Influences of Interpersonal Distance on Use Ratio of Connected-Seat Public Chair

WANG YAXI and WANG QI

ABSTRACT

Based on interpersonal distance studied by American scholar Hall, through combination and analysis of various surveyed experimental contents and theories by combining observation method and field experiment, the reasons for low use ratio of 3-person public chair are found out and the solution is proposed.

INTRODUCTION

“Distance”, an explicit vocabulary in modern society, has been evolved into a scope for reflecting various phenomena at this era gradually. When being in public space, people will always keep certain distance with others and have positive defense psychology in mind subconsciously to keep appropriate interpersonal distance deliberately. Even if body contact cannot be avoided, people will always stagger in face to avoid visual contact. \[1\] Public chair, as the indispensible functional carrier in public space, is not only the embellishment and decoration of public space but also serves people’s various physical and psychological demands. However, through observation, it’s found that the use ratio of public chair is not desirable. To find out its reasons, the reasons for its low ratio are analyzed and the solution is proposed through survey into the use ratio of connected-seat public chairs (partitioned or not) by combining observation method and filed experiment.

OVERVIEW

It is necessary to provide public chairs for people to have a rest in the public spaces where the public work, learn, have cultural exchanges, socialize, organize recreational activities, rest and travel. It is an important element for deciding material basis for public space function and manifesting public spatial form. Its character to differentiate it from ordinary chairs includes “publicity” and “communicability”. \[2\] Morphology can be divided into stool and chair, former of which refers to the mobile board with emphasis laid on the horizontal plane of modeling, reducing the sense of pressure of

First author, Wang Yaxi, School of Art & Design, Wuhan Institute of Technology, Guanggu No. 1 Road, Donghu Hi-tech Zone, Hubei, Wuhan,430205, China
Second author, Wang Qi, School of Art & Design, Wuhan Institute of Technology
vision and randomly variable sitting direction while the latter of which is divided into the single-seat and connected-seat types. To be further, the single-seat chair can be used in places such as: park and square, thus manifesting the personality of area for public rest. The connected-seat chair is generally used for three people. With appropriate length of 180cm, it can be set in landscaping terrace and revetment, thus integrated with the revetment. [3]

INVESTIGATION AND ANALYSIS OF CONNECTED-SEAT PUBLIC CHAIR

Investigation objective

The use ratio of public chair is not very high not matter in any places. To find out its reasons, the related problems imposing influences on use ratio of public chair are investigated next.

Investigation into the demand for seat of public chairs

According to questioning method, the demands of people at all ages in the same leisure place are investigated. By setting the equal quantity of 30 people at each age phase, the demands for alternative stool and chair are made and the proportion for its demands is obtained. The concluded data is the approximately calculated numerical value. For its result, please refer to the table 1:

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of People</th>
<th>No. of People</th>
<th>Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>5</td>
<td>17%</td>
<td>25</td>
</tr>
<tr>
<td>Juveniles</td>
<td>20</td>
<td>67%</td>
<td>10</td>
</tr>
<tr>
<td>Young people</td>
<td>23</td>
<td>77%</td>
<td>7</td>
</tr>
<tr>
<td>Middle-aged people</td>
<td>14</td>
<td>47%</td>
<td>16</td>
</tr>
<tr>
<td>Old people</td>
<td>4</td>
<td>13%</td>
<td>26</td>
</tr>
</tbody>
</table>

It could be seen from the data that the old people and children have large demands for chairs while the juveniles and young people have small demands. Perhaps, people have gradually high demands for rest as they get old. Therefore, it is necessary to design according to the age value of most nearby members in the coming solutions.

Interpersonal distance having influences on the use ratio of public chair

Interpersonal distance, a kind of social distance, indicates the mutual objective distance that people maintain when directly contacting people face to face. It manifests the intimating degree of both sides during socializing and objective observation and measurement can be implemented. The anthropologist Granville Stanley Hall divides “interpersonal distance” into four types. Intimate distance (equivalent to 0.15-0.45m), interpersonal distance (equivalent to 0.45-1.2m), social distance (equivalent to 1.2-3.6m) and public distance (equivalent to 3.6-7.5m).
Investigation analysis of the seat of connected-seat public chair

The experiment is carried out in two large-scale leisure sites in Huhan at same time period. (the length of chair is about 180cm without partition in the middle.)

1) Experimenter and respondent
   Experimenter: one male and female respectively, both the author and its friend. However, for the respondent,
   Respondent: all people passing by the two sites. (100 people)

2) Experiment process
   Firstly adopt scheme 1: the experimenters one male and female respectively are at the same site and take seat in different public chairs (far away from each other), sitting in the first or third location of three-seat chair (with the neighboring two locations vacant) and observe whether the passers-by (100 people) whether to choose to sit in the vacant seats. If there are some taking the seat, go to other seats to implement the experiment continuously until all 100 people attend the test; after the experiment is finished, adopt the scheme 2: the experimenters one male and female take the seats in the middle location of three-seat chair (with the first and third locations vacant), observe whether the passers-by (100 people) will choose to take the vacant seats. If there are some taking the seat, go to other seats to implement the experiment continuously until all 100 people attend the test; after the experiment is finished, adopt the scheme three: the experimenters one male and female take the seats at two sides of three-seat chairs (with the middle seat vacant), then observe whether the passers-by (100 people) will choose to the take the seat. If there are some taking the seat, go to other seats to implement the experiment continuously until all 100 people attend the test (please refer to the Fig. 1).

![Scheme for choosing the seats of connected-seat public chair.](image)

3) Experiment result

<table>
<thead>
<tr>
<th>TABLE 2. EXPERIMENT FOR CHOOSING THE SEAT OF CONNECTED-SEAT PUBLIC CHAIR.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experiment place &amp; sex implementation scheme</strong></td>
</tr>
<tr>
<td>Scheme 1</td>
</tr>
<tr>
<td>Scheme 2</td>
</tr>
<tr>
<td>Scheme 3</td>
</tr>
</tbody>
</table>

For most people, the vacant seat of scheme is appealing for the scheme 2 and 3. To find out its reasons, the digital computation of the use of chair is implemented: according to the man-machine size, the length of chair used by ordinary one person is 40-45cm, equivalent to the shoulder breadth of 1 person; the depth is about 44-45cm (the distance from the hip to the knee). By contrast, the length of connected-seat chair
generally for 3 persons is about 180cm. If three persons take the seat in this chair at the same time, the unoccupied distance in the middle is 22.5cm, namely within the area of intimating distance; if 2 persons take the seat in this chair at the same time, the occupied distance in the middle is 45cm, the maximum value of intimating distance and minimum value of personal distance. Therefore, it is not easy to give the sense of safety to the user about the personal distance. It thus could be seen that whether decide to choose the seat is mostly decided by whether the seat could bring the sense of safety. Let’s imagine, if the connected-seat chair is designed into the two-seat one with its length shortened, the illusion of scheme 1 will be brought to the people. As a result, the material is saved and occupying space is also saved. So, the use ratio of chair could be increased. (Please refer to the Fig. 2).

![Figure 2. Imagination about the selection of seats of connected-seat public chair.](image)

**DESIGN ANALYSIS OF PUBLIC CHAIR BASED ON INTERPERSONAL DISTANCE**

**User group of chair design**

For the investigated recreational squares are equipped with office buildings and shopping malls, the most people are young people, juveniles and middle-aged people. However, through investigation and analysis of demands for seat of public chair, it’s concluded that the backrest is not necessary for the designed chair. Therefore, the chairs will be designed for the recreational squares with office buildings and shopping malls.

**Sitting mode analysis**

1) Basic sitting form analysis

![Figure 3. Basic sitting mode analysis.](image)

Based on the imagination of designing the connected-seat chair into two-seat one to bring the illusion of scheme 1 to people, the public chair can be designed into 8-seat chair with four round multiple positions and two-pair wise directional one. For distribution of seat, please refer to the Fig. 3(1). The chair is divided into many areas...
subconsciously. 8 seats can be combined into the form of inner and outer rings (Fig. 3 shows green and blue seats). The direction can be changed. As for the remaining 4 round seats, they can be selected and combined randomly. Further, the inner and outer ring combination can be scattered to combine the matching of round seats so that a curve-form combination can be formed. The purpose of free combination can be achieved by adjusting personal direction. The diversified combination will give the users the diversified use feelings. The demand for seat can be chosen as required. If the mutual relation is the intimating distance of 0.15-0.45m, those can choose to take seats in inner ring. When it is personal distance of 0.45-1.2m, those can choose take seats in outer ring. Please refer to the Fig. 3 (2). If those want to be left alone and don’t want to contact others, they can choose to take seats in round seat of public chair. Please refer to the Fig. 3 (3).

2) Sitting mode design

1. Intimating distance

![Intimating distance](image1)

Figure 4. Intimating distance.

If familiar with others taking the seat, like family members or intimate friends, the one can choose the four schemes for taking the seats (please refer to the Fig. 4), sitting within the rings (blue & purple) or face to face (orange).

2. Personal distance

![Personal Distance](image2)

Figure 5. Personal Distance.

If familiar with others taking the seat, common friends or colleagues, the one can choose the above scheme for taking the seat. When taking the seat within the ring (flesh color), one take the seat and at two sides respectively. However, when taking the seat out of the ring (grey), 2 persons can take the seat. When there are too many people, one can take the seat at two sides respectively and also can take the seat face to face (purple). Please refer to the Fig. 5.

3. Social distance
If not familiar with others taking the seat, like strangers, the one can choose to take the seat in four round public chairs (blue) (please refer to the Fig. 6) and try to choose the direction in which he or she cannot face others visually.

CONCLUSIONS

The interpersonal distance plays a critical role in use ratio of public chair. The consideration should be given to both interpersonal distance and the age of user group & the number of users during design to select the chairs with or without backrest. The designed public chair could develop its use ratio maximally. The public chair with considerations given into these elements can be regarded as a good design.

REFERENCES