



Dormitory Architecture and Emotional Well-Being of Left-Behind Children: Evidence from a Rural Boarding School in Central China

Tianhong Yan, Xiaoping Wang*

School of Architecture and Built Environment, Deakin University, VIC, Australia

*tianhong.yan@research.deakin.edu.au

Abstract. In China, boarding schools in remote regions have become the primary living and learning environments for millions of left-behind children. Yet little is known about how dormitory environments influence their residential well-being. This study examines newly constructed dormitory buildings at H School, a large public boarding school in the mountainous areas of central China, to understand how dormitory architectural design shapes students' living comfort, adaptability, daily experiences, and overall well-being. The findings indicate that the new dormitory facilities substantially improve students' basic living conditions, including infrastructure quality, spatial scale, and circulation flow. At the same time, management routines, fixed bed allocations, and inspection procedures constrain students' autonomy, making the adaptation process challenging for some. Therefore, enhancing children's agency within personal spaces, adopting more inclusive management practices, and incorporating semi-private and restorative micro-spaces can help strengthen emotional comfort and psychological resilience.

Keywords: Left-behind children, Dormitory spatial environment, Residential well-being

1 Introduction

Rural boarding schools have become a central component of China's contemporary educational landscape, particularly in regions experiencing substantial labor migration. As parents leave rural areas for urban employment, a growing number of children spend most of their formative years living and studying within institutional settings [1, 2]. Boarding schools thus function not only as educational sites but also as the primary environments shaping children's daily lives, emotional experiences, and overall well-being [3, 4]. As Liu & Villa [5] argues, while boarding arrangements can provide access to improved educational resources and stable living conditions, they also generate a set of distinctive challenges, including homesickness, anxiety, and difficulties in adaptation. These challenges may be further intensified for left-behind children, who often confront unfamiliar boarding routines with limited parental support or emotional care [4, 6]. Against this backdrop, examining how dormitory environments influence and

support the psychological development and general well-being of left-behind children holds significant empirical and practical importance.

Research in environmental psychology and childhood studies consistently demonstrates the critical role of residential space design in shaping children's emotional well-being [7, 8]. Theories of place attachment and spatial affordances highlight that children benefit from environments that allow personalization, foster familiarity, and provide a degree of control over everyday routines. Key environmental attributes, such as adequate lighting, ventilation, acoustic quality, and spatial configuration, have been shown to affect sleep quality, emotional regulation, and overall comfort [9–11]. Studies of student dormitories similarly suggest that clear spatial layouts, accessible communal areas, and opportunities for spontaneous interaction contribute to positive social atmospheres and help cultivate students' sense of belonging within school environments. Conversely, overcrowded, highly restrictive, or poorly maintained dormitories may trigger homesickness, stress, or social isolation [12, 13]. While these studies examine the influence of environmental design and spatial arrangements on children's experiences, much of this work is drawn from small-scale boarding settings in Western contexts. Whether these findings can be applied to large rural boarding institutions in China therefore remains an open question.

Moreover, existing research on rural boarding schools in China tends to emphasize institutional discipline, rule-based governance, academic pressure [14], and educational outcomes [15], while paying comparatively little attention to the architectural and spatial dimensions that shape children's everyday lived experiences [16, 17]. This gap underscores both the necessity and the opportunity for the present study to examine how dormitory environments mediate the well-being of left-behind children in large rural boarding schools.

To address this gap, this article investigates how dormitory architectural design in a rural boarding school influences students' physical and emotional well-being, with particular attention to how children interpret, experience, and emotionally engage with dormitory spaces in their everyday lives. Drawing on spatial ethnography, interviews, daily diaries, and participant-generated photographs, the study examines four key dimensions of the dormitory environment: (1) architectural form, (2) infrastructure, (3) circulation areas, and (4) living spaces, and analyses how these elements shape children's living comfort, adaptability, peer support, and emotional health. By adopting a child-centered architectural perspective, the study contributes to a more holistic understanding of residential well-being in institutional environments. The findings offer both conceptual and practical insights for improving dormitory design in rural boarding schools and for creating environments that more effectively support the well-being of left-behind children.

2 Research Design

This study employs a qualitative research design that integrates multiple data collection methods to capture children's everyday interactions with dormitory architecture and to

examine how these interactions shape their boarding experiences and overall well-being.

2.1 Research Site

Fieldwork was conducted at H School (see Figure 1), founded in 1968 and located in Qichun County in central China. As one of the largest public junior secondary schools in the region, the campus covers 60,262 m², with a total building area of 20,717 m². The school comprises a range of functional zones, including the main gate, dormitory buildings, teaching blocks, administrative facilities, a cafeteria, and natural outdoor areas.

The newly constructed dormitories consist of two buildings (see Figure 1) with a combined footprint of approximately 924 m². The school accommodates both day students and boarding students, among whom left-behind children constitute 61%. H School was selected as the research site because its spatial layout, architectural typologies, and administrative structures closely resemble the design patterns of many comprehensive rural boarding schools across central and western China. This representativeness enhances the broader applicability and empirical relevance of the study's findings.



Fig. 1. Dormitory building of H School.

2.2 Data Collection and Analysis Methods

With the support of the school, participants were recruited through purposive and snow-ball sampling [18, 19], resulting in a total of ten teachers (T), five administrative staff members (A), and one dormitory supervisor (DS). All participants reviewed the research plan and signed the Participant Information and Consent Form (PLSC), indicating their willingness to be interviewed. Each participant took part in two semi-structured interviews lasting approximately 40 minutes each. All interviews were audio-recorded with participants' permission for subsequent transcription and analysis. A pre-designed semi-structured interview guide shaped the interview process. Questions focused on four main domains: (1) dormitory environment; (2) infrastructure; (3)

children's boarding experiences; and (4) management practices. All interview questions were open-ended, allowing participants to speak freely and elaborate on their perspectives [20].

In addition, participants were invited to use their mobile phones to photograph the dormitory spaces employing an auto-photography approach [21]. This resulted in 105 participant-generated photographs and 15 videos (all visual materials have been anonymized), which provided rich visual data to help construct an understanding of the overall dormitory environment, architectural details, and the micro-spaces where children rest, play, and create personalized spatial arrangements.

For ethical reasons, this study did not conduct direct interviews with left-behind children [22]. Instead, it collected diaries from 60 students (LBC 1-60), in which children documented their school routines, living habits, and everyday experiences of using dormitory spaces. The diaries also revealed spatial dimensions of well-being, including homesickness, peer relations, and spatial coping strategies.

The data were analyzed using thematic analysis following the six-phase framework proposed by [23]. Coding was conducted in NVivo, with particular attention to architectural features, environmental conditions, emotional responses, and experiential narratives. Through triangulating multiple forms of data, we identified all major themes and subthemes, which subsequently informed the development of the analytical narrative presented in this study.

3 Results

The newly constructed dormitories at H School generate a complex constellation of material, social, and emotional effects for left-behind children. First, the architectural upgrades substantially improved the basic living environment. Participants consistently noted that the new buildings offer larger room sizes, better ventilation and natural lighting, and wider corridors with clearer circulation routes. These enhancements facilitated smoother daily movement, reduced crowding, and increased comfort in shared spaces. Visual data show that students gravitated toward bright, open communal areas and often appropriated windowsills, corridor corners, and stair landings as informal places for resting, chatting, or momentary personal retreat. Although these micro-spaces were not intentionally designed for rest, they allowed children to create temporary zones of privacy and emotional self-regulation, thereby expanding the affective capacities of the dormitory environment.

Second, the quality of infrastructure played a critical role in shaping students' sense of stability and safety. Teachers and administrators emphasized that "new bedding, improved toilet facilities (see Figure 2A), and reliable hot water systems reduced students' stress and helped them adapt more quickly to boarding life" (T5, A2). Diary entries similarly showed that students appreciated these upgrades, frequently linking material comfort with emotional calm. Several described the dormitory as "warm," "clean," or "more like home" (LBC 15, 17), indicating that improvements in physical conditions enhanced predictability and reduced anxiety.



Fig. 2. Improved toilet facilities (A) and fixed bed layout (B).

However, organizational practices introduced constraints that complicated students' adaptation to dormitory life. Fixed bed assignments (see Figure 2B) restricted opportunities for personalization and flexible spatial arrangements, while daily inspections and hygiene checks heightened feelings of pressure and self-consciousness. Teachers acknowledged that these procedures were designed to maintain order, yet students' diaries revealed that such highly regulated environments sometimes limited autonomy and intensified homesickness. Some students described strategies such as “carrying personal belongings that matter to me” (LBC 31), “creating my own little corner,” or finding “a quiet moment away from strict rules” (LBC 50). These small acts reflect children's desire for emotional agency within institutional constraints.

Finally, peer interactions within the dormitory emerged as a vital source of emotional support. Communal areas facilitated informal conversations, shared hobbies, and small acts of mutual assistance, such as helping one another organize bedding or storage boxes. These interactions strengthened students' sense of belonging and mitigated feelings of loneliness. Yet when communal spaces became overcrowded or spontaneous gatherings were restricted, some students reported social withdrawal. Thus, the dormitory functioned simultaneously as a space of sociability and a site of ongoing emotional negotiation. Overall, the results demonstrate that the dormitory operates not merely as a physical residence but as an emotional infrastructure that shapes children's comfort, autonomy, social relations, and broader sense of well-being.

4 Conclusion

This study underscores the critical role of dormitory architecture and organizational practices in shaping the well-being of left-behind children in rural boarding schools in China. The findings show that improvements in spatial quality, such as enhanced lighting, ventilation, and circulation—substantially elevate students' daily comfort and facilitate smoother adaptation to boarding routines. At the same time, institutional rules, routine inspections, and the limited availability of personalized spaces introduce emotional pressures that may undermine children's sense of autonomy. Collectively, the findings reveal that the dormitory environment constitutes a complex system in which material and emotional factors intertwine, and where design and management practices jointly shape students' feelings of safety, belonging, and resilience.

These insights hold important implications for the planning and operation of rural boarding schools. Dormitory design should incorporate semi-private niches, flexible personalization zones, and quiet restorative areas to meet children's needs for autonomy and emotional respite. Management practices, meanwhile, would benefit from adopting more child-centered and inclusive approaches that balance the maintenance of order with opportunities for self-expression and social interaction. Such measures can help transform dormitories into settings that actively support psychological well-being rather than simply accommodate large numbers of students. Moreover, future research may extend this work by comparing multiple rural boarding schools across different regions or by examining how children's emotional adaptation evolves over time as dormitory environments change.

References

1. Chen, K., Zhang, H.: The influence of parental involvement on the development of rural children: A comparative study of left-behind children and non-left-behind children. *Child. Youth Serv. Rev.* 177, 108481 (2025). <https://doi.org/10.1016/j.childyouth.2025.108481>.
2. Zhang, Y., Zeng, J., Long, W., Pang, X.: The difference in mental health between students in boarding school and rented accommodation in Rural China. *Int. J. Educ. Res.* 133, 102637 (2025). <https://doi.org/10.1016/j.ijer.2025.102637>.
3. Tang, B., Wang, Y., Gao, Y., Wu, S., Li, H., Chen, Y., Shi, Y.: The Effect of Boarding on the Mental Health of Primary School Students in Western Rural China. *Int. J. Environ. Res. Public Health*. 17, 8200 (2020). <https://doi.org/10.3390/ijerph17218200>.
4. Chang, F., Huo, Y., Zhang, S., Zeng, H., Tang, B.: The impact of boarding schools on the development of cognitive and non-cognitive abilities in adolescents. *BMC Public Health*. 23, 1852 (2023). <https://doi.org/10.1186/s12889-023-16748-8>.
5. Liu, M., Villa, K.M.: Solution or isolation: Is boarding school a good solution for left-behind children in rural China? *China Econ. Rev.* 61, 101456 (2020). <https://doi.org/10.1016/j.chieco.2020.101456>.
6. Zhou, Q.: Children's emotional geographies at a boarding school in rural China. *Child. Geogr.* 22, 549–564 (2024). <https://doi.org/10.1080/14733285.2024.2313521>.
7. Jack, G.: Place Matters: The Significance of Place Attachments for Children's Well-Being. *Br. J. Soc. Work.* 40, 755–771 (2010). <https://doi.org/10.1093/bjsw/bcn142>.
8. Rahmania, T.: Exploring school environmental psychology in children and adolescents: The influence of environmental and psychosocial factors on sustainable behavior in Indonesia. *Heliyon*. 10, e37881 (2024). <https://doi.org/10.1016/j.heliyon.2024.e37881>.
9. Tao, Z., Wu, G., Wang, Z.: The relationship between high residential density in student dormitories and anxiety, binge eating and Internet addiction: a study of Chinese college students. *SpringerPlus*. 5, 1579 (2016). <https://doi.org/10.1186/s40064-016-3246-6>.
10. Wang, Z., Wu, Y., Jia, Z., Gao, Q., Gu, Z.: Research on Health and Thermal Comfort of Unit-Type Student Apartments in the Western China Science and Technology Innovation Harbor. *Front. Public Health*. 10, (2022). <https://doi.org/10.3389/fpubh.2022.850107>.
11. Li, M., Han, Q., Pan, Z., Wang, K., Xie, J., Zheng, B., Lv, J., Li, M., Han, Q., Pan, Z., Wang, K., Xie, J., Zheng, B., Lv, J.: Effectiveness of Multidomain Dormitory Environment and Roommate Intervention for Improving Sleep Quality of Medical College Students: A Cluster Randomised Controlled Trial in China. *Int. J. Environ. Res. Public Health*. 19, (2022). <https://doi.org/10.3390/ijerph192215337>.

12. Mekonen, Y.K., Adarkwah, M.A.: Exploring homesickness among international students in China during border closure. *Int. J. Intercult. Relat.* 94, 101800 (2023). <https://doi.org/10.1016/j.ijintrel.2023.101800>.
13. Guo, F., Luo, M., Zhao, H., Du, Z., Zhang, Z., Zhang, H., Dong, J., Zhang, D., Guo, F., Luo, M., Zhao, H., Du, Z., Zhang, Z., Zhang, H., Dong, J., Zhang, D.: Qualitative Mechanisms of Perceived Indoor Environmental Quality on Anxiety Symptoms in University. *Buildings*. 14, (2024). <https://doi.org/10.3390/buildings14113530>.
14. Wang, S., Dong, X., Mao, Y.: The impact of boarding on campus on the social-emotional competence of left-behind children in rural western China. *Asia Pac. Educ. Rev.* 18, 413–423 (2017). <https://doi.org/10.1007/s12564-017-9476-7>.
15. Wang, S., Mao, Y.: The effect of boarding on campus on left-behind children's sense of school belonging and academic achievement: Chinese evidence from propensity score matching analysis. *Asia Pac. J. Educ.* 38, 378–393 (2018). <https://doi.org/10.1080/02188791.2018.1470965>.
16. Chen, Q., Chen, Y., Zhao, Q.: Impacts of boarding on primary school students' mental health outcomes – Instrumental-Variable evidence from rural northwestern China. *Econ. Hum. Biol.* 39, 100920 (2020). <https://doi.org/10.1016/j.ehb.2020.100920>.
17. Chang, F., Huo, Y., Zhang, S., Zeng, H., Tang, B.: The impact of boarding schools on the development of cognitive and non-cognitive abilities in adolescents. *BMC Public Health*. 23, 1852 (2023). <https://doi.org/10.1186/s12889-023-16748-8>.
18. Naderifar, M., Goli, H., Ghaljaie, F.: Snowball Sampling: A Purposeful Method of Sampling in Qualitative Research. *Strides Dev. Med. Educ.* 14, (2017). <https://doi.org/10.5812/sdme.67670>.
19. Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., Walker, K.: Purposive sampling: complex or simple? Research case examples. *J. Res. Nurs. JRN.* 25, 652 (2020). <https://doi.org/10.1177/1744987120927206>.
20. Bearman, M.: Focus on Methodology: Eliciting rich data: A practical approach to writing semi-structured interview schedules. *Focus Health Prof. Educ.* 2204-7662. 20, 1–11 (2019). <https://doi.org/10.11157/fohpe.v20i3.387>.
21. Noland, C.M.: Auto-Photography as Research Practice: Identity and Self-Esteem Research. *J. Res. Pract.* 2, (2006). <http://jrp.icaap.org/index.php/jrp/article/view/19/65>.
22. Buchanan, D.: How can a researcher minimise causing harm when conducting interviews with particularly vulnerable children in longitudinal research? *Child. Soc.* 38, 349–364 (2024). <https://doi.org/10.1111/chso.12704>.
23. Braun, V., Clarke, V.: Using thematic analysis in psychology. *Qual. Res. Psychol.* 3, 77–101 (2006). <https://doi.org/10.1191/1478088706qp063oa>.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 3.0 International License (<http://creativecommons.org/licenses/by-nc/3.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

