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ARTICLE

Rethink Left-Behind Experience: New Categories and Its Relationship with Aggression

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ABSTRACT

Left-behind experience refers to the experience of children staying behind in their hometown under the care of only one parent or their relatives while one or both of their parents leave to work in other places. College students with left-behind experience showed higher aggression levels. To further explore the relationship between left-behind experience and aggression, the current study categorized left-behind experience using latent class analysis and explored its relationship with aggression. One thousand twenty-eight Chinese college students with left-behind experience were recruited, and their aggression levels were assessed. The results showed that there were four categories of left-behind experience: “starting from preschool, frequent contact” (35.5%), “less than 10 years in duration, limited contact” (27.0%), “starting from preschool, over 10 years in duration, limited contact” (10.9%), and “starting from school age, frequent contact” (26.6%). Overall, college students who reported frequent contact with their parents during the left-behind period showed lower levels of aggression than others did. Females were less aggressive than males in the “starting from preschool, frequent contact” left-behind situation, while males were less aggressive than females in the “starting from school age, frequent contact” situation. These findings indicate that frequent contact with leaving parents contributes to decreasing aggression of college students with left-behind experience. Meanwhile, gender is an important factor in this relationship.

KEYWORDS

Aggression; left-behind experience; college students; gender differences; latent class analysis

1 Introduction

1.1 Aggression of College Students and Left-Behind Experience

In recent years, college students' behavioral problems, especially aggressive behavior, have aroused public concerns [1,2]. Aggression refers to an individual's tendency to intentionally cause harm to others and believes such behavior will hurt others [3].

“Left-behind” family is an untypical family environment in which children remain in their hometowns while one or both of their parents leave to work in other places. In many cases, these children are taken care of by their unilateral parents, grandparents, or other relatives [4]. A nationwide sample survey in China showed



that the proportion of left-behind families reached 50% in some provinces [5]. Due to separation from parents in their growth process, undergraduates with left-behind experience reported more psychological problems than those without [6]. Moreover, undergraduates with left-behind experience showed higher levels of aggression than other students do [7–9].

According to the frustration-aggression hypothesis, aggressive behavior is the result of frustration, and the occurrence of frustration is always a prerequisite for aggressive behavior [10]. Berkowitz who modified the frustration-aggression hypothesis, pointed out that frustration awakens the preparedness for aggressive behavior, and whether or not aggressive behavior would occur depends on situations [11]. However, it is undeniable that frustration remains an important factor in aggression [12]. Left-behind individuals tend to experience more frustrations and negative situations. For example, left-behind children tend to face a variety of family problems, such as poor material life, lack of parental care, desolate family atmosphere, limited communication with family members, family conflicts, etc. [13–15]. Moreover, left-behind children suffer more at school, such as declining academic performance, school weariness, and conflicting peer relationships [16,17]. Overall, college students with left-behind experience tend to have grown up in a more frustrating environment, and they have shown higher degrees of aggression.

1.2 Categories of Left-Behind Experience and Aggression

In order to better identify aggressive individuals among college students with left behind experience, it may be helpful to explore the relationship between specific left-behind experience and aggression.

Existing studies have distinguished the specific left-behind experience as follows: different parents who left, caregivers, start time of left-behind experience, duration of the experience, contact frequency with parents who left [18–21]. Left-behind individuals who were taken care of by a single parent were shown to be less aggressive than those cared by extended family members were [22]. Contact frequency with parents who left was negatively related to aggression [23]. However, studies on the relationship between some specific left-behind experience and aggression yielded inconsistent results [8,24]. For example, aggression did not differ significantly in terms of both the start time and the separation duration [19]. The separation duration with leaving parents was negatively related to aggression, while the correlation between the start time and aggression was not found [24]. Li found that the earlier the start of separation, the longer of separation, the higher the level of aggression of the college students [8].

Results about the relationship between left-behind experience and individual aggression were inconsistent among studies. A possible reason could be the heterogeneity of left-behind groups. Simply attributing left-behind children's behavioral problems to a specific left-behind factor is too generalized. In order to explore the heterogeneity of left-behind groups, a few studies used the latent profile analysis to explore the psychographic categories of left-behind groups [24,25]. Using the psychographic-based latent profile analysis, we could identify psychographic heterogeneity within the left-behind population. However, previous research did not distinguish the level of aggression among college students with left-behind experience. The present study will categorize students using latent class analysis and reconsider its relationship with aggression.

1.3 Gender Differences in Aggression

Left-behind children can face very different realities simply due to their gender. Under the traditional Chinese division of labor within families, women were responsible for taking care of the family while men dealt with affairs in society. Conventional migrant parents and caregivers thus tend to have more expectations for their male children, oftentimes demanding them to have high academic achievements. They may pay less attention to their female children's achievements and instead ask them to take on domestic labor [26].

Many studies have found that gender affects how children cope in adverse situations. For example, a positive family environment seemed to be a stronger protective factor for girls [27]. Logan-Greene et al. found that neglected males were more likely to be aggressive than females were [28]. These findings suggest that the effect of left-behind experience on individual aggression may also vary with gender. Luo found that female left-behind adolescents were angrier and more hostile than male ones [29]. However, Zhang et al. [23] revealed that left-behind males were more aggressive than left-behind females were. These inconsistent results indicate that the effect of left-behind experience and gender on aggression may depend on specific situations of individuals' left-behind experience.

1.4 The Current Study

To better understand aggressive college students with left-behind experience, the current study, based on the existing classification of left-behind experience, reclassified left-behind experience via latent class analysis and explored the relationship between new categories and aggression of college students.

Existing studies suggested that traditional Chinese culture may influence left-behind males' and females' growth environments differently [26]. Therefore, the current study further explored the relationship between gender and aggression in left-behind individuals from the perspective of the newly defined categories.

2 Methods

2.1 Participants and Procedure

Participants were recruited from a university in Chongqing, China. A total of 1,800 undergraduates were invited to participate in the research. In these subjects, 58 undergraduates returned incomplete questionnaires and were excluded. In 1,742 valid answers, 1,028 undergraduates ($M_{\text{age}} = 19.60$ years, $SD = 0.93$; 49.5% males) have left-behind experience. 753 (73.5%) of them came from rural areas, and 284 (27.7%) was the only child of their family.

The students' informed consent was obtained before the start of the test. Questionnaires were distributed uniformly in classes and the students filled them out voluntarily. Instructions were read out in front of all students to inform them that there were no right or wrong answers and their results would be confidential. Questionnaires were collected on the spot. The testing time was about 10 minutes.

2.2 Measures

2.2.1 Demographic Characteristics

The following demographic characteristics were collected: gender, age, only-child status, family residential status, and left-behind experience.

Students were defined as having left-behind experience when the separation from parents begins before 18 years old and lasts more than six months [7]. The questionnaire of the left-behind experience includes the following items: parents who left, caregivers, the start time of any left-behind experience, duration of such an experience, contact frequency with parents who left (subjective and objective contact frequency). The subjective contact frequency was measured by asking "What do you think is the frequency of contact with your parent(s) who left?" The objective contact frequency was assessed with "How often did you contact your parent(s) who left?".

2.2.2 Aggression

Aggression was measured by the Buss-Perry Aggression Questionnaire [30], which contains 22 items. The four dimensions of the questionnaire include hostility, physical aggression, impulsivity, and anger proneness. Items were scored on a 5-point scale that ranged from 1 = strongly disagree to 5 = strongly agree. The reliability and validity of its Chinese version were verified [31]. The higher the score, the

stronger the aggression. In this study, the overall measure of aggression was internally consistent (Cronbach's alpha's = 0.85).

2.3 Data Analysis

Firstly, descriptive statistics were used to count the number of diverse left-behind experience conditions. Furthermore, aggression differences in diverse left-behind experience conditions were explored by ANOVA.

Secondly, latent class analysis (LCA) was used to identify undergraduates' left-behind experience categories in this study. LCA was used to analyse potential categories by Mplus 7.0 [32]. LCA was started from the initial model, assuming that there was only one category. Then, the number of categories in the model gradually increased until the best fitting model was found. The model fit indices are Akaike Information Criterion (AIC), Bayesian information criterion (BIC), and sample-adjusted Bayesian information criterion (aBIC). The smaller the values are (AIC/BIC/aBIC), the better the model fits [32]. The entropy index was used to evaluate the accuracy of classification in LCA, which ranged from 0 to 1. The bigger the values are, the better the model fits. In addition, Mplus also provided two indicators to compare latent category models, which were Lo-Mendell-Rubin (LMR) and Bootstrap Likelihood Ratio Test (BLRT). When reaching a significant level, the values of LMR and BLRT showed the model of k class was significantly better than that of k-1 class [32].

Finally, a two-factor ANOVA analysis was used to test the effect of gender and latent left-behind experience class on aggression.

3 Results

3.1 Overall Left-Behind Experience

As presented in Table 1, 75% of participants experienced both parents leaving, 20.4% experienced only fathers leaving, and 4.7% only mothers leaving. Approximately 61.1% of participants started having left-behind experience in the preschool period (<3 or 3–6 years old). Approximately 77.0% of participants' caregivers were grandparents, and 8.1% were distant relatives. The majority of the participants' left-behind duration was more than 10 years (37.8%), with "5–10 years" (30.1%) being the second most selected option. As to contact frequency, 32.2% (35.7%) of participants' contacted their leaving parents once a week ("usually").

Table 1: Participants' left-behind experience

Left-behind experience	<i>N</i>	Left-behind experience	<i>N</i>
Leaving parents		Caregivers during left-behind experience	
Mother	47(4.7%)	Unilateral parent	148(14.9%)
Father	206 (20.4%)	Grandparents	766(77.0%)
Both	757 (75.0%)	Others	81(8.1%)
Starting age of left-behind experience		Duration of left-behind experience	
<3	355 (34.9%)	Less than 1 year	91(9.1%)

(Continued)

Table 1 (continued).

Left-behind experience	<i>N</i>	Left-behind experience	<i>N</i>
3–6	266 (26.2%)	1–3 years	116(11.6%)
6–12	254 (25.0%)	3–5 years	113(11.3%)
12–15	93(9.2%)	5–10 years	300(30.1%)
15>	48(4.7%)	More than 10 years	376(37.8%)
Objective contact frequency with parents who work outside		Subjective contact frequency with parents who work outside	
2 or 3 a week	216 (21.3%)	Often	245(24.1%)
Once a week	326 (32.2%)	Usually	362(35.7%)
Once a month	223 (22.0%)	Occasionally	267(26.3%)
Once more than a month	247 (24.4%)	Very rarely	141(13.9%)

3.2 Aggression of Participants with Left-Behind Experience

A series of analyses of variance (ANOVAs) was used to estimate the differences in aggression due to left-behind experience status. Given that multiple ANOVAs were used, the total type I error rate should be corrected. Therefore, means comparison was conducted using Bonferroni corrections. The results (shown in Table 2) showed that there were no significant differences in aggression due to different leaving parents, start time, duration, or caregivers ($ps > 0.05$). However, there was a significant aggression difference due to contact frequency ($ps < 0.05$). The *post hoc* analysis (Bonferroni) revealed that there were no significant differences of aggression among different objective contact frequency, while participants who contacted their leaving parents occasionally or very rarely reported significantly higher levels of aggression than those who often contacted their leaving parents ($\eta^2 = 0.016$).

Table 2: Means and standard deviation of aggression and left-behind status comparison

Left-behind experience	<i>M</i>	<i>SD</i>	<i>F</i>	η^2	<i>Post hoc</i>
Leaving parents			1.62	0.003	
Mother	57.76	12.45			
Father	54.42	13.09			
Both	54.39	12.37			
Starting age of left-behind experience			0.79	0.003	
<3	55.09	11.60			
3–6	54.81	13.35			
6–12	54.12	12.53			

(Continued)

Table 2 (continued).					
Left-behind experience	<i>M</i>	<i>SD</i>	<i>F</i>	η^2	<i>Post hoc</i>
12–15	53.69	13.41			
15>	52.22	12.90			
Caregivers during left-behind experience			1.76	0.004	
Unilateral parent	54.40	12.56			
Grandparents	54.27	12.50			
Others	57.01	12.53			
Duration of left-behind experience			0.33	0.001	
Less than 1 year	54.60	13.10			
1–3 years	53.96	13.33			
3–5 years	55.73	12.56			
5–10 years	54.52	12.48			
More than 10 years	54.40	12.16			
Objective contact frequency with parents who work outside			2.77*	0.008	
2 or 3 a week	53.78	12.51			
Once a week	53.25	11.51			
Once a month	56.00	13.07			
Once more than a month	55.37	13.26			
Subjective contact frequency with parents who work outside			5.55**	0.016	1 < 3,4
Often	52.18	12.27			
Usually	54.36	11.50			
Occasionally	56.31	13.02			
Very rarely	56.14	13.84			

Notes: (1) 1 = “often”; 2 = “Usually”; 3 = “Occasionally”; 4 = “Very rarely”. (2) ** $p < 0.01$, * $p < 0.05$.

3.3 Latent Class Analysis of Left-Behind Experience

Since the latent class analysis can only analyze binary variables, six left-behind conditions were encoded. (1) Leaving parents: mother or father left = 0, both left = 1; (2) Start time: 6–12, 12–15 and >15 years old = 0, <3 and 3–6 years old = 1; (3) Caregiver: unilateral parent or grandparents = 0, others = 1; (4) Duration: less than 1 year, 1–3 years, 3–5 years and 5–10 years = 0, more than 10 years = 1; (5) Objective contact frequency: 2 or 3 a week and once a week = 0, once a month and once more than a month = 1; (6) Subjective contact frequency: often and usually = 0, occasionally and very rarely = 1.

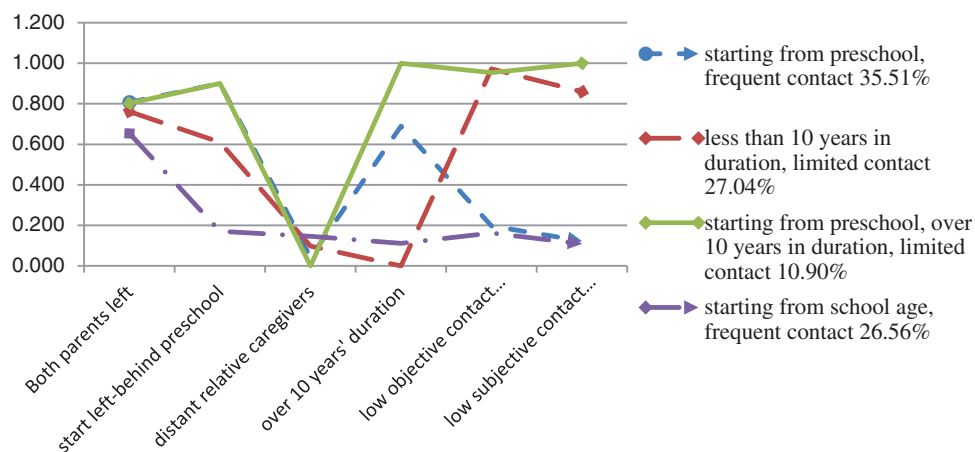
Five latent class models were estimated, and the fit indices of five models were shown in Table 3. The AIC value of the fifth class solution decreased slightly while its BIC and aBIC values increased compared with the fourth class solution. The BIC value of the third class solution was the lowest compared with others, but its entropy value was less than 0.7. The LMR and BLRT values of the fourth class were significant, while those of the fifth class were not. The entropy value was 0.748 and the group sizes were relatively balanced. Therefore, the fourth class solution was the best model for the data.

Table 3: Model fit indices for the latent class analyses ($N = 1028$)

Class	AIC	BIC	aBIC	LMR(p)	BLRT(p)	Entropy	Group sizes				
1	7154.34	7183.95	7164.90				1028				
2	6779.10	6843.26	6801.97	381.388***	-3571.171***	0.787	340	688			
3	6645.10	6743.81	6680.29	145.008***	-3376.548***	0.688	390	339	299		
4	6612.18	6745.44	6659.68	45.971***	-3302.551***	0.748	365	278	112	273	
5	6611.49	6779.29	6671.30	14.44	-3279.09	0.761	111	101	408	269	139

Notes: *** $p < 0.001$.

The participants' proportions of four latent classes and the probabilities of four latent classes in six left-behind conditions were shown in Fig. 1. According to the results and features of every latent class, the four latent classes could be entitled "starting from preschool, frequent contact", "less than 10 years in duration, limited contact", "starting from preschool, over 10 years in duration, limited contact", and "starting from school age, frequent contact". The proportion of the four latent classes revealed that most participants' left-behind experience started at preschool period, while they contacted their leaving parents frequently in their left-behind time. There were approximate 10.9% of participants whose left-behind experience started at preschool, lasted for more than 10 years, and the frequencies of contact were low.

**Figure 1:** Probabilities of four latent classes on six left-behind topics

3.4 Aggression Differences Due to Types of Left-Behind Experience and Gender

Based on the four latent classes of participants' left-behind experience, ANOVA was used to investigate the aggression difference of four classes. The results showed that there were aggression differences among the four types of left-behind experience ($F = 2.74, p < 0.05$). The *post hoc* analyses (LSD) revealed that participants' aggression of "less than 10 years in duration, limited contact" left-behind status was higher than that of "starting from school age, frequent contact" status ($p < 0.01$).

In order to explore the gender differences in participants' aggression in all left-behind experience categories, a two-factor ANOVA analysis was used to test the effects of gender and latent left-behind experience classes on aggression. The results (shown in Table 4) showed that, controlling for age, family residential status, and the only child of family, the main effects of gender and latent left-behind experience classes were not significant ($ps > 0.05$), while a significant interaction effect of gender and latent left-behind experience class was found ($F = 4.63, p < 0.01, \eta^2 = 0.014$).

Table 4: Means and standard deviation of aggression in genders and left-behind experience types

Latent left-behind experience class	Gender	<i>n</i>	<i>M</i>	<i>SD</i>
Starting from preschool, frequent contact		353	54.10	11.33
	Male	149	56.16	11.82
	Female	204	52.60	10.74
		263	56.03	13.35
Less than 10 years in duration, limited contact	Male	146	56.09	14.01
	Female	117	55.95	12.53
Starting from preschool, over 10 years in duration, limited contact		107	55.50	14.21
	Male	52	53.94	14.23
	Female	55	56.98	14.17
		263	53.07	12.59
Starting from school age, frequent contact	Male	143	51.42	12.54
	Female	120	55.05	12.41

Furthermore, simple effect tests showed that there were significant aggression differences in genders under the “starting from preschool, frequent contact” ($F = 7.30, p < 0.01$) and “starting from school age, frequent contact” ($F = 6.78, p < 0.01$) situations. Similarly, aggression differences were found in diverse left-behind experience classes in males ($F = 4.98, p < 0.01$). Specifically, in the “starting from preschool, frequent contact” left-behind experience situation, aggression in males was higher than that in females ($p < 0.01$); while in the “starting from school age, frequent contact” situation, aggression in females was higher than that in males ($p < 0.01$). For males, aggression in “starting from preschool, frequent contact” and “less than 10 years in duration, limited contact” situations was higher than that in the “starting from school age, frequent contact” situation ($ps < 0.01$) (see Fig. 2).

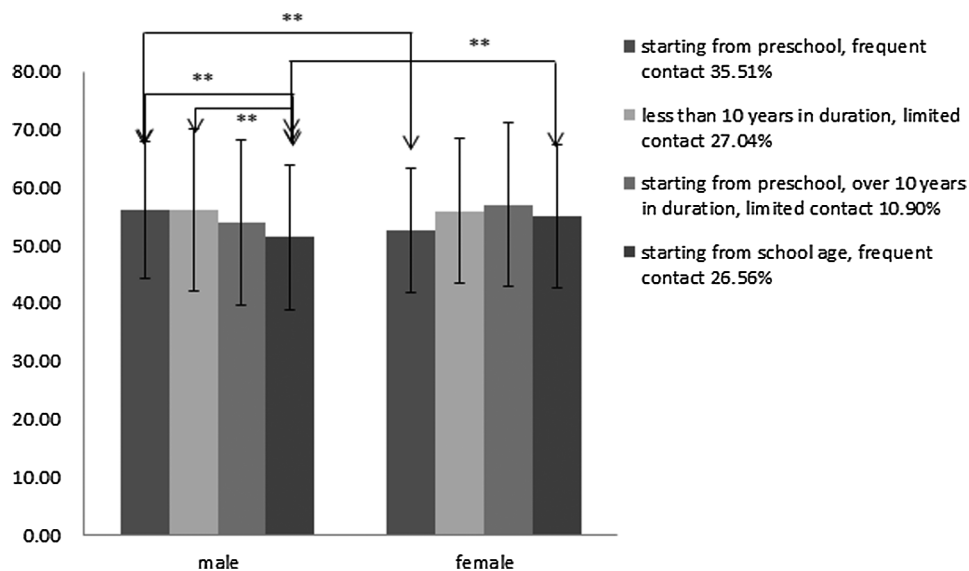


Figure 2: Influence of the interaction between genders and left-behind experience types on aggression
Notes: ** $p < 0.01$

4 Discussion

In the current research, we found that more than half of the participants had left-behind experience. The proportion was higher than that of other studies on similar populations [33,34]. One possible explanation was that left-behind students are unevenly distributed in China [5]. Left-behind experience may affect undergraduates' social support, psychological resilience, self-esteem, and mental health [35,36]. Therefore, it is essential to keep exploring and understanding this complicated issue.

In consideration of the variations of left-behind situations, the current study investigated various left-behind conditions and identified four categories. "Both parents left", "being taken care of by grandparents", "starting at preschool time", "more than 5 years of duration" were typical descriptions of college students' left-behind experience. The left-behind experience was related to family support [35], parent-child attachment [37], affective responsiveness, behavior control, general function, self-control [18], and aggression, suicidal ideation [8]. The existing study showed that all four categories of left-behind experience have the detrimental effect of increasing aggression [8], hence calling for urgent attention and care devoted to this population.

When all the left-behind statuses were considered at the same time, the current study found that undergraduates with higher subjective contact frequencies with their leaving parents were less aggressive. However, there was no aggression difference in other left-behind experience conditions (start time, duration, caregivers, and the leaving parents). Frequent contact with leaving parents not only acts as a protective factor against negative emotional symptoms, but also provides social support and therefore enhances healthy emotional adaptation [38,39]. Moreover, the contact with leaving parents partially makes up for the lack of parent-child communication, which may decrease behavioral problems [40]. Furthermore, with the LCA method, four categories of undergraduates' left-behind experience were found. The undergraduates in the class of "starting from school age, frequent contact" were found to be less aggressive than that in "less than 10 years in duration, limited contact", which confirmed that contact frequency with parents helps to decrease the level of aggression.

Gender differences were found in the participants' aggression in various left-behind experience categories. In the "starting from preschool, frequent contact" left-behind situation, aggression was lower in females than males. Female undergraduates may benefit more from frequent contact with parents when the start time of left-behind experience is relatively early. Female undergraduates with left-behind experience have a higher level of resilience and self-esteem than males do [33]. Contact frequency with leaving parents is related to supportive power, and female undergraduates with left-behind experience showed higher supportive power than males [35]. It has been confirmed that resilience was conducive to decrease aggression in frustrating situations by both empirical experiments and self-report measures [41,42]. Therefore, increasing contact frequency may help to decrease aggression of females with "start preschool" left-behind experience.

Male children presented more aggression than female children did in early childhood [43]. However, the current study showed that males' aggression was lower than females' in the "starting from school age, frequent contact" left-behind situation. This result suggested that male undergraduates may benefit more from "starting from school age, frequent contact" left-behind situation. More parental monitoring was associated with a lower occurrence of delinquency and drinking among male children [44]. Harsh parenting was only associated with male children's aggressive behavior [45]. Therefore, parental companionship may be more helpful for reducing aggression in males than in females.

Moreover, male aggression in "starting from school age, frequent contact" left-behind situation was lower than that in the "starting from preschool, frequent contact" situation. The results showed that male undergraduates may benefit more from the "start at school age" left-behind situation. The start time of left-behind experience affected parent-child attachment [37], and attachment security was associated with

less aggressive behavior [46]. Furthermore, improved parenting practice can help decrease children's aggression [47]. Therefore, males with their parents by their side at the preschool time were likely to receive more care and better parenting. As a result, they have lower levels of aggression than those whose left-behind experience started earlier.

In conclusion, the current study found four types of left-behind experience in undergraduates and distinguished aggression differences among the four categories. The results suggested that in order to preventatively reduce aggression levels of undergraduates with left-behind experience, increasing contact frequency in the left-behind period may be helpful. Specifically, increasing contact frequency may be more helpful for female children than for male ones. For the latter, if their parents left after their school age, they tend to have less aggression.

There were some limitations to the present study. First, the sample of college students came from only one university in Chongqing Province, China. Whether the results could be extended remains to be investigated. Second, our measurement of aggression was based on self-report, which might lead to reporting biases. Third, causal conclusions cannot be found with the cross-sectional design. Future researchers could conduct longitudinal studies to explore the role of left-behind status in the development of individual aggression.

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Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

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