



Plight or light? Elucidating the main and interacting effects of parenting styles and BIS/BAS profiles on left-behind youth's self-esteem

Xiaoyu Lan¹

Accepted: 25 January 2023 / Published online: 14 February 2023
© The Author(s) 2023

Abstract

Today, many labor-aged adults worldwide work and live for a prolonged period outside of their places of origin in locations where the laborers' school-aged children cannot migrate with their parents, creating a group known as left-behind youth. Empirical studies regarding the impact of parental migration (left-behind versus non-left-behind) on positive youth development, such as self-esteem, remain scarce, and the collective findings are divergent and controversial. Accordingly, the relational and individual correlates of self-esteem among those youth are largely underexplored. Two independent studies were conducted to fill these crucial knowledge gaps. In Study 1 ($N=738$; $M_{age} = 15.86$; 54.6% girls), I compared the self-esteem of left-behind youth and their non-left-behind peers after adjusting for sociodemographic covariates and social desirability. In Study 2 ($N=1060$; $M_{age} = 13.05$; 49.5% girls), I aimed to replicate the findings obtained from Study 1 but used a different measurement and another independent sample. Additionally, I extended Study 1 to investigate the main and interactive relationships between parenting styles (parental warmth and control) and the behavioral inhibition/activation system profiles with self-esteem. To clarify the commonality and specificity of these relationships, I also estimated the moderating role of left-behind status herein. Converging findings across both studies challenged the widely vulnerable image of left-behind youth and revealed that this group did not show significant differences in terms of self-esteem, as compared to non-left-behind peers. Interaction analyses also suggested that shy left-behind youth weaken the extent to which their self-esteem is detrimentally affected by low parental warmth/high parental control.

Keywords Self-esteem · Parenting styles · Behavioral inhibition system · Behavioral activation system · Left-behind children

Introduction

Economic globalization, socio-political conflicts, and environmental changes have significantly fueled national and international migration at an unprecedented scale over the past few decades (McAuliffe & Triandafyllidou, 2021; UNESCO, 2019). Under this massive migration trend, millions of children are currently being left behind in their original communities after one or both biological parents migrated to bustling megacities to work (Graham & Jordan,

2011; Gu, 2022; Khalid et al., 2022). In accordance with abundant empirical findings on socioemotional difficulties (Cheng & Sun, 2015; Wang & Mesman, 2015), the “plight” of left-behind children has increasingly been highlighted in media coverage. Are left-behind youth truly worse off than their non-left-behind peers in the original communities? Some existing studies on positive outcomes challenge that widely held assumption, showing that left-behind youth are not socioemotionally and academically disadvantaged compared to their non-left-behind peers (Fu & Zhu, 2020; Lan, 2022a, b; Ma et al., 2022). Parental migration instead sheds a “light” on left-behind youth's psychological growth and academic attainment since economic remittances sent back by migrated parents significantly improve youth's access to healthcare services and boost high rates of educational investment (Fu & Zhu, 2020). Whether parental migration

✉ Xiaoyu Lan
xiaoyu.lan@psykologi.uio.no

¹ Promenta Research Center, Department of Psychology, University of Oslo, Oslo, Norway

renders a “plight” or sheds a “light” on left-behind youth’s psychosocial development remains an open question with inconclusive empirical evidence.

In the present study, I took a strength-based approach to counterbalance the disproportionate literature, which predominantly focuses on the negative outcomes and related correlates, and to help inform better solutions that allow left-behind youth to thrive and flourish. Specifically, the present research brought together two independent but inter-connected empirical studies to compare the self-esteem between left-behind youth and their non-left-behind peers. This research subsequently investigated the main and interactive relationships of parenting styles (i.e., parental warmth and control) and the behavioral inhibition system (BIS)/behavioral activation system (BAS) profiles with self-esteem. Additionally, this study estimated the moderating role of the left-behind status herein to clarify the commonality and specificity of the studied relationships. Studying the self-esteem of left-behind youth who face numerous challenges due to parental absence has considerable implications. Primarily, those implications not only apply to the youth themselves and the families tackling these challenges, building resilience, and ultimately reaching their full potential, but also generate valuable insights for strengthening social services, maintaining societal stability and public order, and aligning with the sustainable development goals highlighted by UNESCO (2019).

Self-esteem

Self-esteem refers to one’s positive or negative attitude toward oneself, expressing self-judgment of personal worth (Rosenberg, 1965). As one key component of psychological resources, past research has long shown that individuals with high self-esteem facilitate a broad range of favorable outcomes, such as fewer problem behaviors, positive interpersonal relationships, and educational or occupational success (Orth & Robins, 2014; Orth et al., 2018; Pyszczynski et al., 2004). Likewise, high self-esteem often acts as a barrier against stress and distress pressure in challenging situations (Hobfoll, 2002; Ma et al., 2022). This stress resistance capacity highlights the importance of studying self-esteem in left-behind youth (Ma et al., 2022). Given the overwhelming evidence that self-esteem produces benefits for left-behind youth and beyond, understanding how parental migration (left-behind versus non-left-behind) influences youth’s self-esteem has considerable significance.

Prior meta-analysis has provided preliminary evidence showing that left-behind children developed lower self-concepts than their non-left-behind peers (Wang et al., 2015). Since this meta-analysis relied on a single measurement of self-esteem and only included a small number of empirical

studies, caution should be exercised. More credible and robust studies are warranted to leverage different measurements of self-esteem to confirm this finding. Additionally, although parental migration inevitably provides a positive or negative influence on adolescents’ self-esteem, not all adolescents flourish or fail. Given significant individual differences therein, existing scholarship should be advanced by investigating how the relational and individual factors shape the conditional processes of this complex association.

To delineate interpersonal (relational) and intrapersonal (individual) correlates of self-esteem, I used the socio-ecological framework (Bronfenbrenner & Morris, 2006). This framework has not only highlighted the isolated roles of the factors rooted in multiple levels but also emphasized the interactive roles of, for instance, the factors across relational and individual levels in explaining the variance of youth’s self-esteem. The current study built upon and expanded the socio-ecological informed conceptualization by focusing on the main and interactive associations of parental styles (relational) and BIS/BAS profiles (individual) with adolescents’ self-esteem. These implied but underexamined associations would allow researchers to gather a multisystemic and comprehensive understanding of the relational-individual processes that contribute to youth’s self-esteem development.

Parenting styles

Parental styles refer to general patterns of parental behaviors and reflect parents’ underlying attitudes and beliefs toward child-rearing (Kuppens & Ceulemans, 2019; Smetana, 2017). The dimensional approach of parental styles is defined initially as two main aspects: responsiveness/warmth and demandingness/control (Baumrind, 1966; Maccoby & Martin, 1983). In the current investigation, my focus was on these two dimensions, with special attention to warmth and psychological control. Specifically, parents with warmth tend to provide emotional support and show involvement and acceptance, whereas parents with psychological control are likely to constrain, invalidate, and manipulate children’s feelings and emotional experiences (Darling & Steinberg, 1993; Grolnick & Pomerantz, 2009). Ample research has shown that adolescents are likely to seek support from their responsive and emotionally warm parents when facing setbacks and challenges (Pinquart & Gerke, 2019). Likewise, when interacting with warm parents, adolescents may feel emotionally energetic and competent in handling difficult circumstances when exposed to stressful events (Pinquart & Gerke, 2019). Parental warmth is therefore reasonably and positively related to self-esteem. In contrast, interacting with psychologically controlling parents may derail adolescents’ chances of establishing independence and restrict the development of self-regulation abilities, consequently

reflecting one's cognitive schema on decreased self-esteem (Barber, 1996; Silk et al., 2003).

Although the relationships between different dimensions of parenting styles and youth's self-esteem have been well-established, less is known about such associations among left-behind youth. This knowledge gap is particularly prominent, considering that enhancing positive self-regard is one of the critical drives for developing effective coping strategies (Hobfoll, 2002), which then smooth left-behind youth's transition when their parents migrate (Ma et al., 2022). Despite the absence of direct physical company and supervision, parents even provide more care and continuous support after migration than before it, largely through social media or surrogates, to somehow psychologically compensate for the parental absence and help their children achieve optimal functions (Lan, 2022c; Ma et al., 2022). Therefore, studying the role of this proximally relational factor—parenting styles—in self-esteem is practically meaningful not only for youth living with parents but also for left-behind youth.

Emerging evidence has also exhibited some boundary processes regarding the strength of the relationship between parenting styles and youth's self-esteem (Pinquart & Gerke, 2019). Since specific parenting dimensions appear to affect youth's self-esteem in various ways depending on individual characteristics, understanding these boundary conditions would estimate how specific patterns of parenting styles are associated with self-esteem. Among individual characteristics, I focused on the BIS and BAS, as discussed below.

Behavioral inhibition system and behavioral activation system

Gray (1972, 1987) claimed that individual differences observed in emotional reactivity and psychopathology are regulated by two neurobiological systems: BIS and BAS. Specifically, BIS—the aversive motivation system—responds to an individual's response to anxiety-provoking stimuli in each environment and is activated in times of punishment or frustrative non-reward. Individuals under the activation of the BIS tend to inhibit movement toward targeted goals, eventually leading to adverse outcomes. In contrast, BAS—the appetitive motivation system—is activated by reward or non-punishment. Individuals under the stimulation of the BAS are likely to actively pursue goals related to the development of competence and task proficiency, which may result in favorable outcomes (Erdle et al., 2010; Cooper et al., 2008; Masselink et al., 2018). Extant research has, however, predominantly relied on the variable-centered approach to assess how BIS/BAS scores relate to relevant predictors and outcomes. In this regard, the simple aggregation of the scores considers all samples homogeneous and

fails to consider the variability and natural configuration of the samples (von Eye et al., 2015). Amid being highly subjective to ecological fallacy, the application of this aggregate analysis may misinterpret individual differences and dynamics (von Eye et al., 2015). The homogeneous assumption is obsolete, particularly considering that, during adolescence, youth show considerable individual differences and complex configurations in BIS and BAS development (Pagliaccio et al., 2016). Given those research ambitions, moving beyond this variable-centered approach—for instance, by using a person-centered approach to derive BIS/BAS profile—is conceptually appropriate and practically meaningful.

A person-centered approach to BIS and BAS profiles is firmly guided by the social motivations theory (Asendorpf, 1990) and the joint subsystems hypothesis (Corr, 2002). These theoretical perspectives stipulate that psychological functioning results from differential combinations of social avoidance (e.g., BIS) and social approach (e.g., BAS) motivations. Four categories can be differentiated in this regard: sociable (low BIS/high BAS), avoidant (high BIS/low BAS), shy (high BIS/high BAS), and unsociable (low BIS/low BAS). Extant research has empirically supported these four theoretically driven BIS/BAS profiles (Coplan et al., 2006; Lan & Wang, 2020a), although the findings were potentially spurious given the small sample sizes in both empirical studies reviewed above. More data and empirical studies should replicate these profiles for credibility and robustness.

Past work has shown the moderating role of BIS/BAS in the association between relational variables and psychosocial outcomes. For instance, Lan and Wang (2020a) found that “shy” adolescents characterized by high BIS and BAS buffered against the adverse effect of attachment insecurity on depressive symptoms. The findings were solely based on a relatively small sample of left-behind youth, and the commonality and specificity of the study associations, as compared with non-left-behind youth, were unclear. Thus, conceptually, prior findings should be extended by investigating the moderating role of BIS/BAS profiles in the association between parenting styles and self-esteem in left-behind and non-left-behind youth.

Overview of the present research

The present research particularly leveraged a strength-based perspective and extended prior scholarship to compare the self-esteem between left-behind and non-left-behind youth. This research subsequently relied on a socio-ecological perspective as the framework delineating the main and interactive relationships of parenting styles (i.e., parental warmth and control), BIS/BAS profiles, and left-behind status with

self-esteem in a combined sample of left-behind and non-left-behind youth. Specifically, two research questions (RQ) were formulated:

RQ1 Are there differences in self-esteem between left-behind youth and their non-left-behind peers?

RQ2 How are parenting styles, BIS/BAS profiles (if identified), and left-behind status directly and interactively linked with self-esteem?

To address these RQs, I zoomed in on left-behind youth in China, a representative fast-paced developing country. Millions of working-age adults have flooded urban megacities in China in the past decades to seek better jobs with decent wages than those available in original communities, resulting in millions of left-behind populations with only surrogate caregivers, such as grandparents and close relatives (Wei et al., 2022; Zhou et al., 2022). Therefore, such a sociocultural context provides a meaningful and suitable context for studying the RQs mentioned above.

I aimed to address these RQs using two independent but inter-connected studies with the combined samples of left-behind and non-left-behind youth. Specifically, in Study 1, I compared the self-esteem between left-behind youth and their non-left-behind peers, after adjusting for sociodemographic covariates and social desirability. In Study 2, I used an independent sample drawing on a different measurement of self-esteem from Study 1 to re-analyze group differences (left-behind versus non-left-behind youth) in self-esteem. This replication design, which highly echoes recent psychological research advocates and movements (Lan, 2023; Shrout & Rodgers, 2018), has at least demonstrated two visible advantages. First, two independent samples recruited from different regions could extend the results' generalization given considerable regional differences in China. Second, relying on two different measurements for self-esteem not only can, to some degree, exclude group differences in self-esteem from potential measurement errors, but also produce credible and robust research findings. If converging evidence on group differences in self-esteem across these two studies could be collected, researchers would be more confident in interpreting ongoing inconsistent evidence regarding the effect of parental migration on left-behind youth's healthy psychological development (either "plight" or "light"). Building on these robust findings, Study 2 was then designed to conceptually extend Study 1 by solely focusing on RQ2. I intentionally used such a design to improve research efficiency and decrease participants' burden.

According to the current literature review, I generated the following hypotheses. In terms of RQ1, I expected

that left-behind youth might not significantly differ in self-esteem from their non-left-behind peers as the current scholarship on positive psychosocial outcomes failed to identify significant differences (Lan, 2022a, b; Ma et al., 2022). However, I kept this hypothesis open given the mixed findings related to the self-concept in extant research and prior meta-analysis (Wang et al., 2015).

In terms of RQ2, I expected parenting styles to significantly affect youth's self-esteem. Specifically, parental warmth would be positively related to self-esteem, whereas parental control would be negatively related to self-esteem. Additionally, I expected that four latent BIS and BAS profiles might be derived: sociable, avoidant, shy, and unsociable (Asendorpf, 1990; Coplan et al., 2006; Lan & Wang, 2020a). Due to the scarcity of the literature, I did not generate specific interactive patterns regarding studied associations. Yet based on existing limited evidence, some expectations can be made. For instance, I expected that shy adolescents characterized by high BIS and BAS might counteract the adverse effect of low parental warmth (or high parental control) on self-esteem, and these associations would be accentuated for left-behind youth more than for their non-left-behind peers.

Study 1

Study 1 aimed to compare the self-esteem in left-behind and non-left-behind youth after adjusting for sociodemographic characteristics and social desirability.

Method

Participants and procedure

Research protocols and procedures were approved by the responsible Research Ethics Committee. Participants were recruited by convenience sampling from public primary and middle schools in central mainland China. Based on cooperating agreements established between Principal Investigator and school principals, written consent forms were delivered by head teachers in each classroom to the parents. Only those who indicated active participation were invited to this anonymous and voluntary survey based on paper-and-pencil formats. The age-appropriate measurements were carefully selected based on existing psychometric properties. Data collection was administered by trained research assistants in each classroom. Adolescents were first given standardized instructions on how to complete this survey independently, and were subsequently given item examples to familiarize themselves with, for instance, Likert-type scales. The

Table 1 Descriptive statistics and reliability estimates in Study 1

	Self-esteem	Age	Gender ^a	Parental education	Family wealth	Social desirability	Separation duration (years)
Left-behind youth (n = 246)							
Mean	3.07	15.77	-	3.80	3.99	5.26	5.60
Standard deviation	0.53	1.50	-	1.08	0.95	0.82	2.34
Skewness	-0.30	-0.38	-	-0.05	0.60	-0.62	-0.70
Kurtosis	-0.31	-1.01	-	-0.06	2.11	1.41	0.36
Range	1–4	13–18	1–2	2–6	1–7	1–7	1–10
Alpha/Omega	0.89/0.88	-	-	-	-	0.86/0.86	-
Left-behind youth (n = 492)							
Mean	3.11	15.91	-	3.92	4.00	5.28	-
Standard deviation	0.52	1.43	-	1.10	0.99	0.82	-
Skewness	-0.28	-0.58	-	0.05	0.72	-0.59	-
Kurtosis	0.12	-0.68	-	-0.13	2.11	0.41	-
Range	1–4	13–18	1–2	2–6	1–7	1–7	-
Alpha/Omega	0.89/0.88	-	-	-	-	0.87/0.86	-
t/χ^2	0.37	0.22	0.75	0.16	0.87	0.72	-

Note. $N = 738$. ^a coded as 1 = boys, 2 = girls

confidentiality of participants' responses was fully guaranteed during all research processes.

The final sample was composed of 738 adolescents (54.6% girls; $M_{\text{age}} = 15.86$, $SD = 1.46$). Most parents (61.8% mothers and 63.3% fathers) completed high school education, and their family income was around 5000–8000 RMB (approximately 700–1100 US dollars) per month. Participants were self-identified as 246 left-behind youth and 492 non-left-behind youth. In terms of left-behind youth, the average length of separation from their parents was 5.6 years ($SD = 2.34$), resembling prior research on left-behind youth in China (Zhao et al., 2019). Sociodemographic information in a comparative manner between left-behind and non-left-behind peers can be found in Table 1.

Measures

Self-esteem

Self-esteem was measured by the 10-item General Self Scale (Marsh, 1988). This scale originally belonged to one of the subscales of the Self-Description Questionnaire I (Marsh, 1988). This questionnaire has been validated in Chinese youth, exhibiting good psychometric properties (Watkins & Dong, 1994). One of the item samples is, "Generally, I like the way I am." The rating options ranged from 1 (*false*) to 4 (*true*). Following prior research (Lan, 2022a), the scores across all items were averaged, and higher scores corresponded to higher self-esteem. Prior research has demonstrated good internal consistency of this scale in Chinese youth (Lan, 2022a).

Covariates

Sociodemographic variables, including age, gender, parental education, and family wealth, were statistically controlled for given their known associations with self-esteem (Bleidorn et al., 2016; Twenge & Campbell, 2002). Specifically, adolescents were asked to report their age, gender, and the highest education level their mothers or fathers achieved, ranging from 1 (*primary school education or lower*) to 3 (*college degree or higher*). These two items of mothers'/fathers' education levels were summed, and higher scores indicated higher parental education. Regarding family wealth, I used a single item with seven options ranging from 1 (*relying on government relief*) to 7 (*more than 20,000 RMB per month*), based on prior research and national income standard (Cui & Lan, 2020; Feng & Lan, 2020).

Additionally, individuals with high social desirability orientation tend to present themselves in a socially desirable manner (Huang, 2013). I therefore adjusted for the levels of social desirability when comparing the self-esteem between left-behind and non-left-behind youth. Specifically, in the present study, social desirability was measured via a 16-item scale developed by Schuessler, Hittle, and Cardassia (1978).

Data analysis

Data analyses were carried out in SPSS 27.0 (IBM Corp., 2020) and Mplus 8.0 (Muthén & Muthén, 2012). Little's Missing Completely at Random (MCAR) test was performed to evaluate the influence of missing data (Little & Rubin, 1987). The results supported that the data were missing in a random way, and the EM algorithm was thus used to replace the remaining missing values. I first conducted

Table 2 Bivariate correlations in Study 1

Variable	1	2	3	4	5	6	7
Left-behind youth (n = 246)							
1. Self-esteem	-						
2. Age	0.11	-					
3. Gender ^a	0.04	0.08	-				
4. Parental education	0.11	0.20**	0.05	-			
5. Family wealth	0.07	0.06	0.05	0.35***	-		
6. Social desirability	0.63***	0.10	0.12	0.10	0.20**	-	
7. Separation duration	-0.09	0.24***	0.13	0.08	-0.07	-0.02	-
Left-behind youth (n = 492)							
1. Self-esteem	-						-
2. Age	-0.07	-					-
3. Gender ^a	0.04	-0.01	-				-
4. Parental education	0.03	0.04	-0.02	-			-
5. Family wealth	0.07	0.01	-0.02	0.36***	-		-
6. Social desirability	0.56***	-0.05	0.07	0.02	0.04	-	-

Note. $N=738$. ^a coded as 1=boys, 2=girls. * $p < .05$, ** $p < .01$, *** $p < .001$

descriptive statistics and zero-order correlations regarding study variables, separated by left-behind and non-left-behind youth. McDonald's omega, together with Cronbach's alpha, was used to evaluate the internal consistencies of the measurements employed. Group differences tests, such as independent t -test or Chi-square test, were subsequently used to preliminarily estimate the differences in study variables between left-behind and non-left-behind youth.

In terms of RQ1, an analysis of covariance (ANCOVA) was used to compare the self-esteem between left-behind and non-left-behind youth, partially out the influences of age, gender, parental education, family wealth, and social desirability. In addition to ANCOVA, raincloud plots that incorporate multiple modalities were used to provide richer information, including data distributions, observed scores, and central and dispersion tendencies (Allen et al., 2019).

Results

Descriptive statistics, reliability estimates, and bivariate correlations

Table 1 presents descriptive statistics and reliability estimates between left-behind and non-left-behind youth. The values of skewness and kurtosis exhibited that study variables followed normal distributions, ensuring that further analyses (e.g., ANCOVA) met statistical assumptions. The internal consistencies of the measurements were sufficient in Study 1. Group differences tests, as estimated by independent t -test or Chi-square test, showed that study variables of left-behind youth did not differ significantly from those of non-left-behind youth.

Table 2 displays the bivariate correlations of study variables in left-behind and non-left-behind youth. For both groups of youth, self-esteem was significantly and positively related to social desirability, but not significantly correlated with the remaining covariates.

RQ1: comparing self-esteem between left-behind and non-left-behind youth

Results based on ANCOVA exhibited that left-behind youth's self-esteem levels did not significantly differ from those of non-left-behind youth after adjusting for age, gender, parental education, family wealth, and social desirability ($F=0.66$, $p=.41$). As visualized in Fig. 1, data distributions, observed scores, and central and dispersion tendencies between the two groups were almost equivalent.

Brief discussion of study 1

The findings of Study 1 resemble prior research (Fu & Zhu, 2020; Lan, 2022a; Ma et al., 2022), showing no significant differences in self-esteem between left-behind and non-left-behind counterparts. Despite this, the sample was only recruited in central China. Given dramatic regional differences in China, further study leveraging the sample recruited from different regions is still warranted to confirm this nonsignificant result. Moreover, although the measurement of self-esteem in Study 1 was methodologically sound and exhibited good internal consistency, employing a different measurement of self-esteem to confirm this nonsignificant result would potentially improve the trustworthiness and credibility of the findings. Additionally, at both conceptual and practical levels, it is important to draw upon

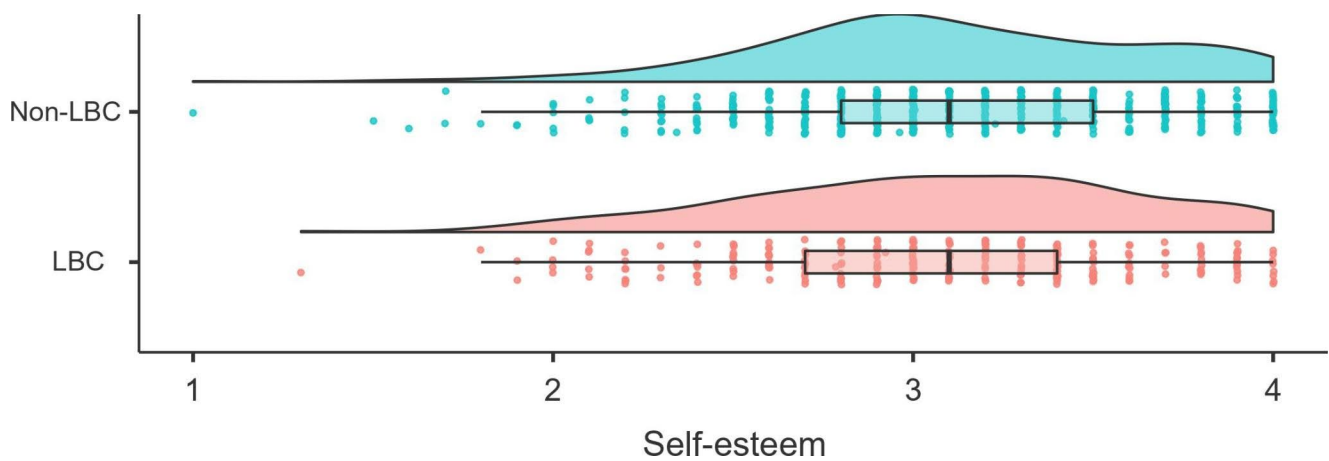


Fig. 1 Self-esteem between left-behind and non-left-behind youth in Study 1

Note. $N_{non-LBC} = 492$; $N_{LBC} = 246$. LBC = left-behind children. “Cloud”

= data distribution, “rain” jittered dots = observed data points, centered bar = mean, and band = 95% confidence interval

a person-centered approach to estimate the relational and individual correlates of self-esteem in left-behind and non-left-behind youth. In addressing these limitations, I conducted Study 2, as elaborated upon below.

Study 2

The purposes of Study 2 were twofold. First, I aimed to replicate the findings obtained from Study 1 by leveraging a different validated measurement of self-esteem and relying on an independent sample recruited from northwest mainland China. Second, I explored BIS/BAS profiles in a person-centered approach and examined whether these emerging BIS-BAS profiles and left-behind status would moderate the relationship between parenting styles and self-esteem.

Method

Participants and procedure

Study 2 employed similar procedures as Study 1. Specifically, participants in Study 2 were recruited from northwest mainland China, in which socioeconomic situations were relatively less developed than in other regions in China. Notably, since Study 2 would assess multiple constructs among young adolescents, I deliberately selected and employed previously validated measurements with relatively fewer items to assess the study construct. This careful selection was made because I aimed to decrease participants’ burden and gather high-quality research data.

The final sample consisted of 1060 adolescents (49.5% girls), with an average age of 13.05 years ($SD = 1.67$). Regarding the youth’s parental education background, most

parents (51.3% mothers and 56.6% fathers) completed primary school education or lower. Participants indicated their family wealth levels as low-to-middle, as evidenced by the family affluence scale (see elaborations below in the measurement section). Of these participants, 323 self-identified as left-behind youth and 737 as non-left-behind youth. In terms of left-behind youth, the average length of separation from their parents was 3.93 years ($SD = 3.80$). The comparison between left-behind and non-left-behind peers regarding sociodemographic information can be found in Table 3.

Measures

Self-esteem

Self-esteem was captured through the Rosenberg self-esteem scale (Rosenberg, 1965), which has been validated previously in Chinese adolescents (Li et al., 2008). This scale contains ten items (e.g., I am able to do things as well as most other people), and response options range from 1 (*strongly disagree*) to 4 (*strongly agree*). Responses across ten items were averaged, and higher scores were indicative of higher self-esteem. Prior research has exhibited good internal consistency of this scale in Chinese adolescents (Pan et al., 2018; Wang et al., 2021).

Parental styles

Parental styles were measured via the parenting inventory originally developed by Stewart et al. (1998). Gao et al. (2015) have further revised this inventory to suit the Chinese cultural context. This revised inventory contains four items related to parental warmth (e.g., my parents let me know through words or actions that they love me), and six items pertaining to parental psychological control (e.g., I

Table 3 Descriptive statistics and reliability estimates in Study 2

	Self-esteem	Parental warmth	Parental control	BIS	BAS	Age	Gender ^a	Parental education	Family wealth	Separation duration
Left-behind youth (n = 323)										
Mean	2.88	4.10	3.26	2.92	2.87	13.02	-	2.55	3.74	3.93
Standard deviation	0.68	1.27	1.27	0.62	0.56	1.77	-	0.67	2.02	3.80
Skewness	-0.41	-0.46	0.12	-0.38	-0.30	-0.06	-	2.23	0.03	0.54
Kurtosis	0.00	-0.42	-0.74	0.26	0.47	-0.90	-	7.01	-0.60	1.24
Range	1–4	1–6	1–6	1–4	1–4	10–18	1–2	2–6	0–9	0.4–15
Alpha/Omega	0.83/0.83	0.81/0.81	0.84/0.84	0.67/0.67	0.85/0.85	-	-	-	-	-
Non-left-behind youth (n = 737)										
Mean	2.88	4.09	3.15	2.91	2.91	13.07	-	2.59	3.83	-
Standard deviation	0.64	1.27	1.24	0.62	0.55	1.63	-	0.75	2.00	-
Skewness	-0.41	-0.48	0.35	-0.33	-0.18	-0.21	-	2.42	0.05	-
Kurtosis	0.25	-0.45	-0.42	-0.05	0.18	-0.78	-	7.31	-0.70	-
Range	1–4	1–6	1–6	1–4	1–4	10–18	1–2	2–6	0–9	-
Alpha/Omega	0.81/0.81	0.83/0.83	0.84/0.84	0.68/0.68	0.85/0.85	-	-	-	-	-
t/χ^2	-0.19	0.03	1.32	0.43	-0.92	-0.37	4.54*	-0.78	-0.67	-

Note. N = 1060. ^a coded as 1 = boys, 2 = girls. BIS = behavioral inhibition system, BAS = behavioral activation system

am worried that my parents will stop loving me if I do not live up to their expectations). The responses were tallied on a six-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The average scores of all items were utilized to reflect the scores for parental warmth/control, with higher values indicating higher warmth/control. Prior study has shown good internal consistency of this inventory in Chinese adolescents (Lan et al., 2019).

BIS and BAS

BIS and BAS were assessed using the BIS/BAS scale (Carver & White, 1994). The Chinese validation of this scale consists of 18 items and four subscales (Li et al., 2008): BIS, BAS-reward responsiveness, BAS-drive, and BAS-fun seeking. Item examples are, “I worry about making mistakes (BIS)”, “when I get something I want, I feel excited (BAS-reward responsiveness)”, “If I set a chance to get something I want, I move on it right away (BAS-drive)”, and “I crave excitement and new sensations (BAS-fun seeking).” Responses were made on a 4-point Likert-type scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). In accordance with prior research on exploring BIS/BAS profiles (Coplan et al., 2006; Lan & Wang, 2020a), I used the two broad-band scores of BIS and BAS instead of four separate dimensions. Such a decision was also in accordance with recent findings on the psychometric evaluation of the BIS/BAS scales (Maack & Ebesutani, 2018), suggesting that the BIS and BAS scales should be conceptualized and measured as separate unidimensional aspects. The mean scores of each subscale were calculated separately, with higher scores indicating higher levels of BIS and BAS. Prior

research has shown good internal consistency of this scale among Chinese adolescents (Wu et al., 2021).

Covariates

I used the same items as Study 1 to gather sociodemographic information, including age, gender, and parental education. I have nevertheless used an alternate objective measure of family wealth—family affluence scale (Boyce et al., 2006; Liu et al., 2012) because youth often have difficulties with reporting accurate parent-based family wealth conditions, resulting in high levels of missing values. Specifically, the family affluence scale is an asset-based four-item measurement regarding the materials (e.g., cars, bedrooms, vacations, and computers) youth are accessible to. A summed score of these four items was used to represent family wealth in Study 2, with higher scores indicating higher family wealth.

Additionally, I deliberately excluded social desirability measurement from the current survey because Study 2 has already included a few questionnaires that aimed to assess the main study constructs. I was concerned about participation fatigue, which potentially violates stringent ethical standards and influences the quality of the data collected. Nevertheless, social desirability bias was partially controlled for by emphasizing the standardized instructions (e.g., “the current survey was not a test, and thus there were no right or wrong answers attached”).

Data analysis

Data analyses were performed using the same software and procedures, as detailed in Study 1. Initially, descriptive

statistics, reliability estimates, and correlation coefficients regarding study variables in left-behind and non-left-behind youth were calculated. RQ1 was evaluated by ANCOVA after controlling for targeted covariates.

Regarding RQ2, I first performed a latent profile analysis based on BIS and BAS scores. This analysis began with one profile solution, and then the number of the profiles systematically increased until the model did not converge. The optimal model was evaluated and selected based on theoretical consideration, conceptual interpretability, and commonly-used fit model statistics. The statistical indices included information criterion statistics (e.g., AIC, BIC, and adjusted BIC), likelihood ratio tests (bootstrapped likelihood ratio test and Lo-Mendell-Rubin adjusted likelihood ratio test), and entropy values. In general, lower information criterion statistics indicate better model fit, and likelihood ratio tests should be significant, indicating that the given model with k profiles is superior to the model with $k-1$ profiles. Entropy values ideally should be higher than 0.80. More elaboration on these model fit statistics can be seen in Nylund et al. (2007). In addition, the smallest profile was considered as a practical criterion because the profiles with less than 5% of the sample were less replicable and short of pragmatic values (Kavčič et al., 2022).

The identified BIS/BAS profiles were further used to answer RQ2. The main and interactive effects of study variables on self-esteem were estimated by linear regression models. Specifically, I ran two separate linear regression models, with each focusing on one parenting dimension (i.e., warmth and control). This separation was done to avoid potential multicollinearity issue that reduces the precision of the estimated coefficients and weakens the statistical power of the regression (Shrestha, 2020), given that warmth and control were significantly correlated in both left-behind and non-left-behind youth. In addition to the covariates and main effects, I established two- or three-way interaction terms in a systematic way. First, two-way interactions were established between warmth/control and BIS/BAS profiles, between warmth/control and left-behind status, and between BIS/BAS profiles and left-behind status. Although the interaction term between BIS/BAS profiles and left-behind status was not in line with the current research focus, I had to establish this in the linear regressions as a prerequisite to creating the final three-way interaction term (see also Lan & Wang, 2020b and Ma et al., 2020). Significant interaction terms were further decomposed using simple slope analyses and visualized figures, following Aiken and West's (1991) recommendations.

Results

Descriptive statistics, reliability estimates, and bivariate correlations

Table 3 presents descriptive statistics and reliability estimates between left-behind and non-left-behind youth. The values of skewness and kurtosis showed that study variables followed normal distributions. The internal consistencies of the measurements were sufficient in Study 2. A series of group difference tests (independent t -test or Chi-square test) on study variables showed no significant results, except for slight gender ratio differences between left-behind and non-left-behind youth.

Bivariate correlations, as shown in Table 4, exhibited that parental warmth was positively related to self-esteem in both groups, whereas parental control was negatively related to self-esteem in non-left-behind youth only. In addition, BIS and BAS were each positively related to self-esteem in both groups.

RQ1: comparing self-esteem between left-behind and non-left-behind youth

The results derived from ANCOVA again supported no significant differences in self-esteem between left-behind and non-left-behind youth after adjusting for age, gender, parental education, and family wealth ($F=0.01$, $p=.92$). The raincloud figure exhibited that data distribution, observed data, and central and dispersion tendencies in both groups were similar.

The selection of optimal BIS/BAS profile solutions

Table 5 summarizes the fit statistics of BIS/BAS profile solution. The model converged until a five-profile solution, but this solution was not taken as optimal because the smallest profile accounted for less than 5% of the total sample. Among the remaining viable solutions, a four-profile solution exhibited lower AIC, BIC, and aBIC, higher entropy, and significant likelihood ratio tests. Importantly, this four-profile solution was in accordance with social motivations theory and prior empirical findings. The four-profile characterization was therefore regarded as the optimal solution in the present study.

A graphical representation of the four-profile solution is presented in Fig. 3. These profiles were named based on the social motivations theory (Asendorpf, 1990) and prior research (Coplan et al., 2006; Lan & Wang, 2020a), and interpreted quantitatively based on standardized BIS/BAS scores. Specifically, adolescents in the first profile ($n=191$; 18.0%) reported below average scores on BIS but

Table 4 Bivariate correlations in Study 2

Variable	1	2	3	4	5	6	7	8	9	10
Left-behind youth (n = 323)										
1. Self-esteem	-									
2. Parental warmth	0.43***	-								
3. Parental control	-0.07	-0.24***	-							
4. Behavioral inhibition system	0.18**	0.12*	0.15**	-						
5. Behavioral activation system	0.38***	0.26***	0.07	0.68***	-					
6. Age	-0.08	-0.22***	0.07	-0.02	-0.04	-				
7. Gender ^a	0.02	0.14*	-0.05	-0.01	-0.06	-0.13*	-			
8. Parental education	0.05	0.02	0.00	0.11*	0.06	-0.12*	-0.03	-		
9. Family wealth	0.13*	0.18**	-0.12*	-0.01	0.08	0.01	0.12*	0.04	-	
10. Separation duration	0.06	-0.03	0.05	0.11	0.14*	0.07	-0.11	-0.05	-0.06	-
Non-left-behind youth (n = 737)										
1. Self-esteem	-									
2. Parental warmth	0.41***	-								
3. Parental control	-0.08*	-0.19***	-							
4. Behavioral inhibition system	0.23***	0.17***	0.14***	-						
5. Behavioral activation system	0.41***	0.22***	0.06	0.63***	-					
6. Age	-0.05	-0.18***	0.12**	-0.02	0.02	-				
7. Gender ^a	0.03	0.07	-0.08*	0.05	0.05	-0.08*	-			
8. Parental education	0.02	0.05	-0.05	0.03	-0.02	-0.17***	0.01	-		
9. Family wealth	0.08*	0.12**	-0.08*	0.02	0.08*	0.10*	0.00	0.13***	-	

Note. N = 1060. ^a coded as 1 = boys, 2 = girls. * p < .05, ** p < .01, *** p < .001

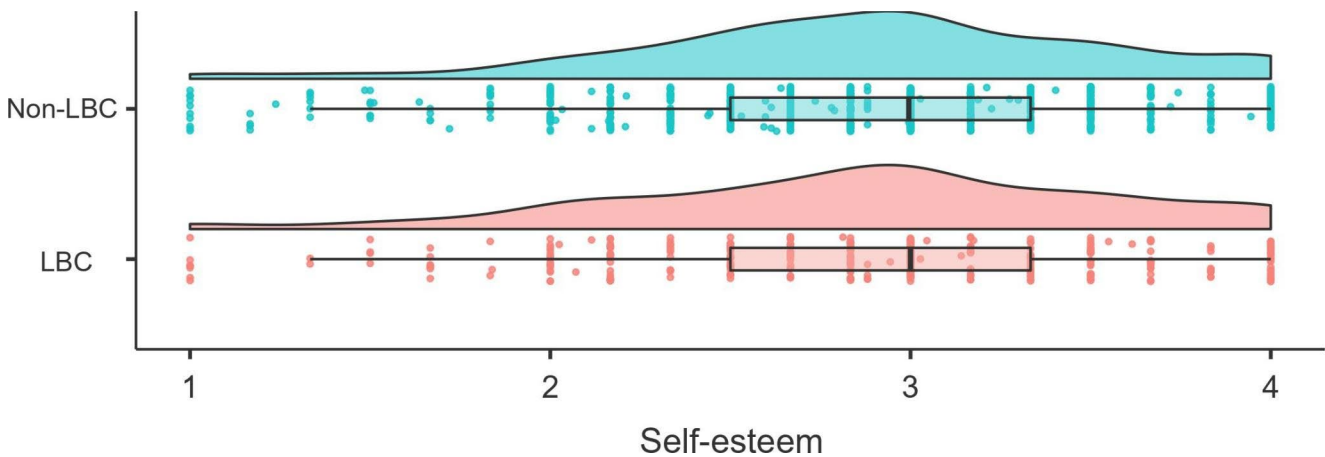


Fig. 2 Self-esteem between left-behind and non-left-behind youth in Study 2 = data distribution, “rain” jittered dots = observed data points, centered bar = mean, and band = 95% confidence interval
 Note. $N_{non-LBC} = 737$; $N_{LBC} = 323$. LBC = left-behind children. “Cloud”

Table 5 Summary of fit statistics for latent profile models

	AIC	BIC	aBIC	Entropy	LMR-LRT	BLRT	Smallest profiles (%)
1-Profile	12545.23	12565.10	12552.39	-	-	-	-
2-Profile	12043.48	12078.24	12056.01	0.83	484.56***	507.75***	47.4%
3-Profile	11875.74	11925.40	11893.63	0.84	165.81***	173.74***	22.8%
4-Profile	11704.85	11769.41	11728.12	0.97	168.80***	176.88***	18.0%
5-Profile	11679.44	11758.90	11708.08	0.94	29.97***	31.41***	3.4%

Note. N = 1060. AIC = Akaike information criteria, BIC = Bayesian information criteria, aBIC = Adjusted Bayesian information criteria, LMR-LRT = Lo-Mendell-Rubin adjusted likelihood ratio test, and BLRT = Bootstrapped likelihood ratio test. The optimal model is highlighted in bold font

*** p < .001

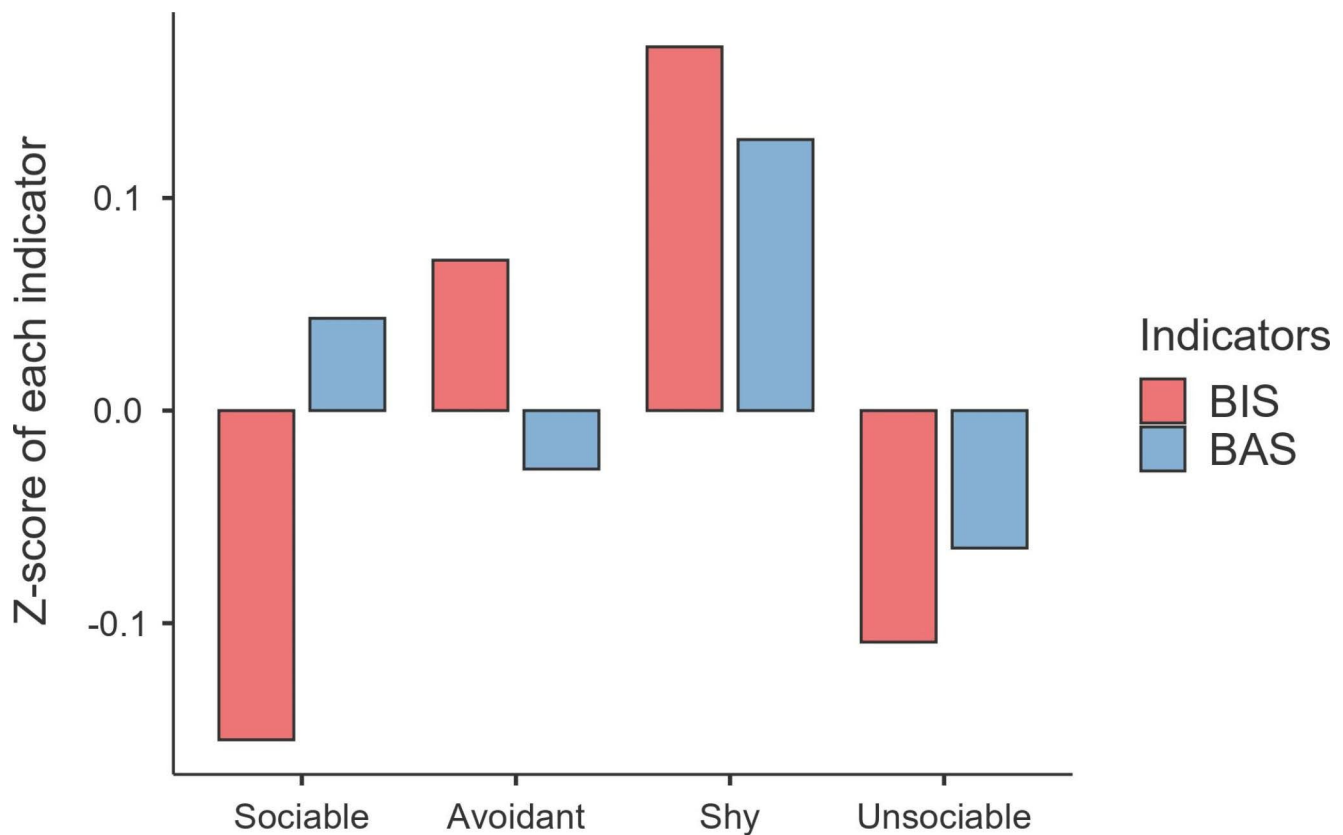


Fig. 3 The four BIS-BAS profiles characterized by BIS and BAS standardized scores
 Note. $N=1060$. BIS = behavioral inhibition system and BAS = behavioral activation system

above average scores on BAS; thus, this profile was labeled “sociable”; adolescents in the second profile ($n=241$; 22.7%) corresponded with above average scores on BIS but below average scores on BAS; thus, this profile was labeled “avoidant”; adolescents in the third profile ($n=289$; 27.3%) reported both above average scores on BIS and BAS; thus, this profile was labeled “shy”; and adolescents in the fourth profile ($n=339$; 32.0%) corresponded with both below average scores on BIS and BAS; thus, this profile was labeled “unsociable.”

RQ2: main and interactive relationships of parenting styles, BIS/BAS profiles, and left-behind status with self-esteem

The linear regression models, separated by warmth and control, are presented in Table 6. The sociable profile was regarded as the reference group to compare with the remaining three BIS/BAS profiles.

When warmth was regarded as the predictor, no covariates were significantly related to self-esteem. Regarding the main effects, parental warmth was positively related to self-esteem. Regarding the interactions, no two-way interactions were significant, whereas the three-way interaction among

warmth, shy (vs. sociable), and left-behind status was negatively related to self-esteem. This significant interaction term was decomposed by simple slope analyses. The results showed that the positive relationship between warmth and self-esteem remained significant in both sociable ($b=0.31$, $SE=0.07$, $t=4.60$, $p<.001$) and shy left-behind youth ($b=0.21$, $SE=0.03$, $t=6.41$, $p<.001$). Since both lines were significant, I could interpret them from a descriptive point of view (see the left panel of Fig. 4). As expected, shy left-behind youth significantly buffered against the adverse effect of low parental warmth on self-esteem. By contrast, the positive association between warmth and self-esteem was also significant in both sociable ($b=0.17$, $SE=0.04$, $t=4.10$, $p<.001$) and shy non-left-behind youth ($b=0.15$, $SE=0.05$, $t=2.79$, $p=.005$). Nevertheless, both lines almost overlapped (see the right panel of Fig. 4), indicating that being sociable or shy did not significantly characterize different levels of self-esteem, depending on the levels of warmth.

When control was regarded as the predictor, covariate effects showed that family wealth was positively related to self-esteem. Regarding main effects, parental control was negatively related to self-esteem. Regarding two-way interactions, the terms between parental control and shy (vs.

Table 6 Results of multiple linear regression with self-esteem as dependent variable

	Parental warmth (PW)				Parental control (PC)					
	<i>b</i>	<i>b</i> SE	95% CI for <i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>b</i> SE	95% CI for <i>b</i>	<i>t</i>	<i>p</i>
Covariates										
Age	0.00	0.01	-0.02	0.03	0.22	-0.02	0.01	-0.05	-1.54e	0.05
Gender ^a	-0.01	0.04	-0.09	0.06	-0.38	0.01	0.04	-0.07	0.16	0.88
Parental education	0.01	0.03	-0.04	0.06	0.31	0.01	0.03	-0.05	0.20	0.84
Family wealth	0.01	0.01	-0.01	0.03	1.30	0.03	0.01	0.01	2.96	0.00
Separation duration	0.01	0.01	-0.01	0.03	1.30	0.02	0.01	0.00	1.48	0.14
Main effects										
PW/PC	0.22	0.02	0.18	0.25	12.69	-0.05	0.02	-0.09	-2.63	0.01
Avoidant (vs. sociable)	0.08	0.07	-0.05	0.22	1.25	0.03	0.07	-0.12	0.35	0.73
Shy (vs. sociable)	0.11	0.07	-0.02	0.24	1.67	0.10	0.07	-0.04	1.44	0.15
Unsociable (vs. sociable)	-0.03	0.06	-0.16	0.09	-0.54	-0.07	0.07	-0.20	-0.97	0.33
Left-behind status (LB)	-0.06	0.06	-0.17	0.05	-1.13	-0.08	0.06	-0.20	-1.23	0.22
Two-way interactions										
PW/PC x Avoidant	0.01	0.05	-0.10	0.11	0.12	0.10	0.06	-0.02	1.59	0.11
PW/PC x Shy	-0.06	0.05	-0.15	0.04	-1.14	0.19	0.06	0.08	3.27	0.00
PW/PC x Unsociable	-0.02	0.05	-0.11	0.08	-0.40	0.13	0.06	0.02	2.39	0.02
PW/PC x LB	0.03	0.03	-0.04	0.09	0.79	-0.03	0.04	-0.11	-0.87	0.39
Avoidant x LB	0.09	0.13	-0.17	0.36	0.69	0.06	0.15	-0.22	0.43	0.67
Shy x LB	0.03	0.13	-0.23	0.28	0.22	0.02	0.14	-0.26	0.14	0.89
Unsociable x LB	0.03	0.12	-0.22	0.27	0.22	0.03	0.14	-0.23	0.26	0.80
Three-way interactions										
PW/PC x Avoidant x LB	-0.13	0.10	-0.33	0.08	-1.24	0.23	0.12	-0.01	1.91	0.06
PW/PC x Shy x LB	-0.19	0.10	-0.39	0.00	-1.94	0.23	0.11	0.01	2.03	0.04
PW/PC x Unsociable x LB	-0.13	0.10	-0.32	0.06	-1.37	0.28	0.11	0.06	2.50	0.01

Note. *N* = 1060. ^a coded as 1 = boys, 2 = girls

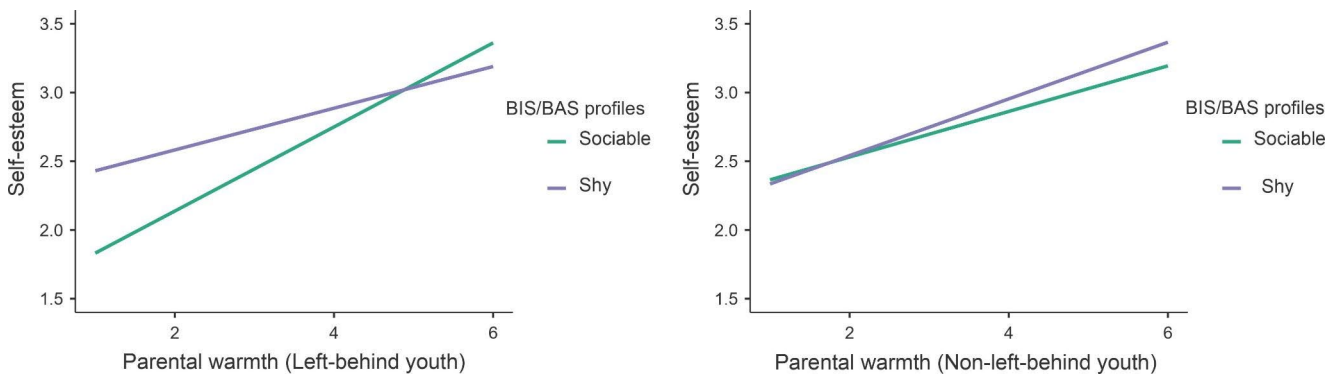


Fig. 4 Interaction effect of parental warmth, BIS/BAS profiles, and left-behind status on self-esteem
 Note. $N = 1060$. BIS = behavioral inhibition system and BAS = behavioral activation system

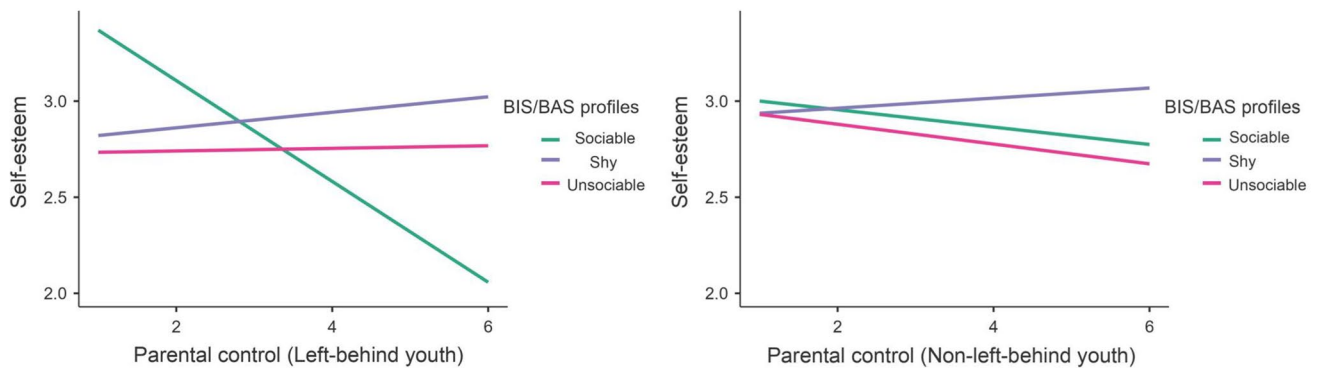


Fig. 5 Interaction effect of parental control, BIS/BAS profiles, and left-behind status on self-esteem
 Note. $N = 1060$. BIS = behavioral inhibition system and BAS = behavioral activation system

sociable), and between parental control and unsociable (vs. sociable) were positively related to self-esteem. Regarding three-way interactions, the terms among parental control, shy/unsociable (vs. sociable), and left-behind status were negatively related to self-esteem. Since the interpretations of higher-order interactions (i.e., three-way interactions in this context) would contain lower-order interactions, I only decomposed significant three-way interaction terms by simple slope analyses in this regard, although two-way interaction terms were significant.

Specifically, with regard to left-behind youth, the negative relation between parental control and self-esteem was significant only for sociable youth ($b = -0.26$, $SE = 0.08$, $t = -3.22$, $p < .001$), but not for shy ($b = 0.04$, $SE = 0.06$, $t = 0.72$, $p = .47$) and unsociable youth ($b = 0.01$, $SE = 0.05$, $t = 0.14$, $p = .89$). According to the presentation of the left panel of Fig. 5, I could conclude that shy left-behind youth (versus sociable left-behind youth) buffered against the detrimental effect of high parental control on self-esteem. By contrast, the association between parental control and self-esteem was not significant in all three BIS/BAS profiles (sociable $b = -0.05$, $SE = 0.04$, $t = -1.04$, $p = .30$; shy $b = 0.03$, $SE = 0.04$, $t = 0.72$, $p = .47$; unsociable $b = -0.05$, $SE = 0.04$, $t = -1.47$,

$p = .14$). Since none was significant (see the right panel of Fig. 5), I could not interpret them from a descriptive point of view.

Brief discussion of study 2

In accordance with the findings obtained from Study 1, the results of Study 2 showed no significant differences in self-esteem between left-behind and non-left-behind youth. Additionally, as expected, four BIS/BAS profiles were empirically derived. Such BIS/BAS profiles and left-behind status characterized different associations between parenting styles and self-esteem.

Discussion

Living apart from close family members is not an unusual life experience in fast-paced modern societies. Today, many people worldwide must work and live away from their families for a prolonged period rather than reside in their hometowns; for instance, some workers' school-aged children cannot be present with their parents during the migration

process and must stay behind in families' original communities. Given these observations, empirical studies regarding the impact of parental migration on positive youth development, such as self-esteem, remain scarce, and the collective findings are divergent and controversial. Accordingly, the relational and individual correlates of self-esteem among left-behind and non-left-behind youth are largely under-explored. By addressing these crucial knowledge gaps, the present research compared the self-esteem levels between left-behind and non-left-behind youth in two independent studies. Subsequently, this person-oriented research aimed to identify BIS/BAS profiles and examined the main and interactive roles of parenting styles, BIS/BAS profiles, and left-behind status with self-esteem levels. Below, the findings of the present research are discussed regarding how the research questions were answered.

The first research question aimed to understand whether significant differences existed in self-esteem between left-behind and non-left-behind youth. The robust and credible results, which were replicated across two independent studies, showed that left-behind youth's self-esteem levels did not significantly differ from those of non-left-behind youth. Undeniably, the absence of significant others, such as parents, brings burdens and challenges to adolescents in developing and maintaining positive self-perceptions (Brummelman & Thomas, 2017; Martínez et al., 2021). The present nonsignificant differences may nevertheless indicate that challenges and opportunities are intertwined for left-behind youth (Zhao et al., 2019). From a positive perspective, left-behind youth may have an increased amount of time to spend with their teachers and peers, and the emotional support from these significant social agents might somehow compensate for the weaknesses associated with parental absence. Likewise, due to the development of social media, stay-away parents could maintain regular contact with youth for "e-parenting" and still provide sufficient emotional support. Better economic remittances due to parental migration for work could also trigger more educational investments (Fu & Zhu, 2020), bringing enough resources to facilitate left-behind youth's positive self-worth.

Another possible interpretation for the lack of a significant difference could be related to the cultural values adolescents endorse. East Asians are likely to exhibit a neutral response bias and avoid the extreme ends when self-rating self-esteem levels (Brown et al., 2009). In collectivistic culture contexts like that of East Asians, adolescents are less likely to emphasize personal talents and capacities due to societal emphasis on modesty and harmonious interpersonal interactions. These cultural perspectives can, at least to some degree, minimize individual differences in reporting self-esteem. Such a finding also enriches the extant literature and theory concerning the commonality of self-esteem,

indicating a universal equivalence in the experience and expression of self-esteem (Schmitt & Allik, 2005). Addressing how parental migration affects self-esteem is important not only to counteract the negatively biased literature predominantly focusing on left-behind youth's adverse psychosocial outcomes, but also to clarify the divergent empirical findings and de-emphasize the vulnerable image of left-behind youth.

The second research question aimed to estimate the main and interactive relationships of parenting styles and BIS/BAS profiles with self-esteem in left-behind and non-left-behind youth. Before estimating these relationships, I identified four empirically derived BIS/BAS profiles—sociable, avoidant, shy, and unsociable—with almost equal percentages for each profile in the total sample. The identification of these profiles corresponds to the social motivation theory (Asendorpf, 1990) and the joint subsystems hypothesis (Corr, 2002), highlighting the interdependent effects of the BIS and BAS on adolescents' psychosocial development. BIS and BAS do not operate in isolation, but rather jointly work and intricately link to each other within an individual. Such a finding replicates prior person-centered studies on BIS/BAS profiles using a larger sample of adolescents (Coplan et al., 2006; Lan & Wang, 2020a), strengthening the credibility and trustworthiness of these empirically derived profiles. At the same time, the current finding extends Lan and Wang (2020a)'s research by using a combined sample of left-behind and non-left-behind youth to then relate the emerging BIS/BAS profiles with self-esteem beyond traditional psychopathology indicators. Perhaps most importantly, leveraging such a person-centered approach to derive BIS/BAS profiles can allow researchers to understand the complex interaction between parenting styles, BIS/BAS profiles, and left-behind status. This approach thus accounts for the observed heterogeneity of self-esteem, as I discuss below.

As expected, interaction analyses showed that shy left-behind youth characterized as high on both BIS and BAS buffered against the negative effect of low parental warmth/high parental control on self-esteem. Prior studies based on adolescents from Western societies have pinpointed that shyness derived from an internal conflict of approach and avoidance motivations is linked to negative outcomes (e.g., negative peer relationships) because shy adolescents are often wary and vigilant, which are not constructive to exhibiting affiliative behaviors with peers (Coplan et al., 2006; Corr, 2002). Distinct from the literature drawn from Western societies, however, the connotation of shyness in East Asian cultures is not necessarily related to social immaturity and incompetence because assertiveness and self-expression are not highly encouraged in such cultural contexts (Chen et al., 2011). Rather, mirroring prior research on Chinese

left-behind youth (Lan & Wang, 2020a), shyness buffered against the negative impact of insecure peer attachment on depressive symptoms. Cultural endorsement of socially wary behaviors might be more pronounced in left-behind youth than in their non-left-behind peers. This difference occurs because, from an evolutionary perspective, adolescents with parental migration experiences tend to be hyper-vigilant about others' emotional expressions and emphasize the importance of extrafamilial relationships (Lan & Moscardino, 2021). In this scenario, shy left-behind adolescents, behaving in accordance with cultural endorsement, counteract the effect of undesirable parenting styles (i.e., low parental warmth and high parental control) with respect to the adolescents developing positive self-perceptions.

Despite these significant results, the current findings should be interpreted with the following limitations in mind. First, the current study relied on self-reported measurements, although deliberate adjustments were made to account for social desirability. The self-reported measurements may still potentially inflate study associations that cannot be statistically excluded. Future studies should employ a multi-informant approach to replicate the current findings—for instance, by requiring parents to report their own warmth and control in addition to children's self-reports. Second, the current study focused on global self-esteem with a unidimensional structure. Future studies should explore the multiple dimensions of self-esteem (Fleming & Courtney, 1984) in left-behind and non-left-behind youth to delineate a thorough picture of how parenting styles and BIS/BAS profiles relate to multidimensional perspectives of self-esteem, perhaps gathering more fine-grained information for targeted intervention or prevention programs. Third, since a cross-sectional design was employed, caution should be taken regarding the causality of study associations. A prospective longitudinal design should instead be conducted to prove a causal relationship between parenting styles and self-esteem in studied samples. Finally, the BIS subscale yielded an acceptable but low internal consistency. Despite resembling prior research (Coplan et al., 2006; Lan & Wang, 2020a), the BIS subscale in the present study shows the need for future modifications on the scale.

These limitations notwithstanding, the current study has revealed several important practical implications. First, the current study calls for increasing public awareness of adolescents with left-behind experiences and weakens the vulnerable image in extant research and media coverage on left-behind adolescents. Second, educators or practitioners working with left-behind adolescents may encourage their stay-away parents to embrace e-parenting initiatives that bring left-behind children emotionally closer to their parents. Meanwhile, a BIS and BAS assessment is warranted at school. According to different combinations of these two

indicators, educators or practitioners may better identify those who are not “shy” for further individual intervention to facilitate higher self-esteem as a psychological immunization against a broad spectrum of difficulties and challenges left-behind youth face when staying away from their parents.

Conclusion

The robust findings obtained across two empirical studies add to a growing body of research highlighting that parental migration might shed a “light” on rather than solely create a “plight” for left-behind adolescents' positive self-regard. The present research also probes for divergent empirical findings regarding the link between parental migration and youth's self-esteem by estimating the moderating roles of parenting styles and BIS/BAS profiles herein. These theoretically articulated and empirically supported findings can better inform educators and practitioners working with left-behind youth, promoting personalized and targeted intervention or prevention initiatives that facilitate their positive self-perception.

Acknowledgements I owe a particular debt of gratitude to Chunhua Ma, Yongfeng Ma, and trained research assistants whose superb assistance in data collection. Additionally, I would like to thank the editor and academic reviewer for their helpful suggestions for improving the presentation of the current article. Finally, to bring this effort to fruition, I am partially supported by grants from the Research Council of Norway (grant #288083, #320709).

Funding Open access funding provided by University of Oslo (incl Oslo University Hospital).

Open access funding provided by University of Oslo (incl Oslo University Hospital)

Data availability statement The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The author declares that there is no conflict of interest.

Informed consent All procedures performed in studies involving human participants were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all participants included in the present study.

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 licence, and indicate

if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence 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 licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Allen, M., Poggiali, D., Whitaker, K., Marshall, T. R., & Kievit, R. A. (2019). Raincloud plots: a multi-platform tool for robust data visualization. *Wellcome Open Research*, 4, 63. <https://doi.org/10.12688/wellcomeopenres.15191.1>
- Asendorpf, J. B. (1990). Beyond social withdrawal: shyness, unsociability, and peer avoidance. *Human Development*, 33, 250–259. <https://doi.org/10.1159/000276522>
- Barber, B. K. (1996). Parental psychological control: revisiting a neglected construct. *Child Development*, 67, 3296–3319. <https://doi.org/10.1111/j.1467-8624.1996.tb01915.x>
- Baumrind, D. (1966). Effects of authoritative parental control on child behavior. *Child Development*, 37, 887–907.
- Bleidorn, W., Arslan, R. C., Denissen, J. J. A., Rentfrow, P. J., Gebauer, J. E., Potter, J., & Gosling, S. D. (2016). Age and gender differences in self-esteem—A cross-cultural window. *Journal of Personality and Social Psychology*, 111, 396–410. <https://doi.org/10.1037/pspp0000078>
- Boyce, W., Torsheim, T., Currie, C., & Zambon, A. (2006). The family affluence scale as a measure of national wealth: validation of an adolescent self-report measure. *Social Indicators Research*, 78, 473–487. <https://doi.org/10.1007/s11205-005-1607-6>
- Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner, & W. Damon (Eds.), *Handbook of child psychology* (6th ed., pp. 793–828). Hoboken, NH: John Wiley & Sons.
- Brown, J. D., Cai, H., Oakes, M. A., & Deng, C. (2009). Cultural similarities in self-esteem functioning: East is East and West is West, but sometimes the twain do meet. *Journal of Cross-Cultural Psychology*, 40, 140–157. <https://doi.org/10.1177/0022022108326280>
- Brummelman, E., & Thomaes, S. (2017). How children construct views of themselves: a social-developmental perspective. *Child Development*, 88, 1763–1773. <https://doi.org/10.1111/cdev.12961>
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: the BIS/BAS scales. *Journal of Personality and Social Psychology*, 67, 319–333. <https://doi.org/10.1037/0022-3514.67.2.319>
- Chen, X., Wang, L., & Cao, R. (2011). Shyness-sensitivity and unsociability in rural Chinese children: relations with social, school, and psychological adjustment. *Child Development*, 82, 1531–1543. <https://doi.org/10.1111/j.1467-8624.2011.01616.x>
- Cheng, J., & Sun, Y. H. (2015). Depression and anxiety among left-behind children in China: a systematic review. *Child: Care Health and Development*, 41, 515–523. <https://doi.org/10.1111/cch.12221>
- Cooper, A., Gomez, R., & Buck, E. (2008). The relationships between the BIS and BAS, anger and responses to anger. *Personality and Individual Differences*, 44, 403–413. <https://doi.org/10.1016/j.paid.2007.09.005>
- Coplan, R. J., Wilson, J., Frohlick, S. L., & Zelenski, J. (2006). A person-oriented analysis of behavioral inhibition and behavioral activation in children. *Personality and Individual Differences*, 41, 917–927. <https://doi.org/10.1016/j.paid.2006.02.019>
- Corr, P. J. (2002). JA Gray's reinforcement sensitivity theory: tests of the joint subsystems hypothesis of anxiety and impulsivity. *Personality and Individual Differences*, 33, 511–532. [https://doi.org/10.1016/S0191-8869\(01\)00170-2](https://doi.org/10.1016/S0191-8869(01)00170-2)
- Cui, G., & Lan, X. (2020). The associations of parental harsh discipline, adolescents' gender, and grit profiles with aggressive behavior among Chinese early adolescents. *Frontiers in Psychology*, 11, 323. <https://doi.org/10.3389/fpsyg.2020.00323>
- Darling, N., & Steinberg, L. (1993). Parenting style as context: an integrative model. *Psychological Bulletin*, 113, 487–496. <https://doi.org/10.1037/0033-2909.113.3.487>
- Erdle, S., & Rushton, J. P. (2010). The general factor of personality, BIS–BAS, expectancies of reward and punishment, self-esteem, and positive and negative affect. *Personality and Individual Differences*, 48, 762–766. <https://doi.org/10.1016/j.paid.2010.01.025>
- Feng, L., & Lan, X. (2020). The moderating role of autonomy support profiles in the association between grit and externalizing problem behavior among family-bereaved adolescents. *Frontiers in Psychology*, 11, 1578. <https://doi.org/10.3389/fpsyg.2020.01578>
- Fleming, J. S., & Courtney, B. E. (1984). The dimensionality of self-esteem: II. Hierarchical facet model for revised measurement scales. *Journal of Personality and Social Psychology*, 46, 404–421. <https://doi.org/10.1037/0022-3514.46.2.404>
- Fu, L., & Zhu, Y. (2020). Are rural children of work-away parents really left behind? Voices from rural teachers. *Children and Youth Services Review*, 117, 105269. <https://doi.org/10.1016/j.chilyouth.2020.105269>
- Gao, Y., Zhang, W., & Fung, A. L. C. (2015). The associations between parenting styles and proactive and reactive aggression in Hong Kong children and adolescents. *International Journal of Psychology*, 50, 463–471. <https://doi.org/10.1002/ijop.12104>
- Graham, E., & Jordan, L. P. (2011). Migrant parents and the psychological well-being of left-behind children in Southeast Asia. *Journal of Marriage and Family*, 73, 763–787. <https://doi.org/10.1111/j.1741-3737.2011.00844.x>
- Gray, J. A. (1972). *The Psychophysiological Nature of Introversion-Extraversion: a modification of Eysenck's theory* (pp. 182–205). New York and London: Biological bases of individual behavior.
- Gray, J. A. (1987). Perspectives on anxiety and impulsivity: a commentary. *Journal of Research in Personality*, 21, 493–509.
- Grolnick, W., & Pomerantz, E. (2009). Issues and challenges in studying parental control: toward a new conceptualization. *Child Development Perspectives*, 3, 165–170. <https://doi.org/10.1111/j.1750-8606.2009.00099.x>
- Gu, X. (2022). 'Save the children!': governing left-behind children through family in China's Great Migration. *Current Sociology*, 70, 513–538. <https://doi.org/10.1177/0011392120985874>
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology*, 6, 307–324. <https://doi.org/10.1037/1089-2680.6.4.307>
- Huang, C. (2013). Relation between self-esteem and socially desirable responding and the role of socially desirable responding in the relation between self-esteem and performance. *European Journal of Psychology of Education*, 28, 663–683. <https://doi.org/10.1007/s10212-012-0134-5>
- IBM Corp. (2020). *IBM SPSS Statistics for Windows, Version 27.0*. Armonk, NY: IBM Corp.
- Kavčič, T., Avsec, A., & Kocjan, G. Z. (2022). Coping profiles and their association with psychological functioning: a latent profile analysis of coping strategies during the COVID-19 pandemic. *Personality and Individual Differences*, 185, 111287. <https://doi.org/10.1016/j.paid.2021.111287>
- Khalid, S., Tadesse, E., Lianyu, C., & Gao, C. (2022). Do Migrant Parents' Income or Relationships With Their Left-Behind

- Children Compensate for Their Physical Absence?. *Journal of Family Issues*, 0192513X221113853.
- Kuppens, S., & Ceulemans, E. (2019). Parenting styles: a closer look at a well-known concept. *Journal of Child and Family Studies*, 28, 168–181. <https://doi.org/10.1007/s10826-018-1242-x>
- Lan, X. (2022a). Left-behind youth are not always bad! Relations between teacher autonomy support, narcissism, and prosocial behavior. *Current Psychology*, 1–11. <https://doi.org/10.1007/s12144-022-03610-0>
- Lan, X. (2022b). “Parents are gone”: understanding the unique and interactive impacts of affective and cognitive empathy on left-behind youth’s academic engagement. *Current Psychology*, 1–15. <https://doi.org/10.1007/s12144-022-03952-9>
- Lan, X. (2022c). Perceived parenting styles, cognitive flexibility, and prosocial behavior in Chinese Youth with an immigrant background: A three-group comparison. *Current Psychology*, 1–19. <https://link.springer.com/article/10.1007/s12144-022-03140-9>
- Lan, X. (2023). Does peer acceptance promote active academic engagement in early adolescence? A robust investigation based on three independent studies. *Personality and Individual Differences*, 203, 112012. <https://doi.org/10.1016/j.paid.2022.112012>
- Lan, X., & Moscardino, U. (2021). Sensitivity to facial emotional expressions and peer relationship problems in Chinese rural-to-urban migrant early adolescents: an exploratory study. *Social Development*, 30, 205–224. <https://doi.org/10.1111/sode.12456>
- Lan, X., & Wang, W. (2020a). To be shy or avoidant? Exploring the longitudinal association between attachment and depressive symptoms among left-behind adolescents in rural China. *Personality and Individual Differences*, 155, 109634. <https://doi.org/10.1016/j.paid.2019.109634>
- Lan, X., & Wang, W. (2020b). Parental attachment and problematic internet use among Chinese adolescents: the moderating role of gender and grit. *International Journal of Environmental Research and Public Health*, 17, 8933. <https://doi.org/10.3390/ijerph17238933>
- Lan, X., Scrimin, S., & Moscardino, U. (2019). Perceived parental guan and school adjustment among Chinese early adolescents: The moderating role of interdependent self-construal. *Journal of Adolescence*, 71, 18–27. <https://doi.org/10.1016/j.adolescence.2018.12.003>
- Li, Y., Zhang, Y., Jiang, Y., Li, H., Mi, S., Yi, G., Gu, H. Y., & Jiang, Y. (2008). The Chinese version of the BIS/BAS scale: reliability and validity. *Chinese Mental Health Journal*, 22, 613–616.
- Little, R. J., & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York, NY: John Wiley and Sons.
- Liu, Y., Wang, M., Villberg, J., Torsheim, T., Tynjälä, J., Lv, Y., & Kannas, L. (2012). Reliability and validity of family affluence scale (FAS II) among adolescents in Beijing, China. *Child Indicators Research*, 5, 235–251. <https://doi.org/10.1007/s12187-011-9131-5>
- Ma, C., Mastrotheodoros, S., & Lan, X. (2022). Linking classmate autonomy support with prosocial behavior in Chinese left-behind adolescents: the moderating role of self-esteem and grit. *Personality and Individual Differences*, 195, 111679. <https://doi.org/10.1016/j.paid.2022.111679>
- Maack, D. J., & Ebesutani, C. (2018). A re-examination of the BIS/BAS scales: evidence for BIS and BAS as unidimensional scales. *International Journal of Methods in Psychiatric Research*, 27, e1612. <https://doi.org/10.1002/mpr.1612>
- Ma, Y., Ma, C., & Lan, X. (2022). Openness to experience moderates the association of warmth profiles and subjective well-being in left-behind and non-left-behind youth. *International Journal of Environmental Research and Public Health*, 19, 4103. <https://doi.org/10.3390/ijerph19074103>
- Ma, Y., Ma, C., & Lan, X. (2020). Uncovering the moderating role of grit and gender in the association between teacher autonomy support and social competence among Chinese undergraduate students. *International Journal of Environmental Research and Public Health*, 17, 6398. <https://doi.org/10.3390/ijerph17176398>
- Maccoby, E. E., & Martin, J. A. (1983). Socialization in the context of the family: parent-child interaction. In P. H. Mussen, & E. M. Hetherington (Eds.), *Handbook of child psychology* (4th ed., 4 vol., pp. 1–101). New York: Wiley.
- Marsh, H. W. (1988). *Self description questionnaire: a theoretical and empirical basis for the measurement of multiple dimensions of pre-adolescent self-concept: a test manual and a research monograph*. San Antonio, TX: Psychological Corporation.
- Martínez, I., Murgui, S., Garcia, O. F., & Garcia, F. (2021). Parenting and adolescent adjustment: the mediational role of family self-esteem. *Journal of Child and Family Studies*, 30(5), 1184–1197. <https://doi.org/10.1007/s10826-021-01937-z>
- Masselink, M., Van Roekel, E., & Oldehinkel, A. J. (2018). Self-esteem in early adolescence as predictor of depressive symptoms in late adolescence and early adulthood: the mediating role of motivational and social factors. *Journal of Youth and Adolescence*, 47, 932–946. <https://doi.org/10.1007/s10964-017-0727-z>
- McAuliffe, M., & A. Triandafyllidou. (2021). World Migration Report 2022. Geneva: International Organization for Migration (IOM). <https://publications.iom.int/books/world-migration-report-2022>
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus User’s Guide: Statistical Analysis with Latent Variables*, 7th Edn. Los Angeles, CA: Muthén & Muthén.
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal*, 14, 535–569. <https://doi.org/10.1080/10705510701575396>
- Orth, U., & Robins, R. W. (2014). The development of self-esteem. *Current Directions in Psychological Science*, 23, 381–387. <https://doi.org/10.1177/0963721414547414>
- Orth, U., Erol, R. Y., & Luciano, E. C. (2018). Development of self-esteem from age 4 to 94 years: a meta-analysis of longitudinal studies. *Psychological Bulletin*, 144, 1045–1080. <https://doi.org/10.1037/bul0000161>
- Pagliaccio, D., Luking, K. R., Anokhin, A. P., Gotlib, I. H., Hayden, E. P., Olino, T. M., & Barch, D. M. (2016). Revising the BIS/BAS scale to study development: measurement invariance and normative effects of age and sex from childhood through adulthood. *Psychological Assessment*, 28, 429–442. <https://doi.org/10.1037/pas0000186>
- Pan, Z., Zhang, D., Hu, T., & Pan, Y. (2018). The relationship between psychological stress and social anxiety among Chinese adolescents: the mediating role of self-esteem and sense of security. *Child and Adolescent Psychiatry and Mental Health*, 12, 1–9. <https://doi.org/10.1186/s13034-018-0255-y>
- Pinquart, M., & Gerke, D. C. (2019). Associations of parenting styles with self-esteem in children and adolescents: a meta-analysis. *Journal of Child and Family Studies*, 28, 2017–2035. <https://doi.org/10.1007/s10826-019-01417-5>
- Pyszczynski, T., Greenberg, J., Solomon, S., Arndt, J., & Schimel, J. (2004). Why do people need Self-Esteem? A theoretical and empirical review. *Psychological Bulletin*, 130, 435–468. <https://doi.org/10.1037/0033-2909.130.3.435>
- Rosenberg, M. (1965). *Society and adolescent self-image*. Princeton, NJ: Princeton University Press.
- Schmitt, D. P., & Allik, J. (2005). Simultaneous administration of the Rosenberg Self-Esteem Scale in 53 nations: exploring the universal and culture-specific features of global self-esteem. *Journal of Personality and Social Psychology*, 89, 623–642. <https://doi.org/10.1037/0022-3514.89.4.623>

- Schuessler, K., Hittle, D., & Cardascia, J. (1978). Measuring responding desirably with attitude-opinion items. *Social Psychology, 41*, 224–235.
- Shrestha, N. (2020). Detecting multicollinearity in regression analysis. *American Journal of Applied Mathematics and Statistics, 8*, 39–42. <https://doi.org/10.12691/ajams-8-2-1>
- Shrout, P. E., & Rodgers, J. L. (2018). Psychology, science, and knowledge construction: broadening perspectives from the replication crisis. *Annual Review of Psychology, 69*, 487–510. <https://doi.org/10.1146/annurev-psych-122216-011845>
- Silk, J. S., Morris, A. S., Kanaya, T., & Steinberg, L. (2003). Psychological control and autonomy granting: opposite ends of a continuum or distinct constructs? *Journal of Research on Adolescence, 13*, 113–128. <https://doi.org/10.1111/1532-7795.1301004>
- Smetana, J. G. (2017). Current research on parenting styles, dimensions, and beliefs. *Current Opinion in Psychology, 15*, 19–25. <https://doi.org/10.1016/j.copsyc.2017.02.012>
- Stewart, S. M., Rao, N., Bond, M., McBride-Chang, C., Fielding, R., & Kennard, B. (1998). Chinese dimensions of parenting: broadening western predictors and outcomes. *International Journal of Psychology, 33*, 345–358.
- Twenge, J. M., & Campbell, W. K. (2002). Self-esteem and socioeconomic status: a meta-analytic review. *Personality and Social Psychology Review, 6*, 59–71. https://doi.org/10.1207/S15327957PSPR0601_3
- UNESCO (2019). Global education monitoring report, 2019: Migration, displacement and education: building bridges, not walls
- Von Eye, A., Bergman, L. R., & Hsieh, C. A. (2015). Person-oriented methodological approaches. In W. F. Overton, P. C. M. Molenaar, & R. M. Lerner (Eds.), *Handbook of child psychology and developmental science: theory and method* (pp. 789–841). John Wiley & Sons, Inc. <https://doi.org/10.1002/9781118963418.childpsy121>
- Wang, L., & Mesman, J. (2015). Child development in the face of rural-to-urban migration in China: a meta-analytic review. *Perspectives on Psychological Science, 10*, 813–831. <https://doi.org/10.1177/1745691615600145>
- Wang, M., Xu, Q., & He, N. (2021). Perceived interparental conflict and problematic social media use among chinese adolescents: the mediating roles of self-esteem and maladaptive cognition toward social network sites. *Addictive Behaviors, 112*, 106601. <https://doi.org/10.1016/j.addbeh.2020.106601>
- Wang, X., Ling, L., Su, H., Cheng, J., Jin, L., & Sun, Y. H. (2015). Self-concept of left-behind children in China: a systematic review of the literature. *Child: Care Health and Development, 41*, 346–355. <https://doi.org/10.1111/cch.12172>
- Watkins, D., & Dong, Q. (1994). Assessing the self-esteem of Chinese school children. *Educational Psychology, 14*, 129–137. <https://doi.org/10.1080/0144341940140107>
- Wei, L., Yang, Y., Zhang, J., & Si, L. (2022). Rural-urban migration, family arrangement, and children's welfare: evidence from China's rural areas. *Family Relations. https://doi.org/10.1111/fare.12720*
- Wu, R., Huang, J., Ying, J., Gao, Q., Guo, J., & You, J. (2021). Behavioral inhibition/approach systems and adolescent nonsuicidal self-injury: the chain mediating effects of difficulty in emotion regulation and depression. *Personality and Individual Differences, 175*, 110718. <https://doi.org/10.1016/j.paid.2021.110718>
- Zhao, J., Li, Q., Wang, L., Lin, L., & Zhang, W. (2019). Latent profile analysis of left-behind adolescents' psychosocial adaptation in rural China. *Journal of Youth and Adolescence, 48*, 1146–1160. <https://doi.org/10.1007/s10964-019-00989-1>
- Zhou, Y., Chen, S., Chen, Y., & Volland, B. (2022). Does parental migration impede the development of the cooperative preferences in their left-behind children? Evidence from a large-scale field experiment in China. *China Economic Review, 74*, 101826. <https://doi.org/10.1016/j.chieco.2022.101826>

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

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.