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Structural Characteristics of Family Educational Investment under Policy Reform: A Case Study of "Double Reduction" Policy in Inner Mongolia, China

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Abstract. Family educational investment refers to the allocation of financial, temporal, and emotional resources by families to support children's education and holistic development. This study examines the structural characteristics of family educational investment under China's "Double Reduction" policy through a mixed-methods approach, utilizing data from 5,967 families in Inner Mongolia. Findings indicate a general decline in such investments, with disparities based on family income and children's educational stages. Emotional investment is the most vital part of the educational production process. Mothers, particularly younger and more educated ones, assume a predominant role, while multi-child families face intensified burdens. The study identifies key patterns, including the reshaping of investment by educational anxiety, polarization of behaviors, and conflicts between family practices and teacher roles. Recommendations are proposed at family, school, and societal levels to optimize educational investments under the policy.

Keywords. "Double Reduction" policy; family education; family educational investment; structural characteristics; educational ecology

1 Introduction

Family education forms the foundation of individual socialization, significantly influencing cognitive, emotional, and social development. Beyond nurturing personal growth, it addresses gaps in educational resource distribution, fostering intergenerational mobility and societal advancement (Blanden & Macmillan, 2016). In China, education has long been viewed as a key pathway to social mobility and personal success, a notion deeply embedded in cultural traditions that drives families to invest heavily in their children's education, whether in terms of time, energy, or money (Hu et al., 2023). In recent years, family education in China has transformed from a complementary aspect of school education to an indispensable part of the cooperative system of family, school and society. This shift reflects society's emphasis on building a balanced educational ecosystem (Chen, Wu, & He, 2023). At the same time, however, gaps in family educational investment are gradually emerging, which not only reflects socio-economic inequalities, but also triggers important discussions about the equity and sustainability of education (Blanden, Doepke, & Stuhler, 2022).

With the development of society, the unequal distribution of educational resources has led to increased competition in education. Parents have been increasing their investment in extracurricular tutoring, private schools, and various educational products and services in order to give their children an edge in the fierce competition (Zhang, & Xie, 2016). This intensified competition in education has led to a trend of over-investment in education by families, creating a heavy financial burden for families and negatively affecting children's growth and mental health (Hu et al., 2023). Against this background, the Chinese government issued the Opinions on Further Reducing the Burden of Homework and the Burden of Out-of-School Training for Students in Compulsory Education (hereinafter referred to as the “Double Reduction” policy) on July 24, 2021, which aims to ease the pressure of competition in education.

The introduction of the policy reflects the government's emphasis on education equity and the all-round development of students, while also attempting to rationalize and balance family investment in education by restructuring the education ecosystem (Liu et al., 2024). By reducing unnecessary education expenditure, the policy encourages families to shift their investment to areas that pay more attention to their children's personalized development and interest cultivation, thus achieving long-term development of education and sustainable development of families. The implementation of the “Double Reduction” policy has had a profound impact on families' investment in education, with studies showing that family education expenditures and parental time investment have been reduced by about 15% after the policy's implementation, and that the physical and mental health indicators of both students and parents have improved significantly (Meng et al., 2024). Some scholars point out that the policy change has driven market size and restructuring, and service providers have adopted strategies such as business transformation and model innovation to reduce the financial pressure on families by reducing extracurricular tutoring expenditures (Zhou, 2023).

However, the effectiveness of the policy in achieving its intended goals can vary, depending on the wider educational and socio-economic context (Bellei & Munoz, 2023), and it has also had unintended consequences. During the promotion of the “Double Reduction” policy, one study found that the overall emotional disposition of the public in the discussion of the policy on the microblogging platform was negative (Hu, 2022). Parents' educational anxiety has changed, and school selection anxiety has been alleviated, but parents' anxiety about their children's academic performance and future education has not been reduced, and even a new anxiety has emerged, which focuses on whether their children can achieve social class mobility through education, and although the market of out-of-school training institutions has been gradually standardized, some parents still insist on seeking off-school subject training for their children (Zhang et al., 2023).

The demand for some training has gone underground, training prices have risen, and the delisting or transformation of subject-based out-of-school training institutions has disrupted the traditional way of investing in family education, and there has been a shift in the structure and type of investment in family education (Yang et al., 2023). The reduction of students' study time in school has led to an increase in extracurricular study time, which in turn has increased parental investment in tutoring their children's studies, exacerbating the fragmentation of family educational investment and student achievement, as well as the polarization of student achievement within classes and grades (Zhang & Wang, 2022). These studies have shown that the “Double Reduction” policy, while reducing the burden on students, has also brought about profound changes in the market and investment patterns of family education and inequality in educational outcomes (Wu & Ming, 2023).

Against this policy context, we are compelled to think deeply about whether this policy really reduces the financial burden on families. How does it affect parents' time and emotional investment, and is there any heterogeneity? What is the specific utility of the dimensions of family educational investment in the educational production process? Are there emerging trends in investment? How do the structural characteristics of family educational investment reflect and influence the balance of the educational ecosystem? An exploration of these questions will help to reveal the specific impact of policy changes on family education practices and how these changes relate to the goals of educational equity and social progress.

Family educational investment refers to the cumulative allocation of financial, time, and emotional resources by parents to support their children's education and all-round development. This investment includes both tangible investments (e.g., monetary expenditures) and intangible contributions (e.g., parental involvement and emotional investment) (Cai, 2022). Existing research has emphasized the dual role of family educational investment as a consumption and investment behavior (Zhao et al., 2023). While economically advantaged families tend to allocate more resources to promote intergenerational privilege, non-financial investments such as emotional support and parental involvement are equally critical in shaping children's socio-emotional development and academic outcomes (Li et al., 2023). Yet, much of the existing literature disproportionately emphasizes economic investment, often neglecting the structural integration of temporal and emotional contributions (Cai, 2022).

The theory of educational ecology provides a comprehensive framework for examining the intricate interactions between the educational system and its surrounding environment. The theory emphasizes the dynamic interplay of family, school, and social factors in shaping learners' educational outcomes, experiences, and opportunities (Tong & An, 2024). From this ecological perspective, the family plays a key role as the primary microsystem that directly influences children's educational trajectories. Families contribute to these trajectories by allocating resources, both physical (e.g., access to books, technology, and financial support) and emotional (e.g., encouragement, parental involvement, and support for learning). In addition, Bronfenbrenner (1979) emphasized the interconnectedness of these systems, whereby family dynamics often interact with broader systems such as school and societal expectations to collectively shape children's learning environments and long-term academic development.

This theory highlights the importance of considering the broader social context of educational investment. Socio-economic factors have a significant impact on family investment patterns in education, with high-income families tending to have more resources to allocate to their children's education (Hjalmarsson, 2023). Conversely, low-income families face economic constraints that limit their educational investments and exacerbate educational disparities (Sabbagh & Walther, 2022). Furthermore, parents' own educational background, which determines their expectations and practices in education, plays a pivotal role in influencing how families invest in education (Lai et al., 2022). More educated parents tend to adopt more participatory and emotionally supportive parenting styles, which in turn positively influence the educational outcomes of their children (Chawla et al., 2022; Kardash et al., 2023).

Apart from family income and parents' educational background, other demographic properties work together to form a complex mechanism of influence on family investment in education. Cai (2022) pointed out that young parents pay more attention to education and tend to actively participate in their children's education, while older parents rely on traditional ways. Meanwhile, ethnic cultural backgrounds and economic conditions limit the financial investment in education of certain ethnic groups, reflecting the influence of cultural values on the importance attached to education (Kafka, 2024). An increase in the number of children in a

family, especially in low-income families, tends to result in less investment in education per child. In addition, as children move up to higher education, family education expenditures increase significantly in response to the pressure to move up to higher education (Jackson et al., 2015). These findings suggest that family investment in education is a multidimensional and multilevel phenomenon that requires comprehensive consideration of various sociocultural and economic factors.

The impact of family educational investment on actual educational outcomes is multidimensional, involving multiple dimensions such as time, money, and emotions. According to the Chinese Family Panel Survey (CFPS) published by Peking University, parental investment, both in terms of time and money, has a significant positive impact on children's academic performance in all subjects. Parenting styles are also crucial, with authoritative, tolerant and authoritarian parenting styles having a greater impact on children's academic performance than neglectful parenting styles, with authoritative parenting styles having a particularly significant effect (Xie & Hu, 2014). However, excessive investment in education may lead to increased academic stress, which may be detrimental to academic achievement. Parental investment in time and energy is a major factor influencing children's academic development compared to financial investment (Zhang, H. et al., 2023).

Additionally, investment of time in family education had a positive effect on adolescents' achievement, especially social capital and cultural capital within the family and extracurricular tutoring on weekends, while extracurricular tutoring on weekdays had a significant negative effect. Parental involvement and daily communication, especially by mothers, had a significant effect on improving children's overall achievement and math scores (Li & He, 2022). Some researchers emphasized the significant enhancing effect of parental expectations on children's academic achievement, which is much greater than other dimensions of family education (Lai et al., 2020), but some scholars found that educational expectations are not more than enough, and that either too high or too low parental expectations of their children's education negatively affects their children's academic achievement (Li & Liu, 2022). These findings suggest that family educational investment is a complex phenomenon that requires comprehensive consideration of various factors in order to achieve optimal educational outcomes. Some studies have also paid attention to the changes in the educational investment of some groups and regions in the context of the "Double Reduction" policy. In rural areas, the educational ecology is being reconstructed, rural schools are faced with the dilemma of after-school services and practice strategies, and the educational problems and solution strategies of rural left-behind children in the context of the "Double Reduction" have also been explored in depth (Mo et al., 2023). A study has deeply analyzed the implementation effect, causes and development of this policy in rural areas, and found that there is a lack of collaborative education among rural families, schools and communities. The impact of the policy on family dynamics is particularly complex in rural and semi-rural areas where educational resources are scarce (Xue et al., 2021). As a result, there are still many gaps in research on educational equalization in semi-rural areas due to the "Double Reduction" policy, especially for special groups and specific areas.

In recent years, scholars have highlighted the challenges faced by education in rural counties, where parents prioritize social class mobility and invest in higher quality educational resources. This has led to increased academic competition and an exodus of students, resulting in the decline of the local educational ecology (Yu et al., 2024). Consequently, the public's basic educational needs remain unmet and an unhealthy educational environment has emerged, highlighted by regional, hierarchical and structural imbalances. These factors have negatively

impacted the structure of family educational investment (Pribesh et al., 2021). Hanggin Banner is one of the underdeveloped counties in Ordos City, Inner Mongolia, known for its grassland culture and ethnic diversity. Because of its unique socioeconomic and cultural characteristics reflecting the intersection of rural and semi-urban educational dynamics, focusing on this region as a research priority is particularly typical and provides a representative context for exploring the structural changes in family educational investment under the “Double Reduction” policy, especially in a region that is resource-constrained and uniquely challenged by educational reforms, making it an ideal target for studying differences in responses to policy reforms across regions.

Despite the large amount of research on family educational investment, however, existing studies have focused primarily on a single dimension of it (N Zhao et al., 2023). The impact of the “Double Reduction” policy on families' overall educational investment and its structural characteristics have yet to be fully and comprehensively explored. Studies combining financial, temporal, and emotional multidimensional integration of family educational investment impact sets are still lacking, ignoring the interplay of multidimensional factors in the broader educational ecology, in addition to gaps in the impact of the dimensions of family educational investment on the actual educational production outcomes, especially in semi-rural areas subject to policy interventions.

By adopting a multidimensional analytical framework, this study fills a gap in the existing literature. It aims to expand the multiple dimensional perspective of family educational investment by drawing on the theory of educational ecosystems and adopting a mixed research methodology to conduct an in-depth study of the current status of family educational investment in Hanggin Banner, with the aim to capture the nuanced impacts of the “Double Reduction” policy on family educational investment. It provides new insights and comprehensive data to enhance the understanding of the complexities of family educational investment in the context of both regional differences and cultural variations. The findings of the study contribute to the evaluation of the “Double Reduction” policy, provide a comprehensive understanding of the changing financial, temporal and emotional investments in the educational environment, and offer practical recommendations for the establishment of a quality educational ecosystem.

2 Methodology

2.1 Research Design and Sample

In order to follow the positivist paradigm, this study employed mixed-methods approach which integrates quantitative surveys with qualitative interviews to analyze family educational investment in Hanggin Banner, Inner Mongolia. Stratified random sampling ensured representation in the quantitative phase, while purposive sampling enriched qualitative insights.

According to National Bureau of Statistics of China, a 10% sample of 6,242 families was surveyed, yielding 5,967 valid responses, representing diverse demographics. Additionally, 31 semi-structured interviews provided qualitative depth, capturing nuanced perspectives across family, school, and administrative roles. The selection of quantitative sample ensured that each family had an equal probability of being selected, minimizing selection bias and enhancing the generalizability of the findings. The selection of qualitative sample provide a comprehensive range of perspectives on the impacts of the “Double Reduction” policy on family educational investment. The selection process utilized stratified and random sampling to ensure that respondents represented various demographics and roles relevant to the study.

2.2 Research Instrument

For the quantitative component, a structured questionnaire was developed based on the previous study, which includes two main sections, the first section is demographic which includes parents' age, gender, educational background, family income, family structure, etc. The second section is consisted of Five-point likert scales which focused on three key dimensions of family educational investment. For the qualitative component, an interviews synopsis was designed to facilitate semi-structured interviews which was tailored to explore participants' perceptions, behaviors, and experiences regarding family educational investment. Open-ended questions were used to encourage detailed responses and to allow participants to share their unique perspectives (Weller et al., 2018). After conducting a pilot study, questionnaire's reliability (Cronbach's Alpha = 0.844) and validity (KMO > 0.7) were confirmed. For qualitative data, independent and repeated coding yielded reliability scores above 94%. Pretesting ensured both instruments' clarity and relevance. The results indicated strong internal consistency and demonstrated the instrument's suitability for accurately capturing the constructs. The integration of these instruments ensured a comprehensive understanding of the structural characteristics of family educational investment and the nuanced impacts of the "Double Reduction" policy.

2.3 Data Analysis

For the quantitative data, descriptive statistical analysis was analyzed using SPSS26.0 to summarize the demographic characteristics of the participants and the overall trends in family educational investment. Additionally, correlation and regression analyses were conducted to explore relationships between variables. These statistical techniques allowed for the identification of key factors influencing financial, temporal, and emotional investments.

The qualitative data, which generated approximately 190,000 transcribed words, offered detailed insights into individual and institutional experiences. Thematic analysis was performed using NVivo11 software according to rooted theory. The study followed a three-step coding process(as Table 1 shows)(Naeem et al., 2023). Open coding flexibly applies the coding rules to ensure that the interview data are accurately condensed. Axial coding builds on open coding, analyzes the relationship between the open coded categories, fully considers the set of influences on family educational investment, and forms the secondary categories. Selective coding is based on open coding and major-axis coding, establishes the core categories of the structural characteristics of family educational investment, and condenses and summarizes the main categories. This approach ensured a structured and systematic exploration of participants' experiences and perceptions, providing deeper insights into the dynamics of family educational investment—the integration of these two analyses allowed for a comprehensive examination of the research questions.

Table 1 Example of a three-level code for“New Educational Anxiety and Its Impact on the Structure of Family Educational Investment”

Original interview data	Open coding	Axial Coding	Selective Coding
There is less homework after the “Double Reduction”, I worry about whether my child's knowledge is solid or not. There used to be some homework and now	Less homework creates anxiety	●Policy Impact	

suddenly there is none which makes me anxious..

Nowadays, the entrance exams of secondary and high schools are all based on a score system, and the academic burden is reduced all of a sudden after the Double Reduction, which makes us at a loss as to what to do, and there are many parents in the class who have a similar feeling and are also quite anxious.

Parents will blindly compare themselves with each other, and when extracurricular tuition used to be an imposition, we would tell our children that you have to go to tuition, otherwise how can you compete with other children.

Nowadays, there are too many different kinds of interest classes, other children learn more, while my child learns less, and I often wonder if my child learns too little. In this process I actually considered the child's physical and mental health, so I enroll him in fewer, but there is still a conflict in my heart.

Educational Testing System Creates Anxiety for Parents in Lower Grades

Blind Comparisons Between Parents Spawn Anxiety

Social comparisons cause parents to worry about the amount of learning their children are doing and create internal conflicts

●System Adaptation New Educational Comparison Among Parents Anxiety and Its Impact on the Structure of Family
●Parental Internal Conflict Family Educational Complexity of Parental Investment Decision Making

3 Findings

3.1 Overview of Respondents

The study surveyed 6,242 families and achieved 5,967 valid responses, representing a recovery rate of 95.6%. Respondents were evenly distributed across various towns and villages within Hanggin Banner, ensuring diverse geographic representation.

The majority of participants were female (75.15%), while male respondents accounted for 24.85%. Regarding age distribution, 46.76% of respondents were between 31 to 40 years old, 42.58% were 41 to 50 years old, 6.33% were 51 to 60 years old, and only 4.32% were aged 20 to 30. Among all the respondents, 82.7% were ethnic Han and 17.3% were ethnic Mongolian and other minorities.

In terms of educational background, 41.8% of respondents had completed secondary school, followed by 24.22% with primary education and 10.96% with high school education. Higher education levels including college (10.19%), graduate (11.8%), and postgraduate degrees (0.35%), were less common.

The occupational distribution of respondents was varied:

- **Self-employed individuals** accounted for 38.81%,
- **Workers and farmers** represented 26.29%,
- **Professionals** comprised 10.66%,
- **State staff** made up 5.46%,
- **Other categories** constituted the remaining proportion.

This diverse demographic profile provided a robust basis for analyzing family educational investment under the Double Reduction policy, ensuring the results reflected a broad spectrum of socio-economic, educational, and geographic contexts.

3.2 Status of Family Educational Investment

3.2.1 Financial Investment

Data revealed significant changes in family financial investment in education following the implementation of the Double Reduction policy. Before the policy, 59.8% of parents reported that their children’s educational expenses accounted for more than half of the total household consumption. After the policy, 43.24% of parents stated that their financial investment in education had decreased, significantly reducing the financial burden on families. One respondent shared, *“It has changed a lot. It used to be nearly 10,000 yuan per semester. But now it is only about 2,000 yuan.”* *“The most obvious change is that he participates in less extracurricular tutoring, and our financial burden is definitely less than before.”* (JZ-F10)

Parents categorized family educational investment into two types:

1. **Compulsory Financial Investment** – Essential expenditures required for education.
2. **Flexible Financial Investment** – Optional expenses that vary according to a family’s economic situation.

As shown in Table 2, there is a notable positive correlation between total family educational investment and compulsory financial investment, indicating that the latter serves as the foundation of educational expenditure.

Since the implementation of the policy, families have saved considerably on academic tutoring costs. A parent commented, *“Now there is significantly less financial investment. I used to spend a lot on make-up classes, but now I don’t. Currently, apart from school tuition fees, which are minimal, there are no additional costs.”*(JZ-M19)

These findings demonstrate the significant impact of the Double Reduction policy, effectively alleviating financial pressure on families.

Table 2 Correlation Analysis of Financial Investment in Family Education

Type of financial investment	Financial investment
Flexible financial investment	0.770**
Compulsory financial investment	0.877**

As shown in Table 3, families with higher income invest more in education. The higher the annual family income is, the more parents are inclined to provide their children with more abundant educational resources.

Compulsory financial investment including tuition and miscellaneous fees, accommodation fees, food expenses and school choice fees are significantly positively correlated with annual family income. There is also a similar situation in flexible financial investment. Parents believe that spending more on extracurricular reading materials, general school supplies, and electronic school supplies can improve children's reading ability and comprehensive literacy. The expenditure of bonuses and gifts to encourage the enthusiasm of learning can help to awaken the enthusiasm and initiative of children. In short, parents with higher annual income pay more attention to improving their children's comprehensive quality and intrinsic motivation for learning in family education funds.

Table 3 One-Way Analysis of Variance for Annual Family Income

	B1: Annual family income (average value ± standard deviation)			F□	p□
	1.0(n=438)	2.0(n=139)	3.0(n=18)		
Financial investment	1.60±0.36	1.65±0.38	1.66±0.44	10.334	0.000* *
Tuition and miscellaneous fees	1.94±1.06	1.83±0.99	1.95±1.08	6.644	0.001* *
Accommodation fees	1.34±0.57	1.28±0.54	1.26±0.58	7.731	0.000* *
Food expenses	1.69±0.72	1.58±0.68	1.56±0.70	13.650	0.000* *
School choice fees	1.21±0.47	1.18±0.45	1.14±0.42	3.994	0.018*
Extracurricular reading materials	1.75±0.56	1.84±0.57	1.83±0.76	13.157	0.000* *
General school supplies	1.75±0.49	1.83±0.47	1.79±0.57	13.726	0.000* *
Electronic school supplies	1.51±0.63	1.64±0.69	1.69±0.88	27.784	0.000* *
Wear glasses and protect eyesight	1.53±0.72	1.63±0.79	1.57±0.83	9.727	0.000* *
Off-campus training classes or learning interest classes	1.54±0.89	1.81±1.06	1.87±1.24	51.360	0.000* *
Bonuses and gift payments to encourage children to learn proactively	1.50±0.54	1.61±0.58	1.64±0.69	25.080	0.000* *
Insurance premiums arising from education	1.37±0.56	1.42±0.59	1.42±0.63	4.814	0.008* *
Go for a trip	1.50±0.76	1.97±1.06	2.16±1.39	192.05	0.000* *

* $p < .05$, ** $p < .01$

3.2.2 Temporal Investment

Before the policy, family temporal investment was mainly used to tutor children in their studies and to transport their children to various tutoring classes. After the policy, the structure of family education temporal investment has changed. With the development of after-school services, parent-child communication, parent-child reading and playing sports occupy most of parents' time. A parent shared, "When the child comes back, he has little written homework, so there is less time for tutoring and more time left for reading. We always read together. He reads by himself, I read by myself, and then we communicate with each other." (JZ-F03)

The average amount of time parents spend directly on their children every day includes the following four aspects: taking care of their children's daily lives, tutoring, playing, and communicating. Among them, the temporal investment in family education is mainly based on

taking care of children's daily life, but the distribution of temporal investment is not balanced in terms of parent's age, gender, education background and child's level of education. As shown in Table 4, the younger the parents are, the more time they tend to spend. Female parents invest longer time than males in education. Educational attainment has a significantly negative affect that parents with higher education backgrounds invest less time. As the grades increase, the time children spent in school increases, so the time parents spend with their children decreases, and the degree of involvement of parents in the learning process also decreases as the academic difficulty increases.

Table 4 Correlation Analysis of Temporal Family Educational Investment

	Time investment
Parent's age	-0.089**
Parent's gender	0.062**
Parent's education background	-0.048**
Child's level of education	-0.100**

* $p < .05$, ** $p < .01$

3.2.3 Emotional Investment

Firstly, the implementation of the Double Reduction policy has changed the emotional family educational investment that parents pay more attention to the emotional experience of their children's daily life. In the case of Hanggin Banner, the parent-child interaction forms are reading, learning, playing or playing sports, and heart-to-heart communication, which shows a trend of economical low cost.

Secondly, after the policy, a large number of parents pay more attention to the physical and mental health and all-round development of their children, which has changed the traditional concept of family education to a certain extent. Some parents shared, *"I think 'Double Reduction' policy actually has a great impact on me. I used to be more strict with her, and I would also pay attention to her grades, but now through the guidance of the teacher, slowly I am not only staring at her learning, and my mind is calmer. Just let nature take its course. The most important thing is for the healthy and happy growth of the child."* (JZ-F05) It can be seen that the focus of emotional investment in family education is towards a more gentle inner mental change for children.

Thirdly, as shown in Table 5, females are more emotionally invested in their children's education, while parents who are younger and more educated pay more attention to emotional investment in education. Parents with higher educational expectations are more emotionally engaged. The more democratic the parenting model, the more emotionally invested they are. Parents who are more democratic are more willing to communicate emotionally with their children, while parents who are authoritarian, doting, and neglectful are difficult to emotionally resonate with their children. Parent's cognition of education's importance significantly affects the level of emotional engagement indicates that parents who pay more attention to education have more emotional investment.

Table 5 Correlation Analysis of Emotional Family Educational Investment

	Emotional investment in family education
Parent's gender	0.082**
Parent's age	-0.099**
Parent's education background	0.185**
Parenting model	-0.181**
Educational expectation	0.236**
Parent's cognition of education's importance	0.229**

* $p < .05$, ** $p < .01$

3.2.4 Family educational investment dimensions and demographic properties

As shown in Table 6, based on the above internal structural analysis of family educational investment, it was found that family demographic attributes all impact family educational investment, so correlation analysis was used to test the internal characteristics of family demographic properties affecting family educational investment dimensions.

According to the correlation coefficients of the independent variables, the research has further found :

- Age is negatively correlated with all three dimensions, indicating that as parents grow older, their combined investment in education decreases. This may be due to the fact that parents may have less energy and available time as they age and may need to make financial plans for retirement or other living expenses, which may also affect their financial investment in education.
- Gender is positively associated with both TEM and EMO, with mothers investing more positively in their children's education in terms of time and emotion.
- Ethnicity is positively correlated with FIN and negatively correlated with TEM and EMO, suggesting that Han ethnic parents are more inclined to make financial investments, while Mongolians and other ethnic minorities are more inclined to make time and emotional investments. This difference may stem from the different understanding and practice of educational values and methods among different ethnic groups. Some ethnic minorities place more emphasis on family education and children's emotional development, which is reflected in their greater willingness to invest time and energy in nurturing their children, while the cultural influence of ethnic regions on the balanced development of education in turn shapes parental decision-making on educational investment(Hughes & Francis, 2022).
- Educational background is positively correlated with FIN and EMO and negatively correlated with TEM, suggesting that families with higher educational backgrounds focus more on financial and emotional investment and relatively less on time investment. This may be due to the fact that parents with high educational background are more inclined to support their children by providing high quality learning resources and environments rather than simply increasing the time spent with them. They are busy and have limited time, bHughes, D. L., & Francis, T. E. (2022)ut are aware of the long-term value of education and are therefore more willing to invest financially and emotionally to ensure better educational opportunities and resources for their children. These families have wider social networks and are able to support their children's education through other means.
- Occupation is negatively correlated with EMO and positively correlated with TEM, showing that high social status parents place more emphasis on education and invest more emotionally but less time due to their busy schedules. They express their emotions by providing resources and support rather than only relying on time spent with them. This reflects differences in family

education strategies across socio-economic backgrounds, with parents optimizing their educational investment based on resources and time, and tending to ensure that their children have access to high quality educational resources.

- Learning stage is positively correlated with FIN and negatively correlated with TEM and EMO, showing that families increase their financial commitment and decrease their time and emotional commitment as they progress deeper into learning. This is related to parental expectations, resource allocation, and they may be more willing to provide financial support for their children. As children become more independent, parents may focus more on fostering independent learning skills and less on direct involvement, resulting in lower time and emotional investment.

- Annual family income is positively correlated with both FIN and EMO, indicating that families with higher family incomes invest more financially and emotionally in education.

Table 6 Correlation analysis of family educational investment dimensions and demographic

	Age	Gender	Ethnic	Education Background	Occupation	Learning stage	Annual family income	FIN	TEM	EMO	CFA
Age	-										
Gender	.164*	-									
Ethnic	0.024	.028*	-								
Education Background	.211*	.026*	.054*	-							
Occupation	.069*	.079*	-.026*	-.554**	-						
Learning Stage	.080*	.060*	.334*	-.064**	.033*	-					
Annual family income	.063*	0.015	.027*	.250**	.211**	-0.006	-				
FIN	.054*	0.001	.031*	.030*	0.014	.154**	.063**	-			

TEM	-	.06	-						.23		
	.08	2*	.02	-.048**	.065	-	0.006		5*		
	9*	*	7*		**	.100**			*		
	*										
EMO	-	.08	-						.08	.32	
	.09	2*	.04	.185**	-	-	.113**		2*	9*	
	9*	*	3*		**	.167**			*	*	
	*		*								
CAA	.08	-	0.0						-	.03	.04
	2*	.06	14	-.079**	.046	0.004	0.005		0.0	1*	3*
	*	*			**				24	*	*
		*									

Notes: FIN: Financial Investment; TEM: Temporal Investment; EMO: Emotional Investment; CAA: Children's Academic Achievement

3.3 Family Educational Investment and Children's Academic Achievement

This study also discusses the relationship between the dimensions of family educational investment and children's academic achievement, aiming to clarify the actual utility of various forms of investment in children's education. Linear regression analyses were conducted to investigate the effects of each dimension (FIN, TEM, EMO) on children's academic achievement (CAA). As shown in Table 7, in terms of the overall model fit, the F-value is 6.33 and the corresponding p-value is less than 0.05 (0.0003), which indicates that the overall regression model is significant and there is a significant relationship between at least one of the independent variables and the dependent variable.

The results show that financial family educational investment has a significant negative effect on children's academic achievement. It suggests that higher family financial investment may not necessarily improve children's academic achievement directly and that there may be a complex role of educational resource allocation or other influencing factors. Emotional family educational investment has a significant positive effect on children's academic achievement which indicates that parents' emotional support is an important factor in shaping children's development. The effect of temporal family educational investment on children's academic achievement is positive, but the p-value is 0.069, which is close to the commonly used level of significance, which means that although it may contribute to the improvement of children's academic performance, it is not statistically significant at the 0.05 level of significance.

Table 7 Linear regression of Family Educational Investment and Students' Academic Achievement

Number of obs	F(3, 5963)	Prob > F	R-squared	Root MSE		
5,967	6.33	0.0003	0.0032	.72227		
Robust						
CAA	Coefficient	std. err.	t	P> t	[95% conf. interval]	VIF
FIN	-.0661781	.0270599	-2.45	0.014	-.1192253 -.0131309	1.059
TEM	.0344034	.0189146	1.82	0.069	-.002676 .0714828	1.179
EMO	.0526835	.0191594	2.75	0.006	.0151242 .0902428	1.122
cons	2.196112	.0598706	36.68	0.000	2.078744 2.31348	

3.4 Structural Characteristics of Family Educational Investment

3.4.1 New Educational Anxiety and Its Impact on the Structure of Family Educational Investment

Since the implementation of the “Double Reduction” policy, positive results have been observed, but new forms of educational anxiety have also emerged. This anxiety manifests in several ways:

1. **Traditional Education Concepts and Policy Tension:** For parents born in the 1970s and 1980s, traditional education was based on the idea that children should attend school during the day, listen to lessons, and then return home to complete homework to reinforce what they learned. The “Double Reduction” policy, which emphasizes reducing homework or eliminating it entirely, has left many parents uncertain about their children's learning progress, contributing to new educational anxiety. As one parent explained, *“I feel that the policy is good for promoting all-round development, but if teachers don't assign any homework, I feel anxious. For years, traditional thinking has told us that school should involve homework.”* (JZ-M06) This anxiety has led many parents to invest in additional educational resources including teaching materials, practice books, and online courses, which has increased flexible financial investment. These parents are mostly aimed at relieving educational anxiety, which forms a hidden resistance to the implementation of “Double Reduction”.

2. **Anxiety About Entrance Examinations:** Despite the policy's goal of reducing academic burden, anxiety surrounding entrance exams for secondary and high school remains prevalent. The competitive nature of the admissions system causes parents to worry about their children's academic performance. This has resulted in a form of emotional investment focused on outcomes rather than holistic development, with many parents prioritizing academic results over their children's overall well-being. One parent noted, *“As a parent, we always want our child to learn more, which is tied to the education system. It's a mindset that's been ingrained over many years. It's about the fear of my child being left behind.”* (JZ-M06)

3. **Educational Competition and Blind Comparison:** The intensification of educational competition has led parents to compare their children's academic performance with those of other families. This competitive mindset drives parents to invest increasingly in their children's education to maintain their competitiveness, often leading to a cycle of escalating educational investments. As one parent observed, *“After the ‘Double Reduction’ policy, if parents can afford it, they will invest more in their children's education. The policy is not only a test of the teachers' abilities but also a test of parents' educational methods and philosophies.”* (JZ-F05) Another parent added, *“Actually, my children attend few out-of-school training courses, while other children almost attend all of them. In fact, I am quite anxious about this. I think there is an inevitable relationship between the financial investment and the growth of children.”* (JZ-F12)

3.4.2 Polarization in Family Educational Investment Behavior

The study found that family educational investment exhibits a polarization trend under the Double Reduction policy. As one teacher explained, *“The biggest issue is with students who fall behind. Their parents are either too busy with work or have different educational concepts. Since school time is now extended, these children are often left without proper guidance at home.”* (JS-F01)

The result indicates that there are characteristics of intergenerational transmission and advantage transfer in family educational investment, and parents with better educational background and more advantageous occupations pay attention to updating the concept of family education, and the communication with their children is more democratic. They pay attention

to cultivating children's interests and all-round development. The family educational investment in this group is more rational, and the motivation to replace compensatory education is weak. In contrast, parents with worse educational background have insufficient advantages, and they often continue to rely on traditional educational practices and are lack time to invest in their children's education.

3.4.3 The Growing Influence of Mothers in Family Educational Investment

The research indicates that mothers, particularly those with lower education levels, are the primary contributors of time and emotional investment in their children's education. In contrast, only 24.9% of fathers actively participate in family educational activities. The phenomenon of "motherhood" in family education reflects the disproportionate time, energy, and childcare responsibilities that mothers assume in order to ensure their children's success. One father noted, *"I don't spend most of my time on my children's education because I also have my own job. I allocate time reasonably between work and family education."* (JZ-M01)

Mothers confirmed this, with one stating, *"Since my husband is self-employed, I am mainly responsible for accompanying and educating the child. As a teacher, I'm very busy at work, and by the time I get home, I'm often exhausted taking care of my children."* (JZ-F03) The phenomenon of motherhood is not an isolated case, which not only shows the status of women in the family, but also shows that mothers are more actively involved in their children's education, and gradually become the protagonists in the competition of family educational investment, paying far more time and emotional investment than fathers' education. At the same time, the imbalance of the subjectivity of family educational investment has caused a space-time squeezing on the development needs of female parents themselves.

In exploring the issue of the distribution of childcare responsibilities in the family, one mother said, with disappointment, *"The children's father is very elegant. He's never been in charge. He did but not on principle. This is the case in most families, ours is a widowed style of marriage. He is unprincipled and spoiled if you let him educate them. Instead of this, it is better not to let him involved in."* (JZ-F07) This reveals the absence of the father in the family, not only physically, but also emotionally and responsibly. This widowed style of marriage suggests a family dynamic in which the role of the father is marginalized and the mother takes on the majority of household and childcare responsibilities. It suggests a gender bias in the allocation of childcare responsibilities in society, which tends to default to the mother's job. This discussion is critical to understanding how family dynamics, gender roles, and parenting responsibilities play out in different families.

3.4.4 The Increasing Burden of Multi-Child Family Educational Investment

Families with multiple children face greater challenges in terms of financial, time, and emotional investment. Financially, parents with more than one child often experience a significant economic burden, especially if the children have multiple extracurricular interests.

As one parent explained frankly, *"The investment in education is a considerable part of our family's expenses. We have two children, and both need to attend out-of-school tutoring. The costs add up quickly, but we feel it's essential for their future."* (JZ-F08)

Additionally, parents of multiple children often face time and emotional investment challenges, struggling to balance their attention between siblings. One parent mentioned, *"After having the second child, I felt my energy was divided. I could no longer devote all my attention to the older one as I did before."* (JZ-F02) Another added, *"I realize the impact on both children's psychology. I started paying more attention to the older one because the younger one spends a lot of time with me."* (JZ-F09) This reflects the inevitable interplay between time and emotional investment and the inseparability of the internal structure of education

investment in multi-child families, where the needs of each child often create conflicting demands on the parents. Most parents believed that temporal investment is accompanied by emotional dedication, and emotional investment consumes time at the same time.

3.4.5 Contradictions Between Family Educational Investor and Teacher Identity

Teachers in Hanggin Banner face a unique challenge as they hold dual identities—both as parents and educators. Of the 2,069 teachers in the area, 1,235 have children in the compulsory education stage, making up 59.7% of the teaching staff. As both key figures in family educational investment and school education, these teachers are under significant pressure. Not only do they need to improve the quality of education, but they also must participate in after-school services to meet students' diverse learning needs.

Given the extended school hours, teachers often struggle to balance their professional responsibilities with the time and emotional investment required for their own children's education. One teacher-parent stated, *"I have no time to spend with my children except on Sundays because I leave early for work and return late after the after-school services."* (JS-F01) Another added, *"I'm also a teacher and very busy at work, so when I get home, I'm too tired to take care of my children."* (JZ-F15) The dual role of teacher and parent highlights the contradiction between the demands of work and the need for emotional and temporal investment in family education, leading to a potential imbalance in the ability to meet both professional and familial obligations.

4 Discussion

1. Consistent with previous research, the general decline in financial investment suggests that the policy has been successful in reducing the financial pressure on families, consistent with the government's goal of promoting educational equity (Zhou, 2023). This alleviated financial burden is particularly important for low-income families, providing them with more opportunities to invest in other areas of their children's development. We found that family socioeconomic status significantly influences education investment patterns, with higher-income families more inclined to invest more resources in their children's education, which is consistent with the key role of economic capital in shaping educational opportunities and outcomes (Zhang M et al., 2023). However, our study further emphasizes the multifaceted nature of family investment in education, which includes not only financial but also temporal and emotional investments, which contrasts with previous studies that have overemphasized financial investment (Cai, 2022). Our findings highlight the importance of structural integration of temporal and emotional contributions, which are equally critical in shaping children's socio-emotional development and academic achievement (Li et al., 2023).

2. This study is in line with previous research confirming that demographic properties have a significant effect on household investment in education. Similar to Hjalmarsson's (2023) study, we find that family income is a key factor in educational investment, and that higher-income families are more likely to invest more resources in their children's education, consistent with the central role of economic capital in educational opportunities and outcomes. At the same time, we support the idea that parental education level has a significant impact on investment patterns, with parents with higher levels of education more likely to adopt participatory and emotionally supportive parenting styles that positively impact children's educational outcomes (Chawla et al., 2022; Kardash et al., 2023). Our study also uncovers some understudied demographic properties such as the significant impact of parental gender, age, and family structure on educational investment, particularly the dominant role of younger and better educated mothers in educational investment (C Ling, 2022).

3. Moreover, we reveal the impact of ethnicity and family size on educational investment, with ethnic Han families favoring economic investment, while ethnic Mongolian and other ethnic minority families are more inclined to time and emotional investment, adding a new dimension to understanding how demographic attributes affect educational investment in different cultural contexts. We also discovered that families with multiple children face greater challenges in terms of economic, time, and emotional investments, a finding that provides new perspectives on understanding the dynamics of family investment in education. Overall, our study extends existing research by shedding light on the impact of income, parental education, and newly discovered demographic properties on families' educational investment, as well as the complex interactions between these factors and educational outcomes, providing a deeper understanding of educational equity and policymaking.

4. This study provides new insights into the relationship between family educational investment and academic achievement in the context of the “Double Reduction” policy, revealing the impact of economic, temporal, and emotional investments on children's academic achievement. Our findings are aligned with previous research confirming the significant impact of family educational investment on academic achievement and emphasizing that economic investment does not always translate linearly into academic achievement but needs to be allocated efficiently to produce positive outcomes (Xue & Li, 2024). However, our study also identified differences from previous research. In particular, we found no significant effect of time investment on academic achievement, which contrasts with research that typically emphasizes the positive role of spending time on children's education. Our findings suggest that the quality, rather than the quantity, of temporal investment may be more influential on academic success, a nuance that has been less addressed in previous research. This integrative approach provides a more comprehensive view of how different forms of investment work together to influence academic achievement.

5. Further analysis reveals a number of important discoveries in this study. The study reveals that the new educational anxieties that emerged in the wake of the “Double Reduction” policy, particularly around the college entrance examination and educational competition, led to a polarization of investment behaviors, a finding that contrasts with studies that have focused primarily on the impact of the policy in reducing economic burdens (Liu et al., 2024). The polarization of new educational anxieties and investment behaviors highlights the complexity of policy implementation, an important finding that suggests that while policies achieve certain goals, they also pose new challenges that may affect educational equity and the well-being of students and parents. In addition, the increased influence of mothers in family educational investment, as well as the increased burden on families with many children, provide important insights into the gender and structural dimensions of educational investment. It is noteworthy that this study also identifies the phenomenon of multiple identities of parent-teachers, a group that faces the challenge of investing in education at home while assuming responsibilities for schooling. The study reveals the new trends, heterogeneity and complexity of family investment in education under the “Double Reduction” policy, provides empirical evidence for the formulation of a more equitable and effective education policy, and emphasizes the need for balanced multidimensional investment in education.

In addition, the findings are closely related to the theory of educational ecology, both confirming the idea that the interaction of family, school and social factors influences educational outcomes and revealing the challenges posed by the new trends of educational anxiety and polarization of investment behaviours to the ability of the educational ecosystem to self-regulate and balance itself. Despite policies aimed at equalizing the distribution of

resources, inequality in family education investment persists, which challenges the theoretical assumption of balanced resource distribution, and the dynamics of family education investment behaviors go beyond existing theoretical frameworks, with mothers playing a more dominant role in family education investment, which also challenges the traditional assumptions of theory about the role of the family (Şengönül, 2022). This suggests the need to integrate more factors, such as socioeconomic status, cultural values and educational expectations, as well as psychological and sociocultural factors of the family, and to expand the multidisciplinary perspectives of psychology, sociology, and economics, in order to provide a more comprehensive analytical framework, and to consider the adaptability of the policy formulation to better serve educational policy formulation and practice.

Although this study was conducted in the specific socio-cultural and policy context of Hanggin Banner, Inner Mongolia, the results have broader implications. Internationally, China's "Double Reduction" policy, along with the UK's child-centered family education philosophy, the US's diversified family education guidance, and Japan's Family Education Law, show a consensus on the importance of family education (Yang et al., 2024; Liu et al., 2024). These policies work together to promote the holistic development of children by reducing the burden on students, providing customized educational support, and strengthening the role of families in education. China's "Double Reduction" policy, while reducing academic pressure, opens up new space for family education, echoing global education trends. This not only provides parents with more opportunities to participate in their children's education, but also raises new challenges and thoughts on how to more effectively integrate family, school and social resources to promote students' personalized growth (Liu et al., 2024). Through international comparisons, we can more fully understand the significance of the "Double Reduction" policy and how China can optimize its education system to achieve a new balance between family education and student development in the context of global education.

Through empirical analysis, this study deepens the understanding of the theory of educational ecology, reveals the connection between multiple and complex factors and the educational investment behavior of families, and explores the adjustment of family investment strategies under the "Double Reduction" policy. The study highlights the multidimensionality and complexity of family investment behaviors, especially under the intertwined influence of policy, economic, educational background and socio-cultural factors. The findings not only enrich theoretical understanding, but also provide policymakers with insights that help them understand the impact of policy changes and provide a scientific basis for formulating effective education policies. The findings are important for advancing educational equity, highlighting the complexity of family educational investment, revealing emerging trends and assessing the long-term effects of policies, providing policymakers with a foundation for designing equitable educational policies to ensure fair distribution of resources and an empirical evidence foundation for family educational support policies to guide families to optimize their educational investment to improve the efficiency of their investment, as well as offering a new perspectives for evaluating the long-term effects of education policies, and provides references for future policy adjustment and optimization.

5 Conclusion

Through a mixed research methodology, this study thoroughly analyzes the current situation of family educational investment in Hanggin Banner under the "Double Reduction" Policy, clarifies the influence of demographic properties on the dimensions of family education, and further explores the utility and influence of the dimensions of family education in the actual educational production process, on the basis of which it proposes the structural characteristics

of the investment in family education in the region. It fills the gap of research on family educational investment in rural areas in terms of research methodology and research perspectives, not only provides inspiration for other regions in China, but also provides comparisons and references for international countries and regions facing similar challenges of educational reforms, and points out new paths for exploring the influencing factors, mechanisms, and outcomes of family educational investment for subsequent researchers. It has important theoretical and practical value for rationalizing family educational investment, promoting educational equity and enhancing educational quality and efficiency.

To optimize family educational investments and improve educational equity, this study provides several recommendations. Policymakers should address regional disparities by providing financial subsidies and public services for disadvantaged families, as well as promoting the integration of family education with community resources. Policies such as the "Guiding Opinions on Strengthening Family Education Work" should ensure equitable opportunities by embedding family education within public service systems. Additionally, systematic measures to reduce competition and promote evidence-based educational investments can help alleviate parental anxiety (Xue & Li, 2024). Rural revitalization efforts that link education reforms to poverty alleviation, coupled with increased public investment, can empower families, reduce disparities, and support holistic child development through collaborative societal efforts. The Government should further increase the training and deployment of family education instructors in order to provide more comprehensive and specialized family education support services. It should not only increase the number of family education instructors and upgrade their professional skills and knowledge, but also ensure that they can cover a wider range of regions and families, especially in areas where educational resources are relatively scarce (Li et al., 2024).

Schools play a central role in supporting family education and must reduce teacher workloads to enable educators to balance professional and familial responsibilities. They should also move away from performance-focused evaluation systems that heighten parental anxiety and adopt comprehensive assessment methods that encourage rational educational investments and emphasize holistic student development (Bayer et al., 2016). Enhancing classroom efficiency and ensuring a balanced approach to academic, artistic, and physical education will allow students to achieve educational goals without undue stress, fostering a healthier learning environment for families and reducing the pressures of competitive educational investments (Mitchell et al., 2017). Reducing educational investment anxiety through organizing family education guidance courses and establishing psychological support mechanisms which can help parents establish a correct concept of education, understand the unique growth rhythm and potential of each child, and learn to reasonably plan their expectations, avoiding blind comparison and over-intervention. By creating supportive educational ecosystems, schools can encourage parents to make balanced investments in their children's development, focusing on moral growth and personal well-being (Hays & Reinders, 2020).

Parents, in turn, must prioritize a comprehensive education that nurtures children's skills, emotional intelligence, and moral character, rather than focusing solely on academic achievements. Education should be about expanding both knowledge and worldview while promoting the spiritual and relational growth of students (Tian, 2022). Many parents equate educational investment with financial expenditures on expensive tutoring and extracurricular activities, often overlooking the critical roles of time and emotional engagement in holistic development. A more balanced approach—incorporating time, emotional involvement, and realistic expectations—will better foster well-rounded individuals. Furthermore, parents should

respect their children's interests and avoid falling into the trap of competitive trends. In today's society, with its diverse educational and career opportunities, parents should adopt open attitudes toward life choices and focus on fostering creativity and individuality. Leveraging community resources such as nature, cultural activities, and public services can help alleviate financial pressures, especially for multi-child households (Friedline et al., 2021). These community resources can enrich children's educational experiences while addressing disparities in family investments. Meanwhile, the involvement of fathers in education should be strengthened, and parents could focus on emotional support and accompaniment while supporting their children's studies. Parents should pay more attention to the rational allocation of resources and the quality of education, avoiding the negative impact of improper use of resources or excessive financial investment on their children's education, while further optimizing the use of time to ensure effective investment of time.

This study provides valuable insights into the current state of family educational investment in Hanggin Banner under the "Double Reduction" policy and its structural characteristics, but there are some limitations. The geographical limitations of the study mean that the results may not be generalizable, and despite the use of stratified random sampling, the representativeness of the sample is limited to specific regions and may not fully reflect the situation in the wider context. The point in time of data collection limits the observation of the long-term impact of policies, while the cross-sectional research design also limits the identification of causal relationships. While the use of mixed research methods provides a rich perspective, challenges remain in integrating quantitative and qualitative data, and the subjectivity and difficulty of quantifying emotional investment leads to some bias in the analysis. In addition, the consistency of policy implementation may vary across regions, which may also affect the interpretation of the findings.

Therefore, cross-national comparative studies can further validate the universality of these findings and offer insights for optimizing international education policies. Future research should examine the long-term effects of the "Double Reduction" policy on family educational investments and its impact on children's developmental outcomes. The use of research methods should be expanded at the same time, such as the development of more precise quantitative tools or indicators, the enrichment of the use of qualitative methods, and the creation of group portraits to provide a deeper understanding of the behaviors and characteristics of different groups of families with regard to their educational investments, and a richer portrayal of the combined impact of educational policies in the family arena. Integrating social, cultural, and psychological dimensions into family education research will offer a more comprehensive analytical framework. Additionally, research on practical application scenarios, such as the application of educational technology and the construction of family education communities, are extensions that will not only strengthen the theoretical and empirical foundation of this research but also advance education equity and resource optimization across various cultural contexts.

In the long run, the significance of this study lies in its far-reaching implications for education policy and practice, especially in rural and semi-rural areas. It challenges traditional notions of investment in education, highlights the importance of taking socio-economic and cultural factors into account, and provides a basis for cross-country comparative studies and the optimization of international education policies. Overall, the study provides valuable insights for understanding and improving family educational investment, and has significant theoretical and practical value for promoting educational equity and improving the quality of education.

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