

**"Action Zones" and Academic Performance  
in a Middle School Classroom**

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**ABSTRACT.** The relationship between self-selection seating choice and academic performance in a classroom was investigated. Eight teachers and 161 pupils in a Florida middle school participated in the study. Results indicated that pupils who sat in the front of the classroom did better academically than those who sat in the middle. However, students who sat in the front of the classroom did not necessarily do better than those who sat in the back.

Relationships between academic performance and where a student sits in a classroom can provide useful information to the teacher. The results of various studies in the field (McCroskey & McVelta, 1978; Schmidt, Stewart & McLaughlin, 1987; Weinstein, 1979) seem to fall into two areas. Some of these researchers perceive that there is a relationship between seating position in a classroom and the student's academic performance (Weinstein, 1979). On the other hand, there are those who suggest that no real relationship exists between a student's academic performance and where he/she sits in the classroom (Schmidt, Stewart, and McLaughlin, 1987).

The first group can be further divided into two subgroups. In one subgroup are those who perceive that students who do well academically tend to position themselves in certain high-profile areas or "action zones" near the front of the classroom, and this process has been dubbed "self-selection" (Hares & Bales, 1963; Becker, Sommer, Bee & Oxley, 1973; Delefes & Jackson, 1972). In the other subgroup are those who hold the view that the environment

or the high-profile areas, the "action zones" themselves, have a positive academic influence on the students regardless of their previous academic performance. This process is called "Environmental Determinism" (Wulf, 1977; Walberg, 1969).

Studies of the relationship between classroom seating arrangements and academic performance can be traced back as far as 1921 when C. R. Griffith provided non-statistical observations that grades obtained by students in classes were somewhat lower in the front as compared to middle rows, peaked near row four, and sharply declined by row eight (Brooks & Rebata, 1989). Studies by Brooks and Rebata (1989) and Mercincavage and Brooks (1990) yielded results which suggested that students who selected seats in the front rows obtained higher grades than those who seated themselves further back in the class. These researchers also observed that females scored higher grades than males.

Mercincavage and Brooks (1990) observed that achievement scores for college freshman, but not upperclassmen, declined as distance from the front of the classroom increased. Becker, Sommer, Bee, and Oxley (1973) also found that the grades of undergraduate college students decreased as distance from the instructor increased both towards the rear and to the sides of the classroom.

Sommer (1967) intimated that if classroom participation were to be interpreted as a positive indicator of academic success then we can conclude that students who sit in the front and center rows are academically more successful than students who sit at the back and sides of the classroom because they participate more in their classes. Morton (1987), by contrast, suggested that a particular side of the classroom may contribute to student's academic achievement, at least at elementary levels. When testing the spelling ability of fourth grade children who selected their seating location, Morton found that children on the right side of the room were superior spellers compared to their classmates, perhaps indicating the favored-attention side preference of the teacher as well.

Several studies have been conducted to prove or disprove the validity of both the "self-selection" and "environmental determinism" hypotheses. Becker et al. (1973) suggested that sitting in a particular area of the classroom may evoke certain role behaviors from seated occupants and those around them. But in many cases, the person selects a position in the classroom because it reflects and reinforces the underlying personal goals brought into the class. Brooks and Rebata (1989) concluded that even though the more motivated and capable students may tend to select seats in the front of the classroom, the environmental characteristics of the front-row seat may also be responsible for the superior

performance of students in that area. The front and center row seats provide greater opportunity for verbal and visual contact with the teacher and thereby positively influence class participation and overall academic performance.

Wulf (1977) investigated the relationship between the classroom seating choice and the grade received in class. He hypothesized that if the grade in a class were the result of an environment in the classroom (Environmental Determinism), then students assigned to the front and center rows should achieve better grades. If, on the other hand, seating choice reflected other stable personality variables, then students would achieve at predictable forms and rates despite having been frustrated in their seating choice. The results of this study showed that during "self-selection" seating, the students in the back rows consistently scored lower grades than the front-row students in the class. When the students were assigned their seats, those students who were high achievers in the class still achieved better grades regardless of where they were randomly seated in the classroom.

Levine, O'Neal, Garwood and McDonald (1980) found that when undergraduates selected their seats in the classroom, those in front performed better academically than those in the rear. However, when students who had previously chosen to sit in the rear were assigned front row seats, their academic performance did not improve.

In brief, the studies by Levine et al (1980) and Wulf's (1977), and Becker, et al. (1973) support the "self-selection" hypothesis rather than the "environmental determinism" hypothesis. A corollary series of studies seem to extend the weakness of the environmental-determinism hypothesis. Millard (1980), in his study to test the validity of the "environmental determinism" hypothesis, also found no difference in test performance between students assigned to the front and those assigned to the rear. He concluded that high achieving students will do well academically regardless of the "zones" or the seats in which they are assigned.

Buckalew, Daly, and Coffield (1986) similarly concluded from the data obtained from their study of 200 assigned seating undergraduate students that no meaningful relationship existed between the location of a student and his or her academic performance.

Schmidt, Stewart, and McLaughlin (1987) conducted a study to determine the effects of self-selection versus assigned seating arrangements with native American junior high students. The overall results of the study indicated that manipulation of seating arrangements had no effect on academic performance.

Montello's (1988) review of the literature on how seating arrangement and location in lecture-style classrooms influenced college students' grades yielded similar conclusions. The results of the reviewed studies showed that the influence of seating location on students' academic performance was too weak to be of any theoretical or practical importance.

Still, a considerable body of research supports environmental determinism. Stires (1980), for example, reported that his study produced evidence which moderately favors the "environmental determinism" hypothesis or at least diminishes self-selection. He found that the test scores obtained in the environmentally determined (no choice) condition were as high as those obtained in the self-selection (choice) condition. He concluded that there was no strong evidence to suggest the results were an artifact of self-selection.

It is apparent from the literature on this subject that there are different view points regarding the relationship between academic performance and seating location. Though more of the studies support the "self-selection" hypothesis than the "environmental determinism" hypothesis, the question of the relationship between seat location and student academic performance seems open to further study. Can the relationship between classroom seating arrangement and academic performance be wholly measured by teacher assigned grades?

As can be seen from the literature on this subject most of the studies were conducted with college students. The lone study with middle school students involved a uniquely homogeneous native American population. Given the volatility of the emotional, social, physical, cognitive and moral development of the middle school age group (11-15 years), (Cobb, 1992; Hamachek 1990), the present investigators were curious about the relationship between classroom seating choice and academic performance for middle school students. The purpose of this study was to examine this relationship on the basis of the "self-selection" hypothesis in a local middle school.

## Method

### Sample

The study was conducted in a Middle School in Escambia County, Florida. Fifty-two percent of the students and 75% of the faculty and staff were white. The school's student-teacher ratio was 26:1 (*School Report*, 1993). The principal of the school granted us permission to conduct the study. Eight female teachers, from regular as well as alternative (dropout prevention) classrooms of

students in grades 6-8, each teaching various subjects in all content areas, volunteered to participate in the study. The sample size was 161.

### **Procedure**

At the beginning of the 1992 spring semester the participating teachers were briefed concerning the methodology of the study. On the first day of school, students were instructed to choose their own seats. However, once they chose their seats they could not change seats for the following six weeks, that is, not before the end of the first grading period. Three days later the investigators gave the participating teachers the student Self-selection Seating Form to record where each student sat in the classroom (front, middle, or back). The recording forms were returned to the investigators at the end of the class period.

At the end of the first six-week grading period, each teacher announced in her class that students could change seats if they wanted to. On the same day, the Self-selection Seating Forms were given back to the participating teachers to record the seating position and grade of each student in the class. The forms were returned to the investigators the same day. This procedure was repeated after each six-week grading period until the end of the semester when each student's final grade was recorded.

### **Data Analysis**

An instrument was created by the investigators to analyze the data from the student self-selection classroom-seating position and academic performance. The students in each class were given numbers to protect their identity and confidentiality in reporting the findings from this study. Race and gender of the student subjects were also recorded. Grades were assigned an integer value so statistical comparisons could be made.

The null hypothesis was "the position of a student in a classroom has no effect on his/her grade in the class." The classes were statistically considered as blocks. Due to the nature of the data, however, a parametric statistical approach for testing the null hypothesis in convenient blocks proved questionable. Therefore, the investigators decided on a non-parametric Quade Test as the best statistical approach for the analysis of the data which were recorded on an interval scale. We also discovered that the Quade Test performs much better than the Friedman test when the number of treatments is fewer than five (Conover, 1971).

## Results

Table 1 shows grade points earned (0 to 100) by seating location (front, middle, back) for various demographic groups (total, white, non-white, male, female, white male, non-white male, white female, non-white female). A significant relationship was found between seat location and grade points earned (Quade test statistic = 3.78,  $\alpha = .05$ ,  $p = .04$ ). Pairwise comparisons, using an overall level of significance of .05, revealed that students who sat in front earned significantly more grade points than those who sat in the middle. No other comparisons were statistically significant.

Table 1  
*Classroom Self-selection Seating Choice and Grade Points by Race and Gender*

Students	Front		Middle		Back	
	n	grade points	n	grade points	n	grade points
Total males	193	65	116	45	219	76
Total females	339	99	258	72	175	48
Total non-whites	217	77	134	49	132	51
Total whites	315	87	240	68	262	73
Non-white males	104	42	43	23	70	31
White males	89	23	73	22	149	45
Non-white females	113	35	91	26	62	20
White females	226	64	167	46	113	28

As can be seen from Table 1, only the white males' test results are consistent with the null hypothesis that students in the front and the back would not differ significantly in their academic performance. While all the other groups, i.e. white female, non-white females and non-white males, did better sitting in front, only the white males, overall, did better while seated at the back. Each student participated in up to four classes. Therefore, the sample size ( $n$ ) in the table represents the number of courses students completed.

## Conclusion

As previously stated, most research on the relationship between academic performance and classroom seating location has been conducted with college students. This study explored the relationship between student academic performance and seating location in a middle school. Students seated in the front of the classroom did better academically as measured by teacher assigned grades than those seated in the middle. However, students in the front did not necessarily do better than those who sat at the back.

These findings are, to a certain extent, consistent with prior literature (e.g., Hare & Bales, 1963; Becker, Sommer, Bee, & Oxley, 1973; Delefos & Jackson, 1972; Brooks & Rebeta, 1989; and Mercincavage & Brooks, 1990), which suggested that students who self-select seats in the front of the classroom do better academically than those who sit in the middle and the back of the classroom. However, results from the present study also seem to contradict the inference from this literature that all students who sit in the middle rows of the classroom do better than those who seat themselves further back. The white male students in this study who sat in the back of the classroom did better academically than those who sat in the middle of the classroom. This study therefore seems to suggest that it is possible that other factors such as race and gender may affect seating choice.

These findings may warrant further studies to discover how additional variables besides seating might affect academic performance. The learning styles (Field Independent, Field Dependent) of students, distribution of teachers (white and non-white male and female teachers) and effects of their teaching styles on the implicit cultural assumptions may also be considered for inclusion in further studies on this topic.

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