mental health and related issues among female youth with disabilities (e.g., Lindstrom et al., 2012; Nelson & Harwood, 2011). Female adolescents with disabilities experience unique challenges to postsecondary transition, making them far less likely to access college education and gainful employment (Lindstrom et al., 2012; Trainor, 2007). High rates of mental health concerns among female youth with disabilities can further impede their ability to transition to postschool opportunities (Gotham et al., 2015; Lindstrom et al., 2012). Supports provided to students with disabilities, such as IEPs and transition planning services, are often not sufficient to support their mental health needs (Poppen et al., 2016). This is troubling, considering that mental health concerns tend to emerge during the high school years (American Psychiatric Association, 2013), and female adolescents with disabilities may be particularly vulnerable to mental health concerns (Gotham et al., 2015). These findings reveal a clear gap in services for addressing mental health concerns among female adolescents with disabilities during their high school years. Targeted career development interventions are beneficial in improving postsecondary transition skills among high school girls with disabilities (Lindstrom, DeGarmo, et al., 2020); however, additional intervention supports are needed to address their mental health needs.

Our findings revealed that the presence of teacher-reported mental health concerns was negatively associated with growth in self-determination skills across both intervention and control group participants. While previous research has documented the negative impact of mental health concerns on self-determination (e.g., Gayman et al., 2011; Van Petegem et al., 2013), our study is the first to document these effects in a large, longitudinal sample of female adolescents with disabilities. Considering that self-determination is an important skill to promote college and career readiness (Petcu et al., 2017), understanding how mental health concerns impact self-determination skills in female adolescents with disabilities is critical in informing future research and practice to more effectively support the unique needs of this population.

Table 3. Unstandardized and Standardized Regression Coefficients From the Final Model.

	Self-determination (T2)		
Pathways of influence	*B* (*SE*)	*p* value	β
Main effects (predictors)			
Mental health concerns (T1)	–0.08 (0.04)	.04	–0.10*
P2F intervention	0.07 (0.03)	.03	0.07*
Main effects (covariates)			
Self-determination (T1)	0.68 (0.05)	<.001	0.64***
Age (in years)	0.01 (0.02)	.70	0.02
Racial/ethnic minority status	–0.06 (0.03)	.08	–0.07
Disability type (specific learning disability)	–0.02 (0.03)	.60	–0.02
Family SES	0.001 (<0.01)	.95	–0.01
Duration (in days) between T1 and T2	0.000 (<0.01)	.07	–0.07
Interaction effects			
P2F × Mental Health Concerns	0.07 (0.15)	.65	1.49

Note. Race and ethnicity (minority) includes African American, Asian American, Native American, Pacific Islander, Other/Unknown, and/or European American with Latina ethnicity. Race and ethnicity (not minority) was omitted as a reference group. Disability type (not Specific Learning Disability) was omitted as a reference group. *B* (*SE*) = unstandardized regression coefficient and standard error; β = standardized regression coefficient; P2F = Paths 2 the Future; SES = socioeconomic status.
*$p < .05$. ***$p < .001$.

We also found evidence that participation in a gender-specific, group-based, career development intervention (i.e., P2F) was associated with significant gains in self-determination, regardless of participant's baseline levels of mental health concerns. Prior studies have found similar effects of targeted interventions (Lindstrom, DeGarmo, et al., 2020; Wehmeyer et al., 2011), but these studies did not account for mental health risk, with the exception of Blakeslee et al. (2020), who found that high levels of traumatic stress can mitigate intervention effects on self-determination in a sample of foster youth with and without disabilities. Taken together, our results suggest that targeted career development skill interventions hold promise in improving self-determination skills for female youth with disabilities.

Participation in the P2F intervention had a direct protective effect in promoting self-determination skills, but it did not buffer the negative impact of mental health concerns. We expected that the group-based nature of the P2F intervention would foster greater social connectedness and peer support, which might serve to dampen the effect of mental health concerns. However, this hypothesis was not supported by our findings. It is possible that participation in the P2F intervention did not produce some of these benefits as it was not intended necessarily to improve social connectedness. It may also be the case that the mental health concerns experienced by the study participants were relatively severe/chronic and require more targeted mental health supports. It is also possible that we had limited statistical power to detect significant interaction effects. Future interventions should consider providing tiered levels of support, including greater mental health resources and supports for female adolescents with disabilities.

Limitations and Future Directions

The following limitations should be considered when interpreting the study findings. First, mental health concerns were assessed using a single item from teacher reports and did not include additional details about the type of mental health symptom, diagnosis, duration, or intensity. Although teachers can be a reliable source of information about mental health risk in the school context (De Los Reyes et al., 2015), our sole reliance on teacher reports may have biased our assessments of mental health concerns in our sample. Future research should consider including multiple sources of information regarding mental health risks, including comprehensive and valid mental health assessments and/or confirm diagnoses of any mental health disorders. In addition, the dichotomous nature of the teacher report on mental health concerns does not allow for analysis on diagnosis, frequency of symptoms, intensity, or other critical information when examining mental health. The effects of mental health on self-determination could also be examined in future research by analyzing how specific disability types may provide unique effects in the relationship between mental health and self-determination. With regard to measurements, the subscale of Self-Realization had low reliability (.62), which may have adversely impacted our assessment of self-determination. Second, while participants assigned to the intervention condition showed greater improvements in self-determination from T1 to T2 than control group

participants, this may have been related to being assigned to the intervention condition and not the intervention itself, as sometimes being in the intervention group can produce positive effects on its own due to participant expectations (Boot et al., 2013). Future research could include active control conditions where participants receive a placebo intervention, so that expectations are the same across conditions. Third, despite our randomized design, we noted baseline differences in mental health concerns, with the intervention group participants having greater mental health concerns than the control group, which could be one potential reason why we failed to observe a buffering effect of the intervention. Future research should consider taking additional steps to ensure baseline equivalence. Furthermore, all of our variables (except for mental health concerns) were based on adolescents' self-reports, which could have resulted in reporting bias. Relatedly, our self-determination measure was based on an average of two of the four key aspects of self-determination (i.e., autonomy and self-realization), which does not allow for examining these aspects separately or understanding how the intervention may have impacted self-determination as a whole. Finally, given possible differences in mental health concerns depending on the specific type of disability, future studies should examine the effects of mental health concerns separately for different disability types. While the current study included only 22 youth with emotional disturbance in the "other disability type" category (which included all other disability types besides specific learning disability), there may be inherent differences related to mental health among youth with emotional disturbance as compared with students with other disability types.

Implications for Practice

As about half of female adolescents with disabilities in this sample were reported by teachers to have mental health concerns, further examination of mental health among female adolescents with disabilities is needed to ensure they receive adequate supports for their mental health while in school. Teachers' awareness of student mental health issues when they enter the school environment is crucial, and teachers potentially can be effective screeners for these concerns, though knowledge of students' mental health would best be explained by analyzing multiple data sources. Knowledge of student mental health also can provide useful contextual information to teachers and other school staff, such as school psychologists, counselors, and administrators, so that they can also better support students in the school environment and during postsecondary transition. Providing targeted career development curricula to female adolescents with disabilities could also be important for career and college readiness skills, including self-determination, which may promote postsecondary transition and success.

Declaration of Conflicting Interests

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References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425596

Blakeslee, J. E., Powers, L. E., Geenen, S., Schmidt, J., Nelson, M., Fullerton, A., George, K., McHugh, E., & Bryant, M., & Research Consortium to Increase the Success of Youth in Foster Care. (2020). Evaluating the my life self-determination model for older youth in foster care: Establishing efficacy and exploring moderation of response to intervention. *Children and Youth Services Review*, *119*, Article 105419. https://doi.org/10.1016/j.childyouth.2020.105419

Boot, W. R., Simons, D. J., Stothart, C., & Stutts, C. (2013). The pervasive problem with placebos in psychology: Why active control groups are not sufficient to rule out placebo effects. *Perspectives on Psychological Science*, *8*(4), 445–454. https://doi.org/10.1177/1745691613491271

Cheatham, L. P., Randolph, K. A., & Boltz, L. D. (2020). Youth with disabilities transitioning from foster care: Examining prevalence and predicting positive outcomes. *Children and Youth Services Review*, *110*, Article 104777. https://doi.org/10.1016/j.childyouth.2020.104777

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334. https://doi.org/10.1007/BF02310555

De Los Reyes, A., Augenstein, T. M., Wang, M., Thomas, S. A., Drabick, D. A. G., Burgers, D. E., & Rabinowitz, J. (2015). The validity of the multi-informant approach to assessing child and adolescent mental health. *Psychology Bulletin*, *141*(4), 858–900. https://doi.org/10.1037/a0038498

Doren, B., Gau, J., & Lindstrom, L. (2011). The role of gender in the long-term employment outcomes of young adults with disabilities. *Journal of Vocational Rehabilitation*, *34*, 35–42. https://doi.org/10.3233/JVR-2010-0532

Doren, B., & Kang, H. J. (2016). Autonomy, self-realization, and self-advocacy and the school- and career-related adjustment of adolescent girls with disabilities. *Career Development and Transition for Exceptional Individuals*, *39*(3), 132–143. https://doi.org/10.1177/2165143415574875

Duineveld, J. J., Parker, P. D., Ryan, R. M., Ciarrochi, J., & Salmela-Aro, K. (2017). The link between perceived maternal and paternal autonomy support and adolescent well-being across three major educational transitions. *Developmental*

Psychology, *53*(10), 1978–1994. https://doi.org/10.1037/dev0000364

Gayman, M. D., Lloyd, D. A., & Ueno, K. (2011). The history and timing of depression onset as predictors of young-adult self-esteem. *Journal of Research on Adolescence*, *21*(3), 691–702. https://doi.org/10.1111/j.1532-7795.2010.00702.x

Gotham, K., Brunwasser, S. M., & Lord, C. (2015). Depressive and anxiety symptom trajectories from school age through young adulthood in samples with autism spectrum disorder and developmental delay. *Journal of the American Academy of Child & Adolescent Psychiatry*, *54*(5), 369–376. https://doi.org/10.1016/j.jaac.2015.02.005

IBM Corp. (2019). IBM SPSS Statistics for Windows, Version 26.0. [Computer software]. Author.

Ji, E., Schaller, J., Pazey, B., & Glynn, K. (2015). Education and employment outcomes from the RSA data file for transition-age African American, White, and Hispanic youth with learning disabilities. *Journal of Applied Rehabilitation Counseling*, *46*(3), 15–24. https://doi.org/10.1891/0047-2220.46.3.15

Kann, L., McManus, T., Harris, W. A., Shanklin, S. L., Flint, K. H., Queen, B., Lowry, R., Chyen, D., Whittle, L., Thornton, J., Lim, C., Bradford, D., Yamakawa, Y., Leon, M., Brener, N., & Ethier, K. A. (2018). Youth risk behavior surveillance: United States, 2017. *Morbidity and Mortality Weekly Report. Surveillance Summaries*, *67*(8), 1–114. http://doi.org/10.15585/mmwr.ss6708a1

Lai, M. H. C., & Kwok, O. (2015). Examining the rule of thumb of not using multilevel modeling: The "design effect smaller than two" rule. *The Journal of Experimental Education*, *83*(3), 423–438. https://doi.org/10.1080/00220973.2014.907229

Lee, J., Powers, L. E., Geenen, S., Schmidt, J., Blakeslee, J., & Hwang, I. (2018). Mental health outcomes of youth in foster care with disabilities. *Children and Youth Services Review*, *94*, 27–34. https://doi.org/10.1016/j.childyouth.2018.09.025

Lindstrom, L., DeGarmo, D., Khurana, A., Hirano, K., & Leve, L. (2020). Paths 2 the Future: Evidence for the efficacy of a career development intervention for young women with disabilities. *Exceptional Children*, *87*, 1–20. https://doi.org/10.1177/0014402920924851

Lindstrom, L., Harwick, R. M., Poppen, M., & Doren, B. (2012). Gender gaps: Career development for young women with disabilities. *Career Development and Transition for Exceptional Individuals*, *35*(2), 108–117. https://doi.org/10.1177/0885728812437737

Lindstrom, L., Hirano, K. A., Ingram, A., DeGarmo, D. S., & Post, C. (2019). "Learning to be myself": Paths 2 the Future career development curriculum for young women with disabilities. *Journal of Career Development*, *46*, 1–15. https://doi.org/10.1177/0894845318776795

Lindstrom, L., Lind, J., Beno, C., Gee, K. A., & Hirano, K. (2020). Career and college readiness for underserved youth: Educator and youth perspectives. *Youth & Society*, 1–19. https://doi.org/10.1177/0044118X20977004

Lindstrom, L., & Post, C. (2015). *Paths 2 the Future curriculum for high school girls with disabilities*. Secondary Special Education and Transition Research Unit. University of Oregon.

Maldonado, L., Huang, Y., Chen, R., Kasen, S., Cohen, P., & Chen, H. (2013). Impact of early adolescent anxiety disorders on self-esteem development from adolescence to young adulthood. *Journal of Adolescent Health*, *53*, 287–292. https://doi.org/10.1016/j.jadohealth.2013.02.025

Mojtabai, R., Olfson, M., & Han, B. (2016). National trends in the prevalence and treatment of depression in adolescents and young adults. *Pediatrics*, *138*(6), Article e20161878. https://doi.org/10.1542/peds.2016-1878

Mojtabai, R., Stuart, E. A., Hwang, I., Eaton, W. W., Sampson, N., & Kessler, R. C. (2016). Long-term effects of mental disorders on educational attainment in the National Comorbidity Survey ten-year follow-up. *Psychiatry and Psychiatric Epidemiology*, *50*(10), 1577–1591. https://doi.org/10.1007/s00127-015-1083-5

Moses, T. (2018). Suicide attempts among adolescents with self-reported disabilities. *Child Psychiatry & Human Development*, *49*, 420–433. https://doi.org/10.1007/s10578-017-0761-9

Muthén, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological Methodology*, *25*, 267–316. https://doi.org/10.2307/271070

Muthén, L. K., & Muthén, B. O. (2017). *Mplus user's guide: Eighth edition*.

National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. NCES (2020). *The condition of education 2021*.

Nelson, J. M., & Harwood, H. (2011). Learning disabilities and anxiety: A meta-analysis. *Journal of Learning Disabilities*, *44*(1), 3–17. https://doi.org/10.1177/0022219409359939

Newman, L., Wagner, M., Knokey, A. M., Marder, C., Nagle, K., Shaver, D., & Wei, X. (2011). *The post-high school outcomes of young adults with disabilities up to 8 years after high school. A report from the National Longitudinal Transition Study–2 (NLTS2)* (NCSER 2011-3005). SRI International.

Petcu, S. D., Van Horn, M. L., & Shogren, K. A. (2017). Self-determination and the enrollment in and completion of post-secondary education for students with disabilities. *Career Development and Transition for Exceptional Individuals*, *40*(4), 225–234. https://doi.org/10.1177/2165143416670135

Pham, Y. K., Hirano, K. A., Lindstrom, L., & DeGarmo, D. S. (2020). Future aspirations of young women with disabilities: An examination of social cognitive career theory. *Career Development and Transition for Exceptional Individuals*, *43*(3), 169–179. https://doi.org/10.1177/2165143420920168

Phillippo, K. L., & Kelly, M. S. (2014). On the fault line: A qualitative exploration of high school teachers' involvement with student mental health issues. *School Mental Health*, *6*, 184–200. https://doi.org/10.1007/s12310-013-9113-5

Poppen, M., Sinclair, J., Hirano, K., Lindstrom, L., & Unruh, D. (2016). Perceptions of mental health concerns for secondary students with disabilities during transition to adulthood. *Education and Treatment of Children*, *39*(2), 221–246. https://doi.org/10.1353/etc.2016.0008

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Sage.

Raufelder, D., & Kittler, F. (2014). The interplay of perceived stress, self-determination and school engagement in adolescence. *School Psychology International*, *35*(4), 405–420. https://doi.org/10.1177/0143034313498953

Rowe, D. A., Alverson, C. Y., Unruh, D. K., Fowler, C. H., Kellems, R., & Test, D. W. (2014). A Delphi study to operationalize evidence-based predictors in secondary transition. *Career Development and Transition for Exceptional Individuals*, *38*(2), 113–126. https://doi.org/10.1177/2165143414526429

Sanford, C., Newman, L., Wagner, M., Cameto, R., & Knokey, A. M. (2011). *The post-high school outcomes of young adults with disabilities up to 6 years after high school. A Report from the National Longitudinal Transition Study-2 (NLTS2)* (NCSER 2011-3004). SRI International.

Shogren, K. A., Gotto, G., Wehmeyer, M., Shaw, L., Seo, H., Palmer, S., Snyder, M., & Barton, K. (2016). The impact of the self-determined career development model on self-determination. *Journal of Vocational Rehabilitation*, *45*(3), 337–350. https://doi.org/10.3233/JVR-160834

Shogren, K. A., & Shaw, L. A. (2016). The role of autonomy, self-realization, and psychological empowerment in predicting outcomes for youth with disabilities. *Remedial and Special Education*, *37*, 55–62. https://doi.org/10.1177/0741932515585003

Shogren, K. A., Shaw, L. A., Raley, S. K., & Wehmeyer, M. L. (2018a). Exploring the effect of disability, race-ethnicity, and socioeconomic status on scores on the Self-Determination Inventory: Student report. *Exceptional Children*, *85*(1), 10–27. https://doi.org/10.1177/0014402918782150

Shogren, K. A., Shaw, L. A., Raley, S. K., & Wehmeyer, M. L. (2018b). The impact of personal characteristics on scores on the Self-Determination Inventory: Student report in adolescents with and without disabilities. *Psychology in the Schools*, *55*(9), 1013–1026. https://doi.org/10.1002/pits.22174

Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Rifenbark, G. G., & Little, T. D. (2015). Relationships between self-determination and postschool outcomes for youth with disabilities. *The Journal of Special Education*, *48*(4), 256–267. https://doi.org/10.1177/0022466913489733

Slayter, E. (2016). Youth with disabilities in the United States child welfare system. *Children & Youth Services Review*, *64*, 165–175. https://doi.org/10.1016/j.childyouth.2016.03.012

Strang, J. F., Kenworthy, L., Daniolos, P., Case, L., Wills, M. C., Martin, A., & Wallace, G. L. (2012). Depression and anxiety symptoms in children and adolescents with autism spectrum disorders without intellectual disability. *Research in Autism Spectrum Disorders*, *6*(1), 406–412. https://doi.org/10.1016/j.rasd.2011.06.015

Trainor, A. A. (2007). Perceptions of adolescent girls with LD regarding self-determination and postsecondary transition planning. *Learning Disability Quarterly*, *30*, 31–45. https://doi.org/10.2307/30035514

Twenge, J. M., Cooper, A. B., Joiner, T. E., Duffy, M. E., & Binau, S. G. (2019). Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005–2017. *Journal of Abnormal Psychology*, *128*(3), 185–199. https://doi.org/10.1037/abn0000410

Van Petegem, S., Beyers, W., Brenning, K., & Vansteenkiste, M. (2013). Exploring the association between insecure attachment styles and adolescent autonomy in family decision making: A differentiated approach. *Journal of Youth and Adolescence*, *42*, 1837–1846. https://doi.org/10.1007/s10964-012-9886-0

Wehmeyer, M. L. (1995). *The Arc's Self-Determination Scale: Procedural guidelines*. Office of Special Education and Rehabilitative Services.

Wehmeyer, M. L., & Kelchner, K. (1995). *The Arc's Self-Determination Scale*. The ARC of the United States.

Wehmeyer, M. L., Palmer, S. B., Lee, Y., Williams-Diehm, K., & Shogren, K. (2011). A randomized-trial evaluation of the effect of whose future is it anyway? On self-determination. *Career Development for Exceptional Individuals*, *34*(1), 45–56. https://doi.org/10.1177/0885728810383559