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**Unleashing Potentials
Shaping the Future**

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The Guideline of Spatial Definition on Children's Play Behavior in Chinese Kindergarten

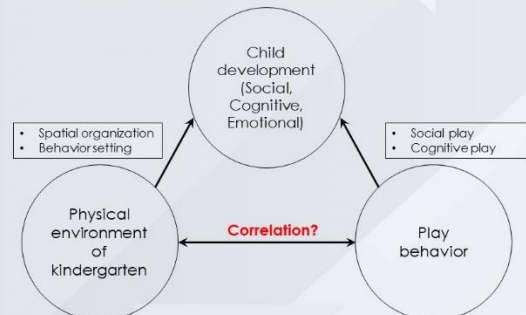
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INTRODUCTION/BACKGROUND

- The Chinese government and Chinese parents attach importance to kindergarten education (MOE, 2012, 2016; Yang, 2022; Liu et al., 2022; Xu & Qin 2021).
- In China, play behavior has gradually become the leading role in children's daily activities (Liu & Zhu, 2020; Huang, 2021; Zhu, 2019), and affects children's cognitive and social development (Aureli, 1996; Rubin, 1978; Elkind, 2007; Levine & Munsch, 2014; Lautamo & Heikkila, 2010).
- As the carrier of children's activities, the physical environment is also one of the prominent factors to evaluate the quality of childcare in kindergarten (Kantrowitz & Evans, 2004; Abbas, 2016; Moore et al., 2003).

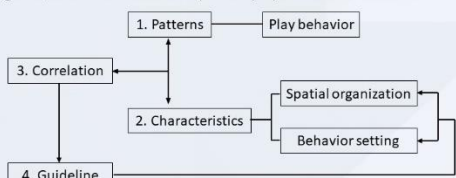


ISSUES/ PROBLEM STATEMENT

- Kindergartens in China are mainly in a closed-plan layout, and obvious "discipline" and "domain" in spatial organization (Lu, 2022). Cause the interior space lacks integrity, connectivity, flexibility, and has a single spatial function (Lu, 2022; Hu, 2013)
- The interior design of Chinese kindergarten is adults' aesthetic orientation, and ignored the needs of children (Li, 2022; Qin, 2020). The classroom lacks vertical communication space (Xu, 2015), furniture and materials are homogenized seriously (Dong, 2007), and the space utilization rate is low (Dong, 2007; Li, 2022; Chen, 2018).
- The lack of study about the relationships between spatial definition of inclusive kindergarten and children's play behavior in China.

OBJECTIVES

The aim of this research is to develop a design guideline for playroom of China's kindergarten, so as to motivate more positive play behaviors of children.



METHODOLOGY

- Data were collected from the physical environment characteristics and children's play behavior of 6 kindergartens in Nanchang.
- All the data of play behavior and spatial definition were qualitative analyzed using a content analysis method through Altas ti.
- Pearson correlation and liner regression was used to examine the potential associations between levels of spatial definition and levels of play behavior.
- Analysis was conducted in SPSS 26.0.

PRELIMINARY STUDY

- 3 kindergartens were investigated and photographed on the spot (Fig. 1, Fig. 2)
- Analyze the physical environment of three kindergartens using Moore's (1987) conclusion on the factors of physical environment (table 1).
- "Well-defined" childcare centers and "Resource-rich activity area" (Fig. 3; Fig. 4)

| Factor of Physical Environment | Kindergarten A | Kindergarten B | Kindergarten C | Conclusion |
|--------------------------------|---|---|---|---|
| Scale | Large | Large | Large | Large |
| Density | Crowded | Crowded | Crowded | Crowded |
| Privacy | Lack | Lack | Lack | Lack |
| Activity settings | Poor-defined | Poor-defined | Traditional | Most poor-defined settings |
| Space plan | Closed plan | Closed plan | Closed plan | Closed plan |
| Floor surface | Ceramic tile, wood floor, stain covered with soft materials | Ceramic tile and wood floor in classroom, corridor and common space covered with soft materials | Soft materials and ceramic tile in classroom, ceramic tile in corridor, wood floor in common space | Lack of diversity in technical design features and serious homogeneity in materials and equipment |
| Wall surface | No change in material with simple decoration (e.g. decorative painting, children's paintings, slogan) | No change in material with simple decoration (e.g. decorative painting, children's paintings, slogan) | No change in material with simple decoration (e.g. decorative painting, children's paintings, slogan) | |
| Color | Monotonous color | Colorful | Colorful | |
| Outdoor play space | Traditional | Traditional | Traditional | Traditional playgrounds |

Table 1. Analysis of physical environment factors of three kindergartens



Figure 1. Classroom of kindergarten C

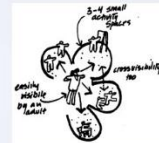


Figure 4 Resource-rich activity pocket

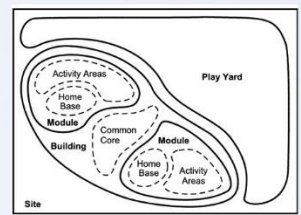


Figure 3 Well-defined childcare center



Figure 2. Activity room of kindergarten B

Result

- Spatial definition involve five aspects: Openness and visibility, Enclosure and private, Variety and flexibility, Concentration and separation, Size and amount (Table 2).
- CPERS and ECEPS are suitable tools for kindergarten physical design environment evaluation (Table 3).
- POS and PLAY are suitable for record and assess children's play behavior (Table 4).

| Categories | Meaning | Source |
|-------------------------------------|---|--|
| Openness and visibility | Openness is mostly reflected in the overall layout of the building space, which is derived from the concept of open-plan school facilities. Moore (1979) proposed the notion of flexible open-plan . Visibility is reflected in both the overall and individual organizations. | International Business Corporations, 1945; Moore, 1979 |
| Enclosure and private | Enclosure refers to the enclosure of the activity area in response to indoor space. Private • Physical shape • Functional private space | Moore, 1979; Waack & Green, 2012; Mochizuki, 1968 |
| Variety and flexibility | Variety • Overall interior planning, • Sequence classrooms, • Activity areas Flexibility • The flexibility of the activity area on an independent classroom, • Activity flexibility. | Moore, 1987, 2009 |
| Concentration and separation | Concentration • The corresponding material resource combined Separation • The degree of separation between functional areas (e.g. indoor and outdoor rooms) • The degree of separation between different age groups • The degree of separation between circulation and activity • The degree of separation between pathways in different activity zones | Moore, 1994 |
| Size and amount | Size • Gross size Amount • The abundance of resources in the activity area | Moore, 1979, 1994; CPERS, 1947 |

Table 2. Categories of Spatial Definition

| Author | Year | Scale | Content | Limitations |
|--|---------------------|-------|---|--|
| Early Childhood Physical Environment Scale (ECPE) | Moore, 1994 | 1-5 | • Openness and visibility • Enclosure and private • Variety and flexibility • Concentration and separation • Size and amount | • Technique design features • Furniture and materials • Outdoor areas |
| Children's Physical Environment Scale (CPERS) | Moore et al., 2009 | 1-5 | • Common core • Module • Resource-rich activity areas • Well-defined space • Evaluation for social definition of indoor environment of childcare centers (Abbas, 2009, 2010; Zhai et al., 2013) | • Equipment • Curriculum materials • English-speaking countries only • Appropriateness in China |
| Classroom Rating Scale (CRS) | Marwell, 2007 | 1-5 | • Social space • Boundaries • Privacy • Personalization • Complexity • Scale • Signage • 7 sub-scales, 37 items | • Validity study • The number of samples is small • Teacher's experience and style |
| Kindergarten Education Quality Evaluation Scale (Urban and Rural Edition) (KEGE-U/R) | Ma, 2019 | 1-5 | • Chinese sociocultural context • Based on the structure of ECPE and ECERS-E | • Physical design environmental assessment |
| Kindergarten Environment Rating Scale (KERS) | Harris et al., 1999 | 1-5 | • Birth-to-3-age period • Complementary with the ECERS-3 • Continuously updated • Adaptive research in Norway (Bouldin, 2012) | • Space and Furnishings • Personal Care • Language and books • Activities • Interaction • Program Structure • 6 sub-scales, 33 items |
| Early Childhood Environment Rating Scale (Revised Edition) (ECERS-R) | Harris et al., 1998 | 1-5 | • Children's behavior assessment • Assess the quality of preschool in low Bangladesh (Akmal, 2004) • Adapted version in China (ECERS-E; Li et al., 2014 and UK (ECERS-E; Silva, 2006) | • Space and Furnishings • Personal Care • Language/Rocking • Activities • Interaction • Program Structure • Teachers and staff • 7 sub-scales, 43 items |

Table 3. Assessment tools for kindergarten environment

CONCLUSION

- The indoor physical environment of kindergarten indeed related to children's behavior and development.
- The spatial definition of classroom and play room in China's kindergarten is not clearly and lacks of evaluation tools.
- The observation dimension of children's play behavior still remains in a single social or cognitive perspective. Future study needs to use scale (e.g. Play Observation Scale) to combine social and cognitive behavior.