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Perceived Social Support and Career Adaptability Among Middle School Students: A Chain Mediation Model and Cross-Lagged Analysis

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Abstract

Objective: To examine how perceived social support, career decision-making self-efficacy and career exploration jointly shape career adaptability in adolescents.

Methods: A total of 1,166 secondary-school students in Beijing completed the Perceived Social Support Scale, Career Decision-Making Self-Efficacy Scale, Career Exploration Scale and Career Adapt-Abilities Scale.

Results: Study 1 specified a chain-mediation model showing that perceived social support not only predicted career adaptability directly, but also via four indirect routes: (a) an exclusive path through career decision-making self-efficacy, (b) an exclusive path through career exploration, (c) a sequential path “career decision-making self-efficacy → career exploration” and (d) a sequential path “career exploration → career decision-making self-efficacy”. Study 2 employed a cross-lagged panel design, which revealed significant reciprocal effects between career decision-making self-efficacy and career exploration over a three-month interval.

Conclusions: Perceived social support fosters secondary students’ career adaptability through bidirectional chains in which career decision-making self-efficacy and career exploration mutually reinforce each other.

Introduction

China’s new college-entrance reform has advanced subject choice and university application decisions to the secondary-school stage, turning the early teen years into a pivotal phase for career development. Career adaptability—the psychosocial resources that individuals use to manage occupational transitions[1]—predicts not only sound career decision-making but also psychological resilience, academic satisfaction and long-term well-being[2]. Yet Chinese adolescents rarely engage in systematic career exploration and report low decision-making confidence[3]: barely half can articulate how their interests and strengths relate to preferred majors or occupations[4], and subject selection is still dominated by family background rather than self-knowledge[5]. Clarifying the mechanisms that strengthen career adaptability is therefore a practical priority.

Social Cognitive Theory[6] and Ecological Systems Theory[7] converge on the premise that behaviour emerges from the dynamic interplay of environmental supports, cognitive beliefs and exploratory actions. Translating this premise to career development, Social Cognitive Career Theory contends that personal factors such as career decision-making self-efficacy and environmental factors such as perceived social support jointly shape career choices and behaviours[8]. Grounded in this framework, the present study models a chained process in which external support is converted into individual cognitive–behavioural responses that, in turn, generate career adaptability. Four core variables—

perceived social support, career decision-making self-efficacy, career exploration and career adaptability—are examined as successive links in this sequence.

Career adaptability denotes an individual's readiness to cope with occupational transitions and comprises four inter-related resources: concern, control, curiosity and confidence[1]. Previous studies have consistently shown that perceived social support is one of its most robust predictors[9–13], acting both directly—by fostering positive affect and reducing strain—and indirectly through gains in psychological resilience[14]. Career decision-making self-efficacy, the domain-specific belief that one can successfully complete the tasks required to make and implement career choices, has emerged as a key cognitive mediator[15,16]: it transmits the effects of decision-making styles[17], proactive personality[18], basic-need satisfaction[19] and work anxiety[20] to subsequent adaptability. Likewise, career exploration—the active search for occupational and self-information—correlates positively with adaptability because it supplies the knowledge and certainty needed to revise goals and adjust strategies[21], and it may also serve as an indirect pathway through which other factors promote adaptability[22].

Perceived social support captures the subjective sense that parents, teachers and peers are willing and able to provide emotional, informational and instrumental assistance[23]. When adolescents interpret these provisions as reliable, they experience greater autonomy and fewer decision-related worries, which in turn strengthens career decision-making self-efficacy[24–27]. Heightened self-efficacy then encourages exploratory behaviour, thereby indirectly linking social support to both exploration[28] and adaptability[29]. Several longitudinal studies further indicate that social support mediates the effect of solution-focused thinking and perceived control on the intensity of career exploration[30,31].

Career decision-making self-efficacy—confidence in one's ability to complete the tasks required to make and implement career choices[32]—reliably predicts how much students explore[33,34]. Adolescents who feel capable experience more positive and fewer negative emotions while gathering occupational information, set clearer learning goals and search more systematically[16]. It also mediates the links that both self-regulation[35] and self-directedness[36] have with exploration. Confident individuals actively collect information and formulate plans, whereas those who doubt their capabilities either avoid exploratory tasks or fear career-related failure[37,38].

Career exploration denotes the ongoing collection and processing of information about the self and the world of work[39]. Meta-analyses consistently link its depth and breadth to sound career decisions and later job satisfaction[21]. Among Chinese secondary-school students, however, exploration is habitually low: high-stakes academic schedules and strong parental preferences leave little room for occupational inquiry[28]. When students do engage in exploration—through job-shadowing, online searches or reflective exercises—they report higher self-esteem[40], stronger career decision-making self-efficacy and a clearer sense of purpose[41], all of which feed directly into enhanced career adaptability.

Although perceived social support, career decision-making self-efficacy and career exploration are well-established predictors of career adaptability[26], three gaps remain. First, the literature is dominated by university samples[19,21,42], leaving the experiences of secondary-school students under China's new college-entrance reform largely unexplored. These adolescents confront an expanded menu of subject combinations that overloads them with information[43], while divergent career beliefs across generations intensify family–student conflict[39]. Second, most evidence is cross-sectional[28], precluding insight into how the three predictors influence one another—and adaptability—over time. Third, Social Cognitive Career Theory posits that self-efficacy and exploration should reinforce each other[8], yet longitudinal tests are scarce. The "cognition → behaviour" account holds that confident students search more widely[34], whereas the "behaviour → cognition" account holds that successful exploratory experiences build confidence[16]; to date, neither pathway has been tracked prospectively.

To address these gaps, we conducted two linked studies. In Study 1 we specified a chain-mediation model that links perceived social support to career adaptability through two sequential cognitive-behavioural steps: career decision-making self-efficacy and career exploration. The model tests how environmental support is converted into students' practical readiness for career transitions. Study 2 then tracked the same students across three months with a cross-lagged panel design to determine whether career decision-making self-efficacy drives later exploration, career exploration feeds back into career decision-making self-efficacy, or both pathways operate equally among secondary-school adolescents.

Drawing on the foregoing theory, we expected career decision-making self-efficacy and career exploration to transmit the effect of perceived social support to career adaptability. Five hypotheses were tested:

H1: Perceived social support positively predicts secondary-school students' career adaptability.

H2: Career decision-making self-efficacy mediates the association between perceived social support and career adaptability.

H3: Career exploration mediates the association between perceived social support and career adaptability.

H4: Career decision-making self-efficacy and career exploration operate as a serial mediator linking perceived social support to career adaptability.

H5: T1 career decision-making self-efficacy prospectively predicts T2 career exploration across the three-month interval.

Research Methods

Participants

Participants were recruited through random convenience sampling from two secondary schools in Beijing. The final sample comprised 1,166 students distributed across Grade 7 (N = 287), Grade 8 (N = 249), Grade 10 (N = 311) and Grade 11 (N = 319). Among them, 574 identified as male (49.2%), 589 as female (50.6%) and three did not report gender (0.2%).

Research Instruments

Perceived Social Support Scale.

Perceived social support was measured using the scale revised by Jiang Qianjin[44]. The instrument consists of 12 items across three dimensions: peer support, parental support, and other sources of support. All items were rated on a five-point Likert scale, with higher scores indicating a greater level of perceived social support. In the present study, the scale demonstrated excellent internal consistency, with a Cronbach's α coefficient of 0.93.

Career Decision-Making Self-Efficacy Scale.

Career decision-making self-efficacy was measured using the scale revised by Zhou Bin[45], which includes 25 items across five dimensions: self-appraisal, information collection, goal selection, career planning, and problem solving. All items were rated on a five-point Likert scale, with higher scores reflecting stronger levels of career decision-making self-efficacy. The Cronbach's α for this scale in the present study was 0.96.

Career Exploration Scale.

Career exploration was measured using the scale revised by Zheng Jiuhua et al.[46], which includes 63 items rated on a five-point Likert scale. Higher scores indicate higher levels of career exploration. In this study, the scale demonstrated excellent internal consistency, with a Cronbach's α of 0.98.

Career Adapt-Abilities Scale.

Career adaptability was assessed using the Chinese version of the Career Adapt-Abilities Scale, revised by Hou Zhijin et al.[47] The scale contains 24 items across four dimensions—career concern, career control, career curiosity, and career confidence—rated on a five-point Likert scale. Higher scores indicate stronger career adaptability. In this study, the Cronbach's α coefficient was 0.95.

Research Procedures

This study examined how perceived social support, career decision-making self-efficacy and career exploration jointly predict career adaptability among secondary-school students. All procedures were performed in accordance with ethical principles of the Declaration of Helsinki for human participants. This study received ethical approval from the Ethics Committee of the Department of Psychology at

Beijing Union University(Approval Number: 114172023003). Participants were recruited from Grades 7, 8, 10 and 11 in two Beijing schools. Written informed consent was obtained from both the students and their parents, emphasizing the voluntary nature of participation, the confidentiality of all responses, and the right to withdraw at any time without consequence. Questionnaires were administered during regular school hours in classroom settings with the assistance of teachers, who were instructed to emphasize the anonymity and academic purpose of the survey. The same ethical procedures and consent protocols were followed for the follow-up data collection conducted three months later.

Data Analysis

All analyses were conducted with SPSS 23.0. Means, standard deviations and correlations were computed for the four focal variables. Chain-mediation effects were estimated with the PROCESS 3.5 macro (Model 6, 5,000 bias-corrected bootstrap samples). Reciprocal prospective influences between career decision-making self-efficacy and career exploration were examined with a cross-lagged panel model fitted in AMOS 24.0.

Results

Common Method Bias Test

To examine potential common method bias, Harman's single-factor test was conducted. The results showed that 17 factors had eigenvalues greater than 1, and the first factor accounted for 33.90% of the total variance, which is below the critical threshold of 40%. Therefore, no serious common method bias was detected in this study.

Correlation Analysis

Table 1
presents the means, standard deviations, and Pearson correlation coefficients between the main variables of this study (N = 1,166).

	M* ± *SD	**1**	**2**	**3**	**4**
1. Perceived Social Support	46.20 ± 10.24	1			
2. Career Exploration	211.00 ± 47.26	0.302**	1		
3.Career Decision-Making Self-Efficacy	91.39 ± 19.54	0.392**	0.73**	1	
4. Career Adaptability	94.48 ± 17.03	0.519**	0.623**	0.683**	1
Note: *p < 0.05, **p < 0.01					

The correlation analysis indicated that perceived social support, career decision-making self-efficacy, career exploration, and career adaptability were all significantly and positively correlated among middle school students (*ps* < 0.01).

Multiple Regression Analysis of Perceived Social Support, Career Decision-Making Self-Efficacy, Career Exploration, and Career Adaptability among Secondary School Students

Based on the analytical approach[48], multiple regression models were constructed to examine the relationships among the study variables. Prior to analysis, all variables were standardized to reduce multicollinearity and to facilitate comparison of regression coefficients across models. Perceived social support (PSS) was entered as the independent variable, career adaptability (CA) as the dependent variable, and career decision-making self-efficacy (CDMSE) and career exploration (CE) as mediating variables. Using SPSS 23.0 and the PROCESS 3.5 macro, we tested a chain mediation model while controlling for gender, grade level, and only-child status. The detailed results are presented in Table 2. In the first step, CA was regressed on the control variables (gender, grade, only-child status) to eliminate their potential influence on career adaptability. In the second step, PSS was included in the model to estimate its total effect on CA. The results showed that PSS significantly and positively predicted CA (β = 0.515, p < 0.001), supporting Hypothesis H1. In the third step, CDMSE and CE were added to the model to examine their mediating and chain-mediating roles between PSS and CA. The findings revealed that: PSS significantly and positively predicted CA (β = 0.294, p < 0.001); CE significantly and positively predicted CA (β = 0.256, p < 0.001); CDMSE significantly and positively predicted CA (β = 0.377, p < 0.001). Moreover, PSS had significant positive effects on CE (β = 0.294, p < 0.001) and CDMSE (β = 0.386, p < 0.001). In turn, CDMSE strongly predicted CE (β = 0.723, p < 0.001), and vice versa (β = 0.676, p < 0.001), indicating a mutual reinforcement mechanism between the two constructs.

Table 2
Multiple Regression Analysis of Perceived Social Support, Career Decision-Making Self-Efficacy, Career Exploration, and Career Adaptability ($N = 1, 116$)

	Career exploration	Career decision-making self-efficacy	Career exploration	Career decision-making self-efficacy	Career Adaptability
Gender	-0.047	-0.048	-0.012	-0.016	-0.055**
Grade	0.049	0.023	0.033	-0.010	-0.030
Only child	-0.072*	-0.058*	-0.029	-0.010	-0.002
Perceived social support	0.294***	0.386***	0.015	0.187***	0.294***
Career exploration				0.676***	0.256***
Career decision-making self-efficacy			0.723***		0.377***
R	0.319	0.401	0.735	0.755	0.758
R^2	0.102	0.161	0.541	0.571	0.575
F	32.960***	55.543***	273.113***	308.405***	261.469***

Note: *$p < 0.05$,**$p < 0.01$,***$p < 0.001$

The Sequential Mediating Role of Career Decision-Making Self-Efficacy and Career Exploration between Perceived Social Support and Career Adaptability

Using PROCESS 3.5 (Model 6) in SPSS 23.0, a chain mediation model was constructed to examine the sequential mediating roles of career decision-making self-efficacy and career exploration in the relationship between perceived social support and career adaptability. Gender, grade, and only-child status were controlled as covariates. The bootstrapping method with 5,000 resamples was employed to estimate the 95% confidence intervals (CI) of the indirect effects. The results are shown in Table 3. The total effect of perceived social support on career adaptability was 0.519, with a 95% CI of [0.470, 0.569], which did not include zero, indicating that the total effect was statistically significant. The direct effect of perceived social support on career adaptability was 0.293 (95% CI [0.252, 0.334]), which also did not include zero, suggesting that PSS directly and positively predicted CA. This direct effect accounted for 56.45% of the total effect.

Model analysis indicated that perceived social support effectively predicted career adaptability, with career decision-making self-efficacy and career exploration serving as mediators through three indirect

pathways. The first path, in which PSS influenced CA through CDMSE, accounted for 28.71% of the total effect ($\beta = 0.149$, $SE = 0.023$, 95% CI [0.108, 0.198]). This result suggests a significant independent mediating effect of career decision-making self-efficacy between perceived social support and career adaptability, supporting Hypothesis H2. The second path, where PSS affected CA through CE, accounted for 0.77% of the total effect ($\beta = 0.004$, $SE = 0.007$, 95% CI [− 0.008, 0.018]). Because the confidence interval included zero, the mediating effect of career exploration alone was not significant, and Hypothesis H3 was not supported. The third path, involving the sequential mediation of CDMSE and CE between PSS and CA, accounted for 14.07% of the total effect ($\beta = 0.073$, $SE = 0.012$, 95% CI [0.050, 0.098]). This finding indicates a significant chain mediation effect, showing that perceived social support enhances career adaptability by first strengthening career decision-making self-efficacy and then promoting exploration behaviors. These results supported Hypothesis H4. The final chain mediation model is presented in Fig. 1.

Table 3
Bootstrap Test of the Chain Mediation Effects (PSS → CDMSE → CE → CA) (N = 1,166)

95%CI			**95%confidence interval**		
Mediated pathways	Efficiency value	*Boot SE*	*Boot LLCI*	*Boot ULCI*	Ratio of total effect (%)
Total Effect	0.519***	0.025	0.470	0.569	100%
Direct Effect	0.293***	0.021	0.252	0.334	56.45%
PSS→CDMSE→CA	0.149***	0.023	0.108	0.198	28.71%
PSS→CE→CA	0.004	0.007	-0.008	0.018	0.77%
PSS→CDMSE→CE→CA	0.073***	0.012	0.050	0.098	14.07%

Note: Chain mediation model of perceived social support (PSS), career decision-making self-efficacy (CDMSE), career exploration (CE), and career adaptability (CA); $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

The Sequential Mediating Role of Career Exploration and Career Decision-Making Self-Efficacy between Perceived Social Support and Career Adaptability

An alternative chain mediation model was constructed to test the sequential pathway “Perceived Social Support → Career Exploration → Career Decision-Making Self-Efficacy → Career Adaptability.” The bootstrapping method with 5,000 resamples was again employed to estimate the 95% confidence intervals (CI) of the indirect effects. The results are presented in Table 4. The total and direct effects were consistent with the previous model, indicating that regardless of the sequential order of the mediating variables, perceived social support continued to exert a stable and significant positive predictive effect on career adaptability.

Regarding the indirect effects, all three mediating pathways in this model were statistically significant, as their 95% confidence intervals did not include zero. The first pathway, where PSS influenced CA via CE, accounted for 14.84% of the total effect ($\beta = 0.077$, $SE = 0.015$, 95% CI [0.051, 0.108]). This indicates that, within this model framework, career exploration independently mediated the relationship between perceived social support and career adaptability, providing additional support for Hypothesis H3. The second pathway, in which PSS affected CA through CDMSE, accounted for 13.68% of the total effect ($\beta = 0.071$, $SE = 0.014$, 95% CI [0.047, 0.101]). This confirms the significant independent mediating role of career decision-making self-efficacy, further supporting Hypothesis H2. The third pathway, which involved the sequential mediation of CE and then CDMSE between PSS and CA, accounted for 15.03% of the total effect ($\beta = 0.078$, $SE = 0.013$, 95% CI [0.055, 0.105]). This finding demonstrates a significant chain mediation effect, suggesting that perceived social support enhances career adaptability by first fostering exploration behaviors and subsequently strengthening career decision-making self-efficacy. These results supported Hypothesis H4. The alternative chain mediation model is illustrated in Fig. 2.

Table 4
Bootstrap Test of the Chain Mediation Effects (PSS → CE → CDMSE → CA) (N = 1,166)

95%CI			**95% confidence interval**		
Mediated pathways	Efficiency value	*Boot SE*	*Boot LLCI*	*Boot ULCI*	Ratio of total effect (%)
Total Effect	0.519^{***}	0.025	0.470	0.569	100%
Direct Effect	0.293^{***}	0.021	0.252	0.334	56.45%
PSS→CE→CA	0.077^{***}	0.015	0.051	0.108	14.84%
PSS→CDMSE→CA	0.071^{***}	0.014	0.047	0.101	13.68%
PSS→CDMSE→CE→CA	0.078^{***}	0.013	0.055	0.105	15.03%

Note: Chain mediation model of perceived social support (PSS), career decision-making self-efficacy (CDMSE), career exploration (CE), and career adaptability (CA); $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Cross-Lagged Model of Career Decision-Making Self-Efficacy and Career Exploration

To test Hypothesis H5, this study focused on students in grades 10 and 11, as key career-related activities such as subject selection and college application are more practically relevant and feasible at this stage. A subsample of 320 students was therefore selected to examine the predictive relationship between career decision-making self-efficacy and career exploration using a cross-lagged panel model. Data collection occurred in March 2024, with a three-month interval between the two measurement waves. A total of 320 questionnaires were distributed, and 283 valid responses were obtained, resulting

in an effective response rate of 88.4%. The results revealed that T1 career decision-making self-efficacy significantly and positively predicted T2 career exploration ($\beta = 0.160$, $p < 0.05$). In addition, T1 career exploration also significantly and positively predicted T2 career decision-making self-efficacy ($\beta = 0.150$, $p < 0.05$). These findings indicate a reciprocal and mutually reinforcing relationship between CDMSE and CE, thereby supporting Hypothesis H5. The cross-lagged panel model is presented in Fig. 3.

Discussion

A questionnaire survey of Beijing secondary-school students was used to test two serial-mediation pathways—(1) perceived social support → career decision-making self-efficacy → career exploration → career adaptability, and (2) perceived social support → career exploration → career decision-making self-efficacy → career adaptability—and to examine the reciprocal longitudinal links between career decision-making self-efficacy and career exploration over three months.

The Influence of Perceived Social Support on Career Adaptability

Perceived social support (PSS) emerged as a robust positive predictor of career adaptability (CA) among secondary-school students, a result that holds across groups[49] and cultures[50,51]. Consistent with Social Cognitive Career Theory, PSS functions as an environmental scaffold that raises career decision-making self-efficacy and favourable outcome expectations, thereby energising adolescents' career-related effort and persistence. Students who feel supported by parents, peers and teachers gain privileged access to timely information and concrete resources, which helps them crystallise occupational goals and revise plans when necessary[28]. PSS also strengthens self-concept and emotional regulation, boosting confidence in career decision-making[52] while cultivating a proactive personality[53] and positive core self-evaluations[54]. Thus, social support exerts both a direct facilitative effect on adaptability and an indirect effect through the positive psychological resources—career decision-making self-efficacy and exploratory behaviour—that it helps to build.

Mediating Role of Career Decision-Making Self-Efficacy in Perceived Social Support and Career Adaptability

Career decision-making self-efficacy (CDMSE) operated as the pivotal mediator linking perceived social support (PSS) to career adaptability (CA). It carried 28.71% of the total effect along the PSS → CDMSE → CA route and an additional 13.68% through the PSS → career exploration → CDMSE → CA chain, jointly accounting for more than 40% of the explained variance. This central role is fully consistent with Social Cognitive Career Theory and corroborates previous longitudinal and cross-sectional findings.

From a theoretical standpoint, SCCT maintains that environmental supports such as perceived social support must be filtered through cognitive–personal factors—career decision-making self-efficacy chief among them—to produce adaptive outcomes[8]. Career decision-making self-efficacy, the domain-specific

conviction that one can complete the tasks required to make and implement career choices[32], serves as the crucial bridge. When adolescents interpret parental career information or teachers' course-selection guidance as reliable assistance, they construct the belief "I can make sound decisions." This cognition lowers anxiety over subject choices under the new college-entrance curriculum and, in turn, raises career adaptability[15,16].

In the Chinese context, the size of this indirect effect is magnified by the "New Gaokao" system, which compresses decisions on subjects, university majors and future occupations into Grades 10–11. Inter-generational disagreements over occupational prestige and the sheer volume of elective information raise the subjective cost of any choice, making confidence the critical filter[38,43]. Perceived social support operates through two complementary channels: (1) emotional encouragement from parents or peers that lowers decision anxiety and consolidates identity, and (2) instrumental aids—career-assessment software, teacher-led counselling, alumni contacts—that supply concrete decision rules and feed mastery experiences[13]. Salim et al. (2024) report the identical pattern cross-culturally: when choices are complex and premature, the pathway from support to adaptability runs almost entirely through self-efficacy[50].

The Mediating Role of Career Exploration between Perceived Social Support and Career Adaptability

The results reveal a path-dependent contingency: career exploration transmits the effect of perceived social support to career adaptability only when it precedes, rather than follows, career decision-making self-efficacy. In the PSS → CDMSE → CE → CA chain the unique indirect effect of career exploration was essentially zero (effect = 0.004, 95% CI straddled zero), whereas in the PSS → CE → CDMSE → CA chain the same behaviour carried a clear 7.7% of the total effect (14.84%). Thus, career exploration by itself does not convert support into adaptability; it becomes influential only after students have first gathered occupational information and subsequently translated those experiences into stronger decision-making confidence.

In the PSS → CDMSE → CE → CA sequence, career exploration is a downstream behaviour that follows the cognitive gain. Perceived social support has already been converted into heightened career decision-making self-efficacy; career exploration is then triggered by that confidence rather than by the original support[55]. Because the "support → efficacy" link has already done the mediating work, career exploration functions chiefly as a confirmatory act and its unique indirect effect becomes negligible. In contrast, the PSS → CE → CDMSE → CA route positions career exploration upstream. Here, support first supplies the concrete means to explore (e.g., parents pay for a career-assessment camp, teachers arrange job-shadowing), allowing students to gather occupational information even when initial decision confidence is low. The knowledge and mastery experiences accrued during career exploration feed directly back into the belief "I can make sound career decisions," and only then is support translated into adaptability. Career exploration is therefore indispensable when it precedes, rather than follows, the cognitive component.

Two contextual realities of Chinese secondary education explain why the sequence matters. First, high-stakes academic pressure compresses career activities into brief, optional slots; without a subsequent cognitive wrap-up, career exploration is reduced to a token visit or worksheet that never feeds into career decision-making self-efficacy[56]. Second, many schools front-load "career experience days" but neglect the guided reflection that would convert new information into mastery appraisals, so the CDMSE → CE link remains weak. The prominence of the PSS → CE → CDMSE pathway shows that effective programmes must (a) use social support to lower the uncertainty that deters initial exploration, and then (b) structure reflective feedback so that exploratory experiences are explicitly processed into decision-making confidence. A "practice-first, cognition-follow" sequence fits the developmental readiness of adolescents who need concrete experience before they can sustain robust career beliefs.

This finding clarifies an ambiguity in earlier work. Previous studies typically treat career exploration as an undifferentiated mediator between social support and adaptability[57]. We show that its capacity to transmit support depends entirely on where it sits in the chain. When career exploration precedes—and is processed into—career decision-making self-efficacy, it carries a clear indirect effect; when it follows an already-established sense of efficacy, it becomes a confirmatory appendage and adds nothing. For school-based interventions this implies that every exploratory activity must be paired with a deliberate feedback loop (guided reflection, mastery debrief, or self-evaluation) that converts new information into the conviction "I can decide." Career exploration alone is inert; it becomes influential only when it feeds forward into strengthened career decision-making self-efficacy.

The Chain Mediating Roles of Career Decision-Making Self-Efficacy and Career Exploration between Perceived Social Support and Career Adaptability

By simultaneously testing two serial-mediation routes—(1) Perceived Social Support → Career Decision-Making Self-Efficacy → Career Exploration → Career Adaptability, and (2) Perceived Social Support → Career Exploration → Career Decision-Making Self-Efficacy → Career Adaptability—the study extends Zhang et al.'s single-mediator model[14] and uncovers a bidirectional interplay between cognitive beliefs and exploratory behaviour, offering a more comprehensive account of how career adaptability takes shape in secondary-school students.

In the first pathway (PSS → CDMSE → CE → CA), perceived social support bolsters students' confidence in career decision-making by providing both emotional affirmation (e.g., parental encouragement) and instrumental resources (e.g., teacher-supplied assessment tools). This accords with Salim et al.[50], who found that support influences adaptability by strengthening core self-evaluations, of which career decision-making self-efficacy is the pivotal mediator connecting environmental input to individual action. The efficacy beliefs cultivated through support constitute a positive cognitive appraisal of one's decision-making capability, laying the psychological groundwork for subsequent career exploration. Consistent with Bandura's social cognitive theory[6], heightened career decision-making self-efficacy generates stronger action intentions, motivating students to engage proactively in career exploration when confronted with complex choices such as subject selection under China's new Gaokao system, thereby

raising career adaptability. Kang et al.[36] likewise reported that CDMSE mediates the effect of support on career exploration, and later studies confirmed the CDMSE → CE link[58], showing that adolescents with stronger efficacy are more likely to translate internal confidence into exploratory behaviours[33,59] that enhance adaptability through experiential learning.

In the second pathway (PSS → CE → CDMSE → CA), perceived social support supplies the initial impetus and resources for career exploration—such as family-funded career camps or teacher-arranged job-shadowing—allowing students to sample the world of work before they feel fully confident. Positive feedback from these experiences (e.g., discovering an aptitude–occupation fit) is internalised as mastery evidence, boosting career decision-making self-efficacy. The strengthened efficacy beliefs then stabilise career choices and reduce uncertainty-related anxiety, ultimately lifting career adaptability[60]. Taken together, the two routes underscore a dynamic, bidirectional interplay between cognition and behaviour: social support can cultivate adaptability through either a cognition-driven or a behaviour-driven sequence, depending on which component is activated first.

The Reciprocal Relationship between Career Decision-Making Self-Efficacy and Career Exploration

Cross-lagged analyses revealed a reciprocal, mutually reinforcing loop between career decision-making self-efficacy (CDMSE) and career exploration (CE), underscoring a “learning-by-doing” pathway in secondary-school students’ career development: engaging in exploratory activities prospectively strengthened self-efficacy beliefs[60]. This reverse effect challenges and extends the prevailing unidirectional view that CDMCE drives CE[33,59,61]. Two factors may explain the divergence. First, prior research typically sampled undergraduates, whereas the present study focused on younger adolescents whose efficacy beliefs remain malleable. Second, the constructs are conceptually intertwined: CDMSE includes an “information collection” component, and CE explicitly entails evaluating the usefulness of gathered information—processes central to the self-assessment, information-seeking, and problem-solving mechanisms that link self-beliefs to career engagement[62]. By actively exploring, students acquire concrete career knowledge, reduce environmental uncertainty, and accumulate mastery experiences that feed directly back into heightened confidence across information-gathering, planning, and problem-solving domains, thereby elevating overall CDMSE.

Research Limitations and Future Directions

First, the sample was restricted to Beijing secondary schools and skewed toward urban residents; townships and rural areas were not represented. Grades 9 and 12 were also omitted, so the data do not cover the full span of secondary-school career development. Future studies should recruit cross-regional, urban–rural, and complete grade-level samples to improve external validity. Second, reliance on self-report questionnaires limits depth. Complementing surveys with interviews or focus groups would clarify how students interpret support, process career exploration experiences, and construct career decisions over time.

Conclusion

This research delineates the complex mechanisms linking perceived social support to career adaptability in Chinese adolescents. We identified two equally viable chain mediation pathways, highlighting a dynamic interplay rather than a rigid sequence between career decision-making self-efficacy and career exploration. Crucially, the longitudinal evidence confirms their reciprocal reinforcement over time. These findings advance our theoretical understanding of career development within the SCCT framework and offer actionable insights for educational practice. Schools can enhance students' career adaptability by building robust support systems and designing interventions that simultaneously target cognitive beliefs and provide structured exploratory experiences with reflective components.

Declarations

Competing interests

The authors declare no competing interests.

Ethics approval

All procedures performed in studies involving human participants were approved by the Ethics Committee of the Psychology Department at Beijing Union University (Approval Number: 114172023003). Written informed consent was obtained from both the students and their parents, emphasizing the voluntary nature of participation, the confidentiality of all responses, and the right to withdraw at any time without consequence.

Consent to participate

Informed consent was taken from each participant before data collection.

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Author Contribution

Y.K.: conceptualization, methodology, formal analysis, writing – original draft. S.X.L.: conceptualization, methodology, investigation, writing – original draft. Y.K. and S.X.L. share first authorship. C.F.C.:

investigation. J.H.W.: investigation. Y.L.C.: formal analysis. J.H.Y.: writing – review & editing. M.Q.T.: writing – review & editing, supervision. All authors approved the final version of the manuscript for submission.

Data Availability

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation. If anyone would like to request data from this study, please contact the corresponding author.

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Figures

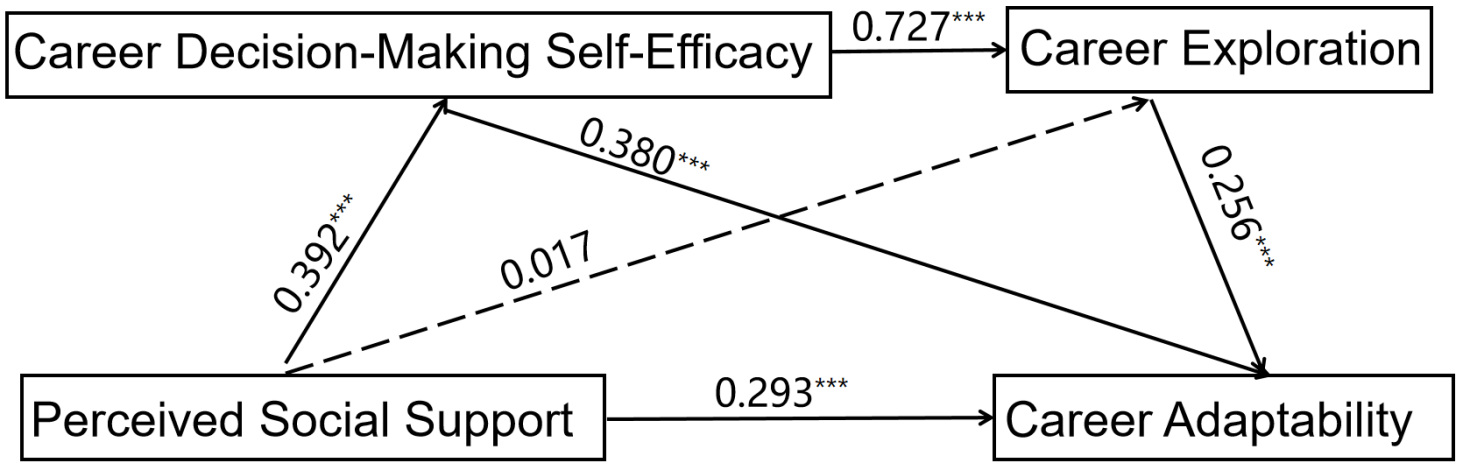


Figure 1

Path diagram of the chain mediation model: PSS → CDMSE → CE → CA

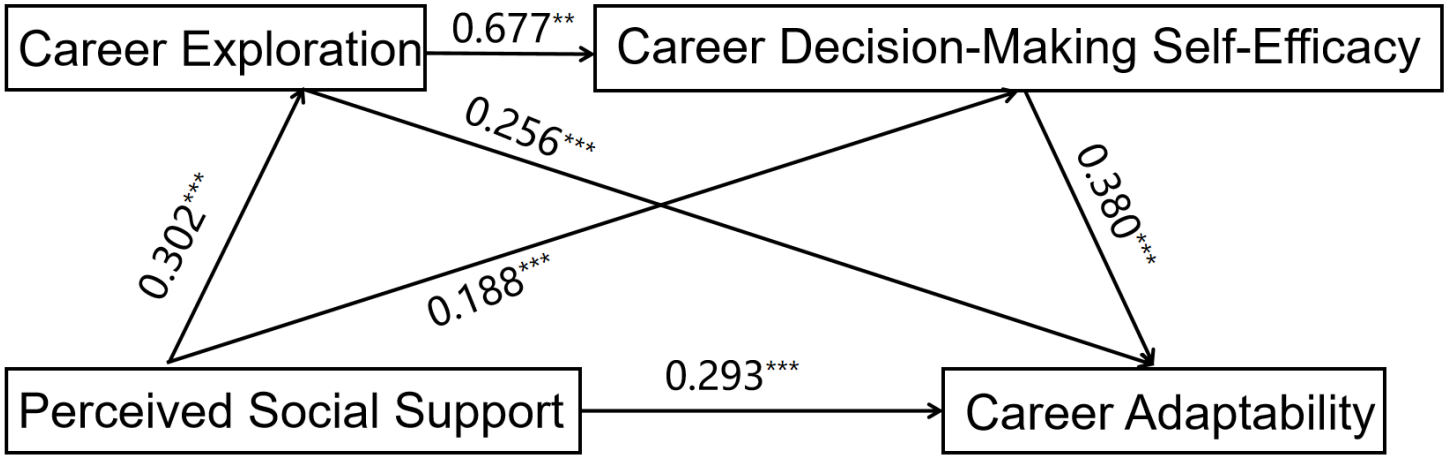


Figure 2

Path diagram of Perceived Social Support→Career Exploration→Career Decision-Making Self-Efficacy→Career Adaptability

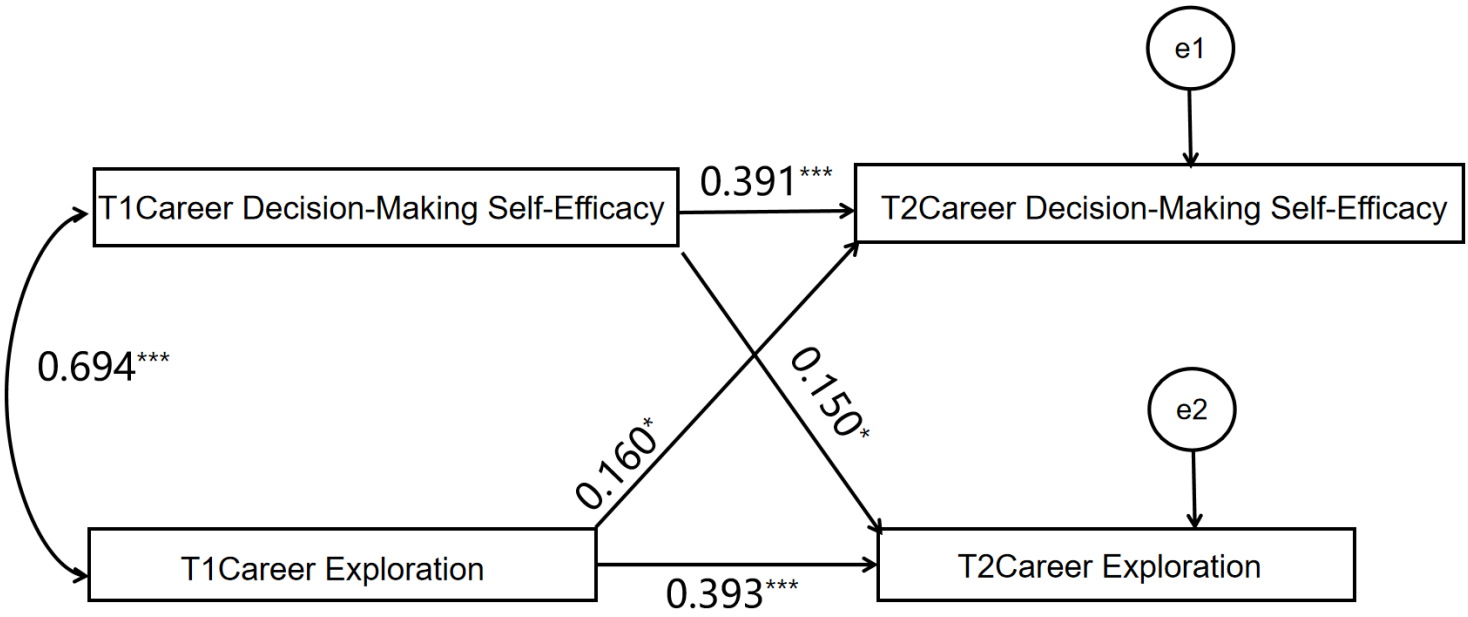


Figure 3

Cross-lagged model of career decision-making self-efficacy and career exploration