

# The Interactive Elements of Art Greenway's Public Chairs in Communicating with Users in Taichung City, Taiwan

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**Abstract:** With the changes of life style, people spend daily lives inside buildings, have weaker and weaker relationships with people around in society, and treat them as if they are invisible. Furthermore, we get used to keeping in touch with relatives and friends with internet, but forget the excitement in real meeting and how to communicate with others face to face. On the other hand, if we observe carefully in environment, we will know people already behave interactively with others. For example, we see each other and behave eye contacts, then start to greet each other and talk or even only give a smile to other persons. These small actions show the intricate relationships between people, however, interactions in outdoor space are not only among humans but also between humans and surroundings. People utilize products consciously or unconsciously everyday, and they have emotions and feelings reflecting on their behavioral mode at the same time.

Street furniture is the most related matter with persons in outdoor space, so the conscious communications through users' behaviors on the street furniture are discussed in this paper. This research takes public chairs of Art Greenway in Taichung as subjects, and uses the non-participant observation to record users' activities to discuss the interactive relationships between users' behaviors and matters. Close questionnaires and inhabitants' interviews are also exercised to realize how users feel appearance images and psychological emotions of public chairs. Study results hold public chairs' types should be varied by basic form elements to make users' gestures and activities abundant to induce more various behaviors and make the interaction happen more frequently. Because of users' unconscious behaviors always make outdoor activities more various indirectly. The researchers take industrial design viewpoints to think the design elements in public space, and hope the results can be references in related fields.

***Key words: communication, interactive behaviors, street furniture, Art Greenway.***

## **1. Introduction**

On moving to the way of industrialization and urbanization, the idea that the pedestrians are streets' leading role seems to go out of fashion. Streets are filled with vehicles and make people's urban life become more dangerous and pollutant. In contrast to comfortable interior living space, people like to stay at home and slowly neglect the importance of outdoor activities. Most people do not really go into the nature and experience it in

life and try to interact with all the surroundings. People’s lives slowly tend to move among boxes, such as houses, companies, department stores, transportations and so on. Furthermore, due to the changes of communication methods, people change their ways of contacting relatives and friends; they write to each other via e-mails instead of hand-writing letter, or talk on line instead of speaking face to face. Gradually they lose the excitement of having fun together and real communications. In fact, many interactive behaviors happen between people outside the boxes, for example we may meet acquaintance accidentally, and then we smile, greet, and talk.

Interactions in outdoor space not only exist among people, but also between people with objects and people with environments. This research mainly discusses interactions between people and objects, and public chairs are chosen to focus on because they play an important role in relaxing. The researchers consider the convenience of investigating and assume people and chairs are good samples in communicating. The public chairs of Taichung City’s Art Greenway are decided as the research subjects. Taichung City is located in the middle of Taiwan and plays an indispensable role in traffic transferring between the Northern and Southern Taiwan. It is like the heart of Taiwan. In Major Hu’s leading, Taichung City is growing up as a cultural city that Wiener Philharmoniker, the violoncello performer, Yo-yo MA, one of The Three Tenors, Luciano Pavarotti, and the popular bossa nova singer, Lisa Ono, all have their live concerts in this city. In the art and cultural ambiance, National Taiwan Museum of Fine Arts that locates in Taichung City preserves Taiwan’s art heritage. Art Greenway is near the NTMOFA and its artistic public chairs have a special function, which is to make space more active, to attract people’s eyes, to increase the time they stay, to bring out more behaviors.

## 2. Research Location and Subjects

### 2.1 Art Greenway

Art Greenway is located in the West District of Taichung City, and its northern part is from Sec. 1, Wuquan W. Rd that closed to NTMOFA and Cultural Affairs Bureau, Taichung City. The range in south is Wuquan W. 8rd St, in east is Wuquan W. 3rd St and in west is Wuquan W. 4rd St (Figure 1). It makes a 1200 meters green belt, and is at the intersection of green belts and blue belts. These green belts are built during Japanese Era, and these blue belts mean the districts that rivers “Luchuan, Meichuan, Han-si, Fa-zih-si” cross.



Figure 1: The map [1] and the picture [2] of Art Greenway

Art Greenway is on the edge of Taichung Cultural City, and it has many cultural, ancient, and industrial characteristics because it is near the NTMOFA. The ambience is filled with art and literature. Due to the ancient history, there are many special antique buildings built during Japanese Era. Nowadays these buildings are rebuilt and redecorated to become restaurants, so the area is having more and more commercial atmosphere.

**2.2 Public Chairs of Art Greenway**

There are all eight chairs in Art Greenway, but in this research only five chairs are discussed. After observing the people’s using condition in reality, those five research subjects are decided according to users’ various behaviors. They are “The Affection of A Leaf”, “The Slanting Setting Piano”, “Flying Colorful Swallows”, “The Imagination of Wind”, and “Rhythm”(Figure 2). What follows is the brief introduction of the subjects.

- (1) The Affection of A Leaf ( subject 1 ) : Its shape and color is similar to a dying leaf, and makes people feel that the falling of one leaf heralds the autumn. It has a conflicting esthetic sensibility with its surrounding green lawn.
- (2) The Slanting Setting Piano ( subject 2 ) : Its appearance is made by colorful mosaic and is created with some cute images like a sun that is pronounced like the creator’s name in Chinese. The shape’s idea comes from a piano, and this chair is functional and interesting.
- (3) Flying Colorful Swallows ( subject 3 ) : Armrests are shaped similar to humans’ look, and there are a hollow swallow and a concrete swallow on the back of the chair.
- (4) The Imagination of Wind ( subject 4 ) : A streamline shape like a European chair offers people recline, and its material looks like a little bulky. The children like it because it is like a slide to them.
- (5) Rhythm ( subject 5 ) : The design idea comes from a nail, and the curved part has ambiguous functions: “armrests or the back of the chair.”

				
The Affection of A Leaf (subject 1)	The Slanting Setting Piano (subject 2)	Flying Colorful Swallows (subject 3)	The Imagination of Wind (subject 4)	Rhythm (subject 5)

Figure 2: The five subjects inside this research

**3. Method**

**3.1 The Non-participated Observation**

The non-participated observation is for recording users’ real body behaviors while the researchers are taking pictures. The researchers analysis what kinds of gestures the users have according to the observational key points ( Table 1 ) based on the chairs’ form design.

Table 1: The observation of body behaviors

Key points and Content
1. Who: Users' characters, using members.
2. What: Do what kinds of activities, use which chair.
3. Where: Record the surrounding environment of chairs' setting.
4. When: Take note about when behaviors are reacted.
5. How: How users use chairs and change their gestures.

### 3.2 The Closed Questionnaire

This research uses the closed questionnaire to investigate users' psychology, to understand their interactive psychology with the chairs by asking questions like what they think about chairs' forms, shapes and designs and how they feel while using them. In the beginning of designing the questionnaire, the researchers first collect some adjectives about emotional feelings and products' images, artistic and painting's styles, and so forth. Next the researchers count which ones are used more often, and finally search out some adjectives ( Table 2 ) that the users use to describe how they feel while they are having interactions with the chairs, and these emotions are caused by the chairs' outer shell. Please note that question 1, Semantic Differential Scale is for testing.

Table 2: The contrary adjectives are used to investigate the interactive element

Eight teams about appearances	Seven teams about emotional feeling
A. How do you think the chairs look like?	B. How do you feel while using the chairs?
1. simple and complex	1. warm and cold
2. delicate and rough	2. excited and sad
3. special and common	3. happy and angry
4. funny and boring	4. interesting and dull
5. personal and public	5. relaxing and tight
6. static and dynamic	6. leisure and hurried
7. animated and mechanical	7. comfortable and uncomfortable
8. affective and reasonable	

In question 2, the researchers use Likert scale to investigate if chairs are too artistic for people to use, or too focus on form design and ignore the function, and if people will stay outside longer because of these chairs. Questions about chairs' setting environment are also considered inside the questionnaires for interviewees ( Table 3 ) .

Table 3: Question 2

Please mark the answers that you agree?
1. These chairs for you are too artistic to set.
2. You think these chairs focus on from design and lose the function.
3. You think these chairs are more artistic, but not suitable to use for the public.
4. You stay longer and more happily in Art Greenway because of these chairs.
5. You always pay attention to the design of public chairs in parks or streets.
6. These chairs are not set in private place and you do not want to sit on them.
7. There are no shade of trees around the chairs and this reason makes you do not want to sit on them.
8. You think these chairs' whole images are very close to the feeling of how Art Greenway shows people.
9. When others talk about Art Greenway, you always think of these chairs.

Besides these main questions, there are still some basic questions about personal data. Their identity (inhabitants, visitors or students), gender, age, visit times, and what kinds of activities they behave. These factors maybe affect the interaction between users and chairs.

#### 4. Results and Discussion

##### 4.1 Users' Body Behaviors

The body behaviors are observed on the weekends of April and May. There are no trees around research subjects to shade, and the weather is too hot to stay outdoors for most people. But when it is cool, streams of people move out. So these behaviors collection are recorded about from 3 to 6:30 in the afternoons. Two hundreds and one photos of the research place, subjects and using behaviors are totally collected. In collecting pictures, the observer can feel that the research place is filled with the active atmosphere and so many activities are going on. People take a rest, await friends, play games, take photos, play flying discs, play badminton, watch others' movement, take care of kids, take a nap, ride bicycles, blow bubbles, walk dogs, sell products, talk on the phone, chat, date, excise, eat, and so on.

Here the paper discusses the relationship between the chairs' forms and people's gestures, and tries to find out what parts of chairs' form to cause the interactive behaviors, and these parts affect interactive behaviors are also called chairs' interactive elements.

- (1) Subject 1: The direction of sitting place is not limited because its form is without armrests and chair's back. According to the real using situation, it can be found that users almost put their elbows on their knees in order to support their upper bodies (the distance from users' knee popliteal to the ground [1] is larger than the chair's height). Due to this kind of chairs' form, users take a rest, take care of kids, read, watch others' movement or are in a daze by sitting on them. The curved seat is suitable to lie down, to lie prone and play games (play on a slide, scramble) for kids. The shape of leafstalk is used for straddling and grabbing in kids' climbing (Figure.3).











without armrests and back			leafstalk	
				
put elbows on knees			straddle	grab
the curved seat: take a rest			the curved seat: play games	
				
lie down	lie prone	kneel-sit	play on a slide	scramble

Figure 3: forms of subject 1 and people's gestures

(2) Subject 2: The direction of sitting place is limited because its form is with incomplete armrests and chair's back. So the gestures are not various. Users usually lean on the back, coil one shank on other thigh, or interlace two legs to sit (the distance from users' knee popliteal to the ground is almost equivalent to the chair's height). Some users take off shoes and coil bodies on the seat, and this gesture is more comfortable and relaxing. Some don't lean on the back, but sit straightly on the half of seat. People's gestures on subject 2 are less than subject 1 due to chair's form. The colorful mosaic also catches many users' eyes to take pictures with the chair (Figure.4).

<b>with incomplete armrests and chair's back</b>				
				
lean on the back, coil one shank on other thigh			lean on the back, interlace two legs to sit	
<b>the colorful mosaic</b>		<b>with the back</b>		<b>the chair's height</b>
				
take pictures		breech by the back		sit straightly on the half of seat

Figure 4: forms of subject 2 and people's gestures

(3) Subject 3: There are armrests and the back, so the direction of sitting place is limited. In contrast to chairs without armrests and the back, the users' behaviors are less. Due to the distance from users' knee popliteal to the ground is larger than the chair's height, people also usually coil one shank on other thigh, or interlace two legs to sit. Coil bodies or lean upper bodies on a right angle that the back and the armrest. The chair's back and height are low, as a result, children like to climb up and down the chair, and so many parents carefully keep an eye on their children. The armrests' shapes are humans in pairs, and it can offer little shelter. It seems to make lovers' interaction closer. Lovers usually sit shoulder to shoulder, arm in arm or put head on lover's shoulder. The human-shape armrests also offer people to support with a head or hand. The swallows on the back are also used to support an elbow or be the back to lien users' backs.

<b>with armrests and the back</b>				
				
lean on the back, coil one shank on other thigh			lean on the back, interlace two legs to sit	






swallows on the back			armrests with human shape	
				
support an elbow	lien users' backs	head on lover's shoulder	sit shoulder by shoulder	arm in arm

Figure 5: forms of subject 3 and people's gestures

- (4) Subject 4: Its shape is like a sling chair although it is set on outdoor space. Still many people lie on it. The up, concave, right and leaf sides, arc of curved seat all offer enough place for people to sit, so users' behaviors and gestures are various due to every different part of chairs. People are lying flat, lying aside, lying prone, and cross their legs, interlace two legs to sit, put hands besides bodies on the seat, and so on.
















like a sling chair				
				
lying flat	lying side	lying prone	cross ones' legs	put hands besides bodies
sitting place				
				
the up	the leaf side	the arc	R angle	the right side

Figure 6: forms of subject 4 and people's gestures

- (5) Subject 5: It looks like a nail, but also is a chair. The shape makes sense of conflict, the upside-down L and no. 3 pattern offer the ambiguous function hit. It can be found that there are many kids scramble and sit on them. For kids, this chair seems more like a recreational facility. The thin seat is not very suitable for people to sit longer, but still can catch people's eyes to take photos with it.

the upside-down L pattern				
				
straddle	lean on	sit down	take photos	lean on

No. 3 pattern			the thin seat	
				
lean on	scramble	straddle	creep	walk on

Figure 7: forms of subject 5 and people's gestures



#### 4.2 Users' Psychology

This part comes from the result of questionnaires, and is about the psychology when people use these chairs. The persons who write this questionnaire are forty-four percent of male and sixty-seven percent of female. Their ages are under 20 years old (10.7%), 21~40 years old (80.3%), 41~60 years old (8.2%), and more than 61 years old (0.8%). Due to the elderly psychological abilities (sight, hearing, illiteracy), they almost refuse to answer the questions. What is more, in order to avoid the useless results, the youngest age of subjects is twelve, for children cannot really understand what these identified adjectives mean. These questions are about how they feel chairs' appearances and what kinds of emotions they have after using the chairs. These causes affect the quality of communication between people and chairs. If people feel that the chairs look like boring, rough, or mechanical, they may not use the chairs. In this situation, the interactive behaviors will not be behaved between people and objects.




This result finds out that the younger subjects are less affective and have not very good vibration from chairs than the older ones. For most people's feelings about subject 2 and 3 are similar, but the level of emotion is different (Table 4), and this is because of their colors, materials, some details form design, etc. The appearance of subject 2 is complex (due to mosaics), delicate, special, funny, personal, static, animated and affective, but subject 3's appearance is simple, rough, and a little dynamic. There are almost no differences between subject 2 and 3, except their form. They are both with armrests and the back, and also belong to the classic chair type [2].

On the other hand, subject 1 and 4 are also thought similar to their facades and feelings (Table 4). They both are simple, funny, special, personal, animated, and affective in appearances; a little excited, happy, interesting, relaxing, leisure and comfortable in users' feeling. Both of them are made of metals, with similar color and shape (with the curved seat). Subject 5 has the totally different construction with other subjects. It just has the upside-down L and no. 3 patterns to replace the functions of armrests and the back.

Table 4: the interactive elements of research subjects

subject	characteristics		Interactive elements of subjects	Users' gestures	
	appearance	feeling			
classic		complex, delicate, special, funny, personal, static, animated and affective.	warm, excited, happy, interesting, relaxing, leisure, comfortable.	long chair's back, colorful mosaics, an oval seat, single armrest.	lean on the back, coil one shank on other thigh, interlace two legs to sit
		simple, rough, and a little dynamic.	a little warm, a little happy, a little interesting, relaxing, leisure, a little comfortable.	swallows and armrest of human shape in pair.	lean on the back, coil one shank on other thigh, interlace two legs to sit, sit shoulder by shoulder, arm in arm



non-classic	1. 	simple, rough, special, funny, personal, animated, and a little affective.	a little excited, a little happy, interesting, relaxing, leisure, comfortable.	the curved seat, the form of leaf, a leafstalk.	put elbows on knees, straddle, grab, lie, scramble, kneel sit.
	4. 	simple, delicate, special, funny, personal, a little animated, and a little affective.	a little excited, happy, interesting, relaxing, leisure, comfortable.	the form of a sling chair, the curved seat.	lie, play, cross ones' legs, put hands beside bodies,
	5. 	simple, special, funny, personal, static, animated	a little cool, a little excited, a little happy, interesting, a little uncomfortable.	the upside-down L and no.3 pattern, the form of a nail.	straddle, creep, lean on, sit down, grab.

## 5. Conclusions

Through observing users' behaviors and investigating their psychology, it can be found that: First, if chairs with the similar form, both users' gestures and emotional feelings are alike. Such as subject 2 and 3 (with armrests and chairs' back), subject 1 and 4 (without armrests and chairs' back), they are good example to prove this result. Second, some special elements of chairs can attract people's attentions and increase the chances for people to use them. Besides, these elements are called the interactive element, for example the curve element of subject 1, subject 2 and subject 3. Third, the classic chairs are focused on the function to satisfy some humans' biological and psychological needs, however, non-classic chairs are stress on the form design, its form is more eye-catching than classic chairs for satisfying others' aesthetic needs.

Through mixing the basic elements (armrests and chairs' back) and add some special form elements, to design two different types of chairs "the classic and non-classic chairs" to increase users' gestures, behaviors, activities, and interaction. If these two types of chairs are set in outdoor space, people will be able to choose what kind of needs that they want and can be satisfied with. These two types of chairs also can be called to play their own characteristics and make atmosphere alive.

## 6. References and Citations

- [1] It meant the distance from the Knee Popliteal to the ground when people sit straightly, look forward and hands drop naturally. The distance is about 43cm. The data was captured from *Anthropometric data book of the Chinese People in Taiwan*.
- [2] The definition of classic and non-classic chair types: classic chairs' form hit the functions directly and its appearances just like people usually see in daily life. The non-classic chairs' forms are through transforming and changing shapes, so the appearances are different with people's common sense of chairs.
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