

Perceived discrimination and academic self-concept among left-behind children in China: The role of school belonging and classroom composition

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ABSTRACT

This study aims to investigate how perceived discrimination affects left-behind children's academic self-concept, and to examine the mediating role of school belonging on the relationship between them. Two prominent classroom compositional effects, the peer spillover effect and the big-fish-little-pond effect, also need to be confirmed. A total of 998 left-behind children participated in the two surveys. They reported perceived discrimination and individual basic information at time 1. After two months, the measurements of school belonging and academic self-concept were completed at time 2. These results suggested that perceived discrimination had a significantly negative prediction on left-behind children's academic self-concept, and school belonging plays a mediating role between these variables. In addition, in a given classroom, a higher proportion of left-behind children could predict lower levels of their academic self-concept. Furthermore, the negative effect of perceived discrimination on academic self-concept was attenuated in classes with a higher classroom proportion of left-behind children. These results have important practical implications for educators on how to enhance the left-behind children's academic self-concept and how to assign classes.

1. Introduction

The term “left-behind children” refers to those children whose parents migrate to the city for work and are left behind in their hometowns (Duan & Zhou, 2005). They are vulnerable groups in China's rapid socio-developmental transition, and their academic development has been a major concern. Left-behind children have more prominent academic problems, for example, their study attitudes are gradually scattered and improper, with some of them being prone to boredom, disengagement, or even school dropout (Zhang et al., 2020). Among the academic-related matters, one needs to pay special attention to academic self-concept. Academic self-concept can be seen as a vital predictor of educational outcomes, and students' achievement, motivation, test anxiety, and course selection can be predicted by it (Kadir et al., 2017; Arens et al., 2017; Umarji et al., 2018). Compared with those children who has no experience of being left behind, the left-behind children's academic self-concept has been proved to be significantly lower (Wang et al., 2014). Therefore, in order to improve left-behind children's academic self-concept and promote their positive academic development, it is worthwhile to further explore in depth the left-behind children's academic self-concept.

Due to parents' migration to urban areas, left-behind children lack parental education and are often labeled as “unsupervised” or “problematic” children. The stigmatization of left-behind children is prominent, and the result of stigmatization is discrimination. Left-behind children often suffer prejudice or unfair treatment from their classmates or teachers (Fu et al., 2016; Shen et al., 2009), and these exclusionary attitudes can lead to the perception of discrimination. Discrimination perception is a risk factor affecting individual development, and the negative impact on disadvantaged individuals is greater (Schmitt et al., 2014). Children who perceive discrimination lack curiosity, persistence and low self-efficacy, all of which negatively impact their academic outcomes (Berkel et al., 2010; Komaraju & Nadler, 2013). A more recent study from Mayo and Le (2021) revealed that perceive discrimination was negatively associated with academic self-concept of college students. Therefore, it can be speculated that perceived discrimination negatively impacts the left-behind children's academic self-concept.

However, there are very few studies that pay attention to left-behind children's perceived discrimination and academic self-concept, and there are potential areas for researches to explore the factors that may mediate or mitigate the relation between left-behind children's perceived discrimination and academic self-concept. Therefore, this

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study focuses on school belonging and classroom composition to understand these questions.

1.1. Perceived discrimination and academic self-concept

Wigfield and Karpathian (1991) defined academic self-concept as “the individual’s perceptions about themselves in academic achievement situations” (p.235). Those individuals high on academic self-concept will be able to bring high academic achievement and is predicted to have ambitious academic pursuits in high school and college (Marsh, 2016). Enhancing academic performance and future educational choices could benefit from improving academic self-concept (Marsh, 2016). It has been found that both single-parent-away and two-parent-away left-behind children have relatively lower academic self-concept than that of those children who has no experience of being left behind (Xia et al., 2019; Zhang et al., 2020; Yao & Mao, 2008).

Perceived discrimination is an important stressor for individual development, which negatively impacts individual academic self-concept. Perceived discrimination refers to the individual’s perception of rejection or exclusion from other groups or members, which may lead to devaluation, exclusion, and lack of control among members of stigmatized groups (Schmitt et al., 2014). The lack of parental supervision makes it easy for left-behind children to experience discrimination in their life (Shen et al., 2009). At the same time, academic researches and mass media increasingly report negative events about left-behind children, which increases the possibility of left-behind children’s perceived discrimination (Zhao et al., 2016). When people adopt distancing, hostile and other harmful attitudes or behaviors toward left-behind children, these children might experience the perception of discrimination.

Considerable evidence suggests that students who have experienced discrimination question their academic self-concept. For example, African American adolescents who experienced racial discrimination at school from their teachers and peers showed declines in their academic self-concept (Wong et al., 2003). Similarly, Brittian and Gray’s (2014) study found that African American students with the higher levels of differential treatment had lower levels of academic self-concept. Additionally, for students of color, experiencing recurrent discrimination may cause worse scores in academic self-efficacy (Hall et al., 2017). For minority students, the perception of racism or racial tension strongly reduces academic self-concept (Cole, 2007). However, the effects of perceived discrimination on left-behind children’s academic self-concept remains to be verified. It is hypothesized that **perceived discrimination could negatively predict left-behind children’s academic self-concept (H1)**.

1.2. School belonging as a mediator

For children of all ages, school belonging is very important (Quinn & Oldmeadow, 2013). This concept is interchangeable with school relatedness and school connectedness since they have the same underlying construct (Christenson, Reschly, & Wylie, 2012). In this study, school belonging is defined as students feel accepted, respected, and included within the school environment (Goodenow & Grady, 1993). Therefore, at the context of school, school belonging can be measured by students’ sense of belonging at school. Korpershoek et al. (2020) confirmed the positive predictive effect of school belonging on academic self-concept. School belonging has been posited to be good for academic self-concept.

Relatedness, autonomy and competence are the human basic psychology needs in the realm of self-determination theory (SDT), which could facilitate positive outcomes when they are met (Deci & Ryan, 2000). Sense of belonging has been incorporated into the theoretical model to some extent, and included it under the label ‘need for relatedness’. Based on the self-determination theory, students’ feeling of relatedness is linked to important academic outcomes (Furrer and Skinner, 2003). In addition, the self-determination theory suggested that

contextual factors were essential for students’ need for relatedness or school belonging, as students internalize values (e.g. social normal) and practices (e.g. interpersonal interactions) from contexts. Students’ school belonging is shaped and restricted by social situations (Osterman, 2000). Experiencing discrimination whether from peers or teachers played a negative role in students’ feelings of belonging (Crul, 2018; Yang et al., 2016).

From this perspective, perceived discrimination may weaken students’ school belonging and further affect students’ academic self-concept. Thus, it can be inferred that **the relationship between perceived discrimination and academic self-concept would be mediated by school belonging (H2)**.

1.3. Classroom composition

The formation of academic self-concept can be influenced by the school environment (Marsh, 2016). The differences between school environments (e.g., student composition) can shape students’ academic self-concept (Canegem et al., 2021). Zell and Alicke’s (2009) studies showed that individuals prefer to use local rather than general/global comparison information. Local comparison information includes peers within the class group or friends, while general/global comparison information refers to broader groups (e.g., schoolmates). That’s to say, the composition of the classroom could affect the academic self-concept (Dumont et al. 2017). Previous studies mainly focus on the classroom composition of academic ability (Palacios et al., 2019), academic achievement (Hutchison, 2007), gender structure (Yuan, 2016), or disruptive students (Zong & Li, 2018), few studies have discussed the composition of left-behind children in the classroom. According to the National Education Development Statistics Bulletin in 2015, there were 20.19 million left-behind children in rural areas among students in the Chinese compulsory education system, and their overall proportion in the rural compulsory education school population was rising (Ministry of Education, 2016). For left-behind children, their proportion is uneven even among classes locally because they are purely random or “average” based on their academic performance assigned to classes, this can account for the potential for compositional effects.

It has been found that two of the most prominent classroom compositional effects are the peer spillover effect and the big-fish-little-pond effect (Willms, 1985; Marsh et al., 2008). There is consensus form these two approaches that social comparison is the key to the formation of academic self-concept (Festinger, 1954). According to the peer spillover effect, individuals behave similarly to their peers in a given environment, they may either experience relative gratification or deprivation, and this phenomenon can also be represented by contextual effect or compositional effect (Richer, 1976). When most students in a class are high achievers, the achievements of all students in the class will be enhanced over-and-above expectations, at this point the classroom compositional structure exerts a positive assimilation effect (Harker & Tymms, 2004). However, Feng (2018) concluded in their study that the classroom with more migrant students was associated with lower math scores of local students. Thus, the peer spillover effect may be positive or negative. Having higher the classroom composition of left-behind children may cause the left-behind children being used as a normative reference group. In this condition, the norms and values of left-behind children will be more accessible to individual (e.g., feelings of inferiority) in the class, showing the negative peer spillover effect. Thus, we hypothesize that **the classroom composition of left-behind children is negatively associated with academic self-concept (H3)**.

According to the big-fish-little-pond effect, students in a low-achieving educational environment tend to have a higher self-concept due to which they compare their achievement with low-achieving peers, which boosts their academic self-concept. It has been found that differences in school/class structure leads to social comparison among classmates. For example, Xia et al.’s (2019) study also shows that the classroom proportion of left-behind children has positive relationship

with left-behind children's academic self-concept in mathematics, and as the proportion of left-behind children increases, the academic disadvantage of left-behind children relative to local children tends to decrease. As indicated by Wang et al., (2020), when migrant children are in the majority of classes, their self-esteem level, peer acceptance, and academic outcomes are better. As migrant children and left-behind children have similar academic problems in China and are generally perceived to have lower levels of academic self-concept, we argue that academic performance triggered by different class structures in the migrant children could predict left-behind children. When the number of left-behind children in a class is relatively low, left-behind children will find that there are fewer students like them in the class. They may make non-left-behind children as a comparative reference group, which makes them easier to perceive higher environmental stress, feel marginalized in the class, and also reduces their attachment to the class, resulting in a negative assessment of their own (Hou, 2015). Such an influence might lead to feelings of inferiority or inadequacy (Richer, 1976) and results in the appearance of the big-fish-little-pool effect. Compared with a class with a higher proportion of left-behind children, left-behind children's academic self-concept would be lower in the class with a lower proportion of left-behind children. We hypothesize that **classroom composition moderates the relationship between perceived discrimination and academic self-concept** (H4). We proposed a hothesised mode of perceived discrimination and academic self-concept (Fig. 1)

2. Methods

2.1. Participants and procedures

Data collection was conducted in primary schools in Anhui province, China. Anhui is a large province of labor export, the number of left-behind children exceeds 600,000. Questionnaires were distributed to the children in the classroom at 9 schools with a total of 49 classes of grade 4 students. Prior to the study, we contacted school administrators and asked them to help distribute the questionnaires in whole groups in the classroom. The whole questionnaire was collected at two time points. At time 1, perceived discrimination and demographic information (e.g., whether they are left-behind children) were investigated. In this stage, 2200 questionnaires were distributed, 5 invalid questionnaires (e.g., not filled in demographic information such as whether they are left-behind children) were deleted, and 2195 valid questionnaires remained. After two months, at time 2, the valid questionnaire for time 1 was tracked and collected variables such as school belonging and academic self-concept, 9 invalid questionnaires were deleted, and 2186 valid questionnaires remained. Among them, there were 998 left-behind children and 1188 non-left-behind children. In the current study, we only analyzed the data of the left-behind children. Finally, there were 508 male left-behind children and 490 female left-behind children.

2.2. Measures

2.2.1. Perceived discrimination

Perceived discrimination was measured based on discrimination perceptions questionnaires developed by Shen et al. (2009). There are 6 items in this scale, and each item was rated on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). Sample items include "I feel respected by the people around me." The scale showed acceptable reliability in this study, and Cronbach's alpha coefficient was 0.783.

2.2.2. Academic self-concept

A 10-item scale developed by Marsh et al.'s (1984) Self-Description Questionnaire-II (SDQ-II) was used to measure academic self-concept. We choose the dimension of the general academic self-concept scale, which includes items such as "Most of my courses are very good." Left-behind children were asked to report the extent to which their real situation matches each item using a 6-point Likert scale ranging from 1 (completely false) to 6 (completely true). The scale showed acceptable reliability in this study, and Cronbach's alpha coefficient was 0.791.

2.2.3. School belonging

Left-behind children completed a revised 8-item scale developed by Deci and Ryan (2000), which was the relatedness subscale of the Basic Needs Satisfaction scale adapted for school. Sample items include "the people I talk to at school seem to like me." Participants were asked to rate all items on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The scale showed acceptable reliability in this study, and Cronbach's alpha coefficient was 0.751.

2.2.4. Classroom composition

To assess classroom composition, we calculated the ratio of the number of left-behind children in each class to the total number of students in the class to represent classroom composition. This resulted in a percentage per class of left-behind children. In this study, classroom composition ranges from 0.18 to 0.69.

2.2.5. Control variables

We controlled for left-behind students' gender and socioeconomic status (SES). Gender was coded 0 = male and 1 = female. SES is measured through parental education, parental occupation, and monthly family income (Bradley & Corwyn 2002). Parental education was measured on a 7-point scale, ranging from (1 = less than primary school) to (7 = doctor), parental occupation was classifies into 9 categories, ranging from (1 = unemployed or lay-offs) to (9 = administrative and managerial cadres), monthly family income was measured on a 4-point scale, ranging form (1 = under ¥ 2000) to (4 = over ¥ 10001). We choose to standardize and sum the five variables to obtain the index of SES.

2.3. Statistical analysis

We used SPSS 22.0 and Mplus 7.0 to conduct the analyses. We first conducted Harman's single-factor test to examine common method bias in this study. Second, we calculated descriptive statistics, correlation, and the mediation model by SPSS 22.0. Then, we tested the multilevel analysis by using Mplus 7.0. The multilevel analysis includes two levels, and all models were analyzed as random intercept multilevel models.

3. Results

3.1. Check for common method bias

We used Harman's single-factor test to examine the potential common method bias. The result showed that 16 factors were generated greater than 1, which explained 70 % of the total variation. The variance explained by the first factor was 23.1 %, less than the 40 %, these results

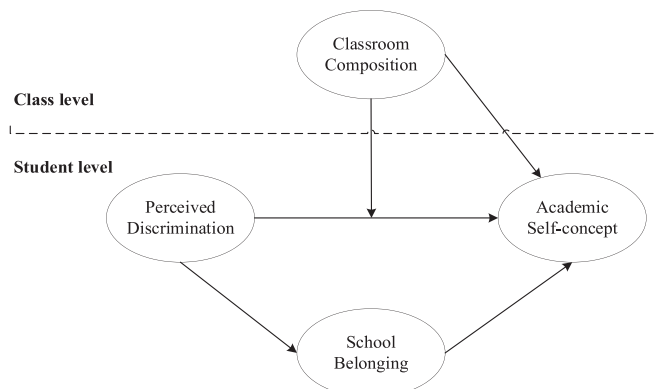


Fig. 1. Hypothesized Model.

illustrated that common method bias was not significant in this study.

3.2. Preliminary analyses

Table 1 shows the descriptive statistics and correlations between main variables. Perceived discrimination was negatively related to academic self-concept ($r = -0.444, p < 0.001$). Perceived discrimination was negatively related to school belonging ($r = -0.524, p < 0.001$). School belonging was positively related to academic self-concept ($r = 0.376, p < 0.001$).

3.3. Testing for the mediating role of school belonging

After controlling for gender, socioeconomic status (Table 2), perceived discrimination was negatively associated with academic self-concept ($\beta = -0.402, p < 0.001$) and school belonging ($\beta = -0.416, p < 0.001$). When school belonging was added, school belonging was positively associated with academic self-concept ($\beta = 0.216, p < 0.001$), perceived discrimination was also negatively associated with academic self-concept ($\beta = -0.312, p < 0.001$), but the association was weaker. These results indicated that school belonging played a mediator role between perceived discrimination and academic self-concept among left-behind children. The sobel test is significant ($z = -5.335, SE = 0.016, p < 0.001$), indicating that the link between perceived discrimination and academic self-concept as mediated by school belonging was statistically significant.

3.4. Testing for the role of classroom composition

In this study, the independent variable is perceived discrimination, and the moderating variable is classroom composition. After centralizing the independent variable and the moderating variable (Marsh et al., 2007), examine whether the interaction term of these two has a significant predictive effect on the academic self-concept of left-behind children, so as to test whether the moderating effect of classroom composition is significant.

As shown in Table 3, classroom composition predicted academic self-concept significantly ($\beta = -1.147, p < 0.001$). Further, the interaction term of classroom composition and perceived discrimination was significant ($\beta = 0.464, p < 0.05$), indicating that the classroom composition moderated the relationship between perceived discrimination and academic self-concept, supporting H4.

Next, a simple slope analysis was conducted to further explain the moderating effect of the classroom composition. We divided classroom composition into two groups based on the criteria of mean value ± 1 SD (Aiken & West, 1991). At high levels of classroom composition ($+1$ SD), the negative relationship between perceived discrimination and academic self-concept ($\beta = -0.220, p < 0.001$) was looser than that at low levels of classroom composition (-1 SD) ($\beta = -0.336, p < 0.001$), and the difference between them is significant ($\beta = 0.116, p < 0.05$). These results suggested that classroom composition mitigate the negative impact of perceived discrimination on academic self-concept. Fig. 2

shows the moderation effect of classroom composition.

4. Discussion

In this study, we aim to explore how perceived discrimination affects the left-behind children's academic self-concept, and to examine the mediating effect of school belonging on the relationship between them. It also hypothesizes that classroom composition may influence the left-behind children's academic self-concept in either a direct way or interact with perceived discrimination to influence the formation. The present study contributes to academic self-concept research strand in three ways. First, we examine the formation of students' academic self-concept in particular environment: classroom with left-behind and non-left-behind children. Regarding academic self-concept, students take the ability or performance of their classmates as frame of references to form their own academic self-concept. We are interested in whether the proportion of left-behind children in a classroom affects their reference standards for social comparison, and further affects left-behind children's academic self-concept. Second, we are interested in how classroom composition interact with perceived discrimination impact the formation of left-behind children's academic self-concept, and the extent to which school belonging can mediate the relationship between perceived discrimination and academic self-concept. Finally, we examine the peer spillover effect and the big-fish-little-pond effect in the formation of left-behind children's academic self-concept. To address these questions, multi-level Structural Equation Models were specified. Furthermore, the role of classroom composition in the formation of academic self-concept provides information for educators to assign classes appropriately and improve left-behind children's academic self-concept effectively.

The results found that perceived discrimination was negatively associated with left-behind children's academic self-concept. This result indicates that perceived discrimination can be seen as a kind of social exclusion, which brings great psychological pressure and further generates unsatisfactory educational performance, such as lower level of classroom participation and willingness to attend (Zhang & Tan, 2019). Perceived discrimination may also cause students to doubt their own academic skills, and further hinder students' academic development and learning outcomes, including academic self-concept (Liang et al., 2018). Many scholars have reached similar findings. For example, Szlyk (2021) proved that the experiences of discrimination lead to lower academic self-concept among alternative high school youths. Likewise, Hu et al. (2022) found that perceived discrimination was a risk factor for Chinese migrant and left-behind children's academic self-concept. This study provided empirical evidence that support Hypothesis 1.

Our findings indicated that perceived discrimination and left-behind children's academic self-concept was mediated by school belonging, which supports Hypothesis 2. In educational settings, Schachner et al. (2019) suggested that school belonging and academic self-concept were positively related. Pittman and Richmond (2007) supported that school belonging was a crucial factor for academic-related variables, such as academic self-efficacy. Thus, school belonging plays a vital role in

Table 1
Descriptive statistics and correlations between variables (N = 998).

Variables	M	SD	1	2	3	4
Student level						
1. Gender	0.509	0.500	1			
2. Socioeconomic status	-0.326	2.884	0.076*	1		
3. Perceived discrimination	2.002	0.847	-0.074*	-0.097**	1	
4. School belonging	3.778	0.683	-0.014	0.168***	-0.524***	1
5. Academic self-concept	4.451	0.787	0.067*	0.147***	-0.444***	0.376***
Class level						
1. Classroom composition	0.497	0.125				

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

Table 2
Hierarchical regression analysis of variables predicting academic self-concept.

Dependent variables	Independent variables	β	SE	t	R ²	F
Outcome Variable: Academic self-concept	Constant	5.242***	0.063	83.333	0.209	87.482***
	Gender	0.043	0.045	0.959		
	Socioeconomic status	0.028***	0.008	3.636		
	Perceived discrimination	−0.402***	0.026	−15.207		
Mediating Variable: School belonging	Constant	4.664***	0.052	90.321	0.292	136.487***
	Gender	−0.084*	0.037	−2.300		
	Socioeconomic status	0.029***	0.006	4.568		
	Perceived discrimination	−0.416***	0.022	−19.204		
Outcome Variable: Academic self-concept	Constant	4.233***	0.188	22.525	0.234	75.758***
	Gender	0.061	0.044	1.385		
	Socioeconomic status	0.022**	0.008	2.840		
	Perceived discrimination	−0.312***	0.030	−10.233		
	School belonging	0.216***	0.038	5.685		

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

Table 3
The effect of class composition on the school level (multilevel analysis).

Dependent variables	Independent variables	β	SE	t
Outcome Variable: Academic self-concept	Class level			
	Constant	3.780***	0.059	64.456
	Classroom composition	−1.147***	0.001	−1155.537
	Classroom composition × perceived discrimination	0.464*	0.228	2.037
	Student level			
	Constant	3.366***	0.158	21.347
	Gender	0.078	0.044	1.767
	Socioeconomic status	0.019**	0.007	2.585
	perceived discrimination	−0.162**	0.034	−8.233
	School belonging	0.279***	0.038	7.409

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

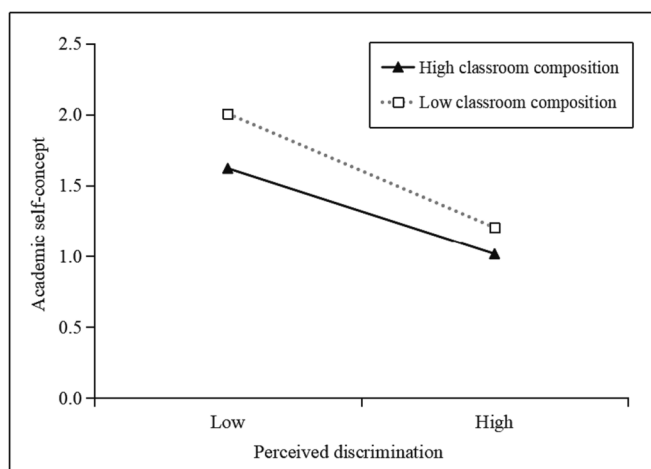


Fig. 2. The moderating effect of classroom composition on the relationship between perceived discrimination and academic self-concept.

several academic outcomes, and consistent with the previous studies, our finding supports that school belonging strengthen academic self-concept. In addition, as hypothesized, experiences of discrimination are negatively related to school belonging. According to

Bronfenbrenner's bioecological model of human development (1994), left-behind children are a part of a broader system; thus school belonging of left-behind children is a phenomenon that interact with outside environment. As Shin et al.'s (2011) study showed that peer discrimination was associated with Asian American adolescents' alienation at school. In other words, when left-behind children reported more perceived discrimination, which may decrease their school belonging. Based on the above findings, our study revealed that left-behind children's school belonging was threatened by their perceived discrimination, but was a key indicator of left-behind students' academic self-concept.

The classroom composition of left-behind children has a direct negative influence on the formation of the left-behind children's academic self-concept, when the proportion of left-behind children in the class is higher, the lower the level of their academic self-concept; this confirmed the H3. Compared with those children who are not been left behind, left-behind children show worse performance in academic outcomes (e.g., poorer academic self-concept) (Xia et al., 2019; Song et al., 2018). It became obvious that left-behind children in the class with higher proportion of left-behind children would display unsatisfactory academic self-concept. Thus, left-behind children would decrease their academic self-concept within a class with a higher proportion of left-behind children. This phenomenon can be explained as the peer spillover effect. A similar phenomenon has been observed in the study of immigrant students. For example, Schneeweis (2015) found that the when immigrant students in Austrian schools with a higher proportion of immigrant students, it could increase their grade retention and reduce their progress to academic track secondary schools.

Our results also supported H4 as well. The influence of perceived discrimination on left-behind children's academic self-concept varies with the classroom composition of left-behind children. The negative effect of perceived discrimination on left-behind children's academic self-concept was attenuated with a higher proportion of left-behind children compared to classes with a lower proportion. This phenomenon can be explained as the big-fish-little-pond effect. More specifically, since downward comparison depends on the availability of comparison samples, when the classroom composition of left-behind children is low, they have less access to examples of downward comparison, and they can only compare themselves those children who has no experience of being left behind in the class, the upward comparison will cause them to experience a lower academic self-concept. In contrast, if the classroom composition of left-behind children is high, left-behind children tend to compare themselves with other left-behind children who are also in a disadvantageous situation, which is beneficial to maintaining their academic self-concept and buffer the adverse impacts of perceived discrimination. Thus, the classroom composition of left-behind children

played a moderating role in the formation of the left-behind children's academic self-concept.

This study's results may offer several practical implications for educators. First, this study found that the negative relationship between perceived discrimination and academic self-concept was mediated by school belonging, therefore, strengthening left-behind children's school belonging by creating a harmonious, friendly, supportive, and open school atmosphere which may help alleviate the negative influences of perceived discrimination. Educators can attempt to strengthen school support for left-behind children by equipping them with more experienced teachers, strengthening group activities, and flexible seating arrangements, in order to give full play to the positive impact of school belonging. Second, based on the findings, the peer spillover effect and the big-fish-little-pool effect of classroom composition were found to be concurrent, specifically, the direct effect of classroom composition on left-behind children's academic self-concept was negative, and this proves the existence of the peer spillover effect. Even so, classroom composition positively moderated the effect of perceived discrimination on left-behind children's academic self-concept, and mitigated the negative influence of perceived discrimination, thus proving the existence of the big-fish-little-pool effect.

Although these two effects demonstrate two contrasting effects of classroom composition of left-behind children's academic self-concept at the same time, both effects can still provide practical implications for the management of left-behind children. Regarding the direct negative effect of classroom composition on left-behind children's academic self-concept, we suggest that when schools assign left-behind children to classes, they should be oriented to reduce the proportion of left-behind children in each class and avoid creating separate classes for left-behind children. In terms of the indirect positive effects of classroom composition on academic self-concept, educators should guide students to make appropriate social comparisons, and could inform left-behind children that many of their classmates or schoolmates face the same dilemma as they do. In addition, educators also need to look positively at the topic of education for left-behind children and avoid the stigmatization of left-behind children. We should help students realize that the left-behind experience is not a legitimate reason for being treated as a minority or discriminated against, nor is it caused by their own mistakes, and that they can change their academic performance or even their fate through their own efforts.

There are some limitations that should be discussed. First, our measures of left-behind children's perceived discrimination, school belonging and academic self-concept, were based on subjective reports. Future studies could collect data apart from self-report measures to test the accuracy and validity of our results. Second, we focused our study on left-behind children in the fourth grade of elementary school only. Perhaps, choosing different grades of the study can lead to different results, such as their level of identification with peer groups, or their choice of reference objects. Future research could be conducted in other elementary or secondary school grades, making the sample more representative. Third, although the present analysis did include several related control variables, there are inevitably other omitted control variables that could have been considered in our study, for example, the highly relevant variables that impact students' academic self-concept, such as academic achievement. Finally, this study was conducted in a Chinese cultural context, where the cultural characteristics of Chinese collectivism require individuals to have a higher degree of congruence with the group to which they belong, which may affect the role played by classroom composition. Future research could be conducted in other countries or regions in order to enhance the external validity.

Ethic statement

The studies involving human participants were reviewed and approved by Academic Ethical Group of The Faculty of Education, Soochow University. The participants provided their written informed consent to participate in this study.

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CRediT authorship contribution statement

Fan Yang: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft. **Zhichen Xia:** Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Validation, Writing – original draft.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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