JOURNAL OF AMERICAN COLLEGE HEALTH
https://doi.org/10.1080/07448481.2024.2404932

Routledge
Taylor & Francis Group

RESEARCH ARTICLE



# Academic motivation and contextual influences in well-being for students with disabilities in higher education

Wei-Mo Tu, PhD, Yangyang Liu, PhD and Sandra Ruvalcaba Diaz, BS

Department of Counselor Education and Rehabilitation, California State University, Fresno, California, USA

**ABSTRACT**

**Objective:** The purpose of this study was to utilize self-determination theory (SDT) incorporating the person-environment contextual factors as a framework to examine how the SDT factors may interact with functional disability and contextual factors to influence well-being for students with disabilities in higher education. **Methods and participants:** A quantitative descriptive design utilizing a convenience sample of 210 students with disabilities in higher education was used. **Results:** The final regression model accounted for 64% of the variance in well-being. When controlling for all other predictor variables in the model, functional disability, autonomy, learning competence, and relatedness were found to be predictive of well-being, with autonomy being the strongest predictor of well-being, followed by relatedness, learning competence, and functional disability. **Conclusion:** This study offers critical insights for higher education institutions, emphasizing the need for fostering environments that prioritize autonomy, competence, and relatedness to promote the well-being of students with disabilities.

**ARTICLE HISTORY**
Received 25 August 2023
Revised 7 February 2024
Accepted 5 September 2024

**KEYWORDS**
Students with disability; self-determination; college experience; well-being; higher education

## Introduction

Quality participation in postsecondary education is crucial to students with disabilities because it is an essential piece of well-being[1] and offers opportunities for developing meaningful social support. Successful completion in postsecondary education also offers pathways to more diverse opportunities for career advancement.[2] While the number of students with disabilities pursuing postsecondary education has increased over the past years,[3] college completion rates for students with disabilities have remained unsatisfactory. For example, only nearly 20% of students with a disability who enrolled in a college during 2019–2021 had obtained a bachelor's degree.[4] These statistics highlight the persistent disparity in higher education achievement among students with disabilities despite the fact that legislative advances have mandated reasonable accommodations for this population. Additionally, college students with disabilities showed poorer physical and mental health compared to their counterparts without disabilities.[5,6] Such disparity in college completion and overall health among students with disabilities not only highlights the need for more comprehensive support but also underscores the critical interplay between college experience and well-being.

While recent research underscores the complex interplay between academic achievement and well-being among students, the academic success does not automatically translate into higher levels of well-being.[7,8] This finding is particularly relevant for students with disabilities, who often encounter additional challenges in academic environments. Furthermore, the importance of perceived support for autonomy, competence, and relatedness has been highlighted in its positive prediction of health and life satisfaction among college students with disabilities.[9] These insights demand a more comprehensive understanding of determinants of well-being for students with disabilities in higher education. It becomes critical to adopt a holistic approach in supporting these students, one that considers their unique academic and well-being challenges in the context of higher education.

### *Well-being of college students with disabilities*

Health does not simply equate to the absence of physical or mental health concerns, but instead is a state of holistic well-being that promotes positive functioning in different aspects of life (e.g. physical, social, psychological, and emotional well-being).[10] College is a critical time for emerging adults as they gain more independence in making daily and long-term decisions. College students often experience challenges to their well-being while transitioning into the college system, as well as managing their academic and overall college experience. In addition to the common developmental tasks that college students take on, students with disabilities face unique barriers during their college experience, such as social isolation, perceived stigma, and mental health needs.[6,11] These challenges negatively impact their well-being.[11] For example, research shows that college students with disabilities

**CONTACT** Wei-Mo Tu weimo@csufresno.edu Department of Counselor Education and Rehabilitation, California State University, Fresno, 5005 N. Maple Ave Fresno, CA 93740, USA

report higher levels of mental health issues such as stress, depression, anxiety, self-harm, and academic-related distress, compared to their counterparts without disabilities.[5,6]

Researchers have identified several common factors associated with well-being for college students with disabilities, such as social support, disability acceptance,[12] sense of belonging, perceived negative attitudes toward disabilities,[13] campus support services,[14] financial concerns, and health concerns.[15–17] It is not surprising that these person-environment contextual factors may be impactful on well-being of students with disabilities since students with disabilities' characteristics and their surrounding environment could potentially influence their functioning, which in turn affects their levels and qualities of participation in various life domains.[18]

Despite the fact, however, that various contextual factors associated with well-being have been identified, little attention has been paid to the motivational aspect and its impact on well-being of college students with disabilities. High levels of self-determined motivation have been found to be associated with well-being.[19,20] Within a college student population, self-determined motivation has been found to increase students' life satisfaction.[21,22] College students with disabilities may also exhibit higher levels of well-being if they exhibit higher levels of self-determined academic motivation. Therefore, incorporating a multi-factorial theory of motivation (e.g. self-determination theory [SDT])[23] in examining person-environment impact in this area will provide a holistic framework to conceptualize how self-determined academic motivation may interact with functional disability and contextual factors to affect well-being for this population.

### Self-determination theory

SDT is an approach toward understanding human motivation and consists of (a) *autonomy support*, (b) *autonomy*, (c) *competence*, and (d) *relatedness*.[23] Autonomy support refers to the social climate fostered through quality support provided by significant others in a motivational context, such as the degree of teachers' expectation on and support toward college students with disabilities in regard to academic participation. Autonomy refers to the extent to which the execution of an individuals' behavior is driven by autonomous motivation (e.g. enjoyment of chosen actions or internalization of the values resulting from chosen actions) rather than controlled motivation (e.g. fulfilling others' expectations or to avoid feeling ashamed). Competence refers to the perception of one's own ability to meet challenges and enhance skills through engagement with activities (e.g. perceived self-efficacy in performing academic-related activities). Relatedness refers to feeling connected to and supported by people who are important to the person's life (e.g. teacher-student or peer relationships).

SDT indicates that an individual's self-determined motivation can be enhanced if the needs for autonomy, competence, and relatedness were satisfied; such self-determined motivation can promote an individual's well-being.[24,25] Thus, college students with disabilities will be expected to experience higher levels of well-being if they exhibit higher levels of self-determined academic motivation. While various contextual factors affecting well-being have been identified,[12,13] no work has been done using the SDT model to examine the motivational component specifically for college students with disabilities in promoting academic motivation and well-being. As a result, it remains unclear how academic motivation, functional disability, and contextual factors will interact with each other to influence well-being for college students with disabilities.

### Current study

The purpose of this study was to utilize SDT incorporating the person-environment contextual factors as a framework to examine how the SDT factors may interact with functional disability and contextual factors to influence well-being for college students with disabilities. Our research question is: Do the expanded SDT constructs (i.e. autonomy support, autonomy, competence, relatedness, functional disability, and contextual factors) predict well-being for college students with disabilities? Findings of this study will increase our understanding on the nuances of SDT and its elements for college students with disabilities, as well as inform best practices based on the relationships of studies variables and SDT application.

## Methods

### Design and procedures

This study utilized a quantitative descriptive design with a convenience sample. Participants were recruited from four public universities in the State of California. These four public universities were selected based on the primary investigator's personal network. Participants who were eligible to participate in the study were (a) 18 years of age or older; (b) enrolled as a student in a degree-granting postsecondary institution at the time of participating in this study; and (c) with a diagnosis of disability or chronic health condition. Following the approval of the Institutional Review Board, a purposive sampling strategy was employed. Emails containing a link to the online survey developed for the study were sent out to potential participants through disability accommodation offices in these four universities.

The accommodation offices were chosen for survey dissemination as they are central points for reaching students with disabilities who are likely to be actively seeking or receiving support services. The offices assisted in disseminating the survey link via their regular communication channels with registered students. It is important to note that while the convenience sample offers valuable insights, it may not fully represent the entire population of students with disabilities in higher education due to the voluntary nature of participation and the specific characteristics of the sample, such as their connection to disability accommodation offices and their geographic location within California. The findings should therefore be interpreted with these considerations in mind.

### Participants

Two hundred and twenty-seven participants completed the online survey. Seventeen cases were removed since these 17 cases contained only demographic information. The data cleaning and model diagnosis process resulted in a final sample size of 210. The sample predominantly consisted of female participants (78%) and was diverse in terms of ethnicity, academic rank, and employment status. The age range of participants was broad, from 18 to 78 years, with a mean age of 29.69 years. The most common diagnoses among participants were psychiatric disorders, learning disorders, and attention-deficit/hyperactivity disorder (ADHD). Detailed demographic characteristics, including percentages for ethnicities, academic ranks, employment status, and types of diagnoses, are presented in Table 1.

### Measures

#### Demographic questionnaire

A demographic questionnaire was utilized to gather essential background information about the participants. It included questions about age, gender, ethnicity, academic rank, employment status, and disability diagnosis. The questionnaire also inquired about participants' prior engagement with special education services and transition services. Special education services refer to tailored instructional and support services provided to students with disabilities during primary and secondary education to address their unique learning needs and challenges.[26] Transition services, on the other hand, are a set of coordinated activities designed to prepare students with disabilities for post-secondary life, including education, employment, and independent living.[26] While the language used for these purposes in higher education often shifts to accommodations, it is critical to understand these foundational services for contextualizing the experiences of students with disabilities in higher education.

**Table 1.** Participant demographic characteristics ($N = 210$).

| Characteristics | *n* (%) | *M* (*SD*) |
|---|---|---|
| Age | | 29.69 (11.21) |
| Gender | | |
| Male | 46 (22%) | |
| Female | 164 (78%) | |
| Ethnicity | | |
| Hispanic / Latino American | 70 (33.30%) | |
| European American | 56 (26.66%) | |
| Multiracial | 36 (24%) | |
| Asian American | 19 (9.04%) | |
| African American | 13 (6.19%) | |
| Native Hawaiian or other Pacific Islanders | 9 (0.95%) | |
| Academic rank | | |
| Freshman | 8 (3.8%) | |
| Sophomore | 22 (10.47%) | |
| Junior | 70 (33.33%) | |
| Senior | 69 (32.38%) | |
| Master | 42 (20%) | |
| Receiving special education in high school | | |
| Yes | 63 (30%) | |
| No | 147 (70%) | |
| Receiving transition services in high school | | |
| Yes | 41 (19.52%) | |
| No | 169 (80.47%) | |
| Employment status | | |
| Full-time employed | 21 (10%) | |
| Part-time employed | 76 (36.19%) | |
| Unemployed | 113 (53.8%) | |
| Disability diagnosis | | |
| Learning disorder | 68 (32.38%) | |
| Attention-deficit/ hyperactivity disorder (ADHD) | 63 (30%) | |
| Autism spectrum disorder | 22 (10.48%) | |
| Visual impairment | 10 (4.76%) | |
| Brain injury | 16 (7.62%) | |
| Hearing impairment | 13 (6.19%) | |
| Mobility disorder | 28 (13.33%) | |
| Psychiatric disorder | 106 (50.48%) | |
| Communication disorder | 7 (3.33%) | |
| Chronic illness | 56 (26.67%) | |
| Other disability and health condition | 32 (15.24%) | |

#### Functional disability

The *World Health Organization Disability Assessment Schedule 2.0* (WHODAS 2.0)[27] was used for measuring functional disability. The WHODAS 2.0 contains 12 items measuring a variety of biopsychosocial variables, such as cognition, mobility, self-care, getting along with people, life activities, and participation in society (e.g. "How much have you been emotionally affected by your health problems?") Each item is rated on a 5-point Likert-type scale, ranging from 1 (none) to 5 (extreme/cannot do), with higher scores indicating more severe functional disability. The internal consistency reliability estimate (Cronbach's alpha) was found to be .83 in this study.

#### Autonomy support

Autonomy support was measured with the 6-item *Learning Climate Questionnaire* (LCQ).[28] The LCQ questionnaire has been used with respect to specific learning settings, which include a particular class and at the college or graduate school levels, reflecting the degree to which the students perceive the instructor or instructors as supporting their autonomy (e.g. "I feel that my instructor provides me choices and options."). The scale was rated on a 7-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores representing a higher level of perceived autonomy support from instructors. The Cronbach's alpha for the sample in this study was found to be .91.

#### Autonomy

The *Index of Autonomous Functioning* (IAF)[29] was used to measure autonomy. The IAF contains 15 items (e.g. "My decisions are steadily informed by things I want or care about.") and has been found to be associated with well-being, the satisfaction of basic psychological needs, and self-determined engagement in daily activities.[29] The scale was rated on a 7-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores representing a higher level of autonomy. The Cronbach's alpha for the sample in this study was found to be .72.

### Competence

The *Perceived Competence for Learning Scale* (PCLS)[28] was used to measure competence. The PCLS contains 4 items assessing participants' feelings of competence about learning in the college settings (e.g. "I feel able to meet the challenge of performing well in this course"; "I am capable of learning the material in this course"). Each item was rated on a 7-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores representing a higher level of perceived learning competence. The Cronbach's alpha for the sample in this study was found to be .86.

### Relatedness

Relatedness was measured with the adapted relatedness subscale of the Work-Related Basic Needs Satisfaction Scale (W-BNS).[30] The W-BNS was composed three subscales measuring three different constructs of basic needs (i.e. autonomy, competence, and relatedness) as defined by Deci and Ryan.[31] In this study, we adapted the relatedness subscale by replacing the word "school" with "work" as a referent and rewording the negative item (e.g. "I don't really feel connected with other people in school") to be positive ("I feel connected with people in my school"). Each item is rated on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating higher levels of satisfaction of needs for relatedness. The Cronbach's alpha coefficients for the sample in this study was found to be .90.

### Academic barrier coping efficacy

The academic barrier coping efficacy was assessed using the 7- item Barrier Coping Self-Efficacy Scale (BCSES).[32,33] The BCSES measures participants' level of confidence in their ability to cope with various barriers that may arise while completing their postsecondary education (e.g. "Find ways to overcome communications problems with professors or teaching assistants in your courses."). Each item was rated on a 7-point Likert-type scale, ranging from 0 (no confidence) to 7 (complete confidence), with higher scores indicating higher levels of academic barrier coping efficacy. The Cronbach's alpha coefficients for the sample in this study was found to be .79.

### Financial stress

Financial stress was measured using an adapted version of the *Financial Stress Scale* (FSS).[34] Its original version contains three subscales, including (a) financial stability, (b) credit factor, and (c) predictable future stressor. Only the subscale measuring financial stability was used for assessing financial stress in this study given its applicability to college life for the participants in this study. Each item (e.g. Not having any emergency money) was rated on a 7-point Likert-type scale, ranging from 0 (never) to 7 (all of the time), with higher scores indicating higher levels of financial stress. The Cronbach's alpha coefficients for the sample in this study was found to be .88.

### Perceived stigma toward disability

Perceived stigma toward disability was measured with the *Stigma Scale for Chronic Illnesses 8-item version* (SSCI-8).[35] The SSCI-8 is composed of 8 items (e.g. "I felt embarrassed because of my physical limitations"), and each item was rated on a 5-point Likert-type scale ranging from 1 (never) to 5 (always), with higher scores indicating higher perceived stigma toward persons with disability. The Cronbach's alpha coefficients for the sample in this study was found to be .86.

### Well-being

The *Psychological Well-Being* scale (PWB)[36] was used to measure well-being as a criterion variable. The PWB scale is a short 8-item summary survey of a person's self-perceived functioning in the areas relevant to the person, such as relationships, purpose and meaning, optimism, and self-esteem. This scale has been found to be correlated substantially with other psychological well-being scales.[36] Each item (e.g. "I am a good person and live a good life.") was rated on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating higher levels of well-being. The Cronbach's alpha coefficients for the sample in this study was found to be .91.

## Data analysis

Descriptive statistics, missing data analysis, and multiple regression were computed using R version 4.2.2 and RStudio version 2022.07.2.576. Missing data ranged from 4% for well-being to 16% for financial stress. The *Little's MCAR test*[37] indicated the data were missing completely at random, supporting the use of regression imputation for handling missing values when missing mechanism was MCAR with less than 20% of missingness.[38] A single regression imputation using predictive mean matching[39] was performed to replace missing values.

A preliminary test was performed to examine demographic differences for controlling potential confounding effect. This test revealed that age correlated with well-being ($r = .16$, $p = .01$), autonomy ($r = .29$, $p = .000$), learning competence ($r = .15$, $p = .02$), and financial stress ($r = .20$, $p = .002$). For binary variables, significant correlations included gender with autonomy support ($r_{pb} = .16$, $p = .01$); special education experience with autonomy support ($r_{pb} = .18$, $p = .006$), well-being ($r_{pb} = .15$, $p = .02$), and relatedness ($r_{pb} = .14$, $p = .03$); as well as transition services experience with autonomy support ($r_{pb} = .21$, $p = .002$), functional disability ($r_{pb} = -0.16$, $p = .01$), and financial stress ($r_{pb} = -0.22$, $p = .001$). One-way analysis of variance (ANOVA) showed significant differences in autonomy support across academic ranks $F(4, 205) = 2.66$, $p = .03$. These significant demographic variables were then controlled for as covariates in the regression model.

### Regression analysis

Multiple regression using Ordinary Least Squares (OLS) estimation was used, and predictor sets were entered into the model hierarchically to account for covariates and assess

changes in $R$-square ($R^2$) for each entry step.[40] The predictor sets were entered based on the following three steps. The step one comprises the following five demographic covariates and functional disability, and the categorical demographic covariates were dummy-coded for ease of interpretation: (a) age; (b) gender ("female" as the reference group); (c) academic rank ("freshman" as the reference group); (d) experience in receiving special education ("no" as the reference group); and (e) experience in receiving transition services ("no" as the reference group). The step two comprises four SDT variables (i.e. autonomy support, autonomy, competence, and relatedness). The step three comprises person-environment contextual factors (i.e. academic barrier coping efficacy, financial stress, and perceived stigma toward disability).

Linear model diagnostics were conducted to verify multiple linear regression assumptions through traditional visual inspection and statistical tests. The Shapiro-Francia test indicated normal distribution ($W = 0.98$, $p = 0.09$), satisfying the normality assumption. Linearity was confirmed *via* polynomial regression analysis,[40] revealing no significant regression coefficients for higher powers of predictor variables, thus meeting the linearity assumption. Multicollinearity was assessed using the variance inflation factor (VIF), with values ranging from 1.05 to 1.36, indicating no multicollinearity issue.

However, the Breusch-Pagan test[41] revealed a homoscedasticity violation ($BP = 34.597$, $df = 16$, $p = .005$), indicating unequal variances in the criterion variable's conditional distributions. We adopted heteroscedasticity-consistent (HC) standard errors for regression coefficients to address the violation of homoscedasticity assumption, offering a more conservative and robust approach.[40] Research has also shown that a regular use of the HC estimator is adequate for its conservative approach to results, even with a valid homoscedasticity assumption.[42] Due to ANOVA's reliance on potentially biased standard errors, we adopted the heteroscedasticity-robust *Wald* test, utilizing HC standard errors to correct the $F$-value in regression model hypothesis testing.[43]

## Results

The mean score for well-being was 5.57 ($SD = 1.05$), indicating that participants displayed a moderate-to-high level of well-being. The mean score for functional disability was 2.36 ($SD = 0.65$), indicating that participants displayed a moderate level of functional disability. The mean scores for SDT variables were mostly at the moderate-to-high level, indicating that participants mostly perceived a moderate-to-high level of autonomy supportive climate ($M = 5.21$, $SD = 1.28$), autonomy ($M = 5.01$, $SD = 0.67$), learning competence ($M = 5.63$, $SD = 1.09$), and relatedness ($M = 4.09$, $SD = 1.58$). Additionally, the mean score for academic barrier coping efficacy ($M = 4.64$, $SD = 1.\ 72$) and financial stress ($M = 4.17$, $SD = 1.86$) indicated that the participants exhibited a moderate level of confidence in coping with academic barriers and experienced a moderate level of perceived financial stress. However, the participants appeared to perceive stigma toward people with disability at the low level ($M = 2.30$, $SD = 0.89$).

The correlations among the predictor variables and criterion variables ranged from small to large, with Pearson product-moment correlation coefficients ranging from .04 to .62. Pearson product-moment correlation coefficients above .40 were found between well-being and autonomy support ($r = .43$, $p < .001$), well-being and autonomy ($r = .60$, $p < .001$), well-being and competence ($r = .57$, $p < .001$), well-being and relatedness ($r = .55$, $p < .001$), well-being and coping efficacy ($r = .46$, $p < .001$), autonomy support and competence ($r = .43$, $p < .001$), autonomy support and relatedness ($r = .41$, $p < .001$), competence and coping efficacy ($r = .51$, $p < .001$), and functional disability and perceived stigma ($r = .62$, $p < .001$). The correlation matrix for all variables is presented in Table 2.

### Multiple regression

Table 3 shows the results from multiple regression analysis, including values of change in $R^2$ ($\Delta R^2$), unstandardized regression coefficients ($B$), HC standard errors of unstandardized regression coefficients ($SE\ B$), and standardized regression coefficients (β) for the predictor variables at each step and in the final model.

In the first step, five demographic covariates and the predictor variable of functional disability were entered: (a) age; (b) gender ("female" as the reference group); (c) academic rank ("freshman" as the reference group); (d) experience in receiving special education ("no" as the reference group); (e) experience in receiving transition services ("no" as the reference group); and (f) functional disability. This set of variables

**Table 2.** Correlations, means, and standard deviations for variables used in regression analyses.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Well-being | – | | | | | | | | |
| 2. Autonomy support | .43*** | – | | | | | | | |
| 3. Autonomy | .60*** | .28*** | – | | | | | | |
| 4. Competence | .57*** | .43*** | .38*** | – | | | | | |
| 5. Relatedness | .55*** | .41*** | .22*** | .36*** | – | | | | |
| 6. Functional disability | −0.32*** | −0.21*** | −0.04 | −0.26*** | −0.27*** | – | | | |
| 7. Coping efficacy | .46*** | .36*** | .34*** | .51*** | .34*** | −0.30*** | – | | |
| 8. Financial stress | −0.09 | −0.12 | .11 | −0.16** | −0.21** | .36*** | −0.18*** | – | |
| 9. Perceived stigma | −0.28*** | −0.30*** | −0.09 | −0.25*** | −0.25*** | .62*** | −0.29*** | .34*** | – |
| *Mean* | 5.57 | 5.21 | 5.01 | 5.63 | 4.09 | 2.36 | 4.64 | 4.17 | 2.30 |
| *SD* | 1.05 | 1.28 | 0.67 | 1.09 | 1.58 | 0.65 | 1.72 | 1.86 | 0.89 |

*Note.* *$p \le .05$, **$p < .01$, ***$p < .001$.

**Table 3.** Multiple regression analysis for prediction of well-being ($N = 210$).

| | | | At entry into model | | | Final model | | |
|---|---|---|---|---|---|---|---|---|
| Variable | $R^2$ | $\Delta R^2$ | *B* | *SE B* | β | *B* | *SE B* | β |
| Step 1 | .18 | | | | | | | |
| Age | | | 0.01 | 0.01 | 0.15** | 0.00 | 0.00 | 0.18 |
| Gender (male) | | | 0.18 | 0.18 | 0.70 | 0.08 | 0.12 | 0.03 |
| Academic Rank (junior) | | | 1.44 | 0.64 | 0.50 | 0.16 | 0.35 | 0.07 |
| Academic Rank (others) | | | 0.96 | 0.64 | 0.36 | 0.03 | 0.36 | 0.01 |
| Academic Rank (senior) | | | 0.90 | 0.63 | 0.39 | 0.03 | 0.36 | 0.01 |
| Academic Rank (sophomore) | | | 0.96 | 0.67 | 0.28 | 0.28 | 0.39 | 0.08 |
| Receiving special education in high school (yes) | | | 0.02 | 0.17 | 0.01 | 0.09 | 0.12 | 0.04 |
| Receiving transition services in high school (yes) | | | 0.26 | 0.16 | 0.10 | 0.08 | 0.12 | 0.03 |
| Functional disability | | | −0.53 | 0.12 | −0.32*** | −0.23 | 0.10 | −0.14* |
| Step 2 | .63 | .45*** | | | | | | |
| Autonomy support | | | 0.03 | 0.04 | 0.03 | 0.02 | 0.04 | 0.03 |
| Autonomy | | | 0.67 | 0.08 | 0.42*** | 0.64 | 0.08 | 0.41*** |
| Learning competence | | | 0.23 | 0.06 | 0.23*** | 0.22 | 0.06 | 0.22*** |
| Relatedness | | | 0.20 | 0.03 | 0.29*** | 0.19 | 0.03 | 0.29*** |
| Step 3 | .64 | .01 | | | | | | |
| Academic barrier coping efficacy | | | 0.04 | 0.05 | 0.04 | 0.04 | 0.05 | 0.04 |
| Financial stress | | | 0.02 | 0.03 | 0.04 | 0.02 | 0.03 | 0.04 |
| Perceived stigma toward disability | | | −0.10 | 0.07 | −0.01 | −0.10 | 0.07 | −0.01 |

*Note.* $F(16, 193) = 16.60$, $p < .001$ for the full model.
*$p \le .05$, **$p < .01$, ***$p < .001$.

accounted for a statistically significant amount of variance in well-being scores, $R^2 = .18$, $F(9, 200) = 3.42$, $p < .001$. At this step, age (β = .15, $t(204) = 2.64$, $p = .008$) and functional disability (β = −0.32, $t(204) = -4.30$, $p < .000$) were found to significantly contribute to the change in variance in well-being scores. This result indicated that higher age predicted higher levels of well-being and that higher levels of functional disability predicted lower levels of well-being. While the experience receiving transition services was correlated to well-being at the bivariate level ($r_{pb} = .15$, $p = .02$), it was not predictive of well-being in the regression model.

In the second step, SDT variables (i.e. autonomy support, autonomy, learning competence, and relatedness) were entered. The addition of SDT variables accounted for a significant increase in variance of well-being scores, $R^2 = .63$, $\Delta R^2 = .45$, $F(13, 196) = 19.84$, $p < .001$, beyond that explained by the predictors entered in the first step. At this step, autonomy, β = .42, $t(200) = 8.17$, $p < .001$, learning competence, β = .23, $t(200) = 3.74$, $p < .001$, and relatedness, β = .29, $t(200) = 5.37$, $p < .001$, were found to contribute significantly to the change in variance in well-being scores while autonomy support, β = .04, $t(200) = 0.69$, $p = .48$, was not statistically significant, suggesting that autonomy, learning competence, and relatedness were positively associated with well-being while controlling for all other variables in the model. This result indicated that higher level of autonomy, learning competence, and relatedness predicted higher levels of well-being. At this step, functional disability, β = −0.14, $t(200) = -2.85$, $p = .004$, remained a significant contributor to the variance in well-being scores.

In the final step, a set of variables comprising three person-environment contextual factors (i.e. academic barrier coping efficacy, financial stress, and perceived stigma toward disability) were entered. The addition of person-environment contextual variables did not account for a significant increase in variance of well-being scores, $R^2 = .64$, $\Delta R^2 = .01$, $F(16, 193) = 16.60$, $p < .001$, as compared to that explained by the predictors entered in the first and second steps. In the final model, functional disability, β = −0.14, $t(193) = -2.17$, $p = .03$, autonomy, β = .41, $t(193) = 7.54$, $p < .001$, learning competence, β = .22, $t(193) = 3.34$, $p < .001$, and relatedness, β = .29, $t(193) = 5.27$, $p < .001$, remained significant while controlling for all other variables in the model.

In sum, the final regression model accounted for 64% of the variance in well-being. When controlling for all other predictor variables in the model, functional disability, autonomy, learning competence, and relatedness were found to be predictive of well-being, with autonomy being the strongest predictor of well-being, followed by relatedness, learning competence, and functional disability.

## Discussion

This study investigated how SDT constructs (i.e. autonomy support, autonomy, competence, relatedness) may interact with functional disability and contextual factors to influence well-being of students with disabilities in higher education. Our findings suggested an important role of self-determined academic motivation in the well-being of college students with disabilities. Specifically, we found that higher levels of autonomy, relatedness, and learning competence predicted higher levels of well-being. The results are consistent with prior studies conducted with college students with disabilities and diverse populations across different countries.[9,44] The results also confirm SDT that a sense of ownership, connection, and mastery are basic psychological needs that are crucial for individuals' growth and wellness.[45] While autonomy support was significantly correlated to well-being at the bivariate level, it did not show a significant effect on well-being in the regression model. This result was partially inconsistent with findings of previous research indicating that autonomy support is a predictor of well-being.[9,46] However, in these prior studies, autonomy support was used as the only SDT construct when predicting well-being.

In our study, we examined autonomy support along with other SDT constructs (i.e. autonomy, competence, relatedness). One possible reason for the insignificant effect of autonomy support might be that these SDT constructs are mediators between autonomy support and well-being. For example, autonomous motivation has been shown to mediate the relationship between autonomy support from father and well-being for students with disabilities.[47]

Our findings also indicated that higher levels of functional disability predicted lower levels of well-being. This result is consistent with a prior study indicating that functional disability was a strong negative predictor of life satisfaction among college students with disabilities.[1] It is noteworthy that functional disability continues to affect the well-being of college students with disabilities even when academic motivation helps their well-being.

Finally, our findings indicated that person-environment contextual factors (i.e. academic barrier coping efficacy, financial stress, and perceived stigma toward disability) did not contribute to the well-being of college students with disabilities, after controlling for all other variables in the model. One possible reason for the non-significant effect of academic barrier coping efficacy and financial stress on well-being in our study is that the mean scores for these factors in our study were generally moderate, suggesting a limited variance in these two variables among our sample. Essentially, these two factors did not vary enough among the participants to show a significant relationship with well-being.

The reported moderate-to-high levels of well-being can have several implications for the variables and outcomes involved in this study. For example, these higher levels of well-being may suggest a degree of resilience among our participants, potentially influencing their perceptions and experiences related to academic barrier coping efficacy, financial stress, and perceived stigma. Students who feel generally well may perceive less impact from these factors, or conversely, their sense of well-being may itself be a result of effective coping strategies and support systems. Furthermore, the relatively high levels of well-being may have overshadowed the potential negative impacts of factors, such as financial stress or stigma. This may partly explain why these factors did not emerge as significant in our results.

It is also worth noting that our sample mainly came from four public universities in California. The sample's characteristics may reflect a demographic with access to well-developed support systems, potentially increasing academic barrier coping efficacy and reducing financial stress and perceived stigma for the participants. The quality of disability support services from accommodation offices, financial aid, and counseling, may have affected our findings because effective support services can directly influence students' experiences of coping efficacy and financial stress. These can potentially improve functioning of students with disabilities in academic settings.[48] Previous research shows that students generally hold a positive view of classmates with disabilities who function effectively in their environment.[49] Notably, the participants were recruited directly via disability accommodation offices, meaning that the participants are recipients of disability accommodation supports.

Regarding the non-significant effect of perceived stigma toward disability, it is possible that the effect of autonomous motivation outweighs that of perceived stigma toward disability on well-being. SDT suggests that higher levels of autonomous motivation can contribute to more positive outcomes, including engagement in tasks, persistence, psychological wellness, and overall performance,[45] which could potentially be related to non-significant perceived stigma. Autonomous motivation has been shown as a mediator in the relationship between increased mental health concerns and psychological help-seeking attitudes.[50] There could be a possible mediating effect of SDT for the relationship between perceived stigma and well-being. This result also reinforces the salient role that self-determined academic motivation plays in the well-being of college students with disabilities.

### Limitations

While this study has provided valuable insights into the relationship between self-determined academic motivation and the well-being of college students with disabilities, several limitations need to be taken into consideration. First, the results, particularly non-significant findings, might be attributed to the potential range restrictions of certain variables such as academic barrier coping efficacy and financial stress. The reported moderate mean scores for these variables indicate that there might have been limited variability among participants, which could potentially mask possible significant relationships. Second, the cross-sectional design with a convenience sample in this study does limit the establishment of causal relationships. Therefore, a longitudinal approach would offer more in-depth insights into the dynamic interplay between SDT constructs, functional disability, and well-being over time.

Third, the variabilities in types and severity of disabilities could potentially affect the generalizability of our findings to a broader student population. Fourth, while the study identified certain relationships, we did not explore potential mediating effects, such as the role of autonomous motivation in the relationship between perceived stigma and well-being. Therefore, there might be potential mediators and overlaps of the SDT constructs. Lastly, self-report measures were used in this study, which might introduce biases resulting from social desirability or recall inaccuracies. Particularly, participants can only respond to the predetermined items in the measures. Further research in this area may consider using a mix methods approach involving open-ended questions soliciting qualitative responses. This approach may provide a more comprehensive view of student experiences.

### Implications for practice

This study highlights critical insights for student affairs practitioners, faculty, and counselors in higher education on supporting students with disabilities. Promoting self-determined academic motivation is of the most importance. Since autonomy, learning competence, and relatedness were identified as significant predictors of well-being among college students

with disabilities, higher education institutions should consider strategies and initiatives to promote these facilitators, such as enhancing student autonomy through curriculum design, nurturing competence with tutoring services, and promoting a sense of belonging through an inclusive environment.

Moreover, tailored support for students with functional disabilities is equally important. The finding suggested that higher levels of functional disability predicted lower well-being. This case underscores the need for higher education institutions to offer specialized support. An example would be rehabilitation counseling services that specifically address functional limitations resulting from disability; another example could be improved accessibility infrastructure and individualized academic accommodations. Furthermore, while the role of self-determined academic motivation is crucial, students with disabilities can benefit from a broader approach by involving the formation of support groups, financial literacy initiatives, and accessible, tailored mental health services to meet the diverse and unique needs of students with disabilities.

### *Implications for future research*

Future research in this topic should consider adopting a longitudinal design with random sampling as it helps determine the dynamics of SDT constructs, functional disability, and well-being over time. An in-depth exploration into potential mediation and interaction effects also could further enrich our understanding of this dynamic. Additionally, employing a mixed methods approach would provide a more nuanced view, combining quantitative data's broad trends with the rich, detailed insights from qualitative data. This approach could offer a comprehensive understanding by triangulating evidence from diverse data sources.

## Conclusion

This study illuminates the significant influence of self-determined academic motivation on the well-being of students with disabilities in higher education. Autonomy, learning competence, and relatedness were found to be the key contributing factors to well-being for this group. This finding is consistent with past research emphasizing the principles of SDT.[9,51,52] The negative correlation between functional disability and well-being also underscores the strong need for specialized support for students with disabilities who experience higher levels of functional limitations in their college experience. What makes this research unique is its exploration of these dynamics specifically within the context of higher education for students with disabilities. While previous studies have established the general importance of SDT constructs in various populations, this study examines how SDT constructs interact with the unique challenges faced by students with disabilities, particularly focusing on the impact of functional disability and contextual factors on their overall well-being. This approach offers a more holistic understanding of the experience among this population, highlighting the need for tailored strategies in college settings.

Moreover, it is critical to acknowledge that students with disabilities in higher education face numerous psychosocial challenges beyond the academic domain. These challenges include, but are not limited to, navigating social and emotional aspects of college life, dealing with stigma, managing financial stress, and accessing adequate healthcare. These factors can significantly influence this population's overall well-being and ability to engage fully in the academic life. Therefore, it is essential to recognize and address these broader psychosocial factors for creating a supportive and inclusive environment of education. In conclusion, this study contributes uniquely to the existing literature by offering an in-depth exploration of how SDT constructs and functional disability interact to influence the well-being of students with disabilities in higher education. It underscores the need to take into account both academic and nonacademic factors in supporting these students, urging higher education institutions to adopt a holistic approach in their support strategies. This approach will not only facilitate academic success but also enhance the overall well-being for students with disabilities, enabling them to navigate their college experience more effectively.

## Conflict of interest disclosure

The authors have no conflicts of interest to report. The authors confirm that the research presented in this article met the ethical guidelines, including adherence to the legal requirements, of USA and received approval from the Institutional Review Board of California State University, Fresno.

## Funding

No funding was used to support this research and/or the preparation of the manuscript.

## References

1. Tansey TN, Smedema S, Umucu E, et al. Assessing college life adjustment of students with disabilities: application of the PERMA framework. *Rehabil Couns Bull.* 2018;61(3):131–142. doi:10.1177/0034355217702136.
2. Rush B, Fondren KB. Postsecondary program outcomes: employment, compensation, and living arrangements of program completers in the Southeast. *J Educ Soc Policy*. 2023;10(2):1–5. doi:10.30845/jesp.v10n2p5.
3. National Center for Education Statistics. Table 311.10. Number and percentage distribution of students enrolled in postsecondary institutions, by level, disability status, and selected student characteristics: academic year 2019–20. In: Digest of Education Statistics. U.S. Department of Education, Institute of Education Sciences; 2023. https://nces.ed.gov/programs/digest/d22/tables/dt22_311.10.asp. Accessed December 5, 2023.
4. Houtenville A, Bach S, Paul S. *Annual Report on People with Disabilities in America: 2023*. Durham, NH: University of New Hampshire, Institute on Disability; 2023.
5. Coduti W, Hayes J, Locke B, Youn SJ. Mental health and professional help-seeking among college students with disabilities. *Rehabil Psychol*. 2016;61(3):288–296. doi:10.1037/rep0000101.
6. Fleming AR, Edwin M, Hayes JA, Locke BD, Lockard AJ. Treatment-seeking college students with disabilities: presenting concerns, protective factors, and academic distress. *Rehabil Psychol*. 2018;63(1):55–67. doi:10.1037/rep0000193.
7. Bücker S, Nuraydin S, Simonsmeier BA, Schneider M, Luhmann M. Subjective well-being and academic achievement: a meta-analysis. *J Res Pers.* 2018;74:83–94. doi:10.1016/j.jrp.2018.02.007.

8. Kaya M, Erdem C. Students' well-being and academic achievement: a meta-analysis study. *Child Ind Res*. 2021;14(5):1743–1767. doi:10.1007/s12187-021-09821-4.
9. O'Shea A, Isadore K, Galván A. Support for the basic psychological needs and satisfaction with health and quality of life in college students with disabilities. *J Am Coll Health*. 2023;71(1):130–139. doi:10.1080/07448481.2021.1879816.
10. Schramme T. Health as complete well-being: the WHO definition and beyond. *Public Health Ethics*. 2023;16(3):210–218. doi:10.1093/phe/phad017.
11. Bailey KM, Frost KM, Casagrande K, Ingersoll B. The relationship between social experience and subjective well-being in autistic college students: a mixed methods study. *Autism*. 2020;24(5):1081–1092. doi:10.1177/1362361319892457.
12. Sánchez J, Muller V, Chan F, et al. Personal and environmental contextual factors as mediators between functional disability and quality of life in adults with serious mental illness: a cross-sectional analysis. *Qual Life Res*. 2019;28(2):441–450. doi:10.1007/s11136-018-2006-1.
13. Fleming AR, Oertle KM, Plotner AJ, Hakun JG. Influence of social factors on student satisfaction among college students with disabilities. *J Coll Student Dev*. 2017;58(2):215–228. doi:10.1353/csd.2017.0016.
14. Fleming AR, Oertle KM, Plotner AJ. Student voices: recommendations for improving postsecondary experiences of students with disabilities. *J Postsecond Educ Disabil*. 2017;30(4):309–326.
15. Fox A, Hedayet M, Mansour KE, Kommers S, Wells R. College students with disabilities experiences with financial, social, and emotional costs on campus in the United States. *Int J Disabil Dev Educ*. 2022;69(1):106–120. doi:10.1080/1034912X.2021.1966758.
16. Soria KM, Coca V. Food insecurity among college students with disabilities during the COVID-19 pandemic. *J Coll Student Dev*. 2023;64(1):102–107. doi:10.1353/csd.2023.0005.
17. Tucker J, Korte S, Kilduff B, Pabian P. An innovative approach to health promotion and wellness for university students with intellectual and physical disabilities: a case series. *Am J Lifestyle Med*. 2022;16(6):687–693. doi:10.1177/15598276221105786.
18. World Health Organization. *World Health Report 2001: Mental Health: New Understanding, New Hope (Previous Reports)*. Geneva, Switzerland: World Health Organization; 2001.
19. Breva A, Galindo MP. Types of motivation and eudemonic well-being as predictors of academic outcomes in first-year students: a self-determination theory approach. *Psych J*. 2020;9(5):609–628. doi:10.1002/pchj.361.
20. Vail IKE, Horner DE. The captain of my soul: self-determination and need-satisfaction help manage death-related cognition, anxiety, and well-being. *J Pers Soc Psychol*. 2023;125(6):1308–1331. doi:10.1037/pspa0000357.
21. Graham M, Vaughan A. An adapted self-determination measure and college student first-year achievement. *Int J Teach Learn High Educ*. 2022;33(2):135–142.
22. Jenkins-Guarnieri MA, Vaughan AL, Wright SL. Development of a self-determination measure for college students: validity evidence for the basic needs satisfaction at college scale. *Meas Eval Couns Dev*. 2015;48(4):266–284. doi:10.1177/0748175615578737.
23. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol*. 2000;55(1):68–78. doi:10.1037/0003-066X.55.1.68.
24. Olafsen AH, Deci EL, Halvari H. Basic psychological needs and work motivation: a longitudinal test of directionality. *Motiv Emot*. 2018;42(2):178–189. doi:10.1007/s11031-017-9646-2.
25. Tang M, Wang D, Guerrien A. A systematic review and meta-analysis on basic psychological need satisfaction, motivation, and well-being in later life: contributions of self-determination theory. *Psych J*. 2020;9(1):5–33. doi:10.1002/pchj.293.
26. Individuals with Disabilities Education Act. 20 USC §1400 et Seq. 2004.
27. World Health Organization. *WHODAS II - Disability Assessment Schedule Training Manual: A Guide to Administration*. Geneva, Switzerland: World Health Organization; 2004.
28. Williams GC, Deci EL. Internalization of biopsychosocial values by medical students: a test of self-determination theory. *J Pers Soc Psychol*. 1996;70(4):767–779. doi:10.1037/0022-3514.70.4.767.
29. Weinstein N, Przybylski AK, Ryan RM. The index of autonomous functioning: development of a scale of human autonomy. *J Res Pers*. 2012;46(4):397–413. doi:10.1016/j.jrp.2012.03.007.
30. Van den Broeck A, Vansteenkiste M, De Witte H, Soenens B, Lens W. Capturing autonomy, competence, and relatedness at work: construction and initial validation of the work-related basic need satisfaction scale. *J Occupat Organ Psyc*. 2010;83(4):981–1002. doi:10.1348/096317909X481382.
31. Deci EL, Ryan RM. The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. *Psychol Inq*. 2000;11(4):227–268. doi:10.1207/S15327965PLI1104_01.
32. Lent RW. Vocational psychology and career counseling: inventing the future. *J Vocat Behav*. 2001;59(2):213–225. doi:10.1006/jvbe.2001.1827.
33. Lent RW, Brown SD, Nota L, Soresi S. Testing social cognitive interest and choice hypotheses across Holland types in Italian high school students. *J Vocat Behav*. 2003;62(1):101–118. doi:10.1016/S0001-8791(02)00057-X.
34. Northern JJ, O'Brien WH, Goetz PW. The development, evaluation, and validation of a financial stress scale for undergraduate students. *J Coll Student Dev*. 2010;51(1):79–92. doi:10.1353/csd.0.0108.
35. Molina Y, Choi SW, Cella D, Rao D. The stigma scale for chronic illnesses 8-item version (SSCI-8): development, validation and use across neurological conditions. *Int J Behav Med*. 2013;20(3):450–460. doi:10.1007/s12529-012-9243-4.
36. Diener E, Wirtz D, Biswas-Diener R, et al. New measures of well-being. In: Diener E, ed. *Assessing Well-Being*. Dordrecht, Netherlands: Springer; 2009:247–266.
37. Little RJA. A test of missing completely at random for multivariate data with missing values. *J Am Stat Assoc*. 1988;83(404):1198–1202. doi:10.1080/01621459.1988.10478722.
38. Roth PL. Missing data: a conceptual review for applied psychologists. *Pers Psychol*. 1994;47(3):537–560. doi:10.1111/j.1744-6570.1994.tb01736.x.
39. Van Buuren S. *Flexible Imputation of Missing Data*. London, NY: Chapman and Hall/CRC; 2012.
40. Darlington RB, Hayes AF. *Regression Analysis and Linear Models: Concepts, Application, and Implementation*. New York, NY: Guilford; 2017.
41. Breusch TS, Pagan AR. A simple test for heteroscedasticity and random coefficient variation. *Econometrica* 1979;47(5):1287–1294. doi:10.2307/1911963.
42. Long JS, Ervin LH. Using heteroscedasticity consistent standard errors in the linear regression model. *Am Stat*. 2000;54(3):217–224. doi:10.1080/00031305.2000.10474549.
43. Wooldridge JM. *Introductory Econometrics: A Modern Approach*. 6th ed. Boston, MA: Cengage Learning; 2016.
44. Yu S, Levesque-Bristol C, Maeda Y. General need for autonomy and subjective well-being: a meta-analysis of studies in the US and East Asia. *J Happiness Stud*. 2018;19(6):1863–1882. doi:10.1007/s10902-017-9898-2.
45. Ryan RM, Deci EL. Intrinsic and extrinsic motivation from a self-determination theory perspective: definitions, theory, practices, and future directions. *Contemp Educ Psychol*. 2020;61:101860. doi:10.1016/j.cedpsych.2020.101860.
46. Yu C, Li X, Wang S, Zhang W. Teacher autonomy support reduces adolescent anxiety and depression: an 18-month longitudinal study. *J Adolesc*. 2016;49(1):115–123. doi:10.1016/j.adolescence.2016.03.001.
47. Dubois P, Guay F, St-Pierre MC. School-to-work transition of youth with learning difficulties: the role of motivation and autonomy support. *Except Child*. 2023;89(2):216–232. doi:10.1177/00144029221112285.
48. Römhild A, Hollederer A. Effects of disability-related services, accommodations, and integration on academic success of students

with disabilities in higher education: a scoping review. *Eur J Spec Needs Educ*. 2024;39(1):1–24. doi:10.1080/08856257.2023.2195074.

49. Tu WM, Yan MC, Li Q, Watts J. Attitudes toward disabilities among students in college settings: a multidimensional scaling analysis with biplot. *Aust J Rehabil Couns*. 2019;25(2):79–95. doi:10.1017/jrc.2019.10.
50. Barta T, Kiropoulos L. The mediating role of stigma, internalized shame, and autonomous motivation in the relationship between depression, anxiety, and psychological help-seeking attitudes in multiple sclerosis. *Int J Behav Med*. 2023;30(1):133–145. doi:10.1007/s12529-022-10078-6.
51. Martela F, Sheldon KM. Clarifying the concept of well-being: psychological need satisfaction as the common core connecting eudaimonic and subjective well-being. *Rev Gen Psychol*. 2019;23(4):458–474. doi:10.1177/1089268019880886.
52. Patrick H, Knee CR, Canevello A, Lonsbary C. The role of need fulfillment in relationship functioning and well-being: a self-determination theory perspective. *J Pers Soc Psychol*. 2007;92(3):434–457. doi:10.1037/0022-3514.92.3.434.