Psychology Research and Behavior Management

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

Development and Validation of the Self-Stigma Scale for Secondary Vocational Students (SSS-SVS)

Jiaqi Leng[1], Huilin Cai[1], Fei Liu[2], Xiaoli Shi[3], Zhiguang Fan[4]

[1]School of English, Jilin International Studies University, Changchun, 130117, People's Republic of China; [2]Section of Student Affair, ChangChun Vocational School of Technology, Changchun, 130117, People's Republic of China; [3]Department of Psychology, University of Exeter, Exeter, EX4 4 QG, UK; [4]Department of Psychology, Shaoxing University, Shaoxing, 312000, People's Republic of China

Correspondence: Zhiguang Fan, Department of Psychology, Shaoxing University, Shaoxing, 312000, People's Republic of China, Tel +86-0431-84924101, Fax +86 1 594-831-4623, Email fanyqm@126.com

Background: Stigma can not only threaten the self-identity of secondary vocational students, but also have negative effects on their mental health and behavior.

Objective: This study aimed to develop the Self-Stigma Scale for Secondary Vocational Students (SSS-SVS) and test its reliability and validity.

Patients and Methods: This study formed a scale based on the stigma conceptualization model and open questionnaire. The formal survey was divided into two stages. In the first stage, a preliminary questionnaire was administered to 328 secondary vocational students to develop a formal SSS-SVS according to the results of the data check. In the second stage, the SSS-SVS, Social Recognition of Secondary Vocational Students (SR-SVS), Intensity of Willingness to Become a Secondary Vocational Student (IWB-SVS), Stigma-Consciousness Scale (SCS), Learning Adjustment Scale (LAS), Professional Identity Scale for Secondary Vocational Students (PIS-SVS), and the Self-Compassion Scale (SCoS) were administered to 1079 vocational secondary school students.

Results: The SSS-SVS consisted of 21 items which were divided into three dimensions of negative characteristics, self-deprecation, and opportunity loss, reflecting secondary vocational students' perception of negative public evaluation, self-feeling under the influence of stigma, and cognition of negative impact on their identity. The confirmatory factor analysis (CFA) shows that the three-factor model has good fit indices. The total score and the scores of each dimension of the SSS-SVS were significantly and positively correlated with Stigma Consciousness; they were significantly and negatively correlated with SA-SVS, IDB-SVS, SVS-PIS, Learning Adjustment, and Self-Compassion. Both the Cronbach's α coefficients of the total scale and each dimension and the McDonald's ω coefficients were satisfactory. Additionally, the scale had measurement equivalence across gender and grade levels. The SSS-SVS has limitations and may be affected by cultural background. Future studies should expand the sample and conduct cross-cultural verification.

Conclusion: The SSS-SVS is a reliable and valid instrument for assessing secondary vocational students' self-stigma, providing support for developing relevant programs and policies. It also advances secondary vocational education and enhances students' mental health.

Keywords: secondary vocational students, self-stigma, reliability, validity

Introduction

Vocational and Technical Education (VTE) and general education belong to different types of education. However, both are equally important.[1] VTE plays an important role in improving the fairness and diversification of education and training high-quality laborers and technical and skilled personnel.[2] At the same time, VTE is of great value in solving employment problems and promoting economic and social development[3] Governments of various countries highlight and strive to promote the development of VTE.[4,5] However, as of today, the phenomenon of stigma in vocational and technical education prevails worldwide.[6] For instance, King, J.'s research points out that vocational education in the United States has long been stigmatized and marginalized, with the term "vocational" being heavily stigmatized, and vocational education is regarded as "a second-class path", an option for "those who cannot succeed in college preparatory

Received: 15 October 2024
Accepted: 8 January 2025
Published: 15 January 2025

courses" as well as 'losers'.[7] In the qualitative study of Trigueros, K. H, it was found that teachers and students in Philippine vocational education schools suffered discrimination and stigma when they participated in vocational education courses.[8] In addition, residents of Indonesia and Nigeria generally value general education more than vocational education.[9,10] In Saudi Arabia, occupations related to skilled and manual labor are often despised by society, and students in vocational and technical education schools are mainly engaged in such jobs after graduation.[11] In China, secondary vocational education is regarded as 'poor students' education, and few students with excellent academic performance actively choose to attend secondary vocational schools.[12]

The negative comments and evaluations from the public can affect vocational students' self-concept and self-identity, leading to self-deprecation and discrimination, and thus the generation of self-stigma. Kim et al conducted a longitudinal study to retrospectively examine the experience of self-stigma among young people who dropped out of middle or high school in Korea.[13] Lebanese students had a negative view of their learning in vocational education and believed they were inferior to students in general education.[14] Canadian vocational students also revealed self-stigma and devaluation of vocational education in interviews;[15] Chinese vocational students have a higher degree of academic self-stigma, with third-year students having the highest degree of academic self-stigma.[16] Most parents tend to regard general high schools as the pathway to higher education and vocational education as the alternative.[12,17] In more familial Asian cultures, the family's stigma on vocational education will deepen the students' self-stigma.[18]

Secondary vocational students might concurrently endure triple stigmas from society, family and within themselves. In the long-term development, self-stigma has a severely negative influence on the mental health of middle vocational school students.[19] Researches indicate that self-stigma can affect an individual's self-esteem,[20] self-efficacy,[21] and might even trigger psychological problems such as anxiety[22] or depression.[23] Self-stigma also exerts a negative impact on the identity of secondary vocational students,[24] even generating a sense of fatalism, triggering withdrawal behaviors, undermining social adaptability,[25] and reducing well-being and life quality.[26,27] Additionally, under the influence of stigma, secondary vocational students attach greater importance to the improvement of academic qualifications while neglecting the learning of professional skills, thereby exerting an adverse effect on their future career development. For instance, it can give rise to occupational stress, job burnout and increase the willingness to quit.[28,29]

Quantitative measurement of self-stigma among secondary vocational students is highly necessary; however, the currently available scales can merely reflect some aspects related to the stigma of these students. For example, the Questionnaire on the Impact of Attitudes in Vocational and Technical Education (QIAVTE) compiled by Aldossar[11] can be used to assess the impact of economic and social transformation on Saudi youth's attitude toward VTE. Vos, R developed a 42-item High School Attitude Scale (HSAS), which can be used to assess adolescents' attitudes towards vocational education.[30] The QIAVTE and HSAS enjoy a wider range of application; however, they lack targeted considerations regarding the particularities of the group of secondary vocational students. Wang et al developed the Junior High School Students to Secondary Vocational Students Stigma Scale (SVSSS)[31] with favorable reliability and validity. This scale was mainly developed based on middle school students and did not delve deeply from the perspective of students' self-cognition, thus being unable to precisely reflect the actual circumstances of secondary vocational students. In addition, Chinese scholar Dong Jimei developed the Scale of Perceived Discrimination of Secondary Vocational Students (SPDSVS) based on the Scale of Perceived Discrimination (SPD)[32] However, this scale mainly pays attention to perceptual discrimination and fails to comprehensively present the complete psychological chain of self-stigma formation.

Secondary vocational students, as a distinctive student cohort, should have their unique situations in aspects such as social public opinion, career expectations, and academic stress fully taken into account. The perception and identification of stigma information within the environment or culture they are in by secondary vocational students are the primary causes that trigger self-stigma.[33] The Conceptualization Model of Stigma is widely employed to explain the formation process of self-stigma, which posits that stigma emerges as a consequence of social classification and social isolation, with power playing a crucial role in the stigmatization process.[34,35] Populations in dominant positions or with high power in society impose negative stereotypes upon minority groups, thereby giving rise to stigma. The generation of Self-Stigma undergoes marking differences, labeling, social isolation, as well as status loss, degradation, and discrimination[34] The outcome of stigmatization is the status loss and social isolation endured by the stigmatized group.[36]

To address the deficiencies of the aforementioned literature, this research specifically targets the group of secondary vocational students and focuses on the specific construct of self-stigma. Based on the Conceptualization Model of Stigma and on the basis of a semi-open questionnaire survey, a SSS-SVS was developed. Schools can employ this scale to evaluate the degree of self-stigma among secondary vocational students and carry out targeted mental health education courses, for instance, implementing self-compassion training interventions to assist students in reducing self-stigma,[37] etc. Educational policy makers can formulate relevant policies based on the scale results to enhance social recognition and elevate the social status of vocational education.[38]

The study hypothesized that the SSS-SVS has good psychometric characteristics and is an effective tool for assessing the self-stigma of secondary vocational students. In addition, taking into account gender-specific evaluation criteria for career expectations and success, and social expectations being not the same,[39] as well as the fact that, with the growth of age and the deepening of the courses taken, the expectation of graduation will also change to different degrees, which may cause the grade difference of self-stigma.[40] The scale has cross-group equivalence, which is the premise of group difference comparison. To this end, the study further examined the cross-gender and cross-grade consistency of the scale and assumed that SSS-SVS had measurement equivalence.

Formation of Scale Items

The conceptualized model of stigma is a multidimensional framework that emphasizes that the generation and existence of stigma depend on the interaction of multiple interrelated components in power situations, which are mainly divided into four stages: labeling differences, labeling people's association with undesirable characteristics, social isolation, and labeling people's experience of status loss and discrimination. In this study, the Conceptualization Model of Stigma was used as the theoretical framework,[34] and the initial questionnaire was complied with in combination with an open questionnaire survey and expert review. Through the open questionnaire survey, high-frequency words can be extracted, and the preliminary data with richer information can be collected to form a vocabulary database, which can provide a reference for the development of articles.

Open Survey Sample

This study conducted an open-ended questionnaire survey on 456 students to collect stigma-related vocabulary among secondary vocational students. A preliminary vocabulary bank was formed by statistical collation of the survey results by 8 college students. One psychology teacher and four postgraduate students sorted out and summarized the vocabulary independently while deleting the words that were inconsistent with the theme, unclear in meaning, and ambiguous. Subsequently, the obtained vocabulary was combined and simplified to form a corresponding typical vocabulary. Word frequency analysis was performed to find the top words in the overall ranking, such as "inferior", "lazy", and "like to play games". One psychology teacher and four postgraduate students compiled 33 original items according to the extracted high-frequency vocabulary and the theoretical framework. A psychology professor was invited to evaluate and discuss the contents of the items, and to delete, merge and modify the unclear, ambiguous, similar and repetitive items according to the theoretical structure and content structure. Finally, 22 items were retained to form the primary SSS-SVS.

Preliminary Research

Participants

In this study, a total of two investigators, one postgraduate student from the Psychology Department, and the other senior head of the secondary vocational school, conducted tests on students in a secondary vocational school of science and engineering from March 2022 to May 2022. The survey covered a wide range of students groups of different grades, different genders, and different majors in this science and engineering secondary vocational school. In the research process, measures were actively taken to expand the sample size as much as possible, and strive to minimize the impact of sample homogeneity to obtain more universal and reliable research results. The inclusion criteria for participants were: 1) Currently attending a secondary vocational school. 2) No language barrier, and having the ability to understand and communicate. 3) Clear consciousness, no mental illness or consciousness disorder. 4) Voluntarily participate in the study

and sign an informed consent form. If the participant is under the age of eighteen, a representative of his/her parent or guardian will sign the informed consent form. The exclusion criteria for participants are: 1) Refusing to participate in the survey and refusing to sign the informed consent. 2) Having participated in similar surveys. 3) Having a psychiatric diagnosis. This study was conducted in accordance with the Declaration of Helsinki, with the informed consent of the participants, and with the approval of the ethics committee of Jilin University of International Studies (project No. 202111001). As data was collected through self-reporting, biases such as social desirability might exist. To mitigate such influences, anonymization was adopted in the questionnaire design, and before distributing the questionnaire, it was emphasized that this investigation would not generate any evaluations related to individuals. The collected data was strictly encrypted, and only authorized researchers were permitted to access the data when necessary to guarantee the security of participants' personal information and follow relevant ethical guidelines to protect participants' privacy. A total of 328 valid questionnaires were collected (sample 1), including 292 males and 36 females, ranging in age from 15 to 19 years old, with an average age of (16.63±0.935). Detailed demographic characteristics are shown in Table 1.

Statistical Analysis

Item analysis (IA) and exploratory factor analysis (EFA) were conducted on the data collected with SPSS 25.0. In item analysis, delete items with insignificant differences in high and low scores and item-total correlation degree < 0.4. At the same time, after calculating the Cronbach's α coefficient value of the initial questionnaire, the questionnaire items were deleted one by one. If the Cronbach's α coefficient value rose after deleting any item, the item was deleted. In EFA, items were removed according to the following criteria: 1) The factor loading is less than 0.4; 2) There are cross-loadings, ie items with loading difference less than 0.2 on two factors, indicating that the item is not clearly attributed in different

Table 1 Basic Information of Sample Participants

Demographic Information	Classification	Sample 1 (N=328)		Sample 2 (N=1079)	
		Number	Percentage	Number	Percentage
Gender	Male	292	89.0%	701	65.0%
	Female	36	11.0%	378	35.00%
Age	15	36	11.0%	151	14.0%
	16	112	34.1%	381	35.3%
	17	121	36.9%	377	34.9%
	18	54	16.5%	140	13.0%
	19	5	1.5%	25	2.3%
	20	0	0.0%	5	0.5%
Grade	Grade 2022	141	43.0%	504	45.7%
	Grade 2021	123	37.5%	403	37.3%
	Grade 2020	64	19.5%	172	15.9%
Place of Residence	City	175	53.4%	1022	95.7%
	County	46	14.0%	57	5.3%
	Village	107	32.6%	0	0.0%
Family Type	Two-parent Family	232	70.7%	788	73.0%
	Single-parent family	67	20.4%	213	19.7%
	Blended Family	22	6.7%	78	7.2%
	Other Types	7	2.1%	0	0.0%
Father's Level of Education	Primary and below	54	16.5%	212	19.6%
	Junior High School	174	53.0%	560	51.9%
	Senior High School	72	22.0%	217	20.1%
	College Degree, Bachelor degree or above	28	8.5%	28	8.3%
Mother's Level of Education	Primary and below	64	19.5%	206	19.1%
	Junior High School	173	52.7%	572	53.0%
	Senior High School	65	19.8%	198	18.4%
	College Degree, Bachelor degree or above	26	7.9%	103	9.5%

dimensions and cannot clearly reflect a single construct; 3) The communality is less than 0.30, indicating that an item is theoretically or conceptually inconsistent with the constructs measured on the scale.[41,42] One item at a time was deleted, while the reliability indicators and the rationality of the cumulative explanatory variance were re-examined and compared with the original theoretical construct to form the final items of SSS-SVS.

Initial Measurement Scale Test

Item Analysis (IA)

The IA results are shown in Table 2. The sorted data were arranged in the order of the total self-stigma score of secondary vocational students from low to high, with the top 27% of the data as the low group and the bottom 27% as the high group. The results showed that there were significant differences in the scores of all items in the high and low groups (t=12.47 ~ 20.03). The Pearson correlation between each item and the total score of the scale was calculated. The correlation coefficient between 22 items and the total score was between 0.612 and 0.882, and the P value was < 0.01, indicating that the items were significantly correlated with the total score. The internal consistency test of SSS-SVS showed that the Cronbach's α coefficient of the scale was 0.973. Meanwhile, the change of Cronbach's α coefficient after any item was deleted was calculated, and the results (see Table 2) showed that deleting any item of the scale will reduce the reliability of the scale. Therefore, in this IA, 22 items met the retention criteria and did not need to be deleted.

Exploratory Factor Analysis (EFA)

Firstly, KMO and Bartlett's Test was performed on SSS-SVS. The results showed that the KMO value was 0.964, χ^2=7457.658, df=231, P<0.001, indicating that the scale was suitable for factor analysis. The SSS-S VS factors are believed to be correlated, and the Promax rotation method is an oblique rotation method, which allows for correlations between factors that better reflect actual relationship of factors in empirical data.[43,44] Therefore, the exploratory factor analysis was conducted using the maximum likelihood (ML) estimation. Factor rotation was performed using Promax

Table 2 The Results of Item Analysis of SSS-SVS (N=328)

Item	Low Group (N=89, M±SD)	High Group (N=89, M±SD)	t Value	Total Correlation Coefficient (r)	α Value after Deleting the Item
1	1.03±0.24	3.10±0.98	19.28***	0.829**	0.972
2	1.01±0.11	3.24±0.94	22.02***	0.849**	0.971
3	1.03±0.18	3.37±1.00	21.48***	0.845**	0.971
4	1.03±0.18	3.64±0.93	25.74***	0.813**	0.972
5	1.01±0.11	3.38±1.04	21.29***	0.862**	0.971
6	1.17±0.51	3.61±0.93	21.69***	0.823**	0.972
7	1.01±0.11	3.33±0.89	24.25***	0.865**	0.971
8	1.03±0.24	3.53±0.87	26.03***	0.882**	0.971
9	1.00±0.00	3.44±0.99	23.15***	0.844**	0.971
10	1.02±0.15	3.07±1.02	18.60***	0.788**	0.972
11	1.02±0.15	3.18±1.00	20.11***	0.831**	0.972
12	1.09±0.39	3.22±0.90	20.39***	0.836**	0.972
13	1.03±0.18	3.13±0.91	21.31***	0.848**	0.971
14	1.34±0.76	3.03±1.03	12.47***	0.633**	0.972
15	1.20±0.57	2.89±0.97	14.05***	0.651**	0.971
16	1.02±0.15	3.42±0.92	24.22***	0.876**	0.971
17	1.07±0.30	3.18±0.85	22.10***	0.779**	0.972
18	1.01±0.11	2.56±1.12	12.96***	0.612**	0.971
19	1.05±0.26	3.08±0.88	20.76***	0.801**	0.972
20	1.07±0.33	3.19±0.88	21.24***	0.837**	0.972
21	1.03±0.24	2.9±0.81	20.68***	0.752**	0.972
22	1.28±0.87	3.29±0.98	14.41***	0.734**	0.971

Note: **P<0.01,***P<0.001.
Abbreviations: C.R. Value, critical ratio value; M, mean; SD, standard deviation.

with eigenvalues greater than 1, and factor extraction was performed in combination with the Scree graph. Observing the Scree graph, it was found that the slope gradually slows down from 3. There were three factors with eigenvalues greater than 1, which were 14.194, 1.245, and 1.017, respectively, with Explained Ratio of 64.519%, 5.660%, and 4.621%, respectively. The cumulative total explained variation reached 74.800%. In addition, all item factor loadings were greater than 0.4, and the communality degree was greater than 0.3. However, item 16 was deleted due to the cross-loadings. Finally, 21 items were retained.

EFA was conducted again for these 21 items. According to the above criteria, the eigenvalues were 13.437, 1.241, and 1.015, and the Explained Ratio were 63.987%, 5.911%, and 4.831%, respectively. The cumulative total explained variation reached 74.729%. Among the 21 items, the factor loading ranged from 0.473 to 0.942, and the communality degree of all items ranged from 0.457 to 0.842 (see Table 3). Finally, Factor 1 was named as Negative Trait (NT) according to the theoretical conception and the topics contained in the various dimensions; Factor 2 was named Self-Devaluation (SD) and factor 3 was named Loss of Opportunity (LO).

Formal Scale Test

Participants

In this study, a total of two investigators, one postgraduate student from the Psychology Department, and the other senior head of the secondary vocational school, conducted tests on students in a secondary vocational school of science and engineering from September 2022 to November 2022 adopting the method of online response. The inclusion and exclusion criteria of participants were the same as above, and 1079 valid questionnaires were finally collected (sample 2). Among them, 701 were male and 378 were female, ranging in age from 15 to 20 years old, with an average age of (16.54±1.10). Detailed demographic information is shown in Table 1.

Table 3 Scale Item and Factor Loading (N=328)

Item Content	NT	SD	LO	Communality
1. In the eyes of outsiders, secondary vocational students like to drink heavily.	**0.942**	−0.053	−0.025	0.778
2. In the eyes of outsiders, secondary vocational students have extreme personalities.	**0.881**	−0.095	0.100	0.788
3. In the eyes of outsiders, secondary vocational students are "punks".	**0.847**	0.206	−0.169	0.783
4. In the eyes of outsiders, secondary vocational students like smoking.	**0.814**	−0.114	0.146	0.712
5. In the eyes of outsiders, the personal quality of secondary vocational students is low.	**0.786**	0.047	0.082	0.786
6. In the eyes of outsiders, secondary vocational students like to fight.	**0.782**	0.292	−0.221	0.739
7. In the eyes of outsiders, secondary vocational students do not follow the rules and regulations.	**0.781**	0.134	−0.001	0.788
8. In the eyes of outsiders, secondary vocational students are addicted to games all day long.	**0.751**	0.021	0.163	0.810
9. In the eyes of outsiders, secondary vocational students have poor learning ability.	**0.646**	0.016	0.233	0.720
10. In the eyes of outsiders, secondary vocational students lack good family education.	**0.570**	−0.014	0.277	0.627
11. Because I study in a secondary vocational school, I feel slighted by others.	0.063	**0.891**	−0.034	0.842
12. Being a secondary vocational student makes me feel inferior.	0.043	**0.838**	0.053	0.827
13. I feel dishonored to be a secondary vocational student.	0.057	**0.783**	0.102	0.823
14. I would hide from others that I was in a secondary vocational school.	−0.005	**0.689**	−0.013	0.461
15. As a result of studying in a secondary vocational school, I feel alienated from others.	−0.052	**0.562**	0.193	0.457
17. As I am studying in a secondary vocational school, it will be difficult for me to find a satisfactory job in the future.	0.099	−0.114	**0.882**	0.769
18. I seriously considered quitting school.	−0.100	0.054	**0.723**	0.480
19. I will miss many good opportunities by studying in a secondary vocational school.	0.066	0.135	**0.694**	0.731
20. As I am studying in a secondary vocational school, I do not feel I can achieve much in the future.	0.174	0.217	**0.527**	0.717
21. I am not satisfied with my study in a secondary vocational school.	0.086	0.242	**0.474**	0.573
22. If I could choose again, I would not attend a secondary vocational school.	0.105	0.244	**0.473**	0.549

Note: The bold text marks the dimension to which this item belongs and the factor loading for this item.

Instruments

SSS-SVS

The formal SSS-SVS contains 21 items, consisting of three dimensions of Negative Trait (NT), Self-Devaluation (SD), and Loss of Opportunity (LO). Items such as "in the eyes of outsiders, secondary vocational students like to drink heavily" are of NT dimension; "I feel despised by others because I study in a secondary vocational school" is a typical SD item; "I considered dropping out of school." is an example of the item in LO dimension. The scale was rated on a Likert scale from 1 (strongly non-conformity) to 5 (complete conformity). The sum of the scores of each item is the total score, and the higher the score, the higher the self-stigma of secondary vocational students.

Social Recognition of Secondary Vocational Students (SR-SVS)

This study adopted the question "How much do you think the society recognizes secondary vocational students?" as a standard to measure the SR-SVS. Participants were asked to rate SR-SVS on a scale of 1 to 10, with 1 being strongly disapproval and 10 being strongly approval. The higher the score, the stronger the social recognition that secondary vocational students feel.

Intensity of Willingness to Become a Secondary Vocational Student (IWB-SVS)

In this study, the question "How strong is your desire to become a secondary vocational student?" was adopted as a standard to measure the IWB-SVS. Participants were asked to rate their IWB-SVS on a scale of 1 to 10 points, with 1 being very reluctant and 10 being very willing. The higher the score, the stronger the will to choose to become a secondary vocational student.

Professional Identity Scale for Secondary Vocational Students (PIS-SVS)

This study adopted the PIS-SVS[45] compiled by Qi Hanyu in 2020, which contains 18 items, including four dimensions of professional cognition (PC), professional emotion (PE), professional engagement (PEG), and professional relevance (PR). For example, "I know the training goal of this major" is an item in PC dimension, "I would like to introduce my major to others", an item in PE dimension, "I can listen to lectures carefully in professional courses", and item in PEG dimension and "My personality is very suitable for studying this major.", an item in PR dimension. The items were rated on a 10-point scale from 1 (completely inconsistent) to 5 (completely consistent). The higher the score, the stronger the professional identity of secondary vocational students. In this study, the Cronbach's α coefficient of this scale was 0.960.

Learning Adjustment Scale (LAS)

This study adopted the LAS for Junior High School Students compiled by Hou Jing in 2016,[46] which contains 85 items and 7 sub-scales, including 16 items in the sub-scale of LAS such as "Dozing off or looking around in class." The items were rated on a 5-point scale from 1 (completely consistent) to 5 (completely inconsistent). The higher the score, the higher the learning adjustment of secondary vocational students. In this study, the Cronbach's α coefficient of this scale was 0.930.

Stigma-Consciousness Scale (SCS)

The scale used in this study was adapted from SCS compiled by Elizabeth C. Pinel in 1999 for women, homosexuals and other groups,[47] which also showed good reliability and validity in China.[48] This scale was adapted according to the life related content of secondary vocational students, so that the scale was more suitable for the characteristics of them. There were six items in the scale, such as "Most people who are not secondary vocational students have more negative views of secondary vocational students than they actually express." The items were rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). The higher the score, the higher the Stigma Consciousness of secondary vocational students. In this study, the Cronbach's α coefficient of this scale was 0.928.

Self-Compassion Scale (SCoS)

In this study, the Adolescent Self-Compassion Scale developed by Kristin D. Neff in 2020 was adopted,[49] and the Chinese version of the scale showed good psychometric characteristics in the adolescent population. For example, "When I encounter difficulties, I will be kind to myself and encourage myself" is an item in Self-Kindness; Self-Criticism

dimensions include items such as "I get very depressed when I find my own shortcomings"; Common Humanity: "When I feel sad or unhappy, I remind myself that everyone feels this way." Self-Isolation dimensions include items as "When I am in a bad mood or depressed, I think most people are probably happier than I am." The Present-Moment Dimension include items such as "When I encounter difficulties, I try to look at these things objectively" The items were rated on a 5-point scale from 1 (never) to 5 (always). The higher the score, the higher the degree of self-Compassion of secondary vocational students. In this study, the Cronbach's α coefficient of this scale was 0.815.

Statistical Analysis

The formal SSS-SVS obtained was tested on sample 2. After data collection, AMOS 24.0 was used to conduct confirmatory factor analysis (CFA) of the structure obtained in the preliminary study, and cross-group invariance test was conducted. The fit indices such as χ^2/df, RFI, CFI, NFI and IFI, RMSEA, and SRMR are widely employed in structural equation models and can effectively assess the goodness-of-fit between the model and the data. Specifically, χ^2/df reflects the parsimony of the model, and RMSEA and SRMR are highly sensitive to model errors. Comprehensive reporting of the values of the above fit indices can furnish researchers with multi-dimensional information, facilitating the determination of whether the structure of the scale is rational and whether the measurement is accurate and reliable.[50] In this study, a good fit is defined by χ^2/df < 3, all of RFI, CFI, NFI, and IFI being greater than 0.90, RMSEA being less than 0.08, and both PNFI and PCFI being greater than 0.50.[51] SPSS 25.0 was used to obtain the total score of the stigma scale and the internal consistency reliability of each dimension. Cronbach a coefficient >0.7 and McDonald's ω coefficient >0.7 were used as the standards for good reliability[52] Through the above procedure, the psychological structure of self-stigma of secondary vocational students was verified again, and SSS-SVS was obtained in line with psychometric standards.

Research Results

Confirmatory Factor Analysis (CFA)

The results of CFA showed that the fitting index was χ^2/df=3.854>3, RMSEA= 0.051, SRMR=0.018, RFI= 0.969, CFI= 0.982, IFI= 0.982, PNFI= 0.780, PCFI=0.785.

Criterion-Related Validity Test (CVT)

The results of CVT showed (see Table 4) that the total score of SSS-SVS and scores of all dimensions were significantly and negatively correlated with scores of social recognition, willingness strength, professional identity, learning adjustment and self-compassion. There was a significant positive correlation between the total score of SSS-SVS and the scores of each dimension.

Table 4 Correlation Analysis Between SSS-SVS and Other Scales (N=1079)

	1	2	3	4	5	6	7	8	9	10
SS	1									
NT	0.967**	1								
SD	0.900**	0.786**	1							
LO	0.950**	0.871**	0.843**	1						
SRD	−0.315**	−0.318**	−0.263**	−0.294**	1					
IW	−0.296**	−0.286**	−0.257**	−0.288**	0.68**	1				
PI	−0.290**	−0.281**	−0.241**	−0.294**	0.36**	0.395**	1			
LA	−0.368**	−0.343**	−0.315**	−0.388**	0.313**	0.268**	0.466**	1		
SC	0.428**	0.432**	0.358**	0.398**	−0.37**	−0.343**	−0.326**	−0.484**	1	
SCo	−0.249**	−0.236**	−0.232**	−0.238**	0.231**	0.209**	0.361**	0.499**	−0.392**	1

Note: **P<0.01.

Table 5 SSS-SVS Results Analysis of Cross-Gender Invariance (N=1079)

Model	S-Bχ^2	*df*	TLI	CFI	RMSEA (90% CI)	SRMR	ΔCFI	ΔRMSEA
M1	1109.017	336	0.964	0.971	0.046 (0.044–0.049)	0.022		
M2	1132.762	354	0.965	0.971	0.045 (0.042–0.048)	0.023	<0.001	0.001
M3	1169.445	375	0.967	0.970	0.044 (0.041–0.047)	0.023	0.001	0.001
M4	1381.944	414	0.963	0.964	0.047 (0.044–0.049)	0.026	0.006	0.003

Abbreviations: df, degrees of freedom; TLI, Tucker-Lewis index; CFI, comparative fit index; CI, confidence interval; NFI, normed fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

Table 6 SSS-SVS Results Analysis of Cross-Grade Invariance (N=1079)

Model	S-Bχ^2	*df*	TLI	CFI	RMSEA (90% CI)	SRMR	ΔCFI	ΔRMSEA
M1	1563.181	504	0.951	0.961	0.044 (0.042–0.047)	0.024		
M2	1595.599	540	0.954	0.961	0.043 (0.040–0.045)	0.024	<0.001	0.001
M3	1628.131	582	0.958	0.961	0.039 (0.039–0.043)	0.024	<0.001	0.004
M4	1876.801	660	0.957	0.955	0.039 (0.039–0.044)	0.027	0.006	<0.001

Abbreviations: df, degrees of freedom; TLI, Tucker-Lewis index; CFI, comparative fit index; CI, confidence interval; NFI, normed fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

Reliability

The total score of SSS-SVS and Cronbach's α coefficients of negative traits, self-devaluation and loss of opportunity were 0.978, 0.972, 0.930 and 0.930, respectively. The McDonald's ω coefficients of SSS-SVS and each dimension were 0.980, 0.975, 0.948 and 0.946, respectively.

Cross-Group Invariance Test (CGIT)

Sample 2 (N=1079) was used to test the cross-gender and cross-grade invariance of SSS-SVS. We establish the Configural invariance model (M1), the weak invariance model (M2), and the strong invariance model for different genders (M3)) and the strict invariance model (M4). Morphological equivalence is used as the baseline model for testing. Only when the equivalence of the previous level is established, the nested model generated by restricting the corresponding parameters on the basis of morphological equivalence continues to test the equivalence of a higher level. As shown in Tables 5 and 6, the model fitting indexes of each model, such as Chi-square ratio, TLI, CFI, RMSEA and SRMR, all meet the measurement requirements. In the comparison of M2 and M1, M3 and M2, M3 and M4, ΔCFI is less than 0.01 and ΔRMSEA is less than 0.15. Each fitting index of the model is basically good, and the morphological equivalent model, weak equivalent model, strong equivalent model and strict equivalent model are all valid. The results showed that SSS-SVS had cross-gender and cross-grade invariance, and the detailed results are shown in Tables 5 and 6.

Discussion

An initial scale of 22 items was developed after expert review through an open-ended questionnaire survey combined with a conceptualized model of stigma. After a series of reliability and validity tests, 1 item was deleted and 21 items were retained. The study found that SSS-SVS has good reliability and validity, and can be used as an effective tool to evaluate self-stigma of secondary vocational students.

Three factor structures of Negative Trait (NT), Self-Devaluation (SD) and Loss of Opportunity (LO) were extracted through EFA. Among them, NT refer to the secondary vocational students' perception of the public's negative evaluation of their group. This dimension enables us to distinctly capture the deeply entrenched negative self-labels that students gradually develop during the prolonged interaction process of social evaluation and self-perception. For instance, considering oneself deficient in certain talents or capabilities necessary for certain occupations. Such cognition frequently influences their career choices and learning motivation subconsciously. This dimension primarily reflects the identification and marking of group characteristics within the Stigma Conceptualization Model. The SD dimension further

discloses the degree to which students grossly underestimate their own value when confronted with external pressure and internal self-perception deviations, as well as how this depreciation is manifested as negative behavior patterns in daily study and life, such as evading challenges and expressing oneself without confidence. This dimension primarily reflects the Social Isolation stage within the Stigma Conceptualization Model. The LO dimension pertains to the negative influence that secondary vocational students perceive their identity to have on their future employment, growth, and personal accomplishments. It showcases, from a more macroscopic and realistic perspective, how self-stigmatization leads students to prematurely self-impose limitations during the process of career planning and development, thereby missing numerous potential opportunities for growth and promotion, and even influencing their trust and participation in the entire vocational education system. This dimension mainly reflects the stages of Status Loss and Devaluation and Discrimination in the Stigma Conceptualization Model and represents the negative consequences of stigma. This process discloses that self-stigma is a continuous and multi-dimensional internalization process involving the interplay of cognition, emotion, and behavior, deepening our understanding of how stereotypes can transform from external social appraisals into internal psychological and behavioral characteristics of individuals.

The results of reliability analysis (RA) showed that the Cronbach's α coefficients range from 0.930 to 0.978 for the totals and dimensions, and from 0.946 to 0.980 for the McDonald's ω coefficients, both greater than 0.7, indicating that the scale has good reliability.[52] In the CFA, the χ^2/df value was 3.854, slightly higher than 3, but all other fitting indicators met the criteria. As χ^2 is a sensitive index, it is easily affected by the sample size,[53] and in this study, a total of 1079 valid data were included in the CFA, with a large sample size, therefore, it can be considered that the three-factor structure had a good fit. In addition, in the cross-gender and cross-grade invariance test, the morphological equivalence model, weak equivalence model, strong equivalence model, and strict equivalence model of SSS-SVS scale were verified. This scale can be used for cross-group comparison of different genders or grades.

The results of CVT showed that the total score and scores of various dimensions of self-stigma of secondary vocational students were significantly and negatively correlated with social recognition, school choice willingness, professional identity, learning adjustment ability, and self-compassion. These variables showed a positive correlation with the perceived level of stigma. Previous studies have found that secondary vocational students, as a specific group in the society, are acutely aware of social stigmatization[54] in daily life, and are aware that others may be viewing themselves and their studies from a negative perspective.[55] The existence of such stigmatization significantly weakens students' willingness to choose secondary vocational schools, and students with a high self-stigma tendency tend to have a lower identification with their major.[56] Internalized stigma labels have a profound negative impact on the self-cognition of secondary vocational students, making it difficult for them to treat themselves with self-compassion, and thus facing more challenges in the process of adapting to life in secondary vocational school[38] The results of this study is consistent with those of previous researches and further confirms the validity and reliability of the secondary vocational students SSS-SVS in assessing the phenomenon and impact of secondary vocational students self-stigma.[57] Meanwhile, the research discovered that self-compassion exhibits a negative correlation with self-stigma. This indicates that self-compassion, as an intra-individual psychological resource, holds a significant regulatory function in responding to the process of stigma internalization and offers a crucial entry point for the intervention of stigma internalization.[37]

The SSS-SVS holds broad application prospects in the domains of education and psychological intervention. In the educational aspect, schools can employ it to evaluate the self-stigma status of secondary vocational students and conduct career planning counseling courses for those with high self-stigma to mitigate the negative effects. In terms of psychological intervention, counselors can, based on the scale, offer personalized counseling for students with prominent problems in different dimensions through, for instance, conducting cognitive restructuring training for those with high scores in the negative trait dimension, organizing group interaction activities for those who are prominent in self-deprecation, and implementing career experience and internship expansion plans for those with a strong perception of opportunity loss, in order to assist students in breaking through self-imposed limitations and reestablishing a positive mindset and career confidence.[58] Families can also utilize this scale to understand their children's psychology, provide support and encouragement, and jointly help secondary vocational students overcome the troubles of self-stigma.[59]

In a multicultural context, the phenomenon of stigmatization in vocational education is widespread and presents in diverse forms.[60] Compared with Western culture, in the highly industrialized environment of the United States,

influenced by the concepts of social class and the culture of elite education, it is manifested as an excessive advocacy for academic career paths and an implicit devaluation of skill-based careers.[6] While Chinese students are often interwovenly influenced by traditional culture and expectations of family honor, which leads to a relatively low regard for vocational education and secondary vocational students being readily affixed with negative labels.[17,31] The commonality between the two lies in the prevalence of self-stigmatization, which commonly causes students' vocational self-confidence to be undermined, psychological health risks to breed, and difficulties in social integration to intensify.[28,29] In some European countries such as Germany, vocational education and general education enjoy an equal status, and society highly recognizes vocational skilled talents, so students choosing a vocational education path do not undergo obvious stigmatization.[61] Evidently, vocational education stigma is a global issue that is influenced by culture and value concepts and possesses unique characteristics. The development of the SSS-SVS scale can provide instrumental support for cross-cultural comparative studies.

In previous studies, many scholars have studied a variety of stigmatized workers, such as nurses and take-away riders, and put forward stigmatization phenomena.[62,63] For those who may be engaged in "indecent jobs", such as secondary vocational students, can also be affected by occupational stigma. In order to get rid of the stigma, students are more willing to upgrade their academic qualifications rather than further learn skills,[64] which has a negative impact on the future development of vocational education.[29] Based on the existing literature, this study expands the research participants and content of self-stigma. The research of SSS-SVS is based on Chinese cultural background and has good reliability and validity. This scale can be used for cross-group comparison among secondary vocational students of different genders or grades. Furthermore, based on the scale, multi-dimensional intervention and guidance can be carried out specifically for the self-stigma of secondary vocational school students.

Limitation

Firstly, although the sample size of this study meets the requirements of scale compilation, only students from a science and engineering secondary vocational school were selected, and their major settings and student groups cannot represent the group characteristics of the whole country. At the same time, the number of male students was significantly higher than that of female students as a result of the recruitment of participants in science and engineering secondary vocational schools. In view of this, it is necessary to further expand the sampling range of secondary vocational schools in different majors, different types and regions for more in-depth verification. At the same time, it is necessary to further analyze the performance differences of the scale in different gender groups, explore whether there is potential bias, and further improve the scale to ensure its fairness and effectiveness between different genders. Secondly, tertiary education, as a part of the vocational education system, their students may still face the same situation as secondary vocational students despite their higher educational level. Whether this scale is applicable to college students still needs further research. In addition, this study was conducted in a self-reporting manner, and participants may be affected by the social approval effect and withhold some negative information to lead to the answer bias, which will have a certain impact on the reliability and validity of the scale. In the follow-up research, multiple methods such as interview, peer evaluation and teacher evaluation can be used to evaluate or conduct experimental research, and retest reliability can be applied to verify the research results. Cross-cultural research can also be carried out to promote and apply the research results in a wider range. Therefore, the study of self-stigma of secondary vocational students still needs to be supplemented and improved by subsequent studies.

Conclusion

This study developed the SSS-SVS, which contains 21 items, divided into three dimensions of NT, SD and LO. The scale has good reliability and validity, and is suitable for evaluating the degree of self-stigma of secondary vocational students. Self-stigma of secondary vocational students is negatively correlated with social recognition, willingness to become secondary vocational students, professional identity, learning adjustment, and self-compassion, and positively correlated with stigma awareness, which are in line with the findings of prior research. These correlations contribute to a deeper understanding of the multifaceted influencing factors and underlying psychological mechanisms involved in the formation of self-stigma among secondary vocational students, thereby providing a theoretical foundation for the development

of targeted intervention strategies. SSS-SVS has measurement invariance between gender and grade, and is applicable to secondary vocational students of different genders and grades. Compared with existing measurement tools, this scale is more targeted at the specific group of vocational school students, providing more precise and effective measurement means for the study of vocational school students' self-stigma. It reveals the psychological process of vocational school students in social evaluation and self-evaluation, and has guiding significance for improving the social status of vocational education and improving the mental health of vocational school students. School managers, teachers, and parents can use this scale to assess the level of self-stigma in students, provide individualized guidance, and give psychological support to children, thus jointly promoting the development of students. There are limitations in the sample of this study, and the sampling range of vocational schools needs to be expanded. The gender differences in the scale should also be analyzed. Future studies should focus on exploring effective interventions to reduce the self-stigma of vocational students and strengthen interdisciplinary research by integrating social science, psychology, and educational theories and methods to comprehensively and deeply study the issue of self-stigma among vocational students.

Ethical Approval

The study protocol was reviewed and approved by the Ethics Committee of Jilin International Studies University (project No. 202111001). All procedures of the study were in accordance with the ethical guidelines outlined in the Helsinki Declaration. Written informed consent was obtained from all participants of secondary vocational students and their parents for the study.

Acknowledgments

We are very much thankful to all the researchers for data collection and processing. We thank all the survey participants in our study.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

References

1. xinhuanet. China's vocational education reform and development achievements overview. Xiaoxiang morning news official hundreds. 2021. Available from: http://education.news.cn/2021-04/11/c_1127317680.htm. Accessed April 11, 2021.
2. Eichhorst W, Rodríguez-Planas N, Schmidl R, Zimmermann KF. A roadmap to vocational education and training systems around the world. 2013.
3. Clifton J, Thompson S, Thorley C. *Winning the Global Race?: Jobs, Skills and the Importance of Vocational Education*. London: IPPR; 2014.
4. Jones A. Vocational education for the twenty-first century. The University of Melbourne; 2018.
5. Ismail A, Hassan R. Issues and challenges of technical and vocational education & training in Malaysia for knowledge worker driven. Paper presented at: National Conference on Engineering Technology. 2013.
6. Essel OQ, Agyarkoh E, Sumaila MS, Yankson PD. TVET stigmatization in developing countries: reality or fallacy? 2014.
7. King J. Dilemmas of design: education versus qualification in the US vocational system. In: *Work and Education in America: The Art of Integration*. Springer; 2011:15–32.
8. Trigueros KH. Combating the stigma: lived experiences of technical-vocational learners and teachers on pre-conceived notions. *Ascendens Asia J Multidiscip Res Abstr*. 2019;3(2B).
9. Kura SS, Mukhtar YA. Bias against vocational education in Nigeria and poverty: perspective on northern region. *Asian J Multidiscip Stud*. 2019;7:1.
10. Ackehurst M, Chan L, Erzinger T. *What if We Could Eliminate the Stigma of VET*. Adelaide: Knowledge Management Branch National Centre for Vocational…; 2022.
11. Aldossari AS. Vision 2030 and reducing the stigma of vocational and technical training among Saudi Arabian students. *Empir Res Vocat Educ Train*. 2020;12(1):1–24. doi:10.1186/s40461-020-00089-6
12. Liang X. *China: Challenges of Secondary Education*. World Bank, Education; 2001.

13. Kim YA, Lee DH, Heo SJ, Kim MJ. Longitudinal perspective of the stigmatization of secondary school dropouts. *Psychol Schools*. 2023;60(6):1979–2000. doi:10.1002/pits.22847
14. Vlaardingerbroek B, Hachem El-Masri Y. Student transition to upper secondary vocational and technical education (VTE) in Lebanon: from stigma to success. *J Vocat Educ Train*. 2008;60(1):19–33. doi:10.1080/13636820701828788
15. Kaur S. *Academic and vocational education in British Columbia: educational divide and social stigma* [Doctoral dissertation]. Electronic version published by Vancouver Island…; 2019.
16. 张寒. 中职生自我认同感与学历自我污名的关系及干预研究 [硕士]. 2023.
17. Ling M. "Bad students go to vocational schools!": education, social reproduction and migrant youth in urban China. *China J*. 2015;73:108–131. doi:10.1086/679271
18. Shifrer D. Stigma of a label: educational expectations for high school students labeled with learning disabilities. *J Health Social Behav*. 2013;54(4):462–480. doi:10.1177/0022146513503346
19. Cheng HL, Wang C, McDermott RC, Kridel M, Rislin JL. Self-stigma, mental health literacy, and attitudes toward seeking psychological help. *J Couns Dev*. 2018;96(1):64–74. doi:10.1002/jcad.12178
20. Rose AL, Atkey SK, Flett GL, Goldberg JO. Self-stigma and domains of well-being in high school youth: associations with self-efficacy, self-esteem, and self-criticism. *Psychol Schools*. 2019;56(8):1344–1354. doi:10.1002/pits.22276
21. Mosley TM, Rosenberg J. Stigma consciousness and perceived stereotype threat and their effects on academic performance. *Univ Alabama McNair J*. 2007;7:85–114.
22. Alonso J, Buron A, Bruffaerts R, et al. Association of perceived stigma and mood and anxiety disorders: results from the World Mental Health Surveys. *Acta Psychiatr Scand*. 2008;118(4):305–314. doi:10.1111/j.1600-0447.2008.01241.x
23. Yen C-F, Chen -C-C, Lee Y, Tang T-C, Yen J-Y, Ko C-H. Self-stigma and its correlates among outpatients with depressive disorders. *Psychiatric Serv*. 2005;56(5):599–601. doi:10.1176/appi.ps.56.5.599
24. Cao J. A "Low Quality" group: stigmatization and identity construction of vocational school students in China. 2024.
25. Corrigan PW, Larson JE, Ruesch N. Self-stigma and the "why try" effect: impact on life goals and evidence-based practices. *World Psychiatry*. 2009;8(2):75. doi:10.1002/j.2051-5545.2009.tb00218.x
26. Yang X, Mak WW. The differential moderating roles of self-compassion and mindfulness in self-stigma and well-being among people living with mental illness or HIV. *Mindfulness*. 2017;8:595–602. doi:10.1007/s12671-016-0635-4
27. Holubova M, Prasko J, Ociskova M, Marackova M, Grambal A, Slepecky M. Self-stigma and quality of life in patients with depressive disorder: a cross-sectional study. *Neuropsychiatr Dis Treat*. 2016;12:2677–2687. doi:10.2147/NDT.S118593
28. Isaac GM, Buchanan MJ. Extinguishing stigma among firefighters: an examination of stress, social support, and help-seeking attitudes. *Psychology*. 2021;12(3):349–373. doi:10.4236/psych.2021.123023
29. Ji H, J Y, W G. How and when does occupational stigma promote intent to leave? The mediation effect of family implicated stigma and the moderating effect of family involvement. *Acta Psychol Sin*. 2022;54(2):182. doi:10.3724/SP.J.1041.2022.00182
30. Vos R. Adolescents' attitudes toward vocational education. 1982.
31. Wang X, Leng J, Cong X, Fan Z. Development of junior high school students to secondary vocational students stigma scale. *Psychol Res Behav Manag*. 2022;15:2957–2970. doi:10.2147/PRBM.S381069
32. Dong J, Liu W, Zhou C, Sun Y, Chen G. The relationship between perceived discrimination and learning burnout of secondary vocational students: the mediating effect of professional identity and psychological capital. *J Spec Educ*. 2020;1(4):76–80.
33. Fung KM, Tsang HW, Corrigan PW, Lam CS, W-M C. Measuring self-stigma of mental illness in China and its implications for recovery. *Int J Social Psychiatry*. 2007;53(5):408–418. doi:10.1177/0020764007078342
34. Link BG, Phelan JC. Conceptualizing stigma. *Annu Rev Sociol*. 2001;27(1):363–385. doi:10.1146/annurev.soc.27.1.363
35. Link BG. On the history and growth of the stigma concept: a reflection on the positioning of social relationships in stigma research. *J Soc Issues*. 2023;79(1):528–535. doi:10.1111/josi.12582
36. Frost DM. Social stigma and its consequences for the socially stigmatized. *Soc Personal Psychol Compass*. 2011;5(11):824–839. doi:10.1111/j.1751-9004.2011.00394.x
37. Kantar A, İ Y. Masculine gender role stress and attitudes towards seeking psychological help: serial mediation by self-stigma and self-compassion. *Curr Psychol*. 2024;43(7):6114–6124. doi:10.1007/s12144-023-04702-1
38. Kantar A, İ Y. Masculinity and seeking psychological help: a review based on social identity theory. *Psikiyatride Güncel Yaklasimlar*. 2023;15(4):677–686. doi:10.18863/pgy.1227948
39. Mello ZR. Gender variation in developmental trajectories of educational and occupational expectations and attainment from adolescence to adulthood. *Dev Psychol*. 2008;44(4):1069. doi:10.1037/0012-1649.44.4.1069
40. 周向华, 邹子卫. 歧视知觉对中职生心理健康的影响:应对方式的中介作用. 衡阳师范学院学报. 2020;41(06):160–164.
41. Raubenheimer J. An item selection procedure to maximize scale reliability and validity. *SA J Ind Psychol*. 2004;30(4):59–64. doi:10.4102/sajip.v30i4.168
42. Wu M. *Questionnaire Statistical Analysis practice—SPSS Operation and Application*. Chongqing: Chongqing University Press; 2010:194–245.
43. Grieder S, Steiner MD. Algorithmic jingle jungle: a comparison of implementations of principal axis factoring and promax rotation in R and SPSS. *Behav Res Methods*. 2022;54(1):54–74. doi:10.3758/s13428-021-01581-x
44. Goretzko D, Pham TTH, Bühner M. Exploratory factor analysis: current use, methodological developments and recommendations for good practice. *Curr Psychol*. 2021;40:3510–3521. doi:10.1007/s12144-019-00300-2
45. 戚涵钰. 中职生专业认同, 学业投入和职业价值观的现状及其关系研究, 四川师范大学; 2020.
46. 侯静. 初中生学校适应量表的编制和信效度检验. 中国健康心理学杂志. 2016(3):413–420.
47. Pinel EC. Stigma consciousness: the psychological legacy of social stereotypes. *J Pers Soc Psychol*. 1999;76(1):114. doi:10.1037/0022-3514.76.1.114
48. Wu Q, Ji Y, Lin X, Yang H, Chi P. Gender congruence and mental health problems among Chinese transgender and gender non-conforming individuals: a process model involving rumination and stigma consciousness. *J Clin Psychol*. 2022;78(4):622–636. doi:10.1002/jclp.23248
49. Pommier E, Neff KD, Tóth-Király I. The development and validation of the compassion scale. *Assessment*. 2020;27(1):21–39. doi:10.1177/1073191119874108

50. Sathyanarayana S, Mohanasundaram T. Fit indices in structural equation modeling and confirmatory factor analysis: reporting guidelines. *Asian J Econ Bus Account*. 2024;24(7):561–577. doi:10.9734/ajeba/2024/v24i71430
51. Guo Q-K, Li F, Chen -X-X, Wang W-L, Meng Q-M. Performance of fit indices in different conditions and the selection of cut–off values. *Acta Psychol Sin*. 2008;40:109–118. doi:10.3724/SP.J.1041.2008.00109
52. Wu M. Questionnaire statistical analysis practice—SPSS operation and application. *Chongqing: Chongqing University Press*. 2010;5:160.
53. 郭庆科, 李芳, 陈雪霞, 王炜丽, 孟庆茂. 不同条件下拟合指数的表现及临界值的选择. 心理学报. 2008;40(1):109–118.
54. Vogel DL, Wade NG, Hackler AH. Perceived public stigma and the willingness to seek counseling: the mediating roles of self-stigma and attitudes toward counseling. *J Couns Psychol*. 2007;54(1):40–50. doi:10.1037/0022-0167.54.1.40
55. Shantz A, Booth JE. Service employees and self-verification: the roles of occupational stigma consciousness and core self-evaluations. *Hum Relat*. 2014;67(12):1439–1465. doi:10.1177/0018726713519280
56. LaVoi T, Kostreba A, Zimmerman S. The effects of self-stigma on occupational engagement for adults with mental illness. *Am J Occup Ther*. 2017;71(4_Supplement_1):7111505157p7111505151. doi:10.5014/ajot.2017.71S1-PO7081
57. Aruta JJBR, Antazo BG, Paceño JL. Self-stigma is associated with depression and anxiety in a collectivistic context: the adaptive cultural function of self-criticism. *J Psychol*. 2021;155(2):238–256. doi:10.1080/00223980.2021.1876620
58. Van Norman D. *Lived Experiences of Career & Technical Graduates Who Have Participated in Internships While in High School: A Phenomenological Study*. Delaware Valley University; 2023.
59. Shi X-L, Li L-Y, Fan Z-G. Psychiatrists' occupational stigma conceptualization, measurement, and intervention: a literature review. *World J Psychiatry*. 2023;13(6):298. doi:10.5498/wjp.v13.i6.298
60. Eichhorst W, Rodríguez-Planas N, Schmidl R, Zimmermann KF. *A Roadmap to Vocational Education and Training Systems Around the World*. IZA Discussion Papers; 2012.
61. Deissinger T. The German dual vocational education and training system as 'good practice'? *Local Economy*. 2015;30(5):557–567. doi:10.1177/0269094215589311
62. Yang L, Zhang S, Leng J, Fan Z, Luo Y. Development of the nurse occupational stigma scale. *Psychol Res Behav Manag*. 2022;15:1627–1636. doi:10.2147/PRBM.S362709
63. Zhao Y, Zhan J. Platform riders' occupational stigma consciousness and workplace deviant behavior: the mediating role of self-depletion. *Balt J Manag*. 2022;17(2):233–249. doi:10.1108/BJM-06-2021-0215
64. Taizhou. Secondary school graduates are more inclined to go on to higher education after the passage to higher education is opened up. 2021. Available from: http://tznews.taizhou.com.cn/news/NewsDetails?newsId=137201. Accessed July 20, 2021.