Users' Behaviour of Small Urban Spaces in Winter and Marginal Seasons

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Summary

In this article, the author tries to analyze users' behaviour and the public life of small urban spaces in both winter and marginal seasons from a behavioural perspective, and holds that the planning, design and management of urban spaces should support the "personal control" mechanism in order to mediate the environmental stress caused by cold climate. The author first puts forward the concept of "sub-marginal period" and points out that only when temperature reaches about 40°F (4°C) do ideal microclimate conditions begin to influence users' behaviour and the public life of urban spaces positively and significantly, and suggests that micro-climate design be focused on the improvement of outdoor thermal comfort of urban spaces in sub-marginal periods and that the standard of building height and density control in downtown areas for solar access of urban spaces be based on the local solar altitude of sub-marginal periods.

Résumé

Dans cet article, l'auteur tente d'analyser le comportement des utilisateurs et le déroulement de la vie publique dans de petits espaces urbains en hiver et dans l'entre-saison. Il utilise une approche behavioriste et considère que la planification, l'aménagement et la gestion des espaces urbain devraient encourager un mécanisme de "contrôle personnel" permettant de tempérer le stress causé par un climat froid. Il propose d'abord le concept de "période sub-marginale" et montre que, lorsque la température atteint environ 40°F, des conditions micro-climatiques idéales influencent de manière significative et positive le comportement des utilisateurs et la vie publique. Il considère que tout aménagement climatique devrait se centrer sur une amélioration des conditions thermales dans les espaces extérieurs pendant les périodes sub-marginales. Il faudrait en outre que, pour les centres-villes, les normes concernant la hauteur des bâtiments et la densité des constructions par rapport à l'ensoleillement se réfèrent aux conditions d'ensoleillement locales pendant les périodes sub-marginales.

Introduction

Cold climate, as an ambient stressor, shares certain characteristics with other ambient stressors: chronic, negative, intractable, non-urgent and perceptible (Campbell, 1983). However, it does have its positive aspect: the beauty of landscape after a snowfall, the enjoyment of winter sports, and the economic benefits brought by winter carnivals, etc.. It is this aspect that makes cold climate different from other ambient stressors such as air pollution, noise, and traffic congestion.

For coping with environmental stress, two major types of strategies have been identified: problem-focused coping and emotion-focused coping. The former involves direct dealing with the source of stress to reduce aversive impacts whereas the latter alters the individual's response or emotional reaction to the negative situation (Lazarus, quoted in Holahan, 1982; Evans & Cohen, 1987). Correspondingly, two fundamental approaches have evolved in northern cities for coping with the cold climate. One is to offer maximum protection by means of advanced technology to create artificial environments which are free from the undesired weather, like the "indoor cities", "underground cities", and "skyway cities" in North America (Gehl, 1990). The other tries not to overprotect people from nature by having cities highly integrated with the natural environment and letting people experience the seasonal impulse (Gutheim, 1979; Pressman, 1987, 1988; Gehl, 1990). Copenhagen seems to be a model of the second approach. The first approach has been criticized by researchers from various aspects (Hall, cited in Zrudlo, 1972; Gutheim, 1979; Culjat & Erskine, 1983; Pressman & Zepik, 1986, Pressman, 1988; Whyte, 1988; and Boddy, 1992).

> "It is a mistake to build more skyways. ... Depression is less a consequence of winter and more a consequence of doming, malling, and staying inside" (Nash, 1987, 21).

However, the information that the Copenhagen model conveys seems not very positive either. Instead of encouraging people to enjoy winter, it simply asks people to "endure the winter in order to have a really enjoyable summer" (Gehl, 1990, 28). There should be the third solution: an optimum balance between protection against the worst parts of the cold climate and exposure to the beneficial aspects of it (Culjat & Erskine, 1983; Pressman & Zepik, 1986; Gehl, 1990). However, in reality, it is difficult to find examples to illustrate how this could be done at a city scale (Pressman & Zepik, 1986; Gehl, 1990).

At an individual level, Lynch (1981) suggests that the "fit" between a person and an environment is enhanced by a person's ability to directly control or modify the environment. Francis (1989) also argues that users' control is an important dimension of the quality of public spaces. Personal control has been found to be an important mediating variable to reduce the negative psychological effects of environmental stress (Evans & Cohen, 1986). Personal control over environmental stressors can be partitioned into three types: "behavioural control" — the availability of a response that can directly modify a threatening event; "cognitive control" — the

way an individual interprets a threatening situation; and "decisional control" — the range of choices available to an individual (Averil, cited in Holahan, 1982). Culjat & Erskine (1983) describe a situation in which a group of people waiting for a bus on an exposed sidewalk bunch together seeking protection behind each other's body. From this they infer that the cold wind and sweeping snow seem to change the response to the spatial pattern with respect to other people. This is in fact a "behavioural control" response. The "officious displays" that Nash (1981, 1983) describes refer to the exaggerated gestures in communicating official messages about what the person is doing and feeling outdoors on bitter cold days. These "officious displays" reflect people's anxiety caused by cold and long time waiting for a bus (crane to look for the bus every few minutes, pace up and down) and also their efforts to keep themselves warm (jump up and down, blow on their mittens or gloves). All these are actually the expressions of "behavioural control" mechanisms over the stress of cold. The "festive attitude" and the "disdain of bitter cold" (Nash, 1981, 1983) can be classified as "cognitive control". Pressman (1988, 24) appeals to "provide people with choice of being outdoors or withdrawing into warm protected recesses either inside buildings themselves or in 'urban pockets' which trap the sun".

This can be considered a strategy of providing people with the opportunity of "decisional control" in coping with the stress of cold climate.

Literature related to behavioural responses to the cold climate and the psychological needs of users in urban public spaces is rare. In this article, the author tries to do some exploration in this aspect and draw some implications for the planning, design and management of small urban spaces.

Research settings and methods

Participant observations have been conducted in New York City at the Seagram Plaza, Herald Square Park, Collect Pond Park, and Rockefeller Centre Plaza. The observations were carried out during lunch hours (11:30am to 2:30pm) on weekdays, and some on weekends. Behaviour mappings and field notes were used as major data collecting methods. The participant observations were done for each of the above mentioned urban spaces for six to seven days, mostly between January and March, October and December, 1989, February and April, 1993. The date, time, weather conditions and other significant

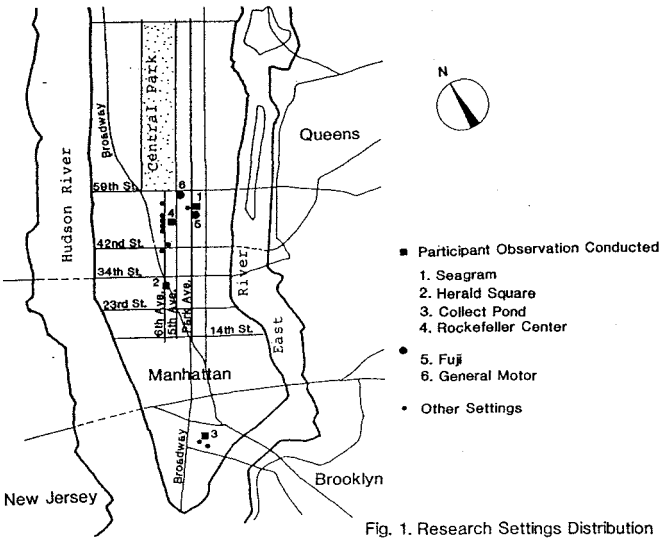


Fig. 1. Research Settings Distribution

events happening during the observations were recorded. Users' age group, gender, principal behaviour, location in the space, length of stay, "mode of stay" — alone or in groups — were also recorded. The data thus collected were used for qualitative analysis supplemented by the statistics data of 15 midtown and downtown Manhattan urban spaces including the above mentioned four. The analysis in this article is mainly based on the data collected from the observations at Seagram Plaza and Herald Square Park. Fig. 1 shows the distribution of these research settings.

Findings and discussions

I. Winter

1. When the temperature was around freezing point or lower, there were still some people staying in outdoor urban spaces, standing, sitting, eating and drinking, talking, smoking, and even reading. Most people just stayed for a couple of minutes. But some people (not homeless) stayed for up to one hour. This tells us that even if there is no programmed or spontaneous activity within urban spaces, some people still have a need to use them in winter. However, the winter use of small urban spaces is very low. For most of the small urban spaces studied in New York City, the use (number of people recorded instantly within an urban space) at about 30°F is only one fifth to one sixth of that at about 50°F in fall marginal period (late fall and early winter) and about one eighth to one tenth of that at about 50°F in spring marginal period (late winter and early spring). Fig. 2 shows how the use of five small urban spaces in NYC varies along with the change of temperature from fall marginal period through winter till spring marginal period. Among them, Seagram, Fuji and Collect Pond have some common features:

a. With the temperature drop from fall marginal to winter, the use decreased; with the temperature going up from winter to spring marginal, the use increased.

b. When the temperature was below 40°F, the use was very low, usually less than ten; when the temperature was lower than the freezing point (32°F), the use was even lower, almost dropped to zero (such as Seagram at 18°F). For this group of urban spaces, when temperature was lower than 40°F, its impact on use was not significant.

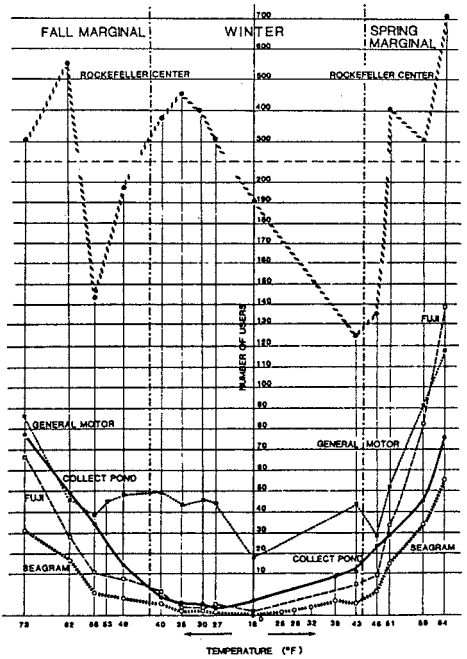


Fig. 2. Use Comparison in Different Seasons

General Motor and Rockefeller Center also share the following features:

a. Their winter use varied at a much higher level than that of the above mentioned three plazas, especially the use of Rockefeller Center, which was always higher than 128 and sometimes even higher than 400.

b. It can be seen from the diagram that their winter use was not correlated to temperature change; actually the correlation coefficient between winter use density (number of users per one thousand square feet) and temperature is only 0.09 for 15 NYC plazas. The only two significant variables influencing winter use density are programmed activity (recreational or commercial within the urban space or the buildings directly adjacent to the urban space) and visual diversity (Li, 1991).

For both of these two groups, when temperature was below 40°F, temperature (the sun and wind as well) would not influence use significantly.

2. Behaviour that could be classified as "behaviour control" phenomenon was frequently observed in these small urban spaces in winter:

(Feb. 9, 1989, Thursday, *Herald Square Park,* sunny, mild wind, 25°F). At 2:00pm, a middle aged man in black overcoat came and stopped at the third southeast chair. *He took out a cushion from his bag, put it on the wooden chair and sat on it.* He lit a cigarette and watched pigeons looking for food on the ground. He stayed for 6 minutes (Fig. 3, a).

* (March 9, 1989, Thursday, *Seagram Plaza,* sunny, a little windy, 41°F). At about 1:00pm, a leisurely dressed young man (mid 20s) with his lunch bag in hand came to sit on the south ledge. He ate and drank while listening to walkman. *After eating, he laid on the ledge, but just a few seconds later he got up.* It seemed that the stone ledge was still too cold to lie on. He stayed for 15 minutes (Fig. 4, b).

* (Feb. 25, 1993, Thursday, *Seagram Plaza,* sunny, windy, 32°F). At 2:06pm, the whole plaza was bathing in the sunlight. A young couple in colorful down coats came together and stopped at the north end of the north ledge. The girl sat on the ledge with her feet hanging out (here the ledge is about five feet high), and the boy semi-sat and semi-laid on the ledge against the north bench, with his head up facing to the sun. They didn't talk. *A couple of minutes later, the boy seemed to feel cold, he erected the collar of his coat and shrank his neck deep into the coat.* He gave a yawn and still stayed there. They stayed for about ten minutes (Fig. 4, c).

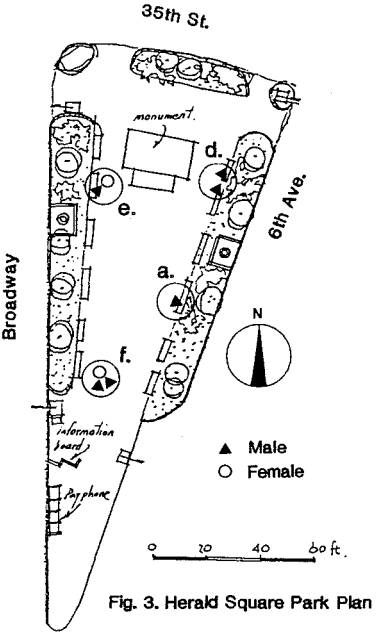


Fig. 3. Herald Square Park Plan

All these examples show that people tried to mediate the stress caused by the uncomfortable cold by using behavioural control mechanisms intuitively. Both the above mentioned behaviours and the "officious displays" described by Nash (1981, 1983) are all expressions of "behavioural control" of the individuals over the cold. However, those "officious displays" mostly happened on bitter cold days around the

Twin Cities area (of Minneapolis-St. Paul) and could hardly be observed in New York City where winter is mild.

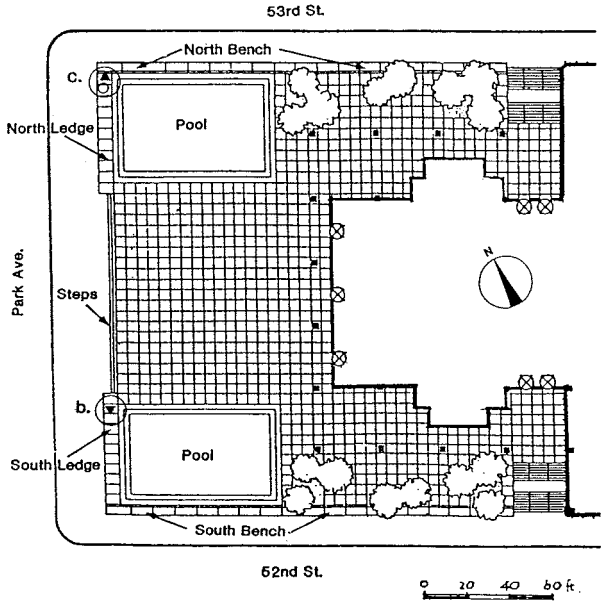


Fig. 4. Seagram Plaza Plan

II. Marginal seasons

1. From Fig. 2, we can see that both in fall and spring marginal periods when temperature reached about 50°F or higher, with the temperature going up, the use of Seagram, Fuji and Collect Pond increased significantly. My former study also shows that both temperature and the sun exposure (percentage of the space area directly exposed to the sun radiation) are significant in influencing marginal seasons' use density (Li, 1991).

2. Fig. 2 also shows that when temperature was around 50°F or higher, at similar temperature level, the use of these three urban spaces was significantly higher in the spring marginal period than in the fall marginal period. When it was at the similar use level in these two periods, the temperature difference could be as much as about ten degree Fahrenheit or more. Take Seagram for example, its use at 48°F in spring was higher than that at 56°F in fall; its use at 51°F in spring was similar to that at 62°F in fall, and its use at 59°F in spring was higher than at 73°F in fall. This also applies to Fuji and Collect Pond.

Bjorkto's (1965, cited in Culjat & Erskine, 1983) study shows that in the Oslo area, the outdoor season begins at about 9°C (49°F) in early spring and ends at about 11°C (52°F) in late fall, because lower temperature is normally accepted after the long winter depending partly on the body's adaptability and partly on attitude. My studies

in New York City show that it is also related to the difference of the sun exposure caused by the difference of solar altitude in fall and spring marginal periods. In New York City, fall marginal period is regarded as from late October to mid November and spring marginal period as from late March to mid April. If we take the solar altitude on November 6 (39°) to represent the altitude of fall marginal period and that on March 21 (50°) to represent spring marginal period, we get the following table as comparison of the sun exposure of 15 NYC urban spaces in the two marginal periods (Fig. 5):

Plaza	Fall Marginal		Spring Marginal	
	Solar altitude (Nov. 6)	Sun exposure	Solar altitude (March 21)	Sun exposure
Bell	39°	0.00	50°	0.06
Grace	39°	0.01	50°	0.02
Celenese*	39°	0.14	50°	0.26
McGraw Hill*	39°	0.21	50°	0.31
Exxon*	39°	0.25	50°	0.44
Time & Life	39°	0.30	50°	0.37
Burlington	39°	0.10	50°	0.16
General Motor	39°	0.09	50°	0.13
Levere House*	39°	0.02	50°	0.14
Seagram	39°	0.25	50°	0.32
Fuji*	39°	0.32	50°	0.64
Rockefeller*	39°	0.11	50°	0.28
Police	39°	1.00	50°	1.00
Federal*	39°	0.36	50°	0.46
Collect Pond*	39°	0.77	50°	0.97

Fig. 5. Sun Exposure Comparison of Fall & Spring Marginal Seasons

Here, for each urban space, the value of the sun exposure is the mean of that at 11:00am, 12:00noon, 1:00pm, and 2:00pm. The sun exposure of all these urban spaces is higher in spring marginal than that in fall marginal except the Police Plaza (both 100%). Among them, the difference of sun exposure is more than 10% at eight urban spaces (with * in Fig. 5), and Fuji Plaza holds the biggest difference — 32 %. It can be seen from Fig. 2, that the use of Fuji Plaza in spring increased more quickly than that of other plazas. In marginal seasons, *activity, seating density* (linear footage per one thousand square feet), *urban context* (ground floor land use around an urban space), *temperature* and *sun exposure* are significant variables influencing use density (Li, 1991).

III. Sub-marginal periods

Sub-marginal period is defined as the period between winter and marginal seasons when the highest day-time temperature is around 40°F. This is another critical temperature range in terms of influencing users' behaviour and the public life of small urban spaces. Extensive and continuous participant observations at Seagram Plaza and Herald Square Park (about 6 to 8 days, more than 20 hours for each) have revealed some very important facts:

1. Around 40°F, on a sunny day with mild wind, within an urban space which was directly exposed to sun radiation, behaviour patterns became diversified. Most of the behaviours happening in urban spaces in summer could be found here now. Behaviours like lying (not homeless), dozing (not homeless), and dating began to appear at this temperature level.

2. The average number of users recorded within one hour (I call it hour use), compared with that at about 30°F increased significantly at both Seagram and Herald Square. At Seagram, it increased from less than 20 to more than 40, or even more than 60; at Herald Square, it increased from about 30 to about 50 (Fig. 6). The sharp drop of hour use on Saturday (a lovely sunny day) at Seagram indicates that its use was largely dependent on weekday working population.

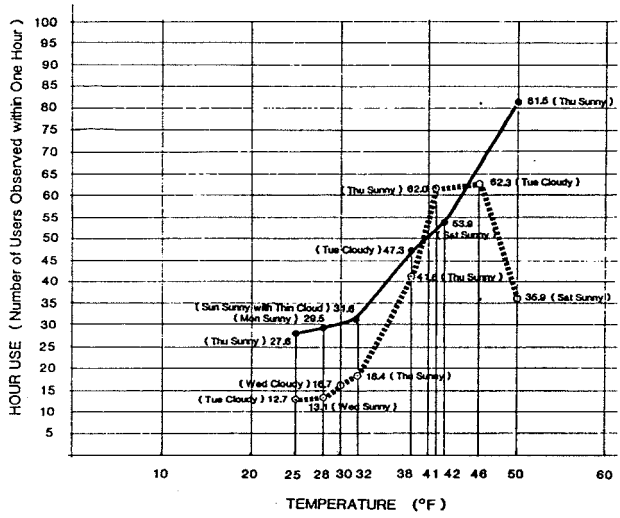


Fig. 6. Hour Use Comparison

3. The average staying time of users also increased significantly. At Seagram, it increased from two to three minutes around 30°F to about seven minutes. At Herald Square, it increased from three to four minutes to about ten minutes (Fig. 7).

4. The ratio of sitting to standing exceeded 1.0, which means that the number of people sitting in these two urban spaces began to exceed the number of people standing (Fig. 8).

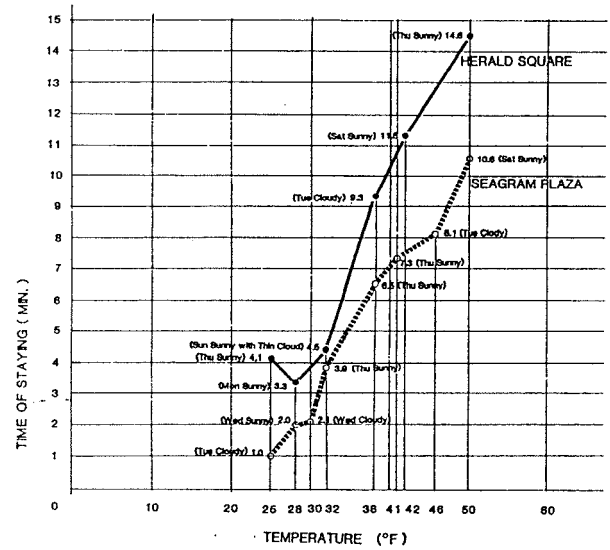


Fig. 7. Time of Staying Comparison

All these have verified that temperature around 40°F is important in influencing users' behaviour and the public life of small urban spaces. What we should notice is that these findings can only be obtained by long term repeated and continuous observations. Instantly recorded data cannot reveal these facts. This is because 40°F is still not a comfortable temperature for people to stay outdoors for a long period. Although some individuals in Seagram and Herald Square stayed up to one hour, most of the users just stayed for a couple of minutes. Instantly recorded data cannot reveal the increasing tendency of the number of short time staying users.

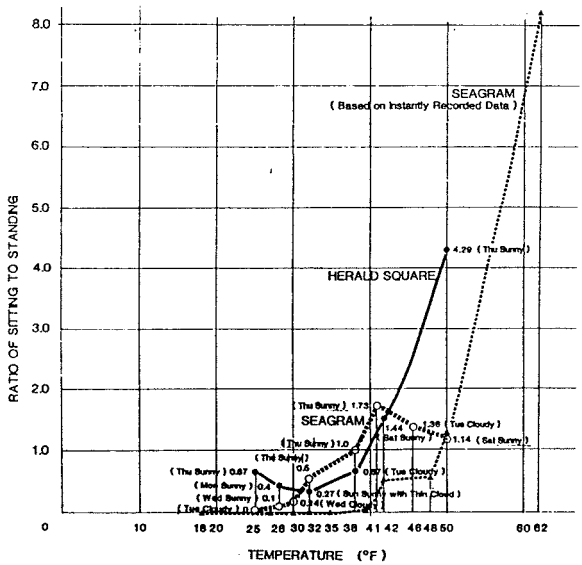


Fig. 8. Ratio of Sitting to Standing Comparison

IV. Scale, Visual Diversity and Social Contact

In Herald Square Park social contacts between strangers were frequently observed, which were seldom found in other urban spaces:

The following scenes have also been observed: one asked another if it was o.k. to include him into his picture of the monument; people asked each other to take photographs of themselves with the monument or Macy's as the background, etc.

Photo 1

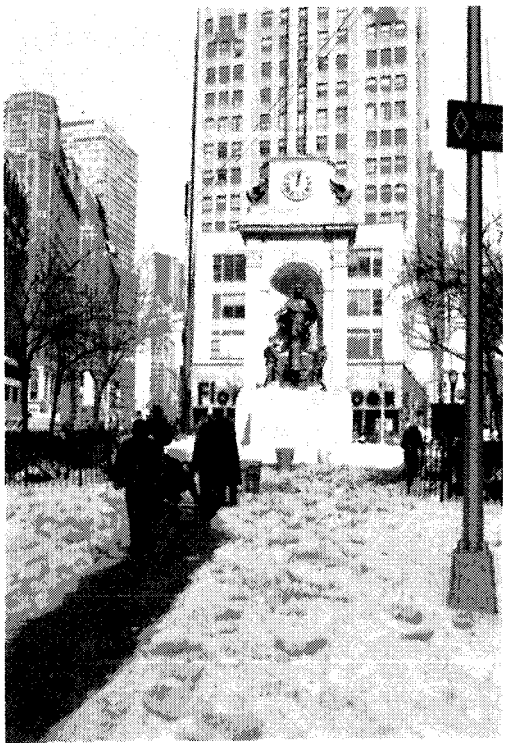
shows that a young man was talking with a homeless on a 42°F day for about ten minutes. When he left, he even shook hands with him (Fig. 3, d).

Photo 2

shows that there was something wrong with this young girl's camera and an aged photographer was helping her. Finally, the camera got fixed, the girl thanked him again and again (32°F) (Fig. 3, e)

Photo 3

shows that a woman fell down on the slippery ground and the strangers behind her were helping her to her feet (30°F) (Fig. 3, f).



Herald Square Park is a very compact urban space with the monument at the north as its visual focus. The main sitting area is just about 35 by 80 feet, and the two rows of wood chairs are arranged face-to-face (see Fig. 3). Based on Hall's (1966) theory of "distance in man", Ashihara translates the application of architectural height-distance relationship into human interaction. He says "in the design of exterior space a modular unit of 70 to 80 feet is useful and appropriate; this I call 70-foot modular unit method" (Ashihara, 1970, 47).

Within this distance, people can identify each other's face, learn about other people's talking and laughing under the typical urban background noise level (60-70dBA), namely, people can keep close sensory involvement among themselves. Measured by this standard, it is obvious that the main sitting area of Herald Square has an intimate exterior space scale.

Social activities are all activities that depend on the presence of others in public spaces (Gehl, 1987). This includes both active and passive contacts. A compact urban space can provide people with more chances to engage in face-to-face interaction. Even the passive contacts by sensing other people's existence within a compact space will get more intimate sensory involvement. This is particularly important in winter. Being close to other people, one can have a warm feeling that will make the cold climate less intolerable. Such a compact urban space can also function as a street performance arena which was also seldom found in other urban spaces studied (photo 4).

Photo 4 Street performance arena

Another phenomenon that deserves mention is that most of the social contacts happening in Herald Square were more or less related to picture taking, which indicates that there is some kind of visual delight existing in this space functioning as "triangulation" by which some external stimulus provides a linkage between people and encourages strangers to talk to each other (Whyte, 1980). So, the significance of visual diversity for the use of winter space lies in not only attracting people, but also indirectly supporting people in their social contacts within the space.

Implications and Recommendations

I. Urban context might be another significant variable apart from activity and visual diversity in influencing winter use density (Li, 1991). This indicates that

planning has a vital role in determining the popularity of a winter urban space. Since World War II, successful new spaces have often had commercial functions, and recreational shopping has become an increasingly important form of public life (Carr et al, 1992). Therefore, a mixed land use (even mixed building use) should be considered which combines commercial and retail, cultural and recreational, and residential functions together. This is particularly important in downtown areas in terms of providing potential user populations and encouraging round-the-clock public life. A comprehensive pedestrian network which includes city squares, urban plazas, downtown parks, neighborhood parks and pedestrian shopping streets, etc. should be blended into such a mixed land use area. Incentive zoning should no longer focus on encouraging developers to provide dispersed single plazas, most of which never work well. Instead, we should explore the possibility of using it to promote the formation of such a pedestrian network accessible mainly by mass transit, and even the introduction of public open spaces together with most of the public life within it, into the privately owned sealed domains.

II. Micro-climate design is not the only, even not the most important criterion affecting the *winter use* and *winter public life* of small urban spaces. Location and urban context (planning), programmed activity (management), visual attraction (physical ingredients), cultural dimension, and people's attitudes toward winter climate may be more important factors. Though my observations show that, if possible, people tend to stay where there was sunlight and no wind in urban spaces in winter, they also show that ideal micro-climate conditions alone could not attract people to stay in urban spaces in cold days (around freezing point or lower). For example, Police Plaza and Collect Pond Park have relatively ideal micro-climate conditions in winter, but their winter use density were much lower than that of Rockefeller Center Plaza and General Motor Plaza, whose micro-climate conditions are much worse. For vital winter public life in urban spaces, we must look to the arts (Gutheim, 1979): the visual delights and special winter decoration; the programmed activity at different levels, such as skating (on site), street festivals (neighborhood), and winter carnivals (city), etc. And we must encourage people to enjoy winter instead of simply enduring winter, or escaping from winter.

Since only when temperature reaches around 40°F, do ideal climate factors begin to influence users behavior and the public life of urban spaces positively and significantly, so micro-climate design should focus on the improvement of outdoor thermal comfort of urban spaces in sub-marginal periods. If this can be realized, then, it is highly possible that the outdoor season could be extended *up to more than six weeks.*

The standard for the control of building height and density to guarantee solar access to urban spaces should be based on the solar altitude of sub-marginal periods. Since downtown land prices are very high, such a relatively loose standard could be of economic significance for land use. However, in other areas such as residential zones, a strict control is recommended in order to guarantee year-round solar access.

III. A successful urban space is not only a usable space but also a lovable one. Not only is it congruent with users' behaviour, but also lets users have the right to get public control through participation and modification and by attaching meaning to the space (Francis, 1989). As a psychological construct, control is an important variable in reducing stress. Therefore, our winter urban space planning, design and management should support personal control mechanism to mediate stress caused by cold climate.

In residential environments, individuals can deal with the threat of cold directly by using behavioural control, such as the increase of heating or improvement of the insulation of the residence. However, in urban spaces, what can be done is very limited. The behavioural control phenomena described in the preceding sections can only mediate the stress caused by cold to a very limited extent. And what the urban space itself can provide to support behavioural control mechanism is very limited. Maybe, movable chairs can be considered as an example that allows users to select a sitting place by tracing sunlight.

How people interpret cold climate stress will determine their emotional and behavioural response to it: to challenge it and adapt to it actively; or simply endure it passively; or even escape from it temporarily. Therefore, cognitive control is a very important personal control mechanism. Holahan (1982) points out that predictability may even be considered as an example of cognitive control in that it provides a form of "information control" over a stressor. Glass & Singer's studies show that "people who had to adapt to an unpredictable stressor would need to expend more energy and would incur greater psychological costs than would people who adapted to a predictable stressor" (Glass & Singer, cited in Holahan, 1982, 176).

Based on such a principle, we could provide a semi-indoor and semi-outdoor buffer space between the indoor and outdoor public spaces. Such a buffer space could have some outdoor environmental features without heating. The electronic information board within this space will show the climate information all the time at both city and micro level. In this way, people will be prepared for the transition from indoor to outdoor spaces both physiologically and psychologically.

As to "decisional control", relatively speaking, more can be done to support this mechanism. At the city level, large scale winter sports and recreation centres can be provided to encourage people with an active attitude to enjoy the pleasure of winter activities. In addition, atria with simulated sub-tropical environments and corresponding activities inside can be provided within large scale hotels or conference centers for those who cannot enjoy outdoor winter beauty and winter sports. At meso and micro level, we can also provide people with choices between indoor and outdoor activities, active participation and passive watching of outdoor activities; different community-privacy hierarchies in outdoor spaces; and between necessary and optional activities, etc.. Choice means the recognition of different

physiological, psychological and social needs of different groups in coping with cold climate in urban spaces and public life.

It is easy to understand that both cognitive control and decisional control are closely related to people's attitudes. This is another important psychological factor influencing people's response to cold climate that begs further exploration.

Conclusion

This article tries to explore how climate conditions influence the use and public life of small urban spaces in the winter and marginal seasons from a behavioural perspective. What we must understand is that winter issues are not related to cold climate only. A successful winter urban space must be a successful one in other seasons first. Only when it meets the general prerequisites of a successful urban space (the congruence between physical characteristics and users' behaviour is only one aspect) and includes excellent micro-climate design, can such an urban space work well in winter. And we should also remember "thinking winter" within a "year round" habitability perspective (Pressman, 1989b). In North America, the development of public space is undergoing noticeable changes from two aspects. First, the diversification of public space types (the privatization and interiorization can be considered as one part of it) and the corresponding diversification of public life forms and their settings, have positive and negative influences on public life; second, with the redevelopment of the older traditional urban spaces, there is an observed increase in those using downtown urban space. Bryant Park in NYC is such an example. Carr et al. thus conclude that "Americans are in the midst of creating a new public space culture" (1992, 343). It is too early to comment on whether this is appropriate or not. However, in most winter cities, the changes in the first aspect and its corresponding consequences are intriguing winter environmental researchers and practitioners. How urban public life can survive and be promoted within an increasingly privatized and interiorized urban environment, is a challenge that shall have to be confronted in future design and policy.

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