

## Uses of Places and Setting Preferences in a French Antarctic Station

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*The various uses of space as well as the environmental preferences of wintering people were investigated during 1 year in a French Antarctic station using daily participant observation (for uses of places) and a repeated measure of the perception and evaluation of the settings. The uses of places varied according to occupational and age subgroups: The young scientists expressed a higher need for privacy and a strong investment in their working areas, whereas the technicians preferred the social leisure area (main hall). These places were used as different behavior settings and thus corresponded to flexible environments. Flexibility was a characteristic of all the preferred places. A change in the preferences among the settings and the uses of places was also observed: After midwinter, the preferences evolved from private places to working areas. At the end of the mission, a behavioral change reflecting a stronger need for privacy was also observed.*

**Keywords:** adaptation; isolated and confined environments (ICE); habitability; privacy; behavior settings

Everyday life usually takes place in various partial institutions: home, working areas, leisure places, and so on. This division of space corresponds to a separation and a specialization of the places according to the activities that take place in each behavior setting (Barker, 1968) along with a temporal pattern. This stresses in particular an essential difference between public and private territories, which is linked to individual balance, because people need to manage their own private space (Prost, 1987). Moreover, the differentiation of places is related to different social norms attached to them. This repartition of activities is almost nonexistent in isolated and confined environments (ICEs), which are more characteristic of a "total institution" (Goffman, 1961), where all the functions are linked to one unique institutional space, more or less confined. Thus, these total institutional spaces constitute places where a small group lives and works, cutoff from the outside world, for a relatively long period. This cloistered life is explicitly and systematically regulated by an external authority. Total institutions are both a residential community and a regulated organization (Goffman, 1961). Therefore, they constitute settings where people have to spend all their time, including their working, leisure, and private activities. To live in such an environment during a relatively long period means that all the usual activities are carried out in a limited space with no clear spatial borders. We already know how useful both the separation of various spaces according to their functions and the use of spatial borders are to regulate the level of social interactions or privacy (Carrère & Evans, 1994). Moreover, in normal environments, social interactions are linked to numerous relational networks, and these networks reflect the various social roles in which people are involved according to their activities. People thus divide up their everyday life among these groups, inside of which they play different social roles. The groups offer at the same time a large variety of social relationships and the possibility of coming into them or withdrawing from them according to the individual's mood and objectives. Typically, the individual arriving in the ICE is removed from his or her accustomed social circles and put into a strange situation with a group, usually a fairly small group, of relative or absolute strangers. Behavior settings in the ICE are much less differentiated than back home, with the same people serving as occupational colleagues and off-duty companions. As a

result, role expectations may become confused and both the guidelines for one's own behavior and one's ability to predict the behavior of others are eroded. (Suedfeld, 1998, p. 99)

Consequently, we often observe a deterioration of interpersonal relationships. In general, the study of confined groups highlights an increase in withdrawal, territorial behaviors, and intragroup conflicts, which seem to be related to crowding and the absence of privacy (Harrison & Connors, 1984). Most of these conflicts result from the exaggeration of trivial issues (Stuster, 1996). Moreover, interpersonal conflicts, anger, and irritability seem to be linked to several reasons, such as different organizational status, goals, values, or cultural backgrounds (Gunderson & Nelson, 1963; Peri, Barbarito, Barattoni, & Abraham, 2000). It can also happen that wintering people within their own mission identify subgroups on the basis of recreational preferences or areas of the station where each subgroup spends most of its leisure time (Johnson, Boster, & Palinkas, 2003). Privacy regulation thus plays a particular role because people have to manage places at the same time according to different activities that take place and especially according to the presence of others. Indeed, the social situation constitutes a double constraint: On one hand, people undergo social isolation from their usual environment, and on the other hand, they are subjected to the continuous presence of others. Personal space, then, is a refuge from the cumulative stress of the mission and near-constant interpersonal exchange (Stuster, 1996). Thus, privacy is usually described as a crucial issue for the habitability of the ICEs: The most frequently asked question regarding the habitability of ICEs concerns spatial requirements.

We can find various definitions of privacy. Some of them emphasize the opportunity of withdrawal and the avoidance of interactions (Bates, 1964); others bring into evidence the freedom in controlling these interactions (Westin, 1970). Obviously, in ICEs where the confinement is extreme, such as on submarines or manned spaceflights, privacy is a critical issue. For instance, the lack of sufficient personal territory for submariners is a primary source of stress (Serxner, 1968). If we consider that privacy means withdrawal from social solicitations and the need to remove oneself occasionally from the company of others, it should not really be a problem in Antarctic stations, because wintering people have at least a private bedroom, which makes it possible to be isolated from the company of station mates. However, privacy is not necessarily linked to personal space. Even if a personal space (i.e., a bedroom) is available, privacy can be a problem. Indeed, privacy regulation does not mean only to be alone or to withdraw; it is a private access to the self or to a group (Altman, 1975). Privacy issues can thus be linked to different kinds of territories: private as well as public ones. Territoriality expresses itself by the appropriation and the control of access to these places (Edney, 1975). In a polar station, subgroups can appropriate some parts of the environment by choosing activities linked to these places and shared by the members of the subgroup. Then, people in ICEs express a need for privacy that most of the time corresponds to the regulation and the maintenance of an optimal level of social interaction (Altman, 1975). The constant interpersonal contact in an ICE is highly stimulating, and people need to get away from constant close contact with others. "It is a normal and healthy coping mechanism that helps individuals to adjust to the many stressors of isolated and confined living" (Stuster, 1996, p. 272). This desire to withdraw from the rest of the crew not only is a need for solitude or the wish to rest in one's bedroom but can be expressed by the possibility to meet a chosen subgroup in a recreational area or to perform some solitary activities, including contemplation of the landscape or work. However, even though we know that this question of privacy is a critical factor for life in ICEs, very few studies have analyzed it in a systematic way. Carrère and Evans (1994) showed that design qualities important in an Antarctic setting are the need for privacy,

flexible behavioral settings, and distinct work, recreational, and berthing areas. The need for distinct areas is also considered a privacy issue because it allows people to get away from one another. Thus, some Antarctic personnel find sufficient private time in their shared quarters; for others, a laboratory work area provides the solitude they need (Stuster, 1996). Even though in some research privacy is not mentioned as an important factor (Stuster, Bachelard, & Suedfeld, 2000), group interaction seems in fact to be a critical variable in these studies. Both conditions, social and spatial, are inextricably interdependent in the individual-environment relationship. This has something to do with the reason that interpersonal problems between members of isolated and confined groups seem to be inevitable.

As Carrère and Evans (1994) noted, "very little is currently known about how occupants of ICEs use these habitats or how they feel about them" (p.738). The present research aims to analyze the various uses of space as well as the environmental preferences of wintering people during their stay in an Antarctic station. The purpose is also to stress the changes in these behaviors and perceptions of the environmental and social situation. We hypothesized that the behaviors and perceptions of the environment change throughout the winter-over. If the "third-quarter phenomenon," described as a period of significant emotional changes (Bechtel & Berning, 1991), has not been found systematically in all polar missions (Palinkas, 2000), the end of the winter-over seems to correspond to deep changes in the individual-environment relationship (Weiss, 2005). Some researchers have pointed out the link between the end of the mission and essentially thymic reactions but not social reactions (Décamps & Rosnet, 2005). However, in accordance with what has been observed in the analysis of the formation and transformation of social networks (Weiss & Gaud, 2004), we hypothesized that the end of the mission should correspond with a change in behaviors linked to the occupation of behavioral settings, thus revealing a more significant need for privacy and reorganization of the individual-environment relationship (Wapner & Craig-Bray, 1992). Indeed, the approach of the end of the mission seems to be associated with a falling off of courtesy in small, isolated crews: With the end of the cohabitation, people allow themselves to express opinions and feelings that can be sources of tension (Sandal, 2001). More precisely, the goals of this research, carried out in the Dumont d'Urville polar station, are to determine the following:

- the use that wintering people make of the different settings in the station (what places are most often attended; what are the main social areas; what places are diverted from their original functions, etc.)
- the individual strategies used to preserve a satisfactory level of privacy (through, for instance, different kinds of space appropriation)

## **Method**

### **Setting**

Data were collected at the French polar station of Dumont d'Urville in Antarctica. Each year, this permanent scientific station accommodates between 25 and 35 winter-over people, split between general services, scientific departments, and ensuring data collection for the French laboratories working on polar programs. The total area covered by buildings is 5000 m<sup>2</sup>. During the winter, each person has a private room (about 9 m<sup>2</sup>). All the bedrooms are located in the same building, which also accommodates the bathrooms, the hospital, and the leader's office. Bedrooms are the only

private space. The other place for relaxation is the main hall, which contains the kitchen, the dining room, the bar, the living room (with a library, games, and sofas), and another room with a video library. The dining room functions as different behavior settings according to the time schedule: After dinner, it becomes a recreation room or a cinema. Working areas are distributed in buildings around the main hall. The scientific activities take place in laboratories, where the scientists work in small groups. However, most of the scientists have the possibility to manage, in their working area, a personal space. Some of them even have an office considered as a private space. However, most of the technicians do not have this opportunity of having a quiet working area. Indeed, even those who have their own place (garage, workshops) have to carry on their duties in the various buildings of the station or outside.

### **Data Collection**

A systematic observation was made by the medical officer of the mission during a winter-over at Dumont d'Urville Station.<sup>1</sup> This observation allowed for the collection of data about the frequency of use of the different places of the station. These specific and repeated statements took place in the common recreational place of the station. They mention where each crew member is and, as far as possible, indications relating to their activities along with their social or withdrawal behaviors in particular. Every day, two observations were made, at 8:30 p.m. and 10:30 p.m. The dinners generally finished around 7:45 p.m., and the food service ended around 8:15 p.m. At this time, people decided what kind of activity they were going to do during the evening. Between 10:30 and 10:45 p.m., the situation could change and a second activity could start. The observation began the day before the last ship left the station and finished 9 months later, the day before the arrival of the new wintering crew. One month before, the boat had brought men from the summer staff, who did not stay in the station. Some of them were going to the Concordia station (inside the Antarctic continent), and the others were going to the Prudhomme station, a smaller facility that functions only during the summer and is a few kilometers away from Dumont d'Urville. A second set of data was collected in parallel, also during the whole winter-over period: Every 2 months, questionnaires were filled out by the participants, that is to say, six times between January and December. The first and the last data collection period corresponded to summer periods, when the staff was more numerous at the station because of transitions between old and new teams and because of the presence of specialized workers for the summer. The questionnaire related to the appreciation and the use of the places by wintering people: They were asked to specify the places where they spent most of their time, those that they preferred, those where they preferred being alone, and finally, places where they preferred being in the company of others.

For each question, a maximum of five places could be mentioned. In the present study, we analyzed only the first-mentioned place for each question. Four kinds of places appeared in the answers:

- the main hall (dining room, bar, living room)
- the working areas (scientific laboratories and technical workrooms)
- the bedrooms (the dormitory building as well as the individual bedrooms)
- outside (areas where people go walking or contemplating the landscape or the animals)

The respondent then indicated the reasons he chose those places. A content analysis of the answers allowed for the categorization of these reasons according to qualities and activities associated with each place. We grouped them into seven main categories:

- rest (relaxation, rest, comfort)
- work (own work as well as work of other people in the station)
- sociability (social games, discussions, informal meetings, etc.)
- leisure (only solitary leisure, such as reading, sport, etc.)
- contemplation (landscape, meditation)
- diverse (more than one activity was mentioned; most of the time, a solitary activity was associated with a social one)
- privacy (for the places where people like to be alone)

### **Participants**

The wintering team was made up of 27 men (from 21 to 59 years old;  $M = 31.8$ ), including the medical officer who collected the data. Because this position of participant-observer could constitute a bias, we removed him from the analysis. We identified two subgroups according to age and to occupational activity:

- Within the first subgroup, there were 14 participants (54% of the whole crew). They constituted the older subgroup ( $M = 37.8$ , range = 30 to 59). All the subjects in this group were from the technical staff, with 11 persons from the technical support team (average age = 35.4 years) and 3 men from the meteorology survey team (average age = 51.7 years). Forty percent of this group had already wintered once.

- The second subgroup was made up of 12 scientists (46% of the total group), who were performing their military duty as volunteers for scientific research. All of them were younger than the first subgroup participants ( $M = 24.3$ , range = 20 to 27) and were staying in Antarctica for the first time. Thus, age and occupational status were two confounded factors. We know that these factors are often linked to the emergence of subgroups in the French winter-over stations and also sometimes to intergroup tensions or conflicts (Weiss & Gaud, 2004). Indeed, these subgroups usually have different interests, leisure activities, and goals and develop different ways of experiencing their winter-over. We have therefore used these factors as independent variables for the analyses. We did not analyze other variables such as previous Antarctic experience or marital status of the subjects, even though these variables could have been relevant. For instance, only some of the older participants had a previous Antarctic experience, and we know that novices and old hands have different relationships with the Antarctic environment (Steel, 2000). The subgroup of technicians was too small to split it again between novices and old hands.

All the crewmates were included in the observation sessions, but some of them did not want to answer the questionnaires. For this set of data, the number of respondents varied between 19 (70%) and 21 (78%), depending on the month.

**Table 1**  
**Mean Percentages for Place Occupation in the Evenings**  
**During the Winter-Over (From the Observation)**

Group	Main Hall	Bedroom	Working Area	Outside
Scientists	40.28	30.32	28.45	0.96
Technicians	35.81	33.65	30.08	0.45
Total	37.79	32.17	29.36	0.68

## Results

### Places Occupation

Broadly during the whole mission, at 8:30 and 10:30 p.m., the main hall was the place where most of the winter-over participants stayed (37.79%). The other winterers remained either in their bedroom (32%) or in the working areas (29%). Fewer than 1% went out for a walk (Table 1). The occupation of the settings in the station was different according to the two occupational and age groups: The young scientists stayed in the main hall more often than did the technicians ( $\chi^2 = 31.62, p < .001$ ). They also went outside more often ( $\chi^2 = 14.06, p = .0002$ ). The technicians remained more in their bedrooms or in the work places ( $\chi^2 = 38.89, p < .001$ ). Among the participants who were not in the main hall, we gathered data on those who were elsewhere for professional reasons and those who left for personal reasons. Indeed, some of them were constrained by professional obligations, and we were more interested by personal choices, that is, with people who were elsewhere (even in the working areas) for nonprofessional reasons. The main hall is the privileged place for informal meetings of the whole group. So when winterers are away from this place for personal reasons, they have chosen to remove themselves from the company of the crew, wherever they selected place: bedroom, outside, or working place. In all these places, they could be alone or meet with subgroups, but it was impossible for us to check this last point. People from the two subgroups were outside the main hall most often for personal versus professional reasons. Yet the technicians left this place more often than the scientists both for personal reasons (54.01% vs. 51.54% for the scientists group) and for professional motives (10.18% vs. 8.18% for the scientists group). The difference between the two subgroups was significant ( $\chi^2 = 39.97, p < .001$ ). Among the crewmates who were outside the main hall for personal reasons, 60.81% were in their bedroom, 37.92% were in a work place, and 1.28% were outside for a walk. Concerning this last distribution of activities, there was no difference between the two groups.

### Setting Preferences

In addition to the observations that were made daily at a specific time, there were questionnaires relating to attended places and preferences linked to them in a global sense. The participants answered with reference to their activities during the whole day. This difference did not allow for a comparison of the two sets of data but made complementary information available.

For all the winterers, the most often used place was the work place (85.94% for the scientists, 81.48% for the technicians; *ns*). For the scientists, this place was also where they preferred to be ( $\chi^2 = 7.038$ ,  $p = .008$ ). In contrast, the technicians answered that they preferred the main hall; the difference between the two groups is also significant,  $\chi^2 = 13.69$ ,  $p = .0002$ . There was a tendency for the younger group (the scientists) to appreciate the outside more than there was for the technicians,  $\chi^2 = 3.18$ ,  $p = .07$  (*ns*). Last, the appreciation of the bedrooms was almost the same in the two groups, and the difference was not very large (Table 2).

With reference to the activities associated with each of these places, contemplation and meditation were the most preferred activities for the scientists group, that is, the most frequently mentioned reasons in association with the favorite place (Table 3). Outside was related mainly to these activities (93.3% of the answers that were associated to the outside as the favorite place mentioned contemplation or meditation); also, the bedrooms were mainly connected with this kind of solitary behavior (83.3%). Within the technicians group, we did not find the same kind of predilection: The answers categorized as diverse (i.e., social as well as solitary activities) were most often related to the chosen place (33.3%).

The working areas, which were the favorite places for the scientists, were not associated with a particular activity or quality. On the contrary, they seemed to be varied insofar as almost all the activities (except contemplation and meditation) were associated with them in an equivalent way. This result seems to correspond to the concept of flexibility evoked by Carrère and Evans (1994).

**Table 2**  
**Mean Percentages for Favorite Place (Mentioned as the First Preferred Place) During the Mission**

Group	Main Hall	Bedroom	Working Area	Outside
Scientists	11.11	11.11	53.97	23.81
Technicians	40.74	18.52	29.63	11.11
Total	24.79	14.53	42.74	17.95

**Table 3**  
**Mean Percentages for Activities or Qualities Related to Favorite Place During the Mission for the Scientists**

Place	Sociability	Rest	Diverse	Contemplation	Work	Leisure
Main hall	33.33	0.00	50.00	0.00	0.00	16.67
Bedroom	0.00	16.67	0.00	83.33	0.00	0.00
Working area	17.86	14.29	25.00	0.00	28.57	14.29
Outside	0.00	0.00	0.00	93.33	0.00	6.67
Total	12.73	9.09	18.18	34.55	14.55	10.91

**Table 4**  
**Mean Percentages for Activities or Qualities Related to**  
**Favorite Place During the Mission for the Technicians**

Place	Sociability	Rest	Diverse	Contemplation	Work	Leisure
Main hall	36.36	4.55	54.55	0.00	0.00	4.55
Bedroom	0.00	60.00	10.00	20.00	0.00	10.00
Working area	6.25	6.25	31.25	6.25	37.50	12.50
Outside	0.00	0.00	0.00	100.00	0.00	0.00
Total	16.67	14.81	33.33	16.67	11.11	7.41

As for the scientists, the outside was always considered by the technicians who had chosen it as a favorite place, to be a good place for contemplation and meditation. But for this group, the bedrooms were more related to rest (60%) than to meditation (20%). Working areas were above all viewed by this group as places where professional activities have to be performed (37.5%), but they could also be associated with other, more personal activities (diverse; 31.25%). They thus constituted settings that for this group again could be associated with nonprofessional activities, although to a lesser extent than for young people (Table 4).

**Table 5**  
**Mean Percentages for First Place Winterers**  
**Preferred to Be Alone During the Mission**

Group	Bedroom	Outside	Working Area
Scientists	47.54	29.51	22.95
Technicians	67.31	15.38	17.31
Total	56.64	23.01	20.35

**Table 6**  
**Activities Associated With the Place Scientists Preferred to Be Alone**

Place	Leisure	Rest	Contemplation	Privacy	Work	Diverse
Bedroom	8.00	32.00	12.00	44.00	0.00	4.00
Outside	0.00	38.89	55.56	5.56	0.00	0.00
Working area	10.00	10.00	0.00	40.00	20.00	20.00
Total	5.66	30.19	24.53	30.19	3.77	5.66

The place where the winterers preferred mainly to be alone was their own bedroom. It corresponded to a preferential private space, and this predilection was more accentuated for the technicians ( $\chi^2 = 4.466$ ,  $p = .03$ ). For the scientists group, outside was also a place where they liked to be alone. Yet the difference with the other group corresponded to a tendency that was not significant ( $\chi^2 = 3.16$ ,  $p = .07$ ). Last, the working areas were also mentioned as one of the places where both groups liked to be alone (Table 5). In response to the question Why did you choose this place? a new category of

answers appeared: the need for privacy. Thus, wherever the chosen setting, privacy and rest were the main reasons used to describe the place where the young scientists preferred to withdraw from the group (30.19% of the answers for each of the two reasons). Privacy was associated with both the bedroom and with the workplace (44% and 40%, respectively, for the associations). Relaxation and rest were slightly more often associated with the outside (38.89%) than with the bedroom (32% of the answers; see Table 6). Privacy seemed to be less important for the technicians than for the scientists (9.62% vs. 30.19%;  $\chi^2 = 6.94, p = .008$ ). Moreover, privacy was related only to the bedroom. Rest corresponded to the activity most often associated with the withdrawal places. It was a little more frequently cited than in the younger group (40.38% of the total answers, *ns*) and also related to the bedroom (Table 7).

**Table 7**  
**Activities Associated With the Place**  
**Technicians Preferred to Be Alone**

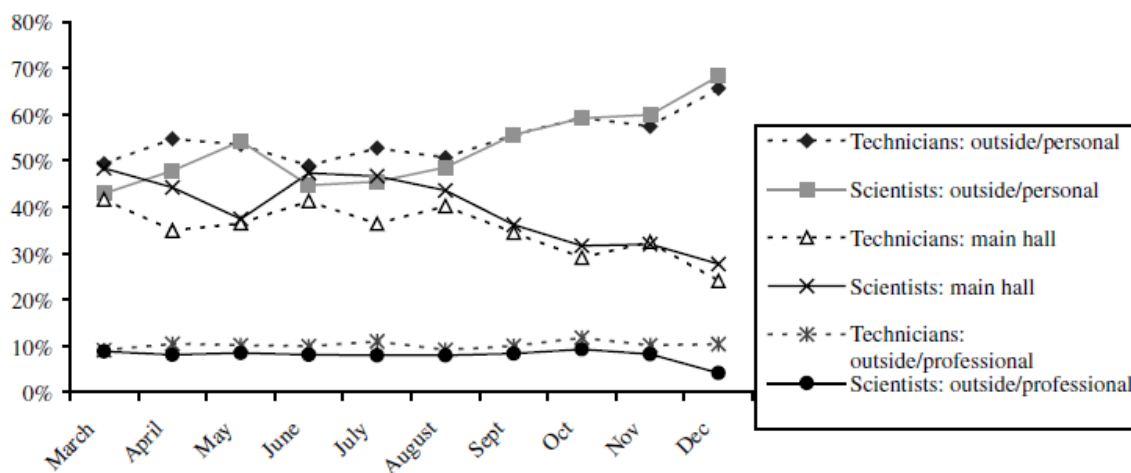
Place	Leisure	Rest	Contemplation	Privacy	Work	Diverse
Bedroom	14.29	54.29	2.86	14.29	0.00	14.29
Outside	0.00	12.50	87.50	0.00	0.00	0.00
Working area	0.00	11.11	11.11	0.00	33.33	44.44
Total	9.62	40.38	17.31	9.62	5.77	17.31

The last question was about the settings where the participants preferred to be accompanied. For this last point, there was no difference between the two occupational and age groups: All the winterers chose the main hall (65.52% of the answers), followed by the working area (29.03% of the answers for the scientists, 25.93% for the technicians). Both the bedroom and outside accounted for approximately 3% of the choices. There was also no difference between the two groups for the related activities or qualities: Most of the crewmates linked social activities with these places (63.89% for the scientists; 52.94% for the technicians) or associated social and other kinds of activities (diverse; 25% for the scientists, 38.24% for the technicians).

### Changes in Occupied Places and Setting Preferences

One of our hypotheses was about the changes in behaviors and perceptions related to the environment. In accordance with what has been highlighted in a great deal of research, we observed that the end of the winter-over was characterized by a specific configuration: After a period during which the behaviors related to the uses of places had been relatively stable, the main hall seemed to be forsaken, and other places were more used, primarily for personal purposes. There was no difference between the two studied subgroups (Figure 1). However, places associated with personal activities remained the same: They were, throughout the winter-over, in the same proportions: the bedroom, then the workplace, and then the outside. Only this last category slightly increased during the last 2 months, which corresponded to the increased possibilities to go for a walk close to the station outside, even in the evening, thanks to the longer daylight and the mild climate during this period of the year.

**Figure 1**  
**Changes in the Use of Different Places During the Winter-Over for the Two Occupational Subgroups**

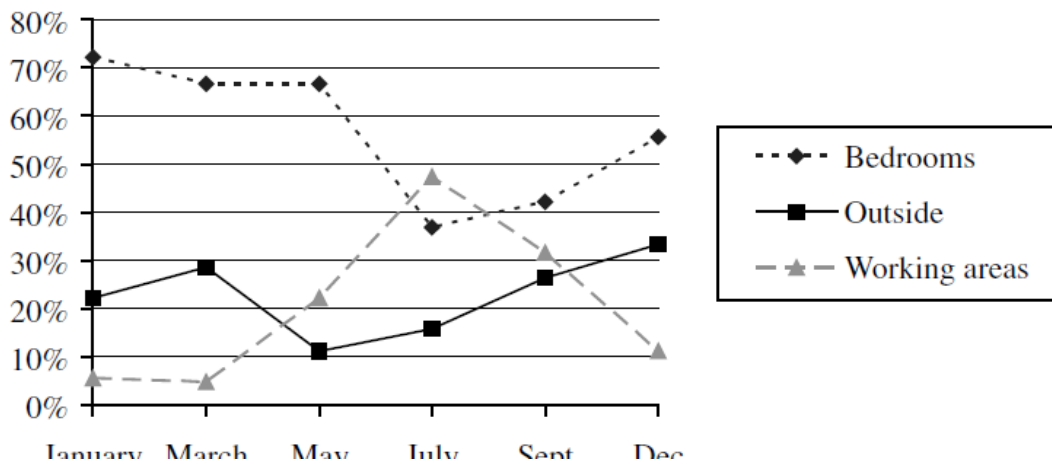


With regard to the preferences associated with the places, it was very difficult to observe the possible changes with only one measurement every 2 months. The number of participants was too small to draw any conclusions about an evolution. Moreover, comparing the two occupational subgroups was problematic because of individual variations. The only tendency that seemed to appear was about the place where winterers preferred to be alone: The bedroom was highly chosen at the beginning of the mission (72.22% of the choices in January and 66.67% in March and May); around midwinter, in July, it was less chosen (36.84%), and the working area was then preferred as a private place (45.37%). At the end of the year, the bedroom became again the privileged personal space (55.56%). At this time, we could also observe a preference for outside, which may again be linked with the good weather, the daylight, and the presence of emperor penguins near the station (Figure 2).

### Discussion

As in a previous study on the formation and transformation of relational networks (Weiss & Gaud, 2004), data resulting from the observations and from the questionnaires were not directly comparable: The frequencies of the collections were not the same. However, they allowed for the gathering of two coherent and complementary sets of data, which made it possible to understand why and how uses of space and especially privacy management played a significant role for people who were living in an ICE. These sets also allowed us to study the relation between social and spatial behaviors and needs. Indeed, the frequency of the observations made it possible to stress the changes in the behaviors, whereas the questionnaires supported knowledge about how winterers globally perceived their living environment. The two sets of indicators highlighted different uses of the places according to the two occupational subgroups, which also corresponded to age subgroups.

**Figure 2**  
**Changes in the Choice of Place Where**  
**Winterers Preferred to Be Alone**



These two groups seemed to have different expectations and needs in terms of interpersonal relationships, privacy, and space occupation. We already knew that the tensions or conflicts that usually occur in polar stations generally correspond to intergroup tensions, reflecting a social categorization related to professional statuses, in particular, because of different values, goals, and activities shared by the subgroups (Stuster et al., 2000; Weiss & Gaud, 2004). But “the formation of subgroups is a natural phenomenon and can contribute to individual adjustment, if not permitted to develop to the extreme” (Stuster et al., 2000, p. A25). Thus, the observation revealed that during the evening, after the meal, the young scientists had more of an investment in the main hall than did the technicians. This place indeed seemed to be associated with a recreational time, when social activities were privileged. On the contrary, at evening time, the older participants used this place, their private room, or their working place in an equivalent way. But paradoxically, they generally chose the main hall as their favorite place in the station. This apparent contradiction seemed to be related to the difference in temporal scales used within the questionnaires (every 2 months) and the observations (twice a day): The related occupations were not the same all day long, and maybe this subgroup would have preferred the main hall and its recreational activities at another period of the day. As we have said before, this place corresponds to several behavior settings in accordance with temporal boundaries, for instance, a movie theater once a week, a bar before and after meals, a recreational area at night, and a dance hall on Saturday nights.

The analysis of the preferences of the scientists group shows a very strong investment in the working areas. These places indeed constituted for them at the same time a private space and a friendly place for recreational activities. They therefore corresponded to flexible environments because they allowed diversified activities. This flexibility was indeed a common characteristic of the participants' favorite places in a general way and not only of the workplace. This corresponds to an important result already highlighted by Carrère and Evans (1994). In the present research, flexibility is linked not to the possibility of rearranging the places but to performing different kinds of activities in the same place and, moreover, to the possibility of using these places alone as well as within small subgroups. So habitability studies may consider places not only as physical spaces but as behavior settings, that is, spatial and social situations temporally bounded in which behaviors are essential for the system's

definition (Barker, 1968). For instance, the working area was, for the scientists, very much related to privacy: The working place was associated not only with professional activities but also with social behaviors and with privacy. Depending on the temporal boundaries, it played the role of three different behavior settings, and in this way, it was a highly flexible place.

In all the cases, privacy was linked to withdrawal: This category of answers appeared only in association with the places where the winterers preferred to be alone. Privacy was much more important to scientists, for whom it constituted, in addition to rest, the first connection made with solitary places (30% of the elicitations). For the technicians, privacy accounted for only 9% of the answers to this question. In addition, in the scientists' group, privacy was associated equally with the bedroom and with the working place, whereas it was exclusively related to the bedroom in the technicians' group. These results brought to light a considerable difference related to expectations in terms of social contacts in the two groups: The younger group seemed to need times and places privileging the social life (as shown with their uses of the main hall) as well as times and various places allowing them to reach a satisfying level of privacy. For the older group, privacy was not mentioned very frequently, and it was associated only with their real personal space, the bedroom. The desired level of interactions was not the same for both groups, and we know that well-being is associated with a balance between desired and achieved levels of social interaction (Evans, Rhee, Forbes, Mata-Allen, & Lepore, 2000). Thus, results from other research sharing the social categorization in ICEs (Weiss & Gaud, 2004) could be to a certain extent explained by these different needs in terms of privacy and social contacts. Indeed, space management in these conditions of isolation and confinement corresponds to a management of both privacy and social relationships. In the present study, it was linked to two different styles of place occupation related to the occupational and age subgroups, which had different expectations about these places. That is why each place seemed to correspond to various behavior settings that differentiated these subgroups.

In addition, there was a change in the preferences and uses of the places: A seasonal variation was observed only for the places where people liked to be alone. Uses of places and expressed preferences demonstrated the difficulties linked to privacy. It seemed difficult to appropriate and to protect one's personal space. Around midwinter, the favorite private place, which was previously the bedroom, became the working place and later became the bedroom once again at the end of the mission. This change is also characteristic of the need for privacy, which is usually not satisfied in an ICE. Indeed, on one hand, in the Dumont d'Urville station, the bedrooms are not soundproof and are small (about 9 m<sup>2</sup>). They were usually not mentioned as pleasant places. On the other hand, work places do not constitute a real private space, because other people can enter them, whereas in their bedrooms, the winterers can withdraw more easily. In the Carrère and Evans (1994) study, people indicated that they used their rooms as places to be alone because others should not disturb them there. Thus, the winterers' choices about their favorite private places seemed to evolve according to their need for withdrawal, more significant at the end of the mission (see, for instance, Kraft et al., 2002; Weiss & Moser, 2000). Moreover, the observations showed that during the mission, the main hall, which was the only place really used by the entire group, was also forsaken for places with more withdrawal possibilities. As in previous studies, a behavioral change thus was observed at the end of the mission, reflecting a stronger need for privacy. As we have hypothesized before (Weiss & Gaud, 2004), this change could correspond to a process of readaptation at this time because at the end of the mission, people had to prepare for their reentry into their normal lives and face problems that they had kept away from during their stay in Antarctica. The management of small, isolated groups

should take this result into account because it seems essential to envisage more withdrawal possibilities at the end of missions because of the environment as well as the activities in which the station mates have to be involved.

### Note

1. The specific year of the study is not given to preserve the confidential nature of the data.

### References

Altman, I. (1975). *The environment and social behavior*. Monterey, CA: Brooks/Cole.

Barker, R. G. (1968). *Ecological psychology: Concepts and methods for studying the environment of human behavior*. Stanford, CA: Stanford University Press.

Bates, A. (1964). Privacy: A useful concept? *Social Forces*, 42, 432.

Bechtel, R. B., & Berning, A. (1991). The third-quarter phenomenon: Do people experience discomfort after stress has passed? In C.-P. Kay (Ed.), *From Antarctica to outer space: Life in isolation and confinement* (pp. 261-265). New York: Springer-Verlag.

Carrère, S., & Evans, G. W. (1994). Life in an isolated and confined environment: A qualitative study of the role of the designed environment. *Environment and Behavior*, 26(6), 707-741.

Décamps, G., & Rosnet, E. (2005). A longitudinal assessment of psychological adaptation during a winter-over in Antarctica. *Environment and Behavior*, 37(3), 418-435.

Edney, J. J. (1975). Territoriality and control: A field experiment. *Journal of Personality and Social Psychology*, 31, 1108-1115.

Evans, G. W., Rhee, E., Forbes, C., Mata-Allen, K., & Lepore, S. J. (2000). The meaning and efficacy of social withdrawal as a strategy for coping with chronic residential crowding. *Journal of Environmental Psychology*, 20, 335-342.

Goffman, I. (1961). *Asylums*. New York: Doubleday.

Gunderson, E. K. E., & Nelson, P. D. (1963). Adaptation of small groups to extreme environments. *Aerospace Medicine*, 34, 1111-1115.

Harrison, A. A., & Connors, M. M. (1984). Groups in exotic environments. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 18, pp. 49-87). New York: Academic Press.

Johnson, J. C., Boster, J. S., & Palinkas, L. A. (2003). The evolution of networks in extreme and isolated environments. *Journal of Mathematical Sociology*, 27, 1-34.

Kraft, N. O., Inoue, N., Mizuno, K., Ohshima, H., Murai, T., & Sekiguchi, C. (2002). Psychological changes and group dynamics during confinement in an isolated environment. *Aviation, Space, and Environmental Medicine*, 73(2), 85-90.

Palinkas, L. A. (2000). Stages of change in mood and behavior during a winter in Antarctica. *Environment and Behavior*, 32, 128-141.

Peri, A., Barbarito, M., Barattoni, M., & Abraham, A. (2000). The dynamics and the interpersonal and intrapersonal relations within an isolated group in extreme environments. *Environment and Behavior*, 31(3), 251-274.

Prost, A. (1987). Frontières et espaces du privé [Boundaries and spaces of private life]. In G. Duby (Ed.), *Histoire de la vie privée* (pp. 13-154). Paris: Seuil.

Sandal, G. M. (2001). Crew tension during a space station simulation. *Environment and Behavior*, 33(1), 134-150.

Serxner, J. L. (1968). An experience in submarine psychiatry. *American Journal of Psychiatry*, 125(1), 25-30.

Steel, G. D. (2000). Polar bonds: Environmental relationships in the polar regions. *Environment and Behavior*, 32(6), 796-816.

Stuster, J. (1996). *Bold endeavors: Lessons from polar and space exploration*. Annapolis, MD: Naval Institute Press.

Stuster, J., Bachelard, C., & Suedfeld, P. (2000). The relative importance of behavioral issues during long-duration ICE missions. *Aviation, Space, and Environmental Medicine*, 71(9), A17-A25.

Suedfeld, P. (1998). What can abnormal environments tell us about normal people? Polar stations as natural psychology laboratory. *Journal of Environmental Psychology*, 18, 95-102.

Wapner, S., & Craig-Bray, L. (1992). Person-in-environment transitions: Theoretical and methodological approaches. *Environment and Behavior*, 11, 3-32.

Weiss, K. (2005). Adaptation et transitions en milieux inhabituels: Le cas des hivernages dans les bases polaires françaises [Adaptation and transitions in unusual environments: The case of winter-overs in French polar stations]. In E. Ratiu (Ed.), *Transitions et rapports à l'espace* (pp. 47-74). Paris: L'Harmattan.

Weiss, K., & Gaud, R. (2004). Formation and transformation of relational networks during an Antarctic winter-over. *Journal of Applied Social Psychology*, 34(8), 1563-1586.

Weiss, K., & Moser, G. (2000). Aspects relationnels de l'adaptation en milieu confiné: Replisur soi, contagion comportementale et comparaisons sociales [Relational aspects of adaptation in isolation and confinement: Withdrawal, behavioral contagion, and social comparisons]. In J. M. Monteil (Ed.), *Perspectives cognitives et conduites sociales* (Vol. 7, pp. 63-93). Rennes: PUR.

Westin, A. (1970). *Privacy and freedom*. New York: Atheneum.