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The Spatial Dynamics
of Classroom Environments

Among the commercially packaged family games made extinct by modern tastes and interests was one which was called "Go to the Head of the Class." In this game the "head of the class" was not just a figurative designation of a place on a teacher's roster but an actual physical location in the classroom toward which good students aspired to go. Players of the game started at the rear of a classroom, shown on the playing board as having a traditional layout of row-and-column seating. Each player attempted to move an upright figure of a brightly smiling student to the number one seat at the extreme front of the classroom, closest to the teacher's desk. The moves toward the head of the class were accomplished when a player correctly answered questions taken in turn from a shuffled deck. As a result of applying this criterion for progress the winning player could claim to be the best student in the imaginary class.

Considering the abundance of new family games with exciting plastic and electronic gimmickry now available, it is not surprising that such a plain old game as "Go to the Head of the Class" should disappear from the shelves of modern toy stores. What is surprising, however, is that the classroom seating arrangement shown on the game's playing board remains a pervasive feature of modern school environments. Surprise at the durability of traditional seating arrangements is not new. As early as the year 1900 the distinguished educator John Dewey was reported to be concerned with the arrangement of pupil seating.[1] Dewey had commented that seats fixed in row-and-column arrangements were not compatible with the experimental outlook he espoused. Perhaps it could be argued that the prolonged continuance of any institution proves its value. However, much more is now known about the dynamics of class-

room seating than was known in Dewey's time, and this knowledge, in turn, demands consideration in the analysis of present classrooms and in the design of future ones. The discussion which follows will show that seat location is still associated with the evaluation of student behavior, that where students sit in a classroom can influence their verbalization rates, and that students use seat locations to partially cope with perceived stress and with notions of privacy.

seat location as an aspect of evaluation

While the "head of the class" as previously discussed was merely the goal of a game, there is reason to suspect that the student area closest to the teacher's area is a favored one. Students who like a teacher probably sit closest to the teacher. At the same time, teachers probably like those students who sit closest to them and with whom they can establish eye contact more easily than those who sit furthest. These speculations are supported by the "immediacy principle", which states that given the opportunity people move toward persons and things they like, evaluate highly, and prefer; and move away from things they dislike, evaluate negatively, or do not prefer.[2] Consequently, the distances which people deliberately maintain between themselves can be read as expressing the degree of liking they have for one another. Short distances and face-to-face orientations enable easy eye contact between persons and can thus facilitate verbal and nonverbal exchanges, while longer distances allow people to look away easily from one another as they avoid communication.

There is research which supports the notion of an interaction effect between student locations and teacher evaluations of student performance. For example, investigators have found that elementary school children seated in the front row are more attentive and are evaluated more positively by their teachers and peers than are the middle and back row students.[3] Other researchers suggest that visual contact with the instructor increases attentiveness, which in turn makes for better grades.[4]

Of course, it is difficult to separate spatial variables from personal ones. Where students choose their own seats, it could be reasonably argued that "good" students, that is, those highly motivated to learn, would want to be up front where the action is. Hence, the positive behavior of these students could be ascribed to personality factors. On the other hand, where students are assigned to up-front seats, their prominence in the eye of the teacher and the resulting pressure to be attentive at such close range could make them

appear to have the same inclinations as the highly motivated students who were so even before they selected their own seats. The point to be noted here is that high participation is likely to be interpreted as high motivation, but that it is not entirely the student's personality which makes for high participation. Their locations in classroom seating arrangements have a great deal to do with students' verbal participation in the classroom. Where verbal participation is used as an indicator of attentiveness and motivation, teachers making evaluations based on such an indicator should be alert to the possibility that the behavior might be elicited more by environmental than by personality factors.

seat location and student participation

Despite repeated and widespread experiencing and observing of the verbal participation of students in relation to their locations in classroom seating arrangements, systematic and documented observations are relatively recent. Among studies considered pioneering are those which precipitated the concepts "internal room ecology"[5] and "classroom ecology".[6] In the latter of these studies it was revealed that in six equivalent discussion sections of an introductory college level psychology class, involved in an experiment in which classrooms were changed from one kind to another in midsemester, student participation was consistently related to seat location, which was self-selected. In seminar-style seating arrangements it was found that students sitting directly opposite the instructor participated more than did students seated on the sides. In classrooms with straight rows, students in front participated more than did students in the rear, and students in the center of each row participated more than did students at the ends.

In observing the pattern of interaction in Grades 1, 6, and 11, other researchers discovered a remarkable consistency which indicated that most student participation, in terms of verbalization, came from students sitting in the centre and front of the traditional row-and-column seating arrangement in a classroom. Sixty-three percent of verbal participation came from the front centre as opposed to thirty-seven percent for the remaining areas. These researchers concluded that it was possible to discriminate an area of the classroom which appeared to be literally the centre of activity.[7] In yet another study similar findings were reported after very systematic observations, employing videotaping, had been made. The findings appeared valid irrespective of the grade level of the class, of the sex or age of the teacher, and of the subjects taught.[8]

The researchers cited thus far recognized that their findings left an important issue unresolved. The issue grew out of the possibility that highly verbal students either migrated to or were placed in those physical locations which had the highest interaction potential. Since all of these studies involved unrandomized student seating, the question remained as to whether a seat's location or its occupant was the more powerful determinant of the verbal participation rates observed in the various classrooms.

"seat" and "person" variables

Recent research conducted by this investigator addressed itself to this unresolved issue.[9] Prior to the experiment, student subjects were categorized as "high", "moderate", and "low" verbalizers, in physical settings where seat locations were equal in respect to the opportunities afforded for verbal interaction. In seven separate trials student subjects were randomly assigned to row-and-column seating without their verbalization-rate categories being known to the investigator. The verbal behavior of these students was then observed, recorded, and statistically compared with the students' verbalization categories. The results revealed that centrally-seated moderates yielded significantly higher verbal interaction rates than did noncentrally-seated moderates. Centrally-seated high verbalizers yielded significantly higher verbal interaction rates than did noncentrally-seated high verbalizers. Low verbalizers were notable for their consistency in maintaining low interaction rates regardless of seat location.

It was concluded that among those students predisposed to verbalize, location in row-and-column seating can increase or decrease verbal participation in the interaction pattern of the classroom. When the data from the seven trials was plotted on the seating plan used for the experiments, a "triangle of centrality" appeared which also placed the area of greatest verbal participation in the front and centre areas of the classroom.

In all of the studies referred to in this discussion the teacher's area was located up front and in the middle of the classroom. The teachers were observed to remain in these locations by apparent choice in the natural settings, and by instruction in the experimental ones. The teacher's location can certainly have an impact on the kind of interaction pattern which emerges in a classroom; but assuming no variation in teachers' locations, the implications of the findings cited thus far are that students can be included in or ex-

eluded from the network of communication mostly through their physical locations in the classroom. Furthermore, misleading evaluations of student attentiveness and motivation could be made, out of ignorance of the dynamics of classroom seating.

seat location, eye contact, and privacy regulation

The power that seat locations have to elicit or prevent verbal participation appears to be based on the premise that people are most apt to talk to those other people whose visual attention they can attract and hold. Some investigators of eye contact and its opposite, gaze aversion, also maintain that among its most important functions are to seek feedback during social interaction, and to signal that the communication channel is open.[10] In the classroom, teachers may search the eyes of physically close and "accessible" students for indications of comprehension and acceptance of given points in a lecture, and to indicate that the students may now share any questions and comments they had been holding for the appropriate occasion. It is conceivable that the teacher's quest for responsiveness could be interpreted by some students as a demand for verbal interaction, instead of a mere invitation. Most people would have no difficulty recalling situations in which, their eyes having been caught by a speaker, they had found themselves nodding or answering out of simple courtesy. To look away or avert one's gaze in such situations is usually considered rude. At the same time, looking at another person too long, or staring, can be considered an invasion of privacy. Indeed, many cities have ordinances which make "ogling", a flirtatious staring on the part of strangers in public places, an offence which warrants police intervention.

In the eye-contact research cited earlier, the investigators advanced a theory which treated eye contact as a functional equivalent of physical proximity and as a component of intimacy. Accordingly, these and other aspects of intimacy are said to be governed by both approach and avoidance forces, and for any two people, are kept in a condition of equilibrium. Thus the advances of one person may be thwarted or ignored by gaze aversion or moving away on the part of another person. Students in a classroom may be able to use both the physical distance and avoidance of eye contact that is associated with certain seat locations as barriers to unwanted intimacy with a teacher or with fellow students; but they usually cannot gracefully move, once a seat has been chosen.

It may seem strange to entertain notions of privacy in so relatively public a place as a classroom. Perhaps some consideration

of current definitions of privacy might make it less strange as a variable of classroom interaction.

Privacy has been defined as the right individuals have to control what information about themselves should or should not be communicated to others and under what conditions.[11] Furthermore, privacy has been described as an interpersonal event involving relationships among people in person-to-person, person-to-group, group-to-person, or group-to-group social units.[12] Additionally, some architects[13] and environmental psychologists[14] have written of privacy in terms of the options which are or can be provided, by the physical environment, for individuals to control their involvement in or withdrawal from interaction with others. The ssential point here is that when privacy is defined from the points of view of social unit and physical environment there develops a paradox, in that an individual can achieve almost total privacy in a very crowded place. How this is possible will be discussed later.

Students can be assumed to be experts on the interaction potentials of various classroom seating arrangements. Their choices of seats presumably reflect their inclinations to interact or their needs for privacy. When seats are arbitrarily assigned to students these needs and inclinations are likely to be frustrated and upset.

seating choice as coping behavior

It has been postulated that, besides being stressed or otherwise affected by the environment, people do use their physical environment to cope with stressful situations.[15] They might use "environmental props" such as the seat itself or its physical orientation and distance from others, or "self-markers" such as eye contact and gaze aversion, gestures, and body positions, or both. There appears to be substantial justification for regarding the seat choices made by students as efforts to cope with the situational definitions they develop before class begins. The first-day seating of students often reveals a tentative commitment to the course or a "wait and see" behavior which would be expressed through the taking of seats at the back of the room and close to the exits. As the course and teacher become familiar, predictable, and less threatening, students might move closer to or into the area of greatest interaction potential.

Coping behavior as a theoretical base was used by this investigator to explain the seat choices made by students in a projective test where the hypothetical situation involved a high degree of encour-

aged and expected verbal interaction between the teacher and students.[16] In that study, students who had been objectively categorized as "high" verbal interactors chose central seats on a row-and-column seating plan to a significantly greater degree than did students categorized as "low" verbal interactors. Since such environmental props may be used for coping with stress, it was suggested that instead of describing the projective seat selections of the high and low verbalizers positively as preferences, it might be just as appropriate to view them negatively as avoidances. A tentative inference, then, would be that "low" verbalizers *avoid* central seats to a greater extent than do "high" verbalizers. High verbalizers might define a good seat as one that enables involvement in discussions, while low verbalizers might define a good seat as one on the periphery or to the rear of the center of verbal activity. In classrooms where there are no more seats than students, later arrivals might not get a preferred seat and might have to cope in other ways with the stresses growing out of seat locations forced upon them. Usually, however, students arrive to class and continue to occupy a given seat, all term long, according to these coping needs.

implications for the design of learning environments

The dynamics of classroom environments discussed thus far have centered on traditional row-and-column seating arrangements. But whatever the arrangement, there are usually seats which enable participation, and there are those which prevent it. Another way of putting this is that in the various seating arrangements now being utilized there are varying mixtures of opportunities for community and privacy.

The extreme opposites of row-and-column seating are the circular and inward-facing arrangements used in seminars and discussion groups. In the latter arrangements everyone is "on stage" and compelled to see others and be seen by them. The pattern of interaction which prevails is across the circle or table, and has been referred to as the "Steinzor effect" by one researcher[17] after its discoverer.[18] The question of which of these two extremes should prevail in classrooms is one which is impossible to answer in the abstract. Either might suit quite nicely the educational programs being conducted by teachers. In any case, teachers and students probably should know of the potentials of these seating arrangements, so that their use of either is compatible with the learning experience being sought.

In short, circular seating arrangements make everyone visually accessible to everyone else, and may require each person to suffer being looked at and having to look back regardless of private inclinations. Shy persons and persons with obvious physical handicaps or visible stigma may find the constant "on stage" aspect of a circular seating arrangement to be psychologically very uncomfortable. On the other hand, row-and-column seating, while providing peripheral seats in which persons can "hide out", may cut off some people from desired interaction. By relating to the restricted interaction patterns of this arrangement, teachers may get only selective feedback on performance from those students in the central seats with whom they find it easiest to interact visually and verbally.

The most important implication of the findings on the dynamics of classroom seating arrangements is that individuals apparently can be involuntarily excluded from, or drawn into, verbal and nonverbal interactions. As a result, there may be a consequent loss of availability of resources to a group when some or all of its members are experiencing psychological discomfort either in not occupying seats of their own choosing or in witnessing a discussion being controlled by persons in central locations. Again, evaluations of student performance may be contaminated by the dynamics of spatial variables and by a teacher's misreading of their meaning.

Obviously, some priority in values must be honoured before designers tamper with classroom seating arrangements. Among the valued elements of the classroom situation are the presentation of certain prescribed educational content, the leadership role of the teacher, and the socialization and psychological well-being of the students. Neither circular nor row-and-column seating realize all of these few values. In each there is some ranking into priorities of institutional, student, and teacher needs.

The discovery of an educational environment which can accommodate these different values simultaneously is certainly within the range of modern technology and architectural talent. Responsive environments can be designed to permit easy alternation between a state of separateness and a state of togetherness. Those students who wish to "go to the head of the class" should be encouraged though not required to do so. The "head of the class" might even be brought to the student through appropriate architectural design. Teachers sensitive to the dynamics of the physical environment are in a position to participate in this search for the alternatives to row-and-column seating which John Dewey had in mind.

notes

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