

Positive Development Patterns in Left-Behind Adolescents: Do Resilience and Making Sense of Adversity Have Beneficial Effects?

Xin Chen¹, Ru Chen², Lulu Zhang³, Yanhua Li²

¹Institute of Psychology & Behavior, Henan University, Kaifeng, People's Republic of China; ²School of Education, Shanghai Normal University, Shanghai, People's Republic of China; ³College of Education Science, Henan Institute of Science and Technology, Xinxiang, People's Republic of China

Correspondence: Ru Chen, School of Education, Shanghai Normal University, Shanghai, People's Republic of China, Email 15836049230@163.com

Purpose: Despite increased attention to the positive development of left-behind adolescents, research findings remain inconclusive. Utilizing latent profile analysis, we identified various positive development profiles among the left-behind adolescents and explored the association between resilience and positive development profiles, alongside the mediating role of making sense of adversity.

Methods: A multi-stage cluster sampling procedure was employed, randomly selecting four provinces—Zhejiang, Guangdong, Henan, and Jiangxi—from the central and coastal regions. The sample comprised 718 left-behind adolescents recruited from primary and junior high schools across grades 4, 5, 7, and 8. Three scales were utilized, and analyses included latent profile analysis and mediation analysis.

Results: Three latent subgroups of positive development among left-behind adolescents were identified: low, moderate, and high. Those with higher resilience and positive perceptions of adversity tended to belong to the high group rather than the low ($\beta = -0.45, p < 0.001$; $\beta = -0.09, p < 0.001$) or moderate group ($\beta = -0.23, p < 0.001$; $\beta = -0.04, p < 0.05$). Left-behind adolescents with higher negative perceptions of adversity tended to belong to the high group rather than the moderate group ($\beta = -0.07, p < 0.01$). Mediation analysis revealed that resilience facilitated the development of positive appraisals of adversity, subsequently increasing the likelihood of being categorized into the high (95% *CI* of -0.09 to -0.03) or moderate group (95% *CI* of -0.05 to -0.01) rather than the low group.

Conclusion: These findings hold significant implications for intervention formulation. Educators should focus on strengthening resilience and fostering positive perceptions of adversity among the low group. For the moderate group, maintaining moderate negative perceptions of adversity may stimulate the intrinsic potential for positive development more effectively.

Keywords: left-behind adolescent, resilience, making sense of adversity, positive development, latent profile analysis

Introduction

Amidst rapid urbanization and economic growth in China, a substantial number of rural laborers have migrated to cities seeking higher incomes and improved living conditions. Due to the barriers imposed by the *hukou* registration system and economic constraints, many of these rural migrants find themselves compelled to leave their children behind in their rural hometowns; they are referred to as “left-behind children”.¹ By 2020, the number of left-behind children in China had reached 6.436 million.² Previous studies have posited that left-behind children face numerous risks, including poor living environments, family dysfunction, and scarcity of educational resources, making them more susceptible to academic, emotional, cognitive, and behavioral problems.^{3–5} Conversely, the positive youth development perspective stresses the plasticity of growing adolescents, contending that young people possess inherent strengths and significant potential despite adverse circumstances.⁶ Promoting the positive development of left-behind children is crucial not only for their personal advancement and social mobility but also for breaking the cycle of inter-generational rural poverty.

Positive youth development is recognized as the pursuit of full, healthy, and successful growth, characterized by a complex and multifaceted structure.⁶ Scholars have proposed a theoretical framework of positive development relevant

to Chinese adolescents, comprising character, competence, confidence, and connection factors.⁷⁻⁹ Competence, for instance, is defined as an individual's perception of their potential for action in a specific domain (eg, academic, social, and life). Character refers to the characteristics of skills, behavioral tendencies, and strengths that need to be continually developed to make the self more capable and better at life. Confidence pertains to an individual's assessment and perception of their own intrinsic value. Connection refers to positive relationships with others and building personal ecologies at school, within the family, and throughout the community.

Using a variable-centered approach, previous researchers have tended to investigate aspects of positive development among left-behind adolescents in isolation, yielding mixed results. Some studies, adopting a deficit perspective, have highlighted the risks and challenges faced by these adolescents that contribute to their poor well-being.¹⁰ An unfavorable environment is more likely to hinder their positive development.¹¹⁻¹³ For instance, parental migration leads to prolonged separation, which imposes significant psychological burdens on children, jeopardizes parent-child relationships, and hinders social and emotional competence.^{11,14} Concurrently, left-behind adolescents often exhibit subpar academic performance,¹⁵ and lower self-esteem.¹⁶ Conversely, studies emphasizing a strengths perspective have highlighted the strengths and inner resources of these adolescents.¹⁷ They are able to achieve high levels of positive development even amidst adversity.^{18,19} Left-behind adolescents have exhibited good academic performance compared to their average rural counterparts.²⁰ One study reported that left-behind adolescents have high levels of cooperation and communication skills, exhibiting clear self-awareness and goals.¹⁹ Notably, they are actively involved in family and school activities, building strong peer relationships. Thus, these inconclusive findings indicate a simplification of left-behind adolescents' developmental patterns in previous variable-centered studies, dichotomizing them as either "vulnerable" or "strong", neglecting the diverse pathways of adolescent development.^{21,22} Moreover, the positive youth development theory's specificity principle suggests group heterogeneity in positive youth development is inevitable due to individual-context interactions.²³ Thus, adopting a person-centered approach, this study combines deficit and strengths perspectives to explore distinct patterns of positive development among left-behind adolescents. This provides a more comprehensive picture of adolescents' positive development.

Why do some adolescents thrive in adversity while others do not? According to the stress-coping theory,²⁴ personal resources may play a pivotal role in helping left-behind children cope with stress and adversity. Resilience, a crucial personal resource characterized by the ability to navigate, overcome, and recover from adversity,^{25,26} has been identified as a key factor in enhancing the self-esteem and subjective well-being of left-behind children.^{27,28} Resilience also mitigates the adverse effects of parental migration on the mental health of left-behind children, influencing life satisfaction, positive affect, and self-acceptance.²⁹ Resilient left-behind adolescents tend to actively engage in school activities, achieve academic success, and demonstrate strong social adaptability.^{30,31} Although previous studies have highlighted the role of resilience as a buffer against risk, promoting positive development in the face of adversity,^{27,28,30} a gap remains in understanding the links between resilience and different subgroups of positive development.

Furthermore, the stress-coping theory²⁴ posits that coping strategies serve as a bridge between personal resources and adaptive outcomes in stressful situations. Individuals with more resources (eg, resilience) are more likely to use coping strategies (eg, making sense of adversity) to effectively protect themselves from threats. This, in turn, may contribute significantly to positive development outcomes. Coping strategies encompass emotion-focused, problem-focused, and meaning-focused coping. Making sense of adversity represents a meaning-focused coping strategy through which individuals attempt to discern the significance of adversity through cognitive appraisal or reframing, which can include both positive and negative appraisals of adverse circumstances (ie, making positive sense and making negative sense of adversity).³²

Most studies on the coping strategies of left-behind adolescents have concentrated on problem-focused and emotion-focused coping.^{33,34} However, the chronic and unalterable nature of adversity experienced by these adolescents points to the potential importance of constructing meaning in, and attributing deeper value to, adversity through the use of meaning-focused coping strategies. Particularly within the context of Chinese culture, where difficulties present both dangers and opportunities.^{32,35} How to construct the meaning of adversity is of great value to left-behind adolescents in coping with adversity.

Previous research lends empirical support to the mediating role of making sense of adversity between resilience and positive development. Resilient individuals, characterized by traits such as optimism, hardiness, and self-efficacy, tend to

adopt positive perspectives and strong beliefs which enable them to employ effective coping methods to overcome challenges.^{36,37} These attributes facilitate the construction of positive meaning associated with adversity. Individuals with high levels of resilience are more inclined to seek meaning in life,³⁸ experience positive meaning and personal growth from challenging experiences,³⁹ and interpret adversity positively. Conversely, low levels of resilience are associated with negative evaluations of adversity.⁴⁰ In addition, the interpretation of adversity is linked to development outcomes. Finding positive meaning in adversity has been linked to increased self-efficacy, higher life satisfaction, and more positive emotions.^{32,35} Notably, a positive appraisal of adversity also contributes to positive social relations and self-acceptance.⁴¹ Conversely, individuals who negatively interpret adversity in the context of HIV diagnoses, reported experiencing depression and PTSD.⁴⁰

Using a person-centered approach, we explore subgroup patterns of positive development among left-behind adolescents. Besides, we investigate the indirect influence of resilience on subgroup membership through the mediation of making sense of adversity. Our research aims to provide a comprehensive portrayal of positive development patterns among left-behind adolescents, extending beyond previous variable-oriented research. Furthermore, from a meaning-construction perspective, we delve into the mediating mechanisms through which resilience influences positive developmental subgroup membership, bridging gaps in the existing literature. We establish three main hypotheses as a framework for this research.

Hypothesis 1 (H1): There may be several distinct positive development patterns among left-behind adolescents that can be identified by latent profile analysis.

Hypothesis 2 (H2): Resilience and making sense of adversity are linked to latent positive development subgroups. Left-behind adolescents with higher resilience and making positive sense of adversity (or lower levels of making negative sense of adversity) are more inclined to fall into high positive development group compared to other potentially low positive development groups.

Hypothesis 3 (H3): Making sense of adversity might play a mediating role between resilience and latent positive development subgroup membership. More resilient left-behind adolescents may have more making positive sense of adversity (or less making negative sense of adversity) and thus be more inclined to fall into the high positive development group.

Methods

Participants and Procedures

A multi-stage cluster sampling procedure was conducted to examine left-behind adolescents in China, focusing on regions with high population migration rates. Four provinces, namely Zhejiang, Guangdong, Henan, and Jiangxi, were randomly selected from central and coastal regions.⁴² Representative districts were randomly selected from each province in stage 1. In stage 2, primary and junior high schools were randomly selected from each selected district. Subsequently, in stage 3, classes were randomly selected from grades 4 and 5 in primary schools and grades 7 and 8 in junior high schools. All students in the selected classes were invited to participate in this study voluntarily. Sampling students from these grades was chosen for two reasons: First, students below fourth grade may not have the necessary literary skills to complete survey questionnaires.⁴³ Second, sixth, and ninth graders were excluded due to entrance exam preparations, making it challenging to secure school approval for survey participation. A total of 782 left-behind adolescents were recruited, with 718 valid responses, yielding a response rate of 91.8%. Participants' ages ranged from 10 to 16 years old. These participants included 373 males (51.9%), with an average age of 12.64 ± 1.58 . None of the participants exhibited any discernible physical or developmental disability. The inclusion criteria for left-behind adolescents were: (1) one or both parents having migrated; (2) adolescents having not cohabitated with their parents for more than six months; (3) belonging to an agricultural household. The definition of left-behind adolescents in this study refers to adolescents who have not lived with their parents for at least six months, aligning with the Chinese national census definition of the floating population, which also used six months as the time reference.⁴⁴ This is

consistent with previous research.^{45–47} Extensive research has shown that a six-month separation from parents significantly impacts adolescents' cognition, emotion, behavior, and physical and mental health.^{48–52}

The study received permission from head teachers to be conducted in the schools. Before administering the survey, the trained researchers explained the study to the students. The students assented to sign a consent form and participate in this study. In addition, the researchers gave the students consent forms to take home for their guardians to sign. Recognizing that many guardians of left-behind adolescents, typically grandparents are illiterate, the researchers reached out to these guardians by phone to obtain verbal informed consent. Students with written or verbal consent from their guardians were allowed to participate. Questionnaires were administered to the students in their classrooms, ensuring privacy as the survey was conducted without the presence of teachers. The researchers provided assistance as needed. Ethical approval for the study was obtained from the Institutional Review Board of Henan Provincial Key Laboratory of Psychology and Behavior (File No. 20211010002). This approval document permits researchers to verbally explain the informed consent form to illiterate guardians. In such cases, researchers obtain verbal informed consent from the guardians in the presence of an impartial witness, and then have the impartial witness sign the informed consent form.

Measures

Positive Youth Development

The Chinese version of the Positive Youth Development Scale was utilized to assess adolescents' positive development.⁸ Given China's unique cultural and educational context, researchers have explored the structure and connotations of positive youth development in the context of Chinese culture and developed the Positive Youth Development Scale for Chinese adolescents.^{7,8} Previous studies have demonstrated the reliability and validity of the scale.^{8,9} The scale contains four subscales that assess character (eg, "If I see someone in trouble, I will do whatever I can to help them"), competence (eg, "I have some skills in making friends"), confidence (eg, "When I consider the things I am not good at, I am still proud of myself"), and connection (eg, "Overall, I have a good time at school"). The scale is comprised of 98 items that are scored a 5-point Likert scale. The responses ranged from 1, "totally disagree", to 5, "totally agree". Higher scores reflect higher levels of positive development. The Cronbach's α values of the total scale and its subscales were 0.97 (full scale), 0.95 (character), 0.93 (competence), 0.90 (confidence), and 0.92 (connection).

Making Sense of Adversity

The Chinese Making Sense of Adversity Scale, developed by Pan et al,³² was employed to measure respondent's sense-making of adversity. As a meaning-focused coping strategy, making sense of adversity is contextually and culturally influenced,³² hence the need for a scale specific to the Chinese context. Previous studies have validated the reliability and validity of this scale.^{32,35,40} The scale contains 12 items encompassing two dimensions, namely, "making positive sense of adversity" (eg, "Adversity offers everyone a great chance to learn") and "making negative sense of adversity" (eg, "I have lost so much because of adversity"). The scale utilizes a 6-point scale ranging from 1, "completely disagree", to 6, "completely agree". Higher scores reflect higher levels of making positive/negative sense of adversity. The Cronbach's α values for these two subscales were 0.93 and 0.83, respectively.

Resilience

The abridged version of the Connor-Davidson Resilience Scale, developed by Campbell-Sills and Stein, was chosen to assess resilience.^{53,54} The Connor-Davidson Resilience Scale was developed based on a resource coping with stress perspective⁵⁵ and views resilience as an important personal resource. This coincides with the concept of resilience utilized in this study. Therefore, the abridged version of the Connor-Davidson Resilience Scale was chosen for this study. Previous studies have demonstrated this scale's reliability and validity.^{56,57} This scale contains 12 items. Resilience was assessed using the sum score of items (eg, "Whatever happens, I can handle it"), each given a 5-point score ranging from "never" (1) to "always" (5). Higher scores reflect greater resilience. In this study, the scale was first translated into Chinese and then back-translated by a researcher proficient in English. The Cronbach's α for this scale was 0.90. Confirmatory factor analysis fit well, $\chi^2 = 70.14$, $df = 29$, $TLI = 0.98$, $CFI = 0.99$, $AIC = 122.14$, $BIC = 241.13$, $SRMR = 0.02$, $RMSEA = 0.04$.

Covariates: Demographic Characteristics

In line with previous literature,^{58,59} demographic data including age, gender, grade (Grade 4, Grade 5, Grade 7, and Grade 8), and parental education level (no schooling, elementary school, junior high school, senior high school, college or tertiary education) were collected. Parental education level was recorded based on the highest education level attained by either parent, considering cases where parents had different education levels.^{60,61}

Data Analyses

Descriptive analysis was employed initially to describe the mean and standard deviation of the variables, providing an overview of the dataset. Subsequently, Pearson's correlation analysis was conducted to elucidate the relationships among variables. We conducted latent profile analysis (LPA) with Mplus 7.0 software to examine the positive development profiles of left-behind adolescents. LPA is a variant of traditional cluster analysis, which serves to categorize individuals into groups. Bayesian information criteria (BIC), Akaike information criterion (AIC), Bootstrap likelihood ratio test (BLRT), Lo-Mendell-Rubin likelihood ratio test (LMR-LRT), and Entropy were used to assess the model's fit. Multivariate Analysis of Variance (MANOVA) and a follow-up post hoc test were conducted to ensure distinct differentiation of positive development profiles.⁶² We also employed multinomial logistic regression to examine associations between the probability of being assigned to certain profiles with resilience and making sense of adversity. Finally, we conducted a mediation analysis using the "RMediation package" in R software, based on established methodologies.⁶³⁻⁶⁵ Specifically, we tested the "resilience-making sense of adversity" path (a) and "making sense of adversity-positive development profiles" path (b) simultaneously, then used a 95% credibility interval (CI) to test for indirect effects.

Results

Common Method Deviation Test

To assess the presence of significant common method bias, we conducted an Exploratory Factor Analysis on all original items using Harman's single-factor test method. Typically, common method bias is indicated by a single factor or a general factor explaining most of the variance. Results revealed a KMO value of 0.96. The chi-square of the Bartlett spherical test was 50,838.15 ($p < 0.001$). The first common factor explained 28.80% of the variance. As this falls below the threshold of 40%, it suggests the absence of significant common method bias.

Preliminary Analyses

Table 1 presents the means, standard deviations, and Pearson's correlations among this study's variables. The results indicate that the positive development of left-behind adolescents in the sample is at a moderate level. Gender appears to be positively related to making negative sense of adversity and negatively related to character and competence. Grade was found to be positively related to resilience, making positive sense of adversity, making negative sense of adversity, and connection. Resilience and making positive sense of adversity were found to be positively related to character, competence, confidence, and connection. A positive association was also identified between making negative sense of adversity and confidence.

Latent Profile Analysis

To uncover latent profiles of positive development among left-behind adolescents, we utilized the mean value of the four dimensions (character, competence, confidence, and connection), derived from the positive development scale as observed variables for the LPA. Successive latent profile models ranging from one to six classes were constructed. Table 2 presents the LPA fit indices. The p values of LMRT tests rejected the 6-class model. In the 2-, 3-, 4-, and 5-class models, the AIC, BIC, and ABIC values decreased as the profile level increased, demonstrating a more acceptable model fit. When comparing the 4- and 5-class model with the 3-class model, the proportions of participants belonging to the 4- and 5-class models were too small (ie, 2.1% and 1.9%) to be meaningful. Therefore, the 3-class model was deemed optimal.

The MANOVA analysis results reveal the extent to which three positive development classes differed in their respective indicators of character, competence, confidence, and connection. The results demonstrate that the three classes had significant differences across all indicators (Table 3). In the first class, the "low group" ($n = 243$, 33.8%), left-behind

Table 1 Descriptive Statistics and Correlations

	M	SD	1	2	3	4	5	6	7	8	9	10	11
Age	12.64	1.58	1	0.08*	0.85***	-0.13**	0.02	0.07	-0.05	-0.02	-0.02	-0.02	0.03
Gender	1.52	0.50		1	0.06	0.07	-0.01	-0.02	0.15***	-0.08*	-0.08*	0.07	0.00
Grade	2.81	1.03			1	-0.11**	0.10**	0.16***	0.11**	0.05	0.05	0.05	0.11**
Parental education level	2.92	0.74				1	-0.01	-0.06	-0.01	0.03	0.04	0.01	0.04
Resilience	34.53	7.86					1	0.68***	0.04	0.69***	0.69***	0.62***	0.67***
Making positive sense of adversity	34.82	9.11						1	-0.05	0.58***	0.54***	0.41***	0.55***
Making negative sense of adversity	11.56	4.88							1	0.05	0.07	0.10**	0.01
Character	3.64	0.60								1	0.78***	0.62***	0.62***
Competence	3.42	0.67									1	0.71***	0.64***
Confidence	3.22	0.80										1	0.56***
Connection	3.53	0.79											1

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Abbreviations: M = mean; SD = standard deviation;

Table 2 Indicators of Fit for the Latent Profile Analysis

Class Tested	AIC	BIC	aBIC	Entropy	LMRT (p)	BLRT (p)	Class Proportion(%)
1-Class	6208.90	6245.51	6220.11	-	-	-	-
2-Class	5210.91	5270.40	5229.13	0.82	0.00	0.00	59.4/40.6
3-Class	4862.08	4944.46	4887.31	0.81	0.00	0.00	33.8/46.5/19.7
4-Class	4661.63	4766.89	4693.86	0.86	0.00	0.00	2.1/37.3/42.2/18.4
5-Class	4577.94	4706.08	4617.17	0.81	0.00	0.00	1.9/29.0/35.3/23.5/10.3
6-Class	4550.26	4701.28	4596.50	0.83	0.07	0.00	2.0/28.1/34.0/24.0/1.2/10.7

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; aBIC, adjusted Bayesian information criterion; LMRT, Lo-Mendell-Rubin likelihood ratio test; BLRT, bootstrapped likelihood ratio test.

Table 3 Mean Differences in Study Indicators Across Three Groups (M \pm SD)

	Character	Competence	Confidence	Connection
Low group (n=243)	3.03 \pm 0.42	2.76 \pm 0.38	2.59 \pm 0.56	2.88 \pm 0.60
Moderate group (n=334)	3.78 \pm 0.32	3.51 \pm 0.35	3.24 \pm 0.48	3.63 \pm 0.58
High group (n=141)	4.35 \pm 0.32	4.36 \pm 0.36	4.30 \pm 0.54	4.41 \pm 0.53
F	652.70***	898.88***	478.33***	326.19***
Partial η^2	0.65	0.72	0.57	0.48
Post hoc	1<2<3	1<2<3	1<2<3	1<2<3

Note: *** $p < 0.001$.

children reported the lowest levels of character, competence, confidence, and connection. In the second class, the “moderate group” ($n = 334$, 46.5%), left-behind children reported moderate levels of character, competence, confidence, and connection. In the third class, the “high group” ($n = 141$, 19.7%), left-behind children reported the highest levels of character, competence, confidence, and connection. Figure 1 illustrates the standardized means for each indicator of positive development.

Multinomial Logistic Regression Analysis

We used multinomial logistic regression analyses to determine whether age, gender, grade, parental education level, resilience, making positive sense of adversity, and making negative sense of adversity contributed to the identification of

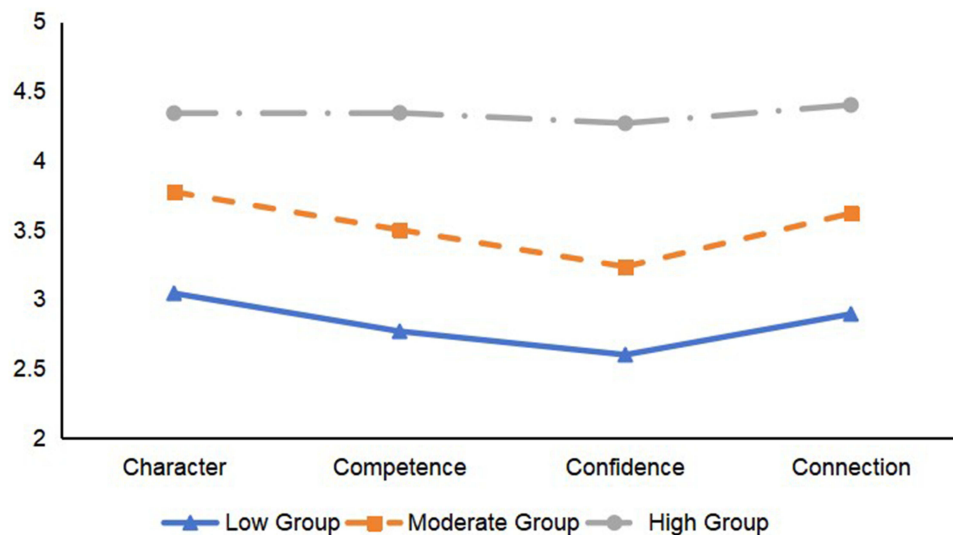


Figure 1 Latent profile analysis produced three groups of positive development (N=718).

positive development groups. In this analysis, the high group was regarded as the reference group. As indicated in Table 4, the association between age, gender, grade, parental education level and positive development profiles was not significant. In addition, we found unique relationships between resilience, making positive sense of adversity, making negative sense of adversity and membership in the low group or moderate group relative to membership in the high group. Left-behind adolescents reporting high levels of resilience and making positive sense of adversity demonstrated a higher likelihood of being categorized into the high group than the low or moderate groups. Moreover, left-behind adolescents with higher levels of making negative sense of adversity exhibited a higher likelihood of being categorized into the high group than the moderate group.

Mediation Analysis

Finally, we investigated whether and to what extent resilience indirectly predicts left-behind adolescents' membership in each positive development group through making sense of adversity. We used the "RMediation package" in R software to conduct this analysis. Table 5 shows the results.

Table 4 Multinomial Logistic Regression Analysis Predicting Positive Development Groups

	Variables	B	SE	95% CI	OR	Wald	p
Low group VS High group	Age	0.37	0.21	0.97–2.17	1.45	3.31	0.07
	Gender ^a	-0.13	0.33	0.46–1.69	0.88	0.14	0.71
	Grade	-0.34	0.32	0.38–1.31	0.71	1.20	0.27
	Parental education level	0.02	0.21	0.68–1.53	1.02	0.01	0.91
	Resilience	-0.44	0.04	0.60–0.69	0.64	137.16	<0.001
	Making positive sense of adversity	-0.08	0.03	0.88–0.97	0.93	9.70	<0.01
	Making negative sense of adversity	-0.06	0.03	0.89–1.01	0.95	2.78	0.10
Moderate group VS High group	Age	0.26	0.17	0.93–1.81	1.30	2.30	0.13
	Gender ^a	0.43	0.27	0.91–2.67	1.53	2.48	0.12
	Grade	-0.22	0.26	0.48–1.33	0.80	0.72	0.40
	Parental education level	0.10	0.17	0.79–1.55	1.10	0.32	0.57
	Resilience	-0.23	0.03	0.75–0.84	0.80	61.58	<0.001
	Making positive sense of adversity	-0.04	0.02	0.92–1.00	0.96	3.90	<0.05
	Making negative sense of adversity	-0.06	0.02	0.90–0.99	0.94	6.43	<0.05

Notes: ^aReference Category=male.

Abbreviations: SE, standard error; CI, confidence interval; OR, odds ratio.

Table 5 Indirect Effects of the Resilience on Three Profiles of Left-Behind Adolescents' Positive Development via Making Positive Sense of Adversity

	Resilience			
	Estimate	SE	Boot LLCI	Boot ULCI
Low group vs High group	-0.06	0.02	-0.09	-0.03
Moderate group vs High group	-0.02	0.02	-0.05	0.00
Low group vs Moderate group	-0.03	0.01	-0.05	-0.01

Abbreviation: SE, standard error.

Before calculating indirect effects, we used linear regression analyses to calculate the direct effect of resilience on making positive sense of adversity ($\beta = 0.79$, $SE = 0.03$, $p < 0.001$). Next, we used the “RMediation package” to calculate the indirect effects. The results showed that when left-behind adolescents had higher levels of resilience, they were more likely to construct positive meaning in adversity, which in turn increased the likelihood that they would be classified in the high group (95% *CI* of -0.09 to -0.03) and the moderate group (95% *CI* of -0.05 to -0.01) rather than the low group. We also found that resilience had no direct effect on making negative sense of adversity ($\beta = 0.03$, $SE = 0.02$, $p = 0.25$). There was no significant indirect effect of making negative sense of adversity between resilience and positive development profile membership.

Discussion

We delineated distinct positive development groups among left-behind adolescents based on indicators of character, competence, confidence, and connection. We also systematically explored the associations between these identified profiles and personal resources, along with the potential role of coping strategies. Our findings are discussed in detail below.

Our study identified three distinct positive development groups among left-behind adolescents, categorized as low (33.8%), moderate (46.5%), and high (19.7%) groups. These results indicate the presence of significant group heterogeneity among left-behind adolescents, confirming our hypothesis (H1). The low group, comprising one-third of the total sample, demonstrated poor performance across all positive development indicators, particularly in confidence, indicating a lack of self-worth and identity. Additionally, they exhibited the weakest academic, social-emotional, and living abilities, along with limited social support networks (ie, connections with teachers, classmates, family members, and neighbors). Interventions targeting this group should prioritize fostering positive development. The moderate group, representing 46.5% of the overall sample, displayed moderate performance across the four positive development indicators, with notable strengths in character but lacking confidence. Finally, the high group, comprising 19.7% of the sample population, exhibited consistently high scores across all four indicators of positive development, suggesting that a small proportion of left-behind adolescents surpass risk factors and attain higher levels of positive development.

Our findings align with previous research demonstrating group heterogeneity in adolescents' positive development (indexed by character, competence, confidence, and connection). A study of migrant adolescents reported that positive development could be categorized as high, moderate, and low profiles.⁶⁶ Overall, positive development is characterized by low confidence and high character. Contrastingly, another study of general adolescents categorized positive development as follows: overall positive development, high competence and high confidence, high character and high connection, and high connection and high confidence,⁹ with positive development characterized by high confidence and relatively low character. These studies suggest that the lack of self-confidence among disadvantaged adolescents is a common and significant feature compared to the general adolescents. Moreover, the physical and psychological needs of disadvantaged adolescents are unmet, contributing to their highly negative self-perception.⁶⁷ Some left-behind adolescents are in a prolonged state of inferiority complex owing to a lack of parental care and societal prejudice and discrimination. Thus, improving their confidence is both urgent and imperative.

We further explored the associations of resilience, making a positive sense of adversity, and making a negative sense of adversity with these emerging groups. Consistent with our hypothesis (H2), greater resilience and positive sense-making of

adversity associated with a higher likelihood of belonging to the high group rather than the low or moderate groups. These findings are also consistent with those of previous variable-centered studies, which emphasized the mitigating role of resilience in alleviating the adverse impact of risk factors.^{28,67} Such sustained coping efforts contribute to positive developmental outcomes. Additionally, when immersed with chronic adverse conditions, the reframing of adversity in positive ways becomes significant.³² Left-behind children with positive beliefs can proactively navigate challenges, fostering positive development.⁶⁸

Conversely, left-behind adolescents with higher levels of making a negative sense of adversity were more likely to belong to the high group rather than the moderate group, contrary to our hypothesis (H2) and previous literature.^{40,69} This discrepancy suggests that the impact of negative making sense of adversity on positive development may vary across subgroups. Making a negative sense of adversity means interpreting adverse life experiences as catastrophes,³² which forces individuals to mobilize additional psychological resources for survival. This phenomenon is particularly pronounced for those with more personal resources. From an evolutionary psychology standpoint, when adversity is catastrophized, individuals feel forced to engage the whole of their self-protection resources to ensure their survival.⁷⁰ The conservation of resources theory further posits that anticipating future resource losses prompts individuals to swiftly and comprehensively leverage their personal resources to counteract such losses.^{71,72} However, this strategy may only apply to individuals possessing abundant personal resources,⁷³ as those with fewer resources may experience increased pressure when catastrophizing adversity. Thus, left-behind adolescents with high levels of making negative sense of adversity demonstrated a higher likelihood of falling into the high group compared to the moderate group.

We delved into the mediating role of making sense of adversity in the connection between resilience and positive development. The results indicated a significant mediating role of making positive sense of adversity. In instances where left-behind adolescents exhibited heightened resilience, they were more inclined to associate positive meaning with adversity, thereby increasing their chances of being categorized into the high or moderate groups rather than the low group. However, more positive perceptions of adversity did not increase the likelihood that left-behind adolescents would be classified into the high group than the moderate group. Thus, H3 was partially confirmed. Previous studies provide support for this result. A research suggests that positive beliefs about adversity may not universally yield positive effects. For migrant adolescents with low socioeconomic status, positive beliefs about adversity played a protective role in the association between child abuse and non-suicidal self-injury; while for those with high socioeconomic status, such beliefs showed vulnerability.⁷⁴ This may be because, for well-developed left-behind adolescents, enhancing their personal capabilities and resources is more conducive to developmental outcomes than maintaining positive perceptions of adversity in general. Targeted interventions for left-behind adolescents across varying levels of positive development, with various backgrounds and personal characteristics, are imperative.

Contributions and Limitations

This study offers significant theoretical implications by challenging traditional dichotomous perspectives on left-behind adolescents' development, which often portray them as either "vulnerable" or "strong". Using a person-centered approach, we delineate diverse positive development patterns among left-behind adolescents, providing a more nuanced understanding of their developmental patterns. By exploring the mediating role of making sense of adversity between resilience and positive development subgroup membership, we fill a crucial gap in previous research, emphasizing the importance of meaning construction in the context of chronic adversity. These insights not only broaden our understanding of the positive development of left-behind adolescents but also add depth to previous variable-centered studies.

From a practical standpoint, our results help to clarify the heterogeneity within the group of left-behind adolescents in terms of developmental characteristics and needs, recognizing that protective factors play different roles for left-behind adolescents with different positive development patterns. Accordingly, we propose targeted interventions for left-behind adolescents. Educators and practitioners can utilize our results to design interventions that strengthen resilience⁷⁵ and promote positive views of adversity among adolescents in the low positive development group. Techniques such as the Activating-event-belief-consequence model can be used to adjust cognitive beliefs and foster adaptive coping strategies.^{76,77} For left-behind adolescents in the moderate group, the impact of resilience on positive development

through positive making sense of adversity is diminished. Thus, maintaining negative making sense of adversity may stimulate their inner potential.^{70,71}

It is important to acknowledge the limitations of this study. Firstly, this study primarily focused on individual factors (eg, resilience and making sense of adversity), overlooking the interaction between individual and environmental factors in shaping positive development. Future research should explore the interaction of other individual factors (eg, psychological capital and physical exercise) and environmental factors (eg, family and school) on the positive development patterns of left-behind adolescents for a more comprehensive understanding.^{78–81} Secondly, sample collection may have been subject to selection bias, limiting the generalizability of our findings to other populations (eg, other grades and regions) of left-behind adolescents. Moreover, the scales used in this study were developed for Chinese populations, necessitating further validation for cross-cultural applicability. Additionally, the study did not consider factors such as migrant status, separation duration, and the frequency of parental contact as covariates, which could influence developmental outcomes.⁸² Future studies should incorporate these variables for a more comprehensive analysis. Lastly, while our study focused on left-behind adolescents, future research is warranted to explore the impact of negative sense-making of adversity on developmental outcomes in other populations.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon request.

Compliance with Ethical Standards

All the methods were performed in accordance with the Declaration of Helsinki. The study was approved by the Institutional Review Board of Henan Provincial Key Laboratory of Psychology and Behavior (File No. 20211010002). Informed consent was obtained from all participants and their guardians.

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Disclosure

The authors report no conflicts of interest in this work.

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