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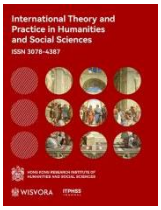

Parental Education and Parental Psychological Stress: An Empirical Analysis from the Perspective of Social Capital—Evidence from CFPS 2022

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Abstract

In recent years, parental psychological stress has emerged as a growing public concern. Understanding its influencing factors is essential for improving family mental health and advancing social governance. Grounded in social capital theory and supplemented by human capital theory and the stress-buffering model, this study utilizes data from the 2022 wave of the China Family Panel Studies (CFPS) to systematically examine the impact and underlying mechanisms of parental education on parental psychological stress.

Employing multiple linear regression models, the study focuses on testing the effect of the highest parental education level on parental psychological stress, measured by the standardized CESD20 depression scale scores. Robustness checks and multidimensional heterogeneity analyses are conducted to enhance the reliability of the results. Empirical findings reveal a significant negative association between parental education and psychological stress among parents. Moreover, notable heterogeneity is observed across different household registration (hukou) types, income groups, and gender categories. Further analysis indicates that family behavioral factors, such as the frequency of parent–child interactions, play an important mediating role in this relationship.

1. Introduction

In recent years, parental mental health issues have increasingly attracted attention from the fields of public health and social governance. With ongoing socioeconomic transitions, family structure changes, and intensifying educational competition, Chinese parents are experiencing unprecedented psychological burdens (He et al., 2025). Parental psychological stress not only affects their own quality of life but also exerts profound influences on their children's academic performance, mental health, and social adaptability (Yuan et al., 2025). Against the backdrop of a weakening family educational function and an underdeveloped social support system, identifying key factors influencing parental psychological stress holds significant theoretical and practical relevance.

Existing research primarily explores the influencing mechanisms of parental psychological stress from multiple dimensions, such as economic resources, social support, and children's behavioral problems (Cao et al., 2022; Wu & Qiu, 2024). On the one hand, financial stress, income inequality, and economic insecurity are recognized as direct contributors to parental

psychological distress (Li et al., 2025). On the other hand, a robust social support network, positive parent-child relationships, and higher levels of psychological capital help alleviate parental psychological stress (Yuan et al., 2025). However, limited attention has been paid to the role of family educational capital—particularly parental education level—in shaping parental psychological stress, and empirical evidence in this area remains insufficient.

From a theoretical perspective, social capital theory offers a compelling explanatory framework. This theory posits that individuals can effectively mitigate the adverse impacts of life stressors through the information, emotional support, and social resources accessed via social networks (Coleman, 1988; Lin, 2001). At the family level, parental education represents a form of structural social capital that not only influences parents' ability to mobilize social resources but also shapes their psychological adaptation and stress coping mechanisms (Cao et al., 2022).

In addition, human capital theory provides a complementary perspective. Parental education level reflects individual cognitive capabilities and psychological resource reserves (Becker, 1993). Parents with higher educational attainment typically possess stronger problem-solving skills, emotional regulation capacity, and social adaptability. These internal attributes serve as important psychological buffers (Li et al., 2025). Furthermore, the stress-buffering model (Cohen & Wills, 1985) supplements the explanatory pathway from a psychological perspective, emphasizing that social capital and individual resources can reduce the negative effects of external stressors on mental health through buffering mechanisms. In this context, parental education enhances families' capacity to mobilize social support and strengthens parents' psychological resilience and coping efficacy.

Despite the robust theoretical foundation, several research gaps remain. First, there is a scarcity of quantitative empirical studies examining the relationship between parental education and parental psychological stress, especially large-sample evidence from Chinese families. Second, limited research has investigated the heterogeneous effects across different social groups, such as urban-rural residence, income levels, and gender, overlooking the moderating role of social structural factors on mental health pathways. Third, the specific mechanisms through which parental education affects parental psychological stress remain underexplored.

To address these gaps, this study utilizes nationally representative data from the 2022 wave of the China Family Panel Studies (CFPS). Drawing on social capital theory, human capital theory, and the stress-buffering model, this research conducts multidimensional empirical analyses to examine the impact of parental education on parental psychological stress. Furthermore, through heterogeneity analysis and robustness checks, this study aims to uncover group differences and underlying mechanisms of the observed effects. The findings are expected to provide new empirical evidence for understanding the influence of family educational capital on parental mental health and to offer theoretical support for developing targeted family psychological support policies and promoting mental health equity.

2. Research Methods and Data Source

2.1 Theoretical Framework and Model Specification

This study is primarily grounded in Social Capital Theory, supplemented by Human Capital Theory and the Stress-Buffering Model, to construct an integrated analytical framework for exploring the mechanisms through which parental education level affects parental psychological stress.

First, Social Capital Theory emphasizes that the quality and quantity of resources embedded in

individuals' social networks significantly influence their social adaptation and mental health (Coleman, 1988; Lin, 2001). At the family level, parental education not only reflects structural social capital but also represents the family's ability to access external resources, social support, and social status recognition (Cao et al., 2022). Parents with higher educational attainment often possess richer social networks, better information acquisition capabilities, and higher perceived levels of social support, all of which help to alleviate psychological stress.

Second, from the perspective of Human Capital Theory, parental education level is not only an external manifestation of social capital but also a critical component of a family's internal human capital (Becker, 1993). More educated parents typically demonstrate stronger cognitive abilities, problem-solving skills, and emotional regulation capacity. These internal psychological resources effectively help them cope with multiple stressors, such as life pressures, work demands, and children's educational issues (Li et al., 2025).

Furthermore, the Stress-Buffering Model offers a psychological perspective to supplement the explanatory pathway between parental education and parental psychological stress. This model emphasizes that social support and individual resources can mitigate the adverse effects of external stressors on mental health through a buffering mechanism (Cohen & Wills, 1985). In the context of this study, parental education reflects both the capacity to mobilize social capital and the endowment of human capital, jointly functioning to reduce parental psychological stress by enhancing resource accessibility and improving psychological resilience and adaptive capacity.

Based on this integrated theoretical framework, the following regression model is constructed:

$$\text{MentalStress}_i = \alpha + \beta_1 \text{ParentEdu}_i + \beta_2 X_i + \varepsilon_i$$

In this model, MentalStress_i represents the level of parental psychological stress, measured by the standardized scores derived from the CESD20 depression scale. The core independent variable ParentEdu_i denotes the highest educational attainment among parents in the household, serving as a proxy for family educational capital. The vector X_i includes a set of control variables, such as household income (log-transformed), hukou status (urban or rural residence), gender, number of living children, frequency of parent–child interactions (including both heart-to-heart conversations and conflict frequency), and household educational expenditure (log-transformed), all aimed at minimizing omitted variable bias. The term ϵ_i captures unobserved factors that may influence parental psychological stress but are not directly observable within the dataset.

The primary analytical focus is on the coefficient β_1, which reflects the marginal effect of parental education on parental psychological stress. A negative and statistically significant coefficient would support the hypothesis that higher parental education reduces psychological stress among parents. To address potential heteroskedasticity, robust standard errors are used in all regression estimations. Moreover, variance inflation factor (VIF) diagnostics are conducted to test for multicollinearity among the independent variables, ensuring the reliability and validity of parameter estimation.

To further enhance the robustness of the findings, this study conducts additional sensitivity analyses, including substituting the primary dependent variable with an alternative measure (the CESD8 short-form depression scale) and performing heterogeneity analyses across different hukou statuses, income levels, and gender groups. These additional steps help verify the consistency and stability of the estimated effects of parental education on parental psychological stress from multiple analytical perspectives.

2.2 Data Source and Variable Definition

The data used in this study are derived from the 2022 wave of the China Family Panel Studies

(CFPS), jointly conducted by the Institute of Social Science Survey at Peking University and the Chinese Academy of Social Sciences. As a nationally representative and comprehensive large-scale social survey, CFPS offers extensive coverage and rich content, making it widely applicable in empirical research across social science, education, and mental health domains (Xie & Hu, 2014).

Given the multidimensional nature of the variables involved, this study integrates data from multiple CFPS sub-databases, including the Family Database, Child Database, Family Economic Database, and Family Relationship Database. Data from these sub-databases were matched using Personal Identification Codes (PID) and Family Identification Codes (FID) to ensure consistency at both individual and household levels. Following data matching, thorough data cleaning procedures were implemented, including handling missing values for key variables, identifying abnormal values, and excluding observations with missing core variables to ensure data quality.

For variable construction, the dependent variable is parental psychological stress, measured by the standardized scores of the CESD20 depression scale. To enhance the robustness of the findings, the CESD8 short-form depression scale is used as an alternative measure in subsequent analyses. The key independent variable—parental education level—is constructed by extracting educational information for both parents and selecting the higher educational level after appropriate coding, thereby representing the household's educational capital.

Control variables include log-transformed household income and educational expenditure, the number of living children (calculated based on child survival status variables), hukou status, gender, age, marital status, and family interaction variables such as the frequency of heart-to-heart conversations and arguments with children. The variable design fully reflects both the theoretical framework and the characteristics of the available data, ensuring the scientific rigor and robustness of subsequent empirical analyses.

3. Empirical Analysis

3.1 Descriptive Statistical Analysis

To provide a comprehensive understanding of the sample characteristics and the basic distribution of key variables, a descriptive statistical analysis was first conducted. The results are presented in **Table 3.1**. By reporting metrics such as means, standard deviations, and sample sizes for the dependent variable, independent variables, and control variables, this section offers preliminary data insights to support the subsequent empirical regression models.

Table 3.1: Descriptive Statistics

Variable	Sample Size (N)	Percentage (%) / Mean (Standard Deviatio
CESD20	22029	33.184 (7.851)
Educational Expenditure (CNY)	6037	5830.392 (9683.439)
Educational Expenditure (log)	6037	6.882 (3.079)
Household Income (CNY)	22029	130069.9 (321756.3
Household Income (log)	22029	11.270 (1.115)
Number of Children	22027	1.108 (0.982)

Highest Parental Education Level	16109	2.468 (1.264)
Age	20396	44.969 (16.901)
Gender (Male = 1)	11178	50.75%
Hukou Status (Agricultural = 1)	15697	71.26%
Marital Status (Married = 1)	15191	68.96%

From the perspective of psychological stress levels (CESD20 scores), the average score in the sample is 33.18 with a standard deviation of 7.85, indicating that parents experience a certain degree of psychological stress with substantial individual variation. This finding aligns with prior studies describing the overall mental health status of Chinese adults and reflects the diversity of psychological conditions within the parent population.

Regarding household economic status, the average annual household income is approximately CNY 130,070, with a large standard deviation (CNY 321,756.3), suggesting significant disparities across households. Considering the strong right-skewness of income data, the income variable was log-transformed for subsequent analyses, resulting in a mean logged income of 11.27 with a standard deviation of 1.12 to mitigate the influence of outliers.

In terms of educational expenditure, the average household spending on education is CNY 5,830.39, with a standard deviation of CNY 9,683.44, indicating considerable heterogeneity. After log-transformation, the mean logged educational expenditure is 6.88 with a standard deviation of 3.08, suggesting that most families spend relatively little on education, though a small number of high-spending households raise the overall mean.

For family structure characteristics, the average number of children per household is 1.11, with a standard deviation of 0.98. This reflects the prevalent reality of single-child or two-child family structures in China under recent fertility policy adjustments.

The average highest parental education level is 2.47 with a standard deviation of 1.26. According to the CFPS coding standard, this corresponds roughly to the level between junior high school and high school, indicating that the overall educational attainment of the parent sample remains at a relatively low-to-middle level.

In terms of demographic characteristics, the average age of parents in the sample is 44.97 years. Male parents account for 50.75%, suggesting a nearly balanced gender distribution. Additionally, 71.26% of surveyed parents come from agricultural hukou households, highlighting a higher proportion of rural samples in the dataset, which is conducive to subsequent analysis of urban-rural differences in psychological stress. Regarding marital status, 68.96% of parents are married, suggesting that most respondents are currently in marital relationships. This variable will also serve as a control variable in the regression models.

Overall, the sample covers parent groups with diverse income levels, educational backgrounds, gender, hukou types, and marital statuses, providing a solid empirical foundation for subsequent causal inferences.

3.2 Benchmark Regression Analysis

Following the descriptive statistics, this study employs multiple linear regression models to test the effect of the highest parental education level on parental psychological stress. Based on the previously formulated research hypotheses, parental education is viewed as a long-term indicator of human capital and social resource accumulation, potentially influencing parental mental health through enhanced cognitive regulation and social support acquisition.

To ensure the robustness of the results, the baseline regression models control for key demographic and socioeconomic variables, including household income, gender, and hukou status. In subsequent models, family interaction variables are gradually introduced. The regression results are reported in **Table 3.2**.

Table 3.2: Benchmark Regression Results

Dependent Variable: Psychological Stress	(1)	(2)
Highest Parental Education Level	-1.445***	-1.370***
	(0.388)	(0.387)
Number of Parent–Child Conflicts		0.376***
		(0.121)
Number of Heart-to-Heart Talks		-0.023
		(0.075)
Household Income (log)	0.703	0.600
	(0.477)	(0.460)
Gender	-0.137	-0.204
	(0.792)	(0.779)
Hukou Status (Agricultural = 1)	-3.166***	-2.196*
	(1.172)	(1.191)
Educational Expenditure (log)	-0.126	-0.016
	(0.303)	(0.250)
Control Variables	YES	YES
Observations	2777	2777

Note: Standard errors are reported in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

The benchmark regression results demonstrate a significant and stable negative effect of parental education on parental psychological stress. After controlling for household income, gender, hukou status, and educational expenditure, the coefficient for parental education remains significantly negative at the 1% level (Model 1: $\beta = -1.445$, $p<0.01$; Model 2: $\beta = -1.370$, $p<0.01$). This result aligns with the core propositions of Social Capital Theory (Bourdieu, 1986; Coleman, 1988; Lin, 2001). Higher educational attainment is associated with better access to social networks, higher-quality social resources, and stronger psychological coping skills, all of which contribute to enhanced psychological resilience in the face of life stressors (Cao et al., 2022).

From the perspective of Human Capital Theory, highly educated parents tend to have stronger cognitive processing and emotional regulation abilities, helping buffer daily psychological stress responses (Becker, 1993). After incorporating family interaction variables in Model (2), the coefficient for parental education slightly decreases but remains significant, suggesting a robust effect. This change also indicates that part of the influence may operate indirectly through family relationship quality pathways (Cohen & Wills, 1985).

Regarding the mechanism variables, the number of parent–child conflicts shows a positive and highly significant association with psychological stress ($\beta = 0.376$, $p<0.01$), indicating that more frequent negative interactions with children increase parental stress levels. This finding is consistent with the empirical results of He et al. (2025) based on Chinese samples, supporting the "Family Conflict Stress Model" that frequent family conflicts increase emotional exhaustion and psychological burden among family members. Conversely, the frequency of heart-to-heart talks shows a negative but statistically insignificant effect, suggesting that simple communication frequency may not effectively alleviate psychological stress. Content quality, emotional warmth, and perceived social support may serve as more critical mediating variables, which will be further examined in the subsequent mechanism analysis.

Regarding hukou status, parents with agricultural hukou exhibit significantly lower psychological stress levels compared to their non-agricultural counterparts ($p<0.1$). This finding is consistent with the empirical conclusions of Gu et al. (2023) and Wu et al. (2021) on urban-rural mental health disparities. Possible reasons include lower social competition and life

expectation pressures in rural families, as well as stronger social support systems characterized by tight-knit, mutually supportive communities (Wu & Qiu, 2024).

For the income variable, although the regression coefficient is positive, it does not reach statistical significance. This suggests that the relationship between household economic status and psychological stress may not be linear or direct, possibly involving complex mediation or moderation pathways. This observation is consistent with Yuan et al. (2025), who highlight the complexity of the income–mental health relationship.

In summary, the benchmark regression analysis not only confirms the alleviating effect of parental education on parental psychological stress but also reveals the multifaceted influence of family interactions and social structural factors in the stress formation process.

3.3 Robustness Tests

To further verify the reliability and robustness of the baseline regression results, this study employs two methods for robustness testing.

First, considering the potential measurement bias associated with the choice of psychological stress scales, the CESD8 short-form depression scale is adopted as the dependent variable for regression analysis to examine the stability of the results across different psychological stress indicators. Although the CESD8 contains fewer items, it has been widely used in large-sample mental health studies and demonstrates good reliability and validity (Wu et al., 2021).

Second, to address the potential issue of multicollinearity within the regression models, the variance inflation factor (VIF) diagnostic method is employed to avoid estimation bias caused by high correlations among explanatory variables. Conducting multicollinearity diagnostics helps to eliminate model specification errors and enhances the credibility of coefficient estimates (Lin, 2001).**Table3.3** reports the regression results for the robustness tests.

Table 3.3: Robustness Test Results

Table 4.3 Robustness Test Results	(1)
Highest Parental Education Level	-0.690***
	(0.196)
Number of Parent–Child Conflicts	0.191***
	(0.061)
Number of Heart-to-Heart Talks	-0.011
	(0.038)
Household Income (log)	0.310
	(0.232)
Gender	-0.121
	(0.395)
Hukou Status (Agricultural = 1)	-1.093*
	(0.061)
Educational Expenditure (log)	-0.007
	(0.127)
Control Variables	YES
Observations	2777

Note: Standard errors are reported in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 3.4: Multicollinearity Diagnostics (VIF Test)

Variable	VIF	1/VIF

Highest Parental Education Level	1.36	0.734
Hukou Status (Agricultural = 1)	1.30	0.772
Household Income (log)	1.24	0.807
Educational Expenditure (log)	1.18	0.851
Number of Parent–Child Conflicts	1.15	0.868
Number of Heart-to-Heart Talks	1.07	0.933
Gender	1.02	0.982
Mean VIF	1.19	

The robustness test results further reinforce the credibility of the baseline regression findings. Specifically, when the dependent variable is replaced with the CESD8 scale, the negative effect of parental education remains significant ($\beta = -0.690$, $p<0.01$), and the coefficient direction is consistent with the baseline model. This indicates that the buffering effect of parental education on psychological stress is not dependent on the choice of a specific mental health measurement tool, demonstrating strong external consistency and measurement robustness. This finding aligns with the theoretical assumptions of Social Capital Theory and Human Capital Theory regarding the buffering role of educational capital in mitigating psychological stress (Bourdieu, 1986; Coleman, 1988; Becker, 1993).

In terms of control variables, the hukou status variable remains significant after substituting the dependent variable, and the direction of its effect remains unchanged. This further confirms the structural existence of urban-rural differences in psychological stress levels, consistent with findings from prior studies (Wu et al., 2021; Gu et al., 2023). Additionally, the positive effect of the number of parent–child conflicts remains significant, highlighting the profound impact of family relationship quality on parental psychological stress. This supports the core proposition of the stress-buffering model that negative social interactions exacerbate psychological stress (Cohen & Wills, 1985).

The multicollinearity diagnostic results show that the VIF values for all explanatory variables range between 1.02 and 1.36, with a mean VIF of 1.19, which is well below the commonly used threshold of 10 for multicollinearity concerns (Lin, 2001). This indicates that the model does not suffer from severe multicollinearity, and the reliability of the estimated coefficients is high.

In summary, whether through replacing the dependent variable or controlling for multicollinearity risks, the negative effect of parental education on parental psychological stress exhibits a high degree of robustness. These results provide a solid empirical foundation for subsequent heterogeneity and mechanism analyses.

3.4 Heterogeneity Analysis

To further investigate the group-specific differences in the effect of parental education level on parental psychological stress, this study conducts heterogeneity analyses across three dimensions: hukou status, income level, and gender. Subsample regressions enable a more in-depth identification of how the effects of parental education vary across different socioeconomic backgrounds, thereby enhancing the external validity of the baseline regression results (Cao et al., 2022; Yuan et al., 2025).

3.4.1 Urban-Rural Hukou Heterogeneity Analysis

Urban-rural disparities represent a fundamental feature of structural inequality in Chinese society. Historically, significant differences have existed between urban and rural areas in terms of social capital accumulation, access to educational resources, and psychological support systems (Gu et al., 2023; Wu & Qiu, 2024). Social Capital Theory also emphasizes that

individuals from different social environments have markedly different access to the quality and quantity of social resources, which may influence the buffering effect of educational capital on psychological stress (Coleman, 1988; Lin, 2001).

Given the institutionalized segmentation of resources and social support networks caused by the hukou system, this study conducts heterogeneity regressions based on hukou status (agricultural vs. non-agricultural). This approach allows for the examination of both urban-rural differences in the impact of parental education on psychological stress and a deeper understanding of the mechanisms through which educational capital operates. The regression results for urban and rural samples are presented in **Table 3.5**.

Table 3.5: Urban-Rural Hukou Heterogeneity Analysis

Dependent Variable: Psychological Stress	Urban Hukou Sample	Agricultural Hukou Sample
Highest Parental Education Level	-0.745***	-0.865***
	(0.244)	(0.176)
Household Income (log)	0.083	-0.244
	(0.321)	(0.197)
Gender (Male)	0.419	-0.229
	(0.665)	(0.336)
Number of Parent–Child Conflicts	0.288***	0.501***
	(0.077)	(0.077)
Number of Heart-to-Heart Talks	-0.130***	-0.062*
	(0.044)	(0.026)
Educational Expenditure (log)	0.101	0.041
	(0.194)	(0.096)
Control Variables	YES	YES
Observations	4010	4175

Note: Standard errors are reported in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

The results from the urban-rural heterogeneity regression show that the highest parental education level exhibits a significant negative effect on parental psychological stress in both urban and rural samples. However, the magnitude of the effect is larger and more significant in the rural sample (Rural: $\beta = -0.865$, $p<0.01$; Urban: $\beta = -0.745$, $p<0.01$). This notable difference suggests that the buffering effect of parental education on psychological stress is more pronounced among rural families.

Several factors may explain this urban-rural disparity:

First, from the perspective of social capital structure, rural areas often possess more closed and homogeneous social support networks, with limited access to formal social support resources (Gu et al., 2023; Lin, 2001). Under such conditions, the role of parental education in enhancing resource acquisition capacity, problem-solving skills, and psychological adaptability becomes even more critical. Highly educated parents generally possess stronger abilities to mobilize social resources and process information, enabling them to utilize limited social support more effectively to mitigate psychological stress (Coleman, 1988).

Second, from the viewpoint of the empowerment effect of education, rural education is widely regarded as a key pathway to improve family status and economic conditions (Wu & Qiu, 2024). Parents with higher education levels often enjoy higher social status, stronger sense of social control, and greater psychological efficacy, all of which play a positive role in psychological coping processes (Cao et al., 2022). In contrast, urban parents, despite generally having higher

education levels, can access more diverse external social support resources, potentially weakening the marginal alleviating effect of education on psychological stress.

Third, differences in life pace and stress sources also contribute to this phenomenon. Urban parents may face more complex work stress, housing pressures, and educational anxiety, making the singular buffering effect of educational capital on psychological stress partially offset (He et al., 2025). In contrast, rural parents encounter more concentrated stress sources, allowing educational capital to play a more direct regulatory role in psychological stress responses.

Further analysis of control variables also supports the above interpretation. Specifically, the number of parent–child conflicts shows a significant positive effect on parental psychological stress in both samples, but the effect is stronger in the rural sample (Urban: $\beta = 0.288$, $p<0.01$; Rural: $\beta = 0.501$, $p<0.01$). This suggests that rural parents may be more emotionally sensitive to negative family events, possibly due to their limited psychological coping resources. Moreover, the frequency of heart-to-heart talks shows a stronger stress-reducing effect in the urban sample ($\beta = -0.130$, $p<0.01$), while the effect remains significant but weaker in the rural sample ($\beta = -0.062$, $p<0.05$). This further reflects differences in family communication patterns between urban and rural households and their effects on parental mental states.

In summary, the urban-rural heterogeneity analysis highlights the moderating role of social structural environments on the psychological buffering effect of parental education. Rural parents appear to rely more heavily on educational capital to resist psychological stress. This finding carries important practical implications for the design of mental health intervention policies, especially regarding the construction of support systems for rural parents. Moreover, the results further enrich the empirical connotations of Social Capital Theory and Human Capital Theory concerning mental health impact pathways in different social structural contexts.

3.4.2 Income-Level Heterogeneity Analysis

Household income level not only reflects the economic status of families but also serves as an important social determinant of mental health (Yuan et al., 2025). According to Social Capital Theory and Resource Substitution Theory, different income groups exhibit significant disparities in resource acquisition capacity, exposure to life stressors, and access to social support (Becker, 1993; Cao et al., 2022). Specifically, parents from low-income families often face greater life stress, economic insecurity, and scarcity of social support resources. Under such conditions, educational capital may play a stronger buffering role against psychological stress.

To examine the moderating effect of income level on the relationship between parental education and parental psychological stress, the sample was divided into “high-income” and “low-income” groups based on the median logged household income. Regression analyses were conducted separately for each group. The results are presented in **Table 3.6**.

Table 3.6: Income-Level Heterogeneity Analysis

Dependent Variable: Psychological Stress	High-Income Group	Low-Income Group
Highest Parental Education Level	-0.386**	-1.119***
	(0.172)	(0.226)
Household Income (log)	-0.300	0.105
	(0.366)	(0.237)
Gender (Male)	-0.111	-0.134
	(0.404)	(0.444)
Number of Parent–Child Conflicts	0.366***	0.457***
	(0.080)	(0.077)
Number of Heart-to-Heart Talks	-0.085***	-0.082**

	(0.031)	(0.034)
Educational Expenditure (log)	0.100	0.038
	(0.116)	(0.128)
Control Variables	YES	YES
Observations	4937	4939

Note: Standard errors are reported in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

The regression results for income heterogeneity show that the mitigating effect of parental education on psychological stress is more pronounced and statistically significant among the low-income group (β = -1.119, p<0.01), while in the high-income group, the effect remains negative but weaker and only marginally significant (β = -0.386, p<0.05). This differential effect further supports the core prediction of Resource Substitution Theory: namely, in families with relatively limited economic resources, educational capital as a non-economic resource plays a more critical buffering role against psychological stress (Becker, 1993).

Specifically, low-income parents, due to higher economic pressures and lower perceived security, are more vulnerable to external family conflicts and resource shortages. In this context, higher parental education may significantly reduce psychological stress by enhancing problem-solving abilities, improving social support network quality, and increasing psychological resilience (Cao et al., 2022; Li et al., 2025). In contrast, high-income families, by virtue of stronger economic buffering capacity and greater resource allocation flexibility, show a reduced marginal alleviating effect of education on psychological stress, which aligns with Social Capital Theory's assertion of resource substitutability (Lin, 2001).

Further analysis of control variables reveals that the number of parent–child conflicts shows a significant positive effect on psychological stress in both groups, with a slightly higher coefficient in the low-income group (High-income: β = 0.366, p<0.01; Low-income: β = 0.457, p<0.01), suggesting that economic stress may amplify the impact of family conflicts on parental psychological stress (He et al., 2025). Additionally, the number of heart-to-heart talks shows a significantly negative effect in both income groups, reflecting the consistent positive role of effective family communication on parental mental health across different income levels.

In summary, the income-level heterogeneity analysis further confirms the positive role of parental education in alleviating parental psychological stress, with a more pronounced effect observed in low-income groups. This finding suggests that mental health interventions should pay particular attention to promoting educational capital accumulation and strengthening psychological support systems for low-income families.

3.4.3 Gender Heterogeneity Analysis

Gender role theory and Social Capital Theory both suggest that gender, as an important social identity characteristic, influences individuals' mental health status and stress perception patterns (He et al., 2025; Cohen & Wills, 1985). Particularly in terms of family role division, social expectations, and psychological coping strategies, male and female parents exhibit significant differences in responding to stressors (Yuan et al., 2025).

To further explore the heterogeneity in the impact of parental education on parental psychological stress across different genders, this study conducted subgroup regressions based on the gender variable, examining the differential effects among male and female parents. This analysis not only helps reveal the moderating role of gender in the psychological stress generation mechanism but also has important practical significance for formulating more targeted mental health intervention policies. The regression results are shown in **Table 3.7**.

Table 3.7: Gender Heterogeneity Analysis

Dependent Variable: Psychological Stress	Male	Female
Highest Parental Education Level	-0.787***	-0.846***
	(0.197)	(0.209)
Household Income (log)	-0.120	-0.223
	(0.206)	(0.295)
Hukou Status (Agricultural = 1)	-1.005*	-0.256
	(0.523)	(0.588)
Number of Parent–Child Conflicts	0.364***	0.439***
	(0.072)	(0.088)
Number of Heart-to-Heart Talks	-0.077**	-0.085***
	(0.033)	(0.032)
Educational Expenditure (log)	-0.023	0.187
	(0.114)	(0.134)
Control Variables	YES	YES
Observations	5008	4868

Note: Standard errors are reported in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

The gender heterogeneity regression results indicate that the alleviating effect of parental education on parental psychological stress is significantly negative in both male and female parent groups, with both effects significant at the 1% level (Male: $\beta = -0.787$, $p<0.01$; Female: $\beta = -0.846$, $p<0.01$). The similar magnitude of the coefficients suggests that, regardless of gender, parental education—acting as both a form of social capital and cognitive resource—has a strong and universal buffering effect on psychological stress (Cao et al., 2022).

Although the main effect remains consistent across genders, differences in control variables deserve attention.

First, regarding hukou status, the stress-alleviating effect of agricultural hukou is more pronounced for male parents ($\beta = -1.005$, $p<0.1$) but not significant for female parents. This may reflect lower social expectation pressures among male parents with agricultural hukou, resulting in greater psychological benefits (Wu & Qiu, 2024).

Second, family interaction variables show stronger effects on psychological stress among female parents. The coefficient for the number of parent–child conflicts is higher for female parents (Male: $\beta = 0.364$, $p<0.01$; Female: $\beta = 0.439$, $p<0.01$), and the negative impact of the number of heart-to-heart talks is also more significant among female samples. This suggests that female parents are more emotionally sensitive to family interaction dynamics and more dependent on the quality of family communication for psychological well-being. This finding aligns with existing empirical research on gender differences in emotional regulation (Yuan et al., 2025; Cohen & Wills, 1985).

Additionally, the effect of educational expenditure on psychological stress remains statistically insignificant for both gender groups, indicating that short-term economic investments in education have limited direct impacts on parental psychological stress, with no evident gender-based differences.

In conclusion, the gender heterogeneity analysis confirms the universal stress-buffering effect of parental education across genders but also highlights differences in the influence pathways of other social structural and family interaction variables. This conclusion suggests that while reinforcing the educational promotion effect, mental health interventions and policy designs should pay close attention to the social role characteristics and psychological needs of parents from different genders.

4. Conclusion

Drawing on data from the 2022 China Family Panel Studies (CFPS), this study systematically investigates the impact mechanism of the highest parental education level on parental psychological stress, grounded in Social Capital Theory and Human Capital Theory. Moreover, the study conducts in-depth analyses of group heterogeneity across various socio-demographic dimensions. The main research conclusions are as follows:

First, the baseline regression results indicate a significant negative relationship between parental education level and parental psychological stress. Specifically, higher parental educational attainment is associated with lower levels of psychological stress among parents. This finding remains robust and consistent across different model specifications, alternative psychological stress measures, and multicollinearity control tests, thereby providing strong empirical support for the "resource-buffering effect" hypothesis within Social Capital Theory (Cohen & Wills, 1985; Cao et al., 2022).

Second, the heterogeneity analysis further reveals group-specific differences in the effect of parental education. In particular, the buffering effect of parental education on psychological stress is more pronounced among rural parents and parents from low-income households. This suggests that the mental health benefits of educational capital are more salient in resource-constrained contexts. From the perspective of Resource Substitution Theory (Becker, 1993), this finding enriches the social stratification explanation of the relationship between parental education and psychological stress. Additionally, the gender heterogeneity analysis shows that the negative effect of parental education on psychological stress is significant for both male and female parents, with comparable effect sizes, indicating a strong degree of gender universality.

Third, analysis of control variables highlights the significant role of family interaction quality in influencing parental psychological stress. Specifically, the frequency of parent–child conflicts is positively associated with psychological stress, while the number of heart-to-heart talks shows a significant negative relationship. This underscores the crucial role of family communication patterns in safeguarding parental mental health (Yuan et al., 2025).

In summary, this study not only verifies the buffering effect of parental education on parental psychological stress but also identifies the differentiated characteristics of this relationship across hukou status, income levels, and gender groups. The findings provide new empirical evidence for understanding the mechanisms linking social capital to mental health outcomes.

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