Average Jeans

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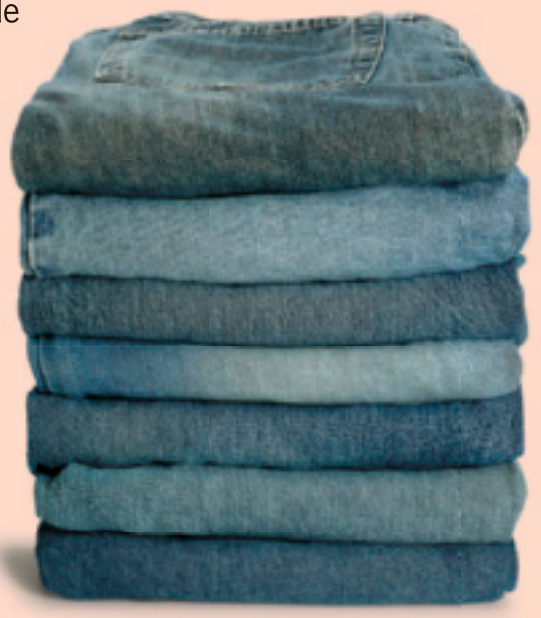
This "Solve It!" task appeared in the March 2011 issue:

According to Jeans Guide (www.jeansguide.net/jeans-interesting-facts), people—on average—own 7 pairs of wearable jeans. Collect data to determine the average number of jeans owned by people in your class or school. Explain how you collected the data, and present your findings and conclusions.



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Edited by **Edward S. Mooney** and **Sherry L. Bair**. This department shares creative solutions to the problems in Solve It! Send student work, with a description of student thinking, to **Edward S. Mooney**, Illinois State University, Campus Box 4520, Normal, IL 61790-4520, or by e-mail to mooney@ilstu.edu. Published solutions will be credited.

Students were not merely working off the cuff when it came to this data-collection question, because more than just thinking on the fly was needed to solve this statistics problem.

Julie Reulbach, a sixth-grade teacher at The Woodlawn School in Davidson, North Carolina, presented this task to her class. Students were asked to count the number of jeans that they owned. The data were recorded the following day, and students worked in groups to analyze the information. The results of the data collection indicated that the mean was, approximately, 9.33 pairs of jeans per person, the mode was 5, and the median was 7. The class compared its results with the average in the task and then discussed why there was a difference in the findings. **Figure 1** presents excerpts from the different groups' findings.

Some felt the difference had to do

with outliers in the data; others believed that since young students do not work at a regular job, they have more chances to wear jeans; and still others felt that students in their class shop more than other people. As can be seen in the comments, the justifications for differences in the data vary greatly. The students' results emphasized a very important idea in data analysis:

> Although there is only one set of results for the mean, median, and mode, the conclusions can vary, based on readers' interpretations.

Results could also vary depending on what is used as the *average.* In this class, the mean was used for the average; however, the mode or the median could have been used as the average, as well. In that case, the conclusions that would have been drawn would vary greatly. To see the work by Julie Reulbach and her students, go to http://mathreuls.pbworks.com/w/page/37863346/Jeans-SOLVE-IT-The-Woodlawn-School.

We thank Julie Reulbach and students Abbey, A. J., Amelia, Ansley, Ava, Callie, Caroline, Charlotte, Ellen, Elliott, Eliza, Erica, Erin, Halynna, Harrison, Jake, Julian, Kristin, Lexi, Merritt, Matt, Quinn, Rachel, Savannah, and Steven at The Woodlawn School in Davidson, North Carolina, for their submission to this issue's Solve It! problem.

Fig. 1 Various reasons caused students to draw different conclusions about the average number of jeans.

After looking at our findings, we discovered that we had an average of nine pairs of jeans and were about two off from the national average. Our grade has a lot of jeans for a grade of only 28 people. This was very surprising, but now that we think about it, everyone wears jeans. In total, we have 260 pairs of jeans. That is a lot for only 28 people!

(a)

Charlotte, Quinn, Ava, and Lexi

We think that $9.3\overline{3}$ is close to the national average but could be closer. What might have thrown us off was 2 people had 19 pairs and 1 had 20 pairs of jeans.

(b)

Rachel, Abbey, Savannah, and A. J.

Our class average was very close to the national average because jeans are very popular and there are seven days in a week and it makes sense to have a pair of jeans for every day of the week. The factors that added up to this were that one person in our class had 20 pairs of jeans, so that affected our average.

(c)

Erin, Halynna, Elliott, and Steven

We think that a couple of things may have affected this data, such as age and the ratio of boys to girls. We think that since there are more girls than boys, that it made the average higher than if there were more boys than girls.

(d)

Callie, Jake, and Harrison

We think this is because some people are growing and some people aren't. This means that the people that are growing grow out of their jeans faster than the people that are not growing. The people that are not growing would not have as much jeans as the people that are growing. This would be affected by growth spurts. Another idea we had about this is some people go shopping more than other people and while they are shopping they get more clothes, including jeans. On the data we found some evidence of this. All the people that we know that go shopping have the most jeans on our data chart.

(e)

Ellen, Kristin, and Merritt

Our average might be bigger because we live in a pretty good area, so most people will have the money to buy a good amount of jeans. On the other hand, the national record has some people who may have less money to buy jeans, so they will have less calculated in their data.

(f)

Matt, Julian, Eliza, and Caroline

Our class got together trying to think of a reason why this may have happened. We came up with an answer: Because we are kids and wear jeans more often than adults, who would also wear work pants, our average was larger than the national.

(g)

Amelia, Ansley, and Erica