

# CULTURE AND ENVIRONMENT:

## Interaction in the Classroom

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Can culture influence Man's interaction with his physical environment? This was one of the issues I wanted to investigate with my study of elementary-school environments. I was interested in the total effects of built surroundings and wondered whether French-speaking and English-speaking Canadians could have differing reactions towards their school buildings.

In his recent book, Edward T. Hall insisted that culture does make a difference, sometimes a decisive one, and mentioned how the French are accustomed to pack themselves together more closely (in their cars, for example) than the Americans. He concluded that "people cannot act or interact at all in any meaningful way except through the medium of culture."<sup>1</sup> Similarly the architect, Henry B. Van Loon, remarked that "culture and environment are so directly linked together that the quality of environment has as direct an effect on the quality of a culture as a culture, through its values, has on the values of space and resources of a civilization."<sup>2</sup>

### *Methodology*

My study included thirty-two elementary schools built between 1950-1968 in the region of Greater Montreal. Half of these belonged to the French-speaking community (composed primarily of French-Canadians), and the other half to the English-speaking community (mostly Canadians of English, Scottish and Irish origins). The buildings were spread over lower, lower-middle, middle and upper income level districts, and urban, semi-urban and suburban localities. I interviewed first the architects then the principals of the schools and spent half a day in each school, visiting the premises and attending a regular class of the highest grade for approximately half an hour.

I distributed questionnaires to which 800 students (a sample classroom in each school) and 400 teachers replied. The responses were

analysed according to various factors. The language difference was one of these factors. The results clearly indicated that English and French\* teachers and students do not react in the same way to the many aspects of the physical environment.

In this article, the teachers' responses are presented under four headings: the spatial, the thermal, the luminous and the aural environments.

### *The Spatial Environment*

Teachers in the sixteen French schools generally show a higher satisfaction with the spatial characteristics of their classrooms (CR), than their counterparts in the sixteen English schools.

TABLE 1

	<i>Percentage of "Adequate" Responses to the</i>		
	<i>CR Area</i>	<i>No. of Students/CR</i>	<i>Storage Area in CR</i>
English	38	60	38
French	64	66	47
	$p < .001$	$p < .01$	$p > .05$

Table 1 shows the percentage of teachers who rated the spatial characteristics of their classrooms as "adequate" on a three-point scale: adequate, barely adequate, and inadequate. In each case, the French teachers gave more "adequate" responses, the most striking difference being the case of the CR area.

To what factors could we ascribe these differences? Inadequacy of area means not enough area. Do the French have larger classrooms? No, on the contrary, their CRs average 700 sq. ft. while those of the English are 750 sq. ft. on the average.\*\* Inadequacy of area can also mean crowdedness of the CR, i.e. lack of space per pupil. But the average figures show that the English have 26.5 sq. ft. while the French 25.5 sq. ft. per pupil, i.e. 1 sq. ft. less. On the

\*Henceforth standing for English-speaking and French-speaking Canadians.

\*\*These and the following averages of the actual physical conditions are based upon the thirty-two sample CRs, and it is assumed (as asserted by the plans) that the other CRs of the schools share the characteristics of the samples.

other hand the French house 27.5 students/CR, or one student less than the English (28.5). However, I believe that this difference of one student per CR cannot cause so large a variation in the teachers' ratings as seen in Table 1. Could these differences be related to the teaching methods of the two groups?

In Table 2, *conventional* seating is the row seating (with one, two, three or even four students abreast per row), *semi-conventional* is a U-shaped arrangement, while the *activist* seating varies in form and size, and is based upon work-groups of four to six students. Logically, therefore, activist methods require larger classroom areas than non-activist approaches.

TABLE 2

	<i>No. of CRs with Seating Patterns Being</i>		
	<i>Conventional</i>	<i>Semi-Conventional</i>	<i>Activist</i>
English	8	3	5
French	12	1	3

As seen from Table 2, the English have double the CRs with semi-conventional and activist seating patterns than the French. This means that, at the time of my investigation, the new teaching methods had been implemented in the English schools more widely than in the French ones. This fact in itself may be an explanation of the dissatisfaction of the teachers with the CR area in the English schools. The French, with more traditional methods, did not feel, it seemed, the need for larger areas. However, it was found that even in those English schools with semi-conventional or activist methods, 34% of the teachers rated the CR area adequate, against 56% in the French schools of the same categories.

Another factor which could be taken into consideration is the age of the school buildings. I found that, in general, people were more satisfied in the new schools than in the old ones. This factor seems to be more decisive in the case of the students than in that of the teachers. However, a comparison of the English and French in old and new buildings shows once again the higher satisfaction of the second group (Table 3).

Could it be that these satisfactions are related to other causes which might not have any bearing upon the actual conditions of the physical environment? Could there be, as Dr. Hall indicated, ecol-

ogical, anthropological or proxemic factors? Couldn't it be that French teachers feel more at ease in relatively smaller areas than English teachers?

TABLE 3

*% of Teachers Rating the CR Area "Adequate" in Schools Built in*

	1951-1965	1966-1968
English	46.5	25
French	60	63.5

There could be some social implications too in these findings. In Montreal the French, less well-to-do than the English, live in more congested neighbourhoods and in more crowded dwellings. Have the French adapted themselves to smaller areas and consequently manifest lesser dissatisfaction with the spatial characteristics of their classrooms? These are a few important questions that need further investigation.

#### *The Thermal Environment*

Investigating the ratings the teachers give to the thermal environment of their classrooms, I found that the English teachers show a higher satisfaction than the French.

TABLE 4

	% of "Adequate" Responses to the	
	<i>Thermal Atmosphere</i>	<i>Ventilation</i>
English	69	67
French	55	49
	$p < .02$	$p \approx .001$

One wonders why. The differences could not be due to the differences in the temperature of the English classrooms, as opposed to the French CRs, since the former generally are found to be two degrees cooler than the latter (respectively 68 and 70 degrees of

Effective Temperature which takes into consideration the cooling effect of humidity). But it is the French who require warmer temperatures!

The findings show that teachers in larger CRs are generally more satisfied with the thermal environment than those in smaller CRs. It may be that English teachers, being in larger CRs, are also thermally more comfortable than the French. However, I suspect that in this case, too, there may be other underlying causes. Perhaps, the English feel better in cooler environments and the French feel better in warmer ones.

#### *The Luminous Environment*

Interestingly, no variations were found between English and French teachers in their appreciation of the classroom lighting. Both groups show a satisfaction of 88-89%. This sameness of the responses, however, makes us wonder about the unpredictable nature of human behavior. How can the same amount of satisfaction with classroom lighting conditions occur in strikingly different environments?

Table 5 shows the average foot candles measured in the thirty-two schools investigated.

TABLE 5

	<i>Average Foot-Candles Measured in the CRs</i>	
	<i>On the Desks</i>	<i>On the Chalkboards</i>
English	76	37
French	142	88

We see that the French CRs have almost double the light intensities that the English CRs have. Can we conclude, therefore, that the English feel more comfortable in less bright environments, while the French feel better in brighter ones? Could we relate this finding to the fact that the forefathers of the English-Canadians came from a country with dull skies, while those of the French-Canadians came from a sunnier clime? And could this cultural inheritance have persisted for two or more centuries?

### *The Aural Environment*

I found that the satisfaction with acoustics and noise reduction in the CRs was almost equal in both the French and the English schools. "Adequate" ratings for acoustics and noise reduction were 79 and 63% respectively for the French and 80 and 68% for the English groups. Unfortunately I had no means of measuring the noise levels in the classrooms. Therefore a comparison between the actual conditions and the teacher responses was virtually impossible.

### *Consequences*

What consequences can these findings have and what useful conclusion can we draw out of them? I believe the first point which becomes apparent is the need for serious investigations in the issues dealt with herein. At the present time there are very few studies conducted in these realms, and I know of none in the linguistic-cultural field, except those mentioned by Dr. Hall. The required investigations of researchers should pave the way to a better understanding of human nature in relation to its environment and make us fully aware of its diversities in this respect.

Architectural design should take this diversity into consideration. Environmental norms should be verified and be adapted to the groups and the individuals for whom the buildings are to be constructed. Architects should know how much area, heat, light and noise is adequate, comfortable or ideal for the specific type of activity and the specific type of people for whom buildings are designed. Harry Rodman refers to "the need for informed skepticism too, about the sacredness of numerical engineering criteria, for example. How important is a standard foot-candle level? Does the precision with which a temperature recorder follows the temperature measure the satisfaction of the indoor climate?"<sup>3</sup>

I believe that these are major problems which deserve consideration. Solutions to them will require contributions from social scientists, behavioral-scientists, biologists and other professionals as well as from architects.

### *References*

1. Edward T. Hall, *The Hidden Dimension*, New York: Doubleday, 1966. See chs. 11 & 14.
2. Henry B. Van Loon, "Earth Space & Human Culture," *A.I.A. Journal*, August 1963, 23-29.
3. Harry E. Rodman, "Designing for the Whole Man," *A.I.A. Journal*, January 1969, 38-40.