Equity Principle Project

Introduction

If I were to ask you to close your eyes and think of a student that goes above and beyond what is expected in the mathematics classroom, who would you picture? Would this student be a boy or a girl? A young child or an older teenager? Would he or she be rich or poor? To what ethnic group would this student belong? Even by picturing this student in your mind, you are carrying bias. All humans—topically, all teachers—have bias regarding stereotypes. It would be unreasonable to ask a teacher to eliminate bias. The goal, however, is to make it invisible in the classroom. Do teachers recognize if or when they show bias in their classrooms? How does teacher bias regarding gender, ethnicity, or seating location affect their classroom habits?

Literature Review

Before we begin to discuss correcting teacher bias, we must discuss its origins. Morge (2007) opens her article with the idea that students' beliefs, especially those regarding gender stereotypes, are heavily influenced by the media and popular culture. Teachers are encouraged to examine their students' beliefs and remove negative stereotypes. NCTM (2000) overturns the myth that only some students are capable of being good at math. There is also the myth that students who are not fluent in English or have disabilities are not as good at math as their peers are. These myth and others lead to low expectations, which cause the rate of learning to drop. To prevent this, teachers should at least be made aware of their own biases and hide it, by creating a more equitable classroom environment.

In the domain of gender equality, Gilbert and Gilbert (2002) offer four different strategies for promoting equity. The first strategy, "combating gender stereotypes" (p. 522) is separate from the other three, which are grouped under the category "creating a safe learning environment" (p. 522). Combating stereotypes is difficult because of the common misconceptions they create. Girls and boys have grown up with expectations specific to their genders, so they are challenged when they encounter something that contradicts their beliefs. Gilbert and Gilbert (2002) recommend that teachers emphasize the importance of mathematics and that this importance is equal for all genders, highlight the achievements that famous women have made in the past, and use "nonsexist language" (p. 525). The last challenge is (in my opinion) the most difficult, and yet the most interesting, because even the smallest pronouns in our speech can have such a large impact on a student's unconscious mind.

The teachers in Bartell and Meyer's (2008) study all agreed that no matter how different their conceptions of NCTM's (2000) Equity Principle, the responsibility of upholding an equitable classroom fell upon the teacher. They believed it is teachers who should take action to address the achievement gap. Bartell and Meyer (2008) assigned each participant to become closer to one student who he or she felt was falling behind in mathematics, and found a positive correlation between the magnitude of the personal relationship of the teacher and student and the magnitude of the student's engagement and achievement in the classroom.

Methods

The data in my survey compares gender, race, seating location, and levels of class participation. For each class period I observed, I created a seating chart of rows and columns and wrote the identifiable gender and race of each student corresponding to their location on the

chart. The row numbers start with 1 at the front of the room and increase as the desks move back. The column numbers start with 1 at stage left—the left side relative to the front of the room—and increase as the desks move rightward. My initial goal was to tally up the number of times each student was called on, but my mentor teacher, Mr. Noble, does not call on students often so I took a different approach: I developed a system of symbols (Figure 2) to describe the different ways students interacted with the teacher. For each time the student participated in some way, I would tally the corresponding symbols on that student's location in my seating chart.

There were two conditions that I thought might affect the data collection. The first was my seating location. To correct for this, I changed my seating location in each class in which I collected data. Figure 1 describes each class period—including date, time, and course—and my seating location relative to the front of the classroom. I decided to vary my seating position in case it might affect student participation.

The other factor that possibly had an influence on the data was Mr. Noble's location. On February 22, the first day of my data gathering, he had indicated that the SMART Pad was not working, so he would have to teach from the front of the classroom. I first wondered if this was unusual. His teaching from the front may have been a different experience for his students, which may have greatly affected their participation data since they might not have been used to him standing in front of them. On March 1 Mr. Noble returned to his normal teaching location at his desk. Figure 1 also notes Mr. Noble's location in each class period.

Results and Conclusions

Figure 3 corresponds to the raw data that I collected from each of the three classes I observed, in chronological order. Each table represents one class period. The top of each table represents the front of the room. Each cell represents a desk, and empty cells represent empty desks. Cells that contain identifiable gender, identifiable race, and participation tallies represent students and their corresponding data. The tallies are *not* ordered chronologically.

Figure 4 organizes the data into groups of gender and ethnicity, showing in color the different degrees of participation. I extracted the data involving "pound," that is, the number of times the student was called on involuntary. Figure 5 compares "pound" with gender and ethnicity.

Across all three periods, Mr. Noble called on 27% of his students when they were not prepared. Of these, 59% were white and 41% belonged to other ethnic groups, which contrasts to the fact that 74% of the total population is white (and 26% belong to other ethnic groups). Therefore Mr. Noble appears to have called on a more racially diverse group than represented by the total population. Regarding gender: Of the students Mr. Noble called on when they were unprepared, 65% were male and 35% were female. However, the total population is only 47% male (and 53% female), so there is a large bias to Mr. Noble's selection of students regarding gender. He calls on 38% more males than expected. This skew is possibly dependent on Mr. Noble's method—conscious or unconscious—of calling on students. For example, Mr. Noble may call on students who he believes are not paying attention, he may call on more males because he himself is male, etc.

Figure 6 shows that there was no identifiable location-dependent pattern of the students Mr. Noble called on. The data involving "question," "ampersand," and "exclamation" (see Figure 2 for keyword definitions) did not seem significant when identifying teacher bias, mainly because there weren't enough students who earned those symbols. I feel that with a larger population, those particular sets of data could be further analyzed.

Appendix

Period	Date	Time	Course	My Seating Location	Mr. N's Location
6th	22-Feb-11	12:04PM–12:52PM	Algebra II	Room front, stage right	Standing at front of room
7th	22-Feb-11	12:57PM–1:45PM	Algebra II	Room front, stage left	Standing at front of room
5th	01-Mar-11	11:11AM–11:59AM	Geometry	Row 5, column 3	Row 5, column 6 (his desk)

Figure 1. My and Mr. Noble's seating location in multiple classes, relative to the front of the classroom.

Symbol	Keyword	Level of Participation
?	"Question"	The student raised a hand to ask a question, or to answer a question asked by the teacher, and was called on to speak.
&	"Ampersand"	The student responded to a question or remark without being called on.
!	"Exclamation"	The student spoke out of turn or interrupted the teacher.
#	"Pound"	The student was called on involuntarily.

Figure 2. Varying levels of student participation.

6th Period					
white male &	white female ?,&	white male ?,&&&&&,!!!!	white male &	hispanic female &&&&	
white male ?	white female ?	white female ?	white male		asian female #
	white male	white female	black male ?,!,#	black female &	
	white female		white female	white female ?	hispanic female
		white female	white male	black female &,#	mixed female ?,#

7th Period					
		white male	white female ???	white male	black female
	white male #	black female	white female	white male	white female
hispanic male ?,&&&&,#	white male	white female	white female ?,&	white female ?	white female
		white female #	hispanic male #	hispanic female	hispanic male #
	white male &&,#		white male #	white male	white male #

5th Period					
white female &&&,#		white male &&,!,#	hispanic female !,#	white male &,#	white female
asian female &,!!	white female ?		white female &,!	white female	white male
white male #	black male	hispanic male	white male &&,!	white female	white female &,#
			white male &	white male	
(Mr. N's seat)	white male &		(my seat)		

Figure 3. Raw data of gender, race, and participation.

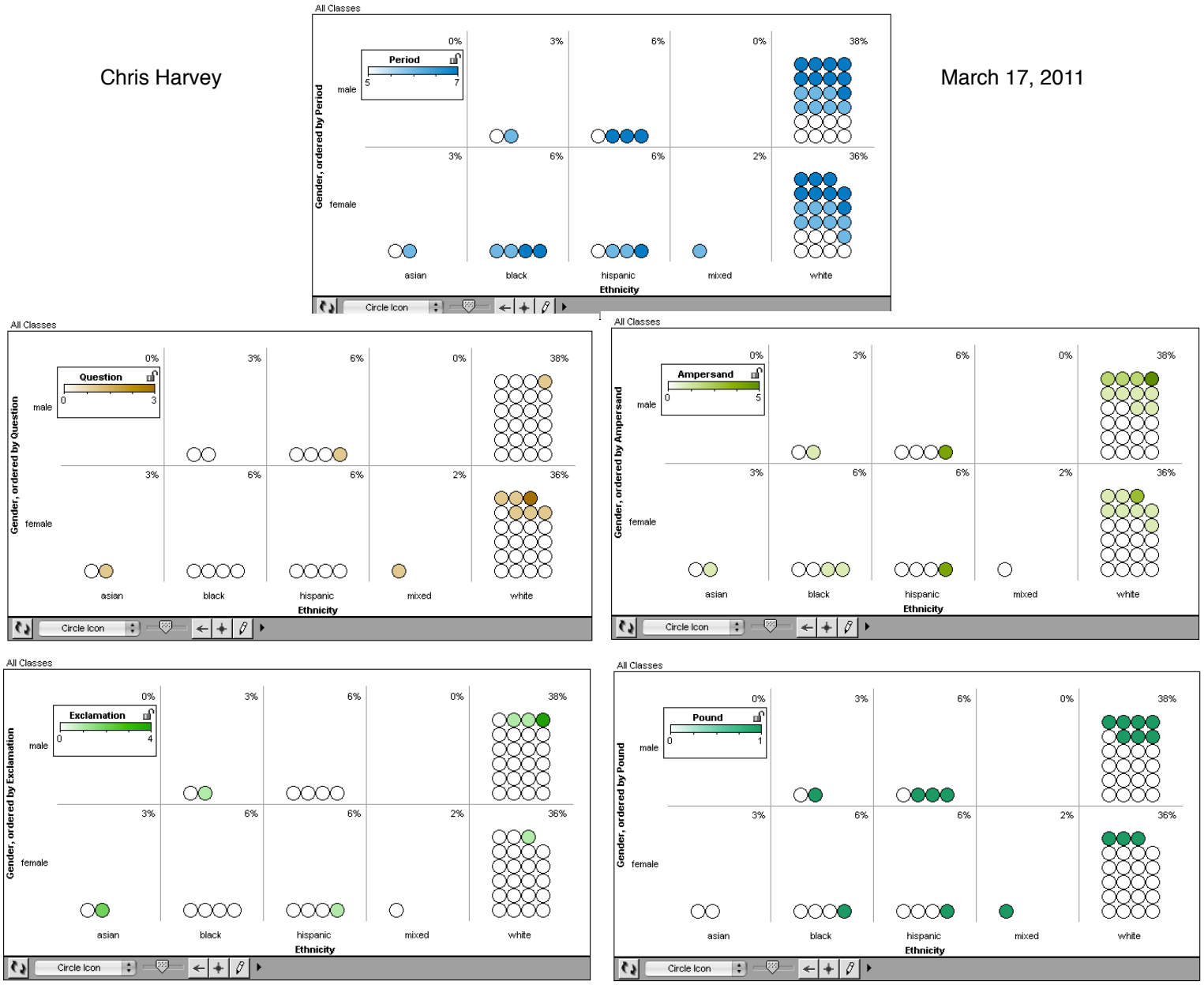

Figure 4. Gender vs. Ethnicity, showing period, ?, &, !, and #.

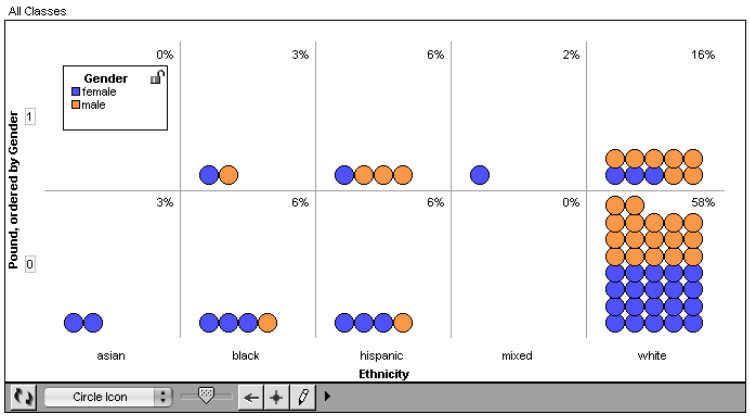

Figure 5. # vs. ethnicity, showing gender.

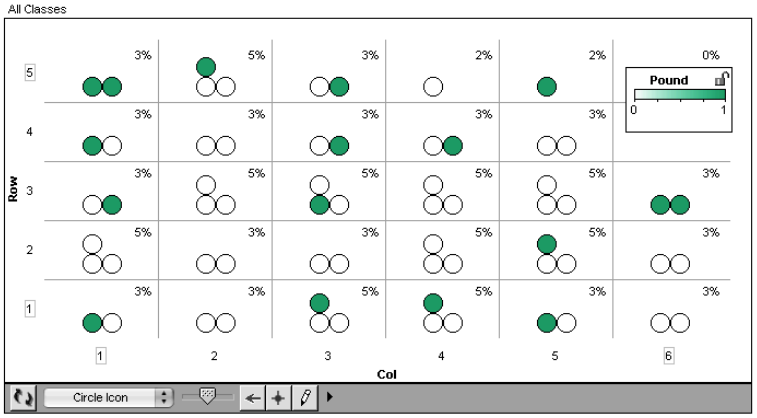

Figure 6. Student seating location, showing #.

References

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