





ARTICLE



<https://doi.org/10.1057/s41599-023-02248-y>

OPEN

Pedagogical concept and social environment matters: example from parents' attitudes towards student-learning burden reduction policy and its influencing factors in China

Jian Li¹, Eryong Xue¹ & Chang Liu¹

In many societies, parents' perceptions play a key role in assessing the quality of education policy implementation, and the student learning burden reduction policy is the most discussed and influential education policy among K-12 education policies in China. However, there are few studies examining parents' attitudes toward the student learning burden reduction policy and its influencing factors. In this study, we used nationally representative data and public opinion data to identify the factors influencing parents' attitudes towards the student learning burden reduction policy. The Hovland's model of attitude change have been adopted in this study. Using factor analysis and structural equation modeling, we found that, for survey analysis results, a total of 83.2% of parents supported the implementation of student learning reduction policies. Parents' educational/pedagogical and academic concepts, students' academic burdens, and parents' after-school service concepts had significant influences on parents' attitudes toward the implementation of the student burden reduction policy. Our findings show how the social implicit environment in which parents live can shape their perceptions of the implementation of the student burden reduction policy.

¹China Institute of Education Policy, Faculty of Education, Beijing Normal University, Beijing 100875, China. ✉email: jianli209@bnu.edu.cn; eryongxue@bnu.edu.cn

Introduction

In pedagogy, research on parental perceptions/attitudes can be broadly divided into several categories, such as perceptions of education policies and learning, factors that influence parents' attitudes, and the impact of parents' educational attitudes (Staerklé 2009; Konisky et al. 2008; Gadarian et al. 2021; Petrić et al. 2013). For example, Krysan (2000) examined the prejudice, politics, and public opinions to understand the sources of racial policy attitudes. Hacker et al. (2013) explored the implicit relations among economic experiences, financial worries, and policy attitudes in American. Konisky et al. (2008) and Gorman (1998) also focused on factors influencing parents' attitudes, such as social class and the school environment.

Overall, the existed various studies on parents' attitudes (Yang and Shin 2008; Tompson et al. (2013); Legault and Pelletier 2000; Schaller et al. 2007) have been characterized by continuous refinement and service-based practice, and the focus of these studies has shifted from macroscopic parents' attitudes toward education to detailed parent group characteristics and specific educational research content (Gao and Park 2012; Budiyaana 2017; Chiocca 2017). For instance, Perera (2014) argued that parents' attitudes towards science play a positive effect on their children's science achievement. Lim et al. (2017) highlighted that Parents' attitudes toward genetic testing of children is correlated with children's health conditions. Sharma and Trory (2019) examined how parents' attitudes to inclusive education influent special education learning performance. In addition, Ghosh and Steinberg (2022) found that there existed a close connection between parents' attitudes and unequal opportunities in early childhood development in Eastern India. Rätty (2003) also highlighted the significance of parents' evaluations of their own school for their educational attitudes. Al-Regaiey et al. (2022) uncovered influence of social media on parents' attitudes towards vaccine administration. Roth and Salikutluk (2012) suggested that parents' attitudes towards education mediate the relationship between social networks and parental expectations. Moreover, Turner et al. (2015) argued that ethnicity as a moderator of how parents' attitudes and perceived stigma influence intentions to seek child mental health services. Mohr-Schroeder et al. (2017) analyzed parents' attitudes toward mathematics and the influence on their students' attitudes toward mathematics.

In addition to reviewing above studies on parents' attitudes toward education policy, we found that children cannot grow up without parents' companionship (Legault and Pelletier 2000; Schaller et al. 2007). Not only in daily life and learning, but also to understand the education of the child's subjectivity, which is about the child's character and attitude (Yang and Shin, 2008; Lim et al. 2017). Therefore, in this study, we aim to explore parents' attitudes towards student learning burden reduction policy in China, contextually. On 24 July 2021, the General Office of the CPC Central Committee and The General Office of the State Council issued *Opinions on Further Reducing the Homework Burden and Off-campus Training Burden of Students in Compulsory Education* ("Student burden reduction policy"), marking the official implementation of the double reduction policy. Subsequently, the Ministry of Education and local education administrative departments issued a series of policies aimed at reducing the burden of students to facilitate the implementation of the double reduction policy. Student learning burden reduction policy aims to reduce the burden of primary and secondary school students. The excessive academic burden is considered as complicated social issue. It involves the concept of education, the concept of talent and the student cultivation mechanism. Because the root cause of the heavy burden on students is the examination system and the evaluation mechanism, it is obviously always an international generalized to crack the examination of exam-

oriented education with the teaching method of quality-oriented education.

Therefore, this study aims to identify the factors influencing parents' attitudes toward the student learning burden reduction policy. Unlike previous studies on student learning burden reduction policy, we used both the nationally representative data and public opinion data to identify the factors influencing parents' attitudes toward the student learning burden reduction policy. The research questions are provided as follows:

1. What are parents' attitudes towards students' burden reduction policy?
2. What factors affect parents' attitude towards students' burden reduction?

In many societies, parents' perceptions play a key role in assessing the quality of education policy implementation, and the student learning burden reduction policy is the most discussed and influential education policy among K-12 education policies in China. However, there are few studies examining parents' attitudes toward the student learning burden reduction policy and its influencing factors.

In this study, to determine which specific factors, have the greatest influence on parents' attitudes, we used a grounded, progressive strategy, adapting a well-established model including several studies. Teachers, parents, and students are considered the key stakeholders in relation to the student burden reduction policy, and thus their opinions were considered the most important. We tried to collect the students' opinions, but because the student burden reduction policy is aimed at reducing the burden of students in the compulsory education stage, it is difficult to collect students' opinions in China. First, this is because students in compulsory education do not have many channels and platforms through which they can express their opinions. Second, they do not have sufficient writing ability, judgment, or time to express their opinions through various social media. Then, we analyzed parents' perceptions of the student burden reduction policy to determine the parents' attitudes toward the student burden reduction policy. We used Exploratory Factor Analysis (EFA) to determine which factors influence parents' perceptions. Based on the results of the EFA, we collected relevant social media reports, publications, and newspaper articles regarding parents' perceptions and quantitatively analyzed the key factors influencing parents' attitudes toward the student burden reduction policy.

Reducing student learning burden: integrating local and global contexts

We examined student learning burden reduction policies from both local and global contexts. The student learning burden reduction policy in China is also of significance in the different countries (Fan 2021; Zhu 2021; Zhou and Qi 2022). For example, Xiang (2019) argued that in such a need to highlight the public welfare of education worldwide, it aims to promote people's holistic education development. Ning and Yang (2022) insisted that reducing student burden can only reduce the burden of some families who cannot afford out-of-school education, while families who can afford it will continue to study outside school. Long (2021) found that student learning burden reduction policy is considered that the "excessive academic burden" hindering the development of education has become a big barrier affecting every child's happy experience, every family's happy life, every teacher to obtain happiness of education globally.

In addition, student learning burden is also a worldwide topic (Fan 2021; Zhu 2021; Zhou and Qi 2022). Turner et al. (2015)

found that, along with the “difficulty in reducing the burden” caused by the elite education system with educational selection, competition, insufficient resources, and single standards, as well as the resulting “burden reduction trap”, “theater effect” and “prisoner’s dilemma” at different countries. Zhu (2021) and Zhou and Fu (2021) also highlighted that local governments are shirking responsibility, and “burden reduction” is “reducing responsibility”, especially in East Asian countries.

From an international comparative perspective, many countries, such as Japan, UK, and New Zealand, have implemented various policies to reduce students’ learning burden (Staerklé, 2009; Konisky et al. 2008). For instance, as early as in the 1980s, the Japanese government put forward the student learning burden reduction education, hoping that children can grow up in a comfortable and fulfilling way, and not be killed by the pressure of examinations (Ning and Yang 2022). Since 1989, Japan’s central and local education authorities have implemented a series of policies, which generally include: The number of class hours between elementary and high schools would be reduced. As early as 1965, to make education fair and let children have a happy childhood, the UK set out to establish non-selective comprehensive schools and abolished the key high school in the UK (Wu et al. 2015). In 1976, the Labor Party demanded that British middle schools should be prohibited from selecting students through examination (Turner et al. 2015).

To sum up, there also exists the similarity and distinction of above educational practices in different contexts. The student burden reduction policies carried out in most countries pay more attention to the reduction of students’ learning burden in schools, including the setting of courses, the length of learning time and the assignment workload. However, due to the differences in the history of basic education development, social, economic, and cultural development of different countries, different countries also have different priorities and unique considerations for the policy of reducing the burden on students. For example, for reduce student learning burden, New Zealand primary and secondary education respects the characteristics and individual differences of each child at different growth stages, pays attention to the comprehensiveness, practicality, and collaboration of the curriculum, and helps each student to discover and develop their own advantages and potential through in-depth learning of the teaching content, pays attention to the society and loves the nature (Wild and Heuling 2020). From the perspective of the burden reduction policies of different countries around the world, reducing the content of school lessons and reducing the difficulty of learning are common actions to reduce student learning burdens (Nieuwoudt and Pedler 2021).

Parents’ attitude and influencing factors: insights from national and international

The previous research on parents’ perspectives on specific education policy (Cheung et al. 2018; Zhou and Fu 2021; Zhu 2021; Ma and Wu 2014) focuses on the exploration of internal influencing factors of the policy itself, such as policy historical development, policy development background, and implementation process. For example, Zhu (2021) explored the cognitive renewal, institutional innovation and reform actions of student learning burden reduction policies in China. He suggested that it need to return to the essence of education, to solve the problem of education caused by excessive schoolwork, reshaping the education ecology of healthy growth of students. In addition, Ma and Wu (2014) examined parents’ attitudes towards the essence and mechanism of time allocation of academic burden. They argued that parents’ attitudes play a key role to influence teacher pressure and after-school service regarding to implementing student

learning burden reduction policy. Yang (2013) found that excessive academic load led to imbalance of academic quality evaluation, which influence parents’ subjective perceptions of implementing policies. Moreover, Zhou and Fu (2021) also investigated how to realize the teaching-exhaustively in classroom teaching under the background of student learning burden reduction policies. They argued that, for future study on parents’ attitudes towards student learning burden reduction policies, it is needed to analyze the policy development trends and ideas related to curriculum and classroom reform, management system and mechanism innovation. In addition, Ning and Yang (2022) also found that parents’ perceptions on the implementation effect is corrected to the coordination mechanism for primary and middle school students.

There might be some international research on parents’ perceptions of educational policy, which might be the literature in this study could have dialogue with. For instance, Wild and Heuling (2020) found that parents’ perceptions of policy implementation are based on the consideration of maximizing the public interest of social education and aims at solving educational real problems and social problems. Budiayana (2017) also highlighted that parents’ attitudes also associated with the risks in the field of education policy brought by social reality. He found that influencing parents’ perceptions included endogenous “primary” risks in the education policy system, socially related risks and “induced” risks outside the education system. In addition, Nieuwoudt and Pedler (2021) found that the induced problems of educational policies include national talent training and security crisis, the unstable factors of education caused by the influx of external capital, and the impact of capital collateral effect on national sustainable development. Staerklé, (2009) highlighted that influencing parents’ attitude toward specific education policy includes the cognition of single utilitarian education purpose, the one-sided cognition of educational function, and the prejudice of society towards different types of education.

To sum up, it is acknowledged there are some similarity and distinction of these practice in different contexts. For the similarities, all above literature is more likely to concentrate on specific education policy, such as the exploration of internal or external dimension or elements of the specific policy itself. Both international and national studies regarding to parents’ attitude and influencing factors involve the specific dialogue on how to provide a in-depth understanding of education policy formation, process, implementation, assessment and feedback. For the differences, local studies more focus on offering a macro-scope to epitomize the major directions and values of both governmental and institutional educational policies. International explorations more concentrates on providing a relatively micro lens to figure out the challenges and strategies of one educational policy, contextually.

Theoretical perspective: Hovland’s model of attitude change

In this study, we apply Hovland’s model of attitude change to identify parents’ attitudes towards student learning burden reduction policy. The reason why we choose this theory is that the main contribution of this theory is to explain the influencing factors of attitude and its change from the perspective of social psychology and how to understand the dimensions of individual attitude. Parents’ attitude is an individual’s psychological tendency towards student learning burden reduction policy as certain kind of social perceptions (Bullock and Fernald 2003; Wyer and Shrum 2015). Its components include cognitive, emotional, and behavioral tendencies, which are social (not inherent), relativity (relative relationship between subject and object), coordination (coordination of cognition, emotion, and behavioral

tendencies), stability (once formed, not easily changed), and indirect (behavioral tendencies are not behaviors themselves). It develops in a social environment. The factors that promote its formation include five aspects: need (developed in the satisfaction of desire), group relationship, absorption of new knowledge, personality characteristics and imitation (Zhang et al. 2016).

Hovland's model is provided to analyze the influencing factors affecting parents' attitudes. In this model, various factors affecting parents' attitude change include the information delivered, individual cognition and environment, and the effect of persuasion or the degree of attitude change is determined by the interaction or action of these factors (Bullock and Fernald 2003; Yue 2022; Liu et al. 2023). Individual attitude change is also influenced by the characteristics of specific policy as the target object (Bullock and Fernald 2003). To sum up, based on Hovland's model of attitude change, parents' attitude towards Chinese student learning burden reduction policy is parents' evaluation and behavior tendency based on their own moral outlook and values (Wyer and Shrum 2015). The formation of parents' attitude means that parents change from never having an attitude towards something to having an attitude towards something, while the change of attitude means that parents change based on their existing attitude towards something (Bullock and Fernald 2003). In Hovland's model of attitude change, it is believed that attitude includes three components: cognition, emotion, and behavioral tendency (Bullock and Fernald 2003). Cognition is the intellectual understanding and emotion is the emotional experience of the persuader, and behavioral tendency component is the readiness for behavior. Based on cognition, attitude change is the tendency of the subject to experience emotions and eventually produce behaviors. In other words, the attitude change of the stakeholders depends largely on their own emotional experience (Bullock and Fernald 2003).

In this study, we apply Hovland's model of attitude change to explore parents' attitude change that happens to the receiver involves four factors: the transmitter, the communication information, the receiver, and the situation. Communication is the most direct cause of attitudinal change. Within the four key elements of Hovland's model of attitude change (Wyer and Shrum 2015), the conceptualized analytical model of parents' attitudes towards students' burden reduction policy is proposed and included four key elements: (1) Transmitter of parents' attitudes are prestige, position, intention, and attraction will affect the change of attitude, such as national/local government, policy makers, directors, principals, or administrators; (2) Communication information of parents' attitudes include information difference and information provision method, such as policy documents, policy implementation guidelines, social media, social network (e.g., Wechat, Tencent News, Weibo); (3) The recipient of parents' attitudes means the characteristics of the original attitude and belief, personality and, individual psychological tendency, including the characteristics of the original attitude and belief, personality (high self-esteem, self-confidence of parents); (4) Contexts of parental attitudes concentrate on social environmental context (e.g., cultural, social, ideological, institutional factors). All these elements of parents' attitudes towards students' burden reduction policy compared to other stakeholders (e.g., teachers) involve the types of attitudes, including the dynamic interaction among cognitive, emotional, and behavioral tendencies of attitudes (See Table 1).

Methods

To examine parents' attitude towards student learning burden reduction policy and its influencing factors, we undertook a two-step process. We analyzed a national survey on parents' attitudes

towards student burden reduction policies. And we also conducted exploratory factor analysis on influencing factors of parents' attitudes student burden reduction policies.

Step 1: Survey of parents' attitudes towards student burden reduction policy. We conducted a national representative survey to explore parents' attitudes towards student learning burden reduction policy implementation. In terms of demographic variables, male parents accounted for 32.3% of participants, while female parents accounted for 67.8%. Agricultural households accounted for 67.2% of participants, while non-agricultural households accounted for 32.9%. Of the participants, 28.8% were fathers, 69.0% were mothers, 0.8% were grandfathers, and 1.5% were grandmothers. Regarding parents' self-evaluation of their economic conditions, most parents felt that their family's economic condition was average, and more parents think their family's economic difficulties than rich parents. In terms of parents' attitudes toward the double reduction policy, most parents (83.2%) agreed with the statements presented that the aim of the double reduction policy was to reduce the burden of homework, improve the quality of homework design, reduce the burden of after-school tutoring, improve the quality of school learning, reduce the educational burden on parents, reduce family education economic expenditure, reduce the pressure of student examinations, and alleviate parents' educational anxiety, with 61.2%, 85.6%, 84.1%, 87.1%, 77.9%, 72.5%, 72.8%, and 83.5% respectively, of parents agreeing with the statements. For the specific operational definitions for top, middle, and bottom families, according to the People's Bank of China's 2020 standard classification of social and economic classes of Chinese families, the standard middle class requires a monthly disposable income of 8,300 to 12,500 yuan and a monthly income of 4,150 to 6,250 yuan for a couple to be considered as the standard middle class. A family with an annual income of more than 10 million yuan is a rich top family. An annual income of 200,000 to 500,000 yuan is a middle-class family; an annual income of 80,000 to 80,000 yuan is a bottom level family. In this study, we applied above standards to classify the top, middle and bottom families. The research hypothesis concentrates on middle class households may have a negative view of burden reduction policies relative to top or bottom households.

Step 2: Exploratory factor analysis on influencing factors of parents' attitudes. We proposed the hypothesis that demographic variables, parents' parenting concept, parents' academic concept, students' academic burden, and parents' after-school service concept have an impact on parents' attitudes toward the double reduction policy. Cronbach's alpha coefficient was $0.757 > 0.7$, and the KMO value was $0.90 > 0.9$, indicating that the questionnaire had good reliability and validity and was suitable for information extraction and factor analysis. Meanwhile, KMO values for all dimensions of the questionnaire were greater than 0.6, indicating that all dimensions had good validity and good structural validity. The 2000 samples were randomly selected and SPSSAU was used for exploratory factor analysis. The 44 items were divided into six factors. Based on the exploratory factor analysis results, 13 items with low factor loading coefficients and common degree were deleted, and 31 items were retained. The KMO value following factor analysis of the revised scale 6 was 0.909, and the interpretation rate of the cumulative variance after rotation was 54.631%, which was greater than 50%, indicating that the revised scale could extract data well.

Of the sample, male parents accounted for 32.3% and female parents accounted for 67.8%, while agricultural households accounted for 67.2% and non-agricultural households accounted

Table 1 The conceptualized analytical model of parents' attitudes towards students 'burden reduction policy.

Elements of Hovland's model of attitude change	Parents' attitudes towards students' burden reduction policy compared to other stakeholders (e.g., teachers)	The types of attitudes
Transmitter	National/local government, policy makers, directors, principals. or administrators.	Cognitive
Communication information	Policy documents, policy implementation guidelines, social media, social network (e.g., WeChat, Tencent News, Weibo)	Cognitive, Emotional
The recipient	The characteristics of the original attitude and belief, personality (high self-esteem, self-confidence of parents.	Emotional
Contexts	Social environmental context (e.g., cultural, social, ideological, institutional factors).	Emotional, Behavioral

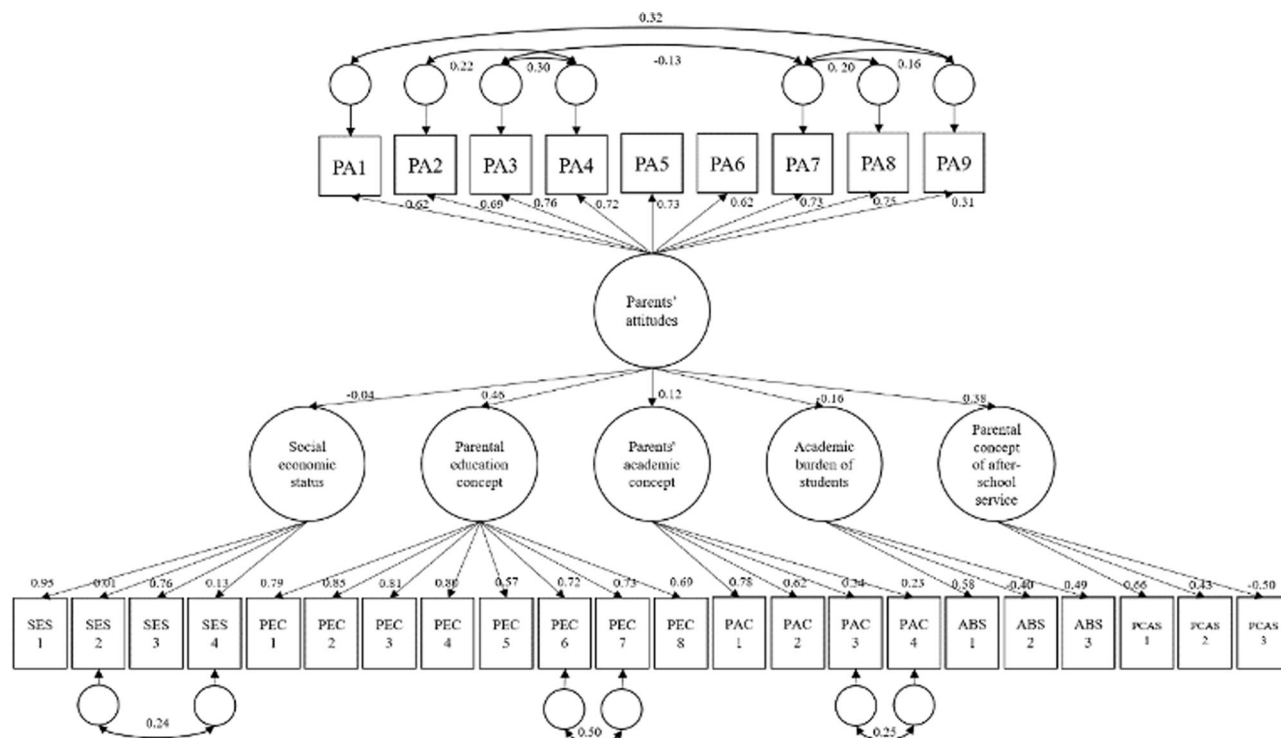


Fig. 1 Standardized path of factors influencing parents' attitudes with student learning burden reduction policy.

for 32.9%. Parents generally supported the policy and acknowledged the value of after-school services. GFI and AGFI were 0.935 and 0.921, respectively, with both exceeding the ideal level of 0.9. RMR and RMSEA were 0.045 and 0.044, respectively, which met the adaptation standards. The value-added suitability index test results showed that NFI, RFI, IFI, TLI, and CFI were 0.914, 0.902, 0.93, 0.92, and 0.93, respectively, all greater than 0.9, and thus reaching the ideal level. The data were consistent with the established model, and thus the corresponding path analysis results were supported. Then, we analyzed the path coefficients between variables, as well as between variables and items. There were 31 standardized paths in this study, of which seven (22.5%) had standardized path coefficients of less than 0.5.

Results

Parents' attitudes towards student burden reduction policy. For survey analysis results, a total of 83.2% of parents supported the implementation of student learning reduction policies. The standard deviation of all items except for "Increase their academic burden" was small, indicating that there was little difference in parents' attitudes. When asked about the impact of the

cancellation of discipline off-campus training institutions, 35% of parents said it would have a negative impact on their children's academic performance, while 37.4% said it would be beneficial for children to have more independent study time. In the survey on students' burden, 65% and 70.2% of parents said that students' burden and homework difficulty, respectively, were normal, while 19.6% and 18.3% of parents said that students' burden was heavy and homework was not too difficult, respectively. Regarding sleep, 26.4%, 26.8%, and 25.3% of children often, sometimes, and none, respectively, went to bed late because of homework. Regarding parents' after-class service concept, 64.4%, 55.6%, and 62.1% of parents were satisfied with existing after-class services, accepted after-class service charges, and felt that the services met the demands of diverse learning after class, respectively Fig. 1.

The factors influencing parents' perceptions on student burden reduction policy. In this study, we used EFA to identify the factors influencing parents' perceptions. Based on the results of factor analysis, we used structural equation modeling (SEM) to analyze how various factors influence parents' attitudes toward the student burden reduction policy. At the beginning, the sample

was 9726 after data cleaning. For reliability and validity test, regarding reliability, the Cronbach's alpha coefficient was 0.757. When the coefficient is greater than 0.6, the reliability of the questionnaire is acceptable, and when the coefficient is greater than 0.7, the reliability of the questionnaire is good. Therefore, the reliability of the data used in this study was good. Regarding validity, factor analysis was used to analyze the validity of the sample. The KMO value was greater than 0.9, indicating that the sample was highly adequate for information extraction and factor analysis. The A-F values of KMO of each dimension of the scale were 0.647, 0.898, 0.918, 0.617, 0.659, and 0.694. They were all greater than 0.6, indicating that the validity of each dimension of the scale was good, and thus the questionnaire had good structural validity (see Table 2).

For factor analysis, following factor analysis of the selected scale, it was concluded that the explanatory power of the cumulative variance following the rotation of the 44 items was

39.592%, or less than 50%, indicating that factor extraction was extremely limited, and thus the items needed to be revised. As can be seen from Table 3, the factor load coefficients of items A6, A7, A8, A10, B9, C6, C10, F1, and F5 were relatively low. In addition, category variables A4 and A5 will affect the fitting of the subsequent structural equation model, and items B10 and E3 cannot well express the measured variables, and thus these 13 items were deleted. Following revision, the KMO value for the six-factor analysis was 0.909, and the explanation rate of the cumulative variance after rotation was 54.631%, or greater than 50%, indicating that the revised scale was adequate for data extraction (see Table 3).

For test of model fit, because the sample size was large, and thus the Chi-square free ratio was too high, we used subsampling to test for model fit. SPSS 22 was used to randomly select 2000 samples for SEM analysis (See Table 4).

Amos 24.0 was used to test the overall model fit, and the results are shown in Table 4. The results of the absolute fit tests were as follows: χ^2 was 2023.065 (the smaller the value, the better), and the GFI and AGFI values were 0.935 and 0.921, respectively, both exceeding the ideal level of 0.9. The values of RMR and RMSEA were 0.045 and 0.044, respectively, which met the adaptation standards. The value-added suitability index test results showed that NFI, RFI, IFI, TLI, and CFI were 0.914, 0.902, 0.93, 0.92, and 0.93, respectively, which were all greater than 0.9, thereby reaching the ideal level. Regarding the simple fit index, the

Table 2 Results of KMO and Bartlett tests.

KMO vaule		0.901
Bartlett sphericity test	The approximate chi-square	134371.869
	df	946
	p-value	0.000

Table 3 Factor analysis results.

Item	Factor loading coefficient						Common factor variance
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	
C1 Good conduct is related to family	0.764	0.220	0.142	0.043	-0.032	0.079	0.661
C2 Involves their children in the labor force	0.795	0.222	0.079	0.068	-0.049	0.056	0.697
C3 Different age requirements are different	0.771	0.215	0.146	0.023	-0.037	0.077	0.670
C4 More hope to have a healthy body and good habits	0.788	0.226	0.052	0.041	0.005	0.056	0.679
C5 Increase their academic burden	0.570	0.245	0.072	0.000	0.204	-0.129	0.448
C7 Communicate patiently about learning problems	0.792	0.172	-0.022	0.112	-0.036	-0.054	0.674
C8 Manage your children's time	0.790	0.187	-0.022	0.124	-0.036	-0.063	0.679
C9 Seek advice from children to sign up for classes	0.745	0.196	0.035	0.064	-0.020	0.005	0.599
B1 Lighten the load	0.161	0.659	0.125	-0.023	0.210	-0.109	0.533
B2 Improve job design quality	0.276	0.680	0.031	-0.017	0.029	0.043	0.543
B3 Reduce the burden of after-school tutoring	0.219	0.756	0.006	0.007	-0.012	0.058	0.623
B4 Improve the quality of learning at school	0.269	0.747	-0.022	0.015	-0.014	0.048	0.633
B5 Reduce the educational burden on parents	0.149	0.746	0.005	0.126	-0.095	0.022	0.605
B6 Reduce family education economic expenditure	0.154	0.685	0.106	0.025	-0.018	0.028	0.506
B7 Reduce students' examination pressure	0.203	0.732	-0.016	-0.005	0.064	-0.108	0.594
B8 Alleviate parents' educational anxiety	0.278	0.756	0.002	-0.002	-0.005	0.001	0.649
B11 Views on the policy of reducing students' burden	-0.022	-0.394	-0.018	-0.096	-0.130	0.311	0.279
A2 Household	0.029	0.037	0.699	-0.022	-0.014	-0.035	0.493
A9 Economic conditions	0.009	0.025	0.503	0.166	0.034	0.144	0.303
E1 Whether the student burden is heavy	0.064	-0.059	0.051	0.469	0.066	0.126	0.250
E2 Difficulty of School work	-0.024	0.082	0.025	-0.362	0.112	-0.107	0.163
E4 Whether to sleep late because of homework	0.108	0.013	-0.056	0.514	0.171	0.118	0.323
F2 Whether Satisfaction with after-school service	0.081	0.270	0.041	0.597	-0.057	-0.040	0.443
F3 Whether or not Charge for after-school services	0.072	0.181	0.317	0.453	-0.071	-0.030	0.350
F4 Whether or not believe that after-school services meet diverse needs	-0.002	-0.235	0.123	-0.551	0.174	0.247	0.465
D1 Whether or not additional assignments in other disciplines are required	-0.041	0.034	0.008	-0.072	0.723	-0.020	0.531
D2 Additional subject assignments will improve your grades	-0.048	-0.023	0.073	-0.141	0.693	0.023	0.508
D3 Whether it is necessary to participate in the discipline training	0.070	0.067	0.071	0.226	0.618	0.009	0.447
D4 The cancellation of discipline off-campus training institutions on the impact of grades	0.042	0.047	-0.147	0.120	0.509	0.002	0.300
A1 Gender	-0.004	0.012	0.020	0.154	0.031	0.802	0.669
A3 Family role	-0.058	0.054	-0.025	0.083	0.038	0.741	0.564

Table 4 Results of model fit testing.

factor	χ^2	χ^2/df	GFI	AGFI	RMR	RMSEA	NFI	RFI	IFI	TLI	CFI
Result	2023.065	4.934	0.935	0.921	0.045	0.044	0.914	0.902	0.930	0.920	0.930
Standard	the smaller the better	< 5	> 0.9	> 0.9	< 0.05	< 0.08	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9

Table 5 The testing results.

Pathway	Standardization	Non-standardization	S.E.	C.R.	P	Result
Parents' attitudes <--- Demographic variable	-0.042	-0.061	0.035	-1.751	0.08	Not support
Parents' attitudes <--- Parenting concept	0.491	0.502	0.045	11.117	***	Support
Parents' attitudes <--- Parents' academic concept	0.093	0.062	0.019	3.306	***	Support
Parents' attitudes <--- Student academic burden	-0.136	-0.241	0.078	-3.098	0.002	Support
Parents' attitudes <--- The concept of after-school service for parents	0.342	0.321	0.045	7.145	***	Support

****p* < 0.001.

chi-square degree of freedom ratio was 4.934, or less than 5, indicating that the model fit was good, and no modification was required. There are 31 standardized paths in this model, of which seven are less than 0.5, accounting for 22.5% of the total. In general, most paths meet the ideal standard (see Table 5).

Based on the analysis of the structural equation model, F2, parents' parenting concept, F3, parents' academic concept, F4, students' academic burden, and F5, parents' after-school service concept had a significant influence on F6, parents' attitudes toward the student burden reduction policy. Among them, parents' education concept, parents' academic concept, and parents' after-school service concept are all significant at the 0.001 level, while students' academic burden is significant at the 0.01 level. Thus, the following conclusions can be drawn.

The effect of parents' education concept. Parents' education concept has the greatest influence on parents' attitudes among which, whether parents will take the initiative to increase the burden of students (*B* = 1.102), ask their children for advice to apply for classes (*B* = 1.024), make different requirements according to different ages (*B* = 1), agree that good conduct is related to family (*B* = 1) are important factors influencing parents' rearing concept. In addition, it can be seen from Table 5 that all paths in the dimension of parents' education concept are significant, and the absolute value of the standardization coefficient is greater than 0.5, indicating that all items in this dimension are representative of the variables studied. The variable of parents' education concept refers to the basic, holistic viewpoints that parents hold on the development of children and how children develop in the process of educating and nurturing their children. In this study, after clustering analysis, it includes 8 sub-items, such as students' daily behaviors, health habits cultivation, commination competence and skills, time management, motivation and interactions with teachers or parents. The results show that parents' attitudes toward the double reduction policy have an important relationship with whether parents respect the law of students' growth and development, respect students' learning willingness and pay attention to students' physical and mental growth.

The effect of parents' after-school services concept. Parents' after-school services concept had an obvious impact on parents' attitudes toward the student burden reduction policy. Whether parents are satisfied with after-school services and whether

parents think after-school services meet students' diverse needs have a significant impact on their concept of double reduction, with absolute values of the standardized path coefficients of 0.662 and 0.508, respectively. This shows that in addition to the parents' own factors, the quality of after-school services is also an important factor affecting parents' attitudes toward the double reduction policy.

The effect of students' academic burden. Students' academic burden has an impact on parents' attitudes toward the student burden reduction policy. As can be seen, whether students go to bed late because of homework (*B* = 2.29) has a significant impact on parents' attitudes toward the double reduction policy, while the path of homework difficulty in relation to students' academic burden is not significant.

The effect of parents' academic concept. Parents' academic concept has the least influence on parents' attitudes toward the student burden reduction policy. The variable of parents' academic concept refers to the key viewpoints that parents hold on the learning performance of children and how children's learning improvement in the process of educating at formal schooling. In this study, it contains 4 sub-items, including whether additional assignments in different disciplines are required, perception of additional subjective assignment would improve students' grades, whether it is necessary to participate in the discipline training, the ideas on the disciplines off-campus training institutions on the impact of grades. Among the four paths of parents' academic concept, only parents' standardized path of homework concept is greater than 0.5, with values of 0.708 and 0.677, respectively. The standardized paths related to the concept of after-school tutoring were all less than 0.5, with values of 0.385 and 0.239, respectively. Parents' concept of after-school tutoring has little influence on parents' concept of study and the double reduction policy, while parents' view of homework better represents parents' views of students' study.

Discussion

In this study, we used both the factor analysis and SEM to identify the factors influencing parents' attitudes toward the student burden reduction policy. We found that parents' educational concept, parents' academic concept, students' academic burden, and parents' after-school service concept had a significant

influence on parents' attitudes toward the implementation of the student burden reduction policy.

Along with Hovland's model of attitude change, we found both the parents' educational concept, parents' academic concept and after-school service concept as the "recipient", which is the characteristics of the original attitude and belief, personality (high self-esteem, self-confidence of parents play significant roles to influence their attitudes towards student burden reduction policy, essentially. Within the proposed four elements of Hovland's model of attitude change, the long-held belief or innate idea play a fundamental role to impact parents' perceptions or ideas. For example, a set of fixed views held by parents, and they used as the basis for judging and evaluating the student learning burden reduction policy. In the process of recognizing and forming parents' attitudes, it is easy to have cognitive biases of specific policy due to various environmental factors. If this bias occurs in the perception of a class or group of people, it can create social stereotypes (Gadarian et al. 2021; Petrić et al. 2013).

There is a possible mechanism to influence parents' perceptions and attitudes to implementing student learning burden reduction policies in contemporary China. It is true that the middle class is the most anxious and complains the most in China's society (Ning and Yang 2022). So why is the middle class the most anxious about National College Entrance Examination (NCEE)? Because the main body of the middle class is the ordinary wage earners, mainly by administrative institutions staff, enterprise staff and individual industrial and commercial businesses. The wage earners are mostly intellectuals. Most of the current middle class have leap-crossed or maintained their parents' class status by going to college, so they know the importance of a degree in finding a job. They are most worried that their children will not be able to find a good job in the future, thus slipping down the social ladder. They are also the ones most willing to invest in their children's education (Fan 2021).

Parents' educational/pedagogical concept is an important factor affecting their attitudes toward the student burden reduction policy. In this study, the variables of parents' educational concept and parents' academic concept correspond to different contents respectively. The concept of parents' education focuses on the ideas of parents in cultivating students' moral quality, diligence and gratitude, physical and mental health, etc. Parents' academic concepts, focusing on parents' ideas of students' studies, including attending out-of-school training, completing extra homework, etc. The social environment plays a key role in influencing parents' perceptions of specific education policy implementation. For example, the accumulation of family capital causes parents to attach more importance to after-school training to strengthen learning (Yang and Shin 2008). The accumulation of family social, economic, and cultural capital enables them to support students' participation in after-school training. In addition, parents who blindly trust after-school training and do not trust the quality of school education tend to dislike the student burden reduction policy (Ghosh and Steinberg 2022). The academic burden of students under the current performance-oriented evaluation system is an important factor affecting parents' attitudes toward the student burden reduction policy. The emphasis on diligent practice in exam-oriented education contradicts the expectation of comprehensive development under the student burden reduction policy. Cutting learning time will lead to an increased academic burden on students and increased parental anxiety (Zhou and Qi 2022). In addition, the atmosphere of survival of the fittest and the educational anxiety created by off-campus training institutions are increasing the academic burden of students, the economic pressure on and educational anxiety of parents, and the demand for high-quality school education.

After-school services are also a core aspect of the student burden reduction policy. High-quality after-school services can not only meet parents' demand for learning content, but also reduce economic pressure on them, reduce "blind" competition, and enhance their trust in school education. When the main goal of parents' participation in after-school training is after-school care, daily guidance, or non-disciplinary motivation, they tend to support the student burden reduction policy (Zhu 2021).

In addition, in current centralized Top-down education policy system, it is acknowledged that parents as the neglected and inevitable stakeholder also play a key role to influence student burden reduction policy implementation. For example, student burden reduction policy is a systematic project, involving schools, parents, students, and many other aspects, among which parents play a vital role. In 2021, the recently promulgated Law of the People's Republic of China on the Promotion of Family Education clearly states: "Parents or other guardians should establish a sense of responsibility that the family is the first classroom and parents are the first teachers, assume the main responsibility for the implementation of family education for minors, and use correct ideas, methods and behaviors to educate minors to develop good thoughts, conduct and habits." It can be said that the cognitive attitudes and their engagement of parents on the policy directly affects the effect of student burden reduction policy, relatively. In addition, parents' attitudes and engagement have also directly impacted on students' learning process (Fan 2021; Zhu 2021). They should make greater efforts in shaping the personality of their children and promote the comprehensive development of their children in terms of moral level, cognitive ability, and emotional ability, to lay a foundation for better adaptation to the changing world and coping with various challenges in the future.

There are some limitations to this study in terms of the sample data and research methods. Regarding sample diversity, a larger sample could be used to capture a more diverse range of participants, such as male parents, minority parents, low-income parents, or other specific parental characteristics. Regarding research methods, a more in-depth approach, including semi-structural interviews with participants, observations, and field studies could be used to enrich the comprehensiveness of the data on parents' attitudes. For future studies, we can also explore the possible mechanisms through questionnaires or interviews to investigate the in-depth understanding of internal and external contexts regarding different social class's attitudes towards implementing student learning burden reduction policies.

In conclusion, in this study, we apply nationally representative Chinese data to identify what parents' attitudes and what factors influencing parents' attitudes toward the student burden reduction policy. It is acknowledged that the most (a total of 83.2%) of parents supported the implementation of student learning reduction policies. It is acknowledged that the most (a total of 83.2%) of parents supported the implementation of student learning reduction policies. Parents' educational/pedagogical and academic concepts, students' academic burdens, and parents' after-school service concepts had significant influences on parents' attitudes toward the implementation of the student burden reduction policy. We also highlighted how the social environment in which parents live can shape their perceptions of the implementation of the student burden reduction policy.

Data availability

The paper includes a dataset that has been deposited in the journal's Dataverse repository. <https://doi.org/10.7910/DVN/LWAFMV>.

Received: 2 July 2022; Accepted: 17 October 2023;

Published online: 10 November 2023

References

- Al-Regaiey KA, Alshamry WS, Alqarni RA, Albarrak MK, Alghoraiby RM, Alkadi DY, Iqbal M (2022) Influence of social media on parents' attitudes towards vaccine administration. *Hum Vaccines Immunother* 18(1):1872340
- Budiyana YE (2017) Students' parents' attitudes toward Chinese heritage language maintenance. *Theory Pract Lang Stud* 7(3):195–220
- Bullock HE, Fernald JL (2003) "Feminist lite?" - Feminist identification, speaker appearance, and perceptions of feminist and antifeminist messengers. *Psychol Women Quart* 27(4):291–299. <https://doi.org/10.1111/1471-6402.00109>
- Cheung K, TWang Y, Yu S, Shao Y (2018) The experiences of Chinese mainland students with English-medium instruction in a Macau University. *Educ Stud* 44(3):357–360. <https://doi.org/10.1080/03055698.2017.1373635>
- Chiocca EM (2017) American parents' attitudes and beliefs about corporal punishment: An integrative literature review. *J Pediatr Health Care* 31(3):372–383
- Fan Y (2021) Ecological reconstruction of high-quality development of basic education in the post-burden Reduction Era. *J Sichuan Normal Univ (Social Sciences Edition)* 06:42–52. <https://doi.org/10.13734/j.cnki.1000-5315.2021.06.006>
- Gadarian, SK, Goodman, SW, & Pepinsky, TB (2021) Partisanship, health behavior, and policy attitudes in the early stages of the COVID-19 pandemic. *Plos One* 16(4). <https://doi.org/10.1371/journal.pone.0249596>
- Gao F, Park J (2012) Korean Chinese parents' language attitudes and additive bilingual education in China. *J Multiling Multicult Dev* 33(6):539–552
- Ghosh S, Steinberg HS (2022) Parents' attitudes and unequal opportunities in early childhood development: Evidence from Eastern India. *J Early Childhood Res* 20:413–430. <https://doi.org/10.1177/1476718X221077170>
- Gorman TJ (1998) Social class and parental attitudes toward education: Resistance and conformity to schooling in the family. *J Contemp Ethnogr* 27(1):10–44
- Hacker JS, Rehm P, Schlesinger M (2013) The insecure American: Economic experiences, financial worries, and policy attitudes. *Persp Politics* 11(1):23–49
- Konisky DM, Milyo J, Richardson LE (2008) Environmental policy attitudes: Issues, geographical scale, and political trust. *Soc Sci Quart* 89(5):1066–1085
- Krysan M (2000) Prejudice, politics, and public opinion: Understanding the sources of racial policy attitudes. *Ann Rev Sociol* 26(1):135–168
- Legault L, Pelletier LG (2000) Impact of an environmental education program on students' and parents' attitudes, motivation, and behaviours. *Canadian J Behav Sci/Revue canadienne des sciences du comportement* 32(4):243
- Lim Q, McGill BC, Quinn VF, Tucker KM, Mizrahi D, Patenaude AF, Wakefield CE (2017) Parents' attitudes toward genetic testing of children for health conditions: a systematic review. *Clin Genet* 92(6):569–578
- Liu C, Sun K, Liu L (2023) The Formation and Transformation Mechanisms of Deep Consumer Engagement and Purchase Behavior in E-Commerce Live Streaming. *Sustainability* 15(7). <https://doi.org/10.3390/su15075754>
- Long B (2021) The proliferative mechanism of academic burden in primary and secondary schools and the way to cure it - Also on the limit and increase of "double reduction" policy. *Nanjing Soc Sci* 10:146–155
- Ma J, Wu J (2014) Why Students' Burden Reduction Policy is difficult to achieve results? - On the essence and mechanism of time allocation of academic burden. *J Beijing Norm Univ (Social Sciences Edition)* 02:5–14
- Mohr-Schroeder MJ, Jackson C, Cavalcanti M, Jong C, Craig Schroeder D, Speler LG (2017) Parents' attitudes toward mathematics and the influence on their students' attitudes toward mathematics: A quantitative study. *School Sci Math* 117(5):214–222
- Nieuwoudt JE, Pedler ML (2021) Student Retention in Higher Education: Why Students Choose to Remain at University. *J College Student Retention-Res Theory Pract*. <https://doi.org/10.1177/1521025120985228>
- Ning B, Yang L (2022) Implementation effect and coordination mechanism analysis of "Homework Reducing Burden" policy for primary and middle school students: Based on a survey of 137 prefecture-level cities in 30 provinces (municipalities and districts) *China Audio-Visual Education* (01):9–23
- Perera LDH (2014) Parents' attitudes towards science and their children's science achievement. *Int J Sci Educ* 36(18):3021–3041
- Petrić J, Malički M, Marković D, Meštrović J (2013) Students' and parents' attitudes toward basic life support training in primary schools. *Croatian Med J* 54(4):376–380
- Räty H (2003) The significance of parents' evaluations of their own school for their educational attitudes. *Soc Psychol Educ* 6(1):43–60
- Roth T, Salikutluk Z (2012) Attitudes and expectations: do attitudes towards education mediate the relationship between social networks and parental expectations? *Br J Sociol Educ* 33(5):701–722

- Schaller A, Rocha LO, Barshinger D (2007) Maternal attitudes and parent education: How immigrant mothers support their child's education despite their own low levels of education. *Early Childhood Educ J* 34(5):351–356
- Sharma J, Trory H (2019) Parents' Attitudes to Inclusive Education: A Study Conducted in Early Years Settings in Inclusive Mainstream Schools in Bangkok, Thailand. *Int J Special Educ* 33(4):877–893
- Staerklé C (2009) Policy attitudes, ideological values and social representations. *Soc Personal Psychol Compass* 3(6):1096–1112
- Tompson TN, Benz JK, Agiesta J (2013) Parents' attitudes on the quality of education in the United States. Chicago, IL: Associated Press-NORC Center for Public Affairs Research
- Turner EA, Jensen-Doss A, Heffer RW (2015) Ethnicity as a moderator of how parents' attitudes and perceived stigma influence intentions to seek child mental health services. *Cultural Divers Ethnic Minor Psychol* 21(4):613–627
- Wild S, & Heuling LS (2020) Student dropout and retention: An event history analysis among students in cooperative higher education. *Int J Educ Res* 104. <https://doi.org/10.1016/j.ijer.2020.101687>
- Wu X, Tao S, Zhang Y, Zhang S, Tao F (2015) Low Physical Activity and High Screen Time Can Increase the Risks of Mental Health Problems and Poor Sleep Quality among Chinese College Students. *Plos One* 10(3). <https://doi.org/10.1371/journal.pone.0119607>
- Wyer Jr. RS, Shrum LJ (2015) The Role of Comprehension Processes in Communication and Persuasion. *Media Psychol* 18(2):163–195. <https://doi.org/10.1080/15213269.2014.912584>
- Xiang X (2019) The historical perspective of two rounds of "burden reduction" education reform in China in the past 70 years. *J East China Normal Univ (Educational Science)* 05:67–79. <https://doi.org/10.16382/j.cnki.1000-5560.2019.05.006>
- Yang Q (2013) Excessive academic load and imbalance of academic quality evaluation. *Curriculum, Teaching Mater, Teach Meth* 01:12–17. <https://doi.org/10.19877/j.carolcarrollnkCJCJF.2013.01.002>
- Yang S, Shin CS (2008) Parental attitudes towards education: What matters for children's well-being? *Children Youth Services Rev* 30(11):1328–1335
- Yue X (2022) Research on the influence of comment information on consumers' ambivalent attitudes based on Hovland's theory of attitude change. *J Industr Eng Manag* 36(4):36–49
- Zhang M, Chen C, Hu W, Chen L, Zhan J (2016) Influence of Source Credibility on Consumer Acceptance of Genetically Modified Foods in China. *Sustainability* 8(9). <https://doi.org/10.3390/su8090899>
- Zhou H, Qi Y (2022) Implementation of "Double Reduction" Policy: Focus, Difficulties, and suggestions. *J Xinjiang Normal Univ (Philosophy and Social Sciences Edition)* 01:69–78. <https://doi.org/10.14100/j.cnki.65-1039/g4.20211022.001>
- Zhou X, Fu J (2021) How to realize the teaching-exhaustively in classroom teaching under the background of "Double Reduction". *Chinese J Educ* 12:1–5
- Zhu Y (2021) "Double Reduction": Cognitive renewal, Institutional Innovation and Reform Actions. *Nanjing Soc Sci* 11:141–148. <https://doi.org/10.15937/j.carolcarrollnkissn1001-8263.2021.11.016>

Acknowledgements

This research was funded by National Social Science Foundation Youth Project in Education "Study on Process Tracking and Effect Evaluation of Policy Implementation of Excellent Teacher Plan in Ministry-affiliated Normal Universities" (Project No.: CIA220282).

Author contributions

Conceptualization, JL and EX; Data curation, JL and EX; Formal analysis, JL and EX; Funding acquisition, EX; Investigation, EX, JL and CL; Methodology, JL and EX; Software, EX, JL and CL; Supervision, EX and JL; Validation, EX and JL; Visualization, EX, JL and CL; Writing—original draft, JL and EX; Writing—review & editing, JL, EX and CL. JL and EX contribute equally to this study.

Competing interests

The authors declare no competing interests.

Ethical approval

This research received the ethical approval from Ethical Review Committee, Faculty of Education, Beijing Normal University (Project No.: CIA220282). We confirm that all research was performed in accordance with relevant guidelines/regulations applicable when human participants are involved by Declaration of Helsinki.

Informed consent

We confirm that informed consent was obtained from all participants and/or their legal guardians for participation in the study.

Additional information

Correspondence and requests for materials should be addressed to Jian Li or Eryong Xue.

Reprints and permission information is available at <http://www.nature.com/reprints>

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2023