

The Random Person of the Week and Bias towards Faculty

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Many people are concerned that the Random Person of the Week is **biased towards faculty**. Assuming the numbers I generate are random, the process is definitely random, so I evaluated whether I should switch random number generators. I performed a statistical test on my records of Random Persons of the Week and found that the amount of faculty that have been selected as Random Persons of the Week was **not significantly** greater than what was expected. Still, the results raised my concern that the Random Persons of the Week may actually be slightly biased towards faculty. **In the future I will use more random methods to choose the Random Persons of the Week.**

Philosophy Club

MONDAYS at 3:00 in room 2N5 (Ms. Favretti’s room)

1 Picking the Random Person of the Week

I use the student telephone directory with some supplementary pages for faculty and new students, giving me a total of 48 pages. First, I generate a random number from 1 to 48 to select the page number. Next, I generate a random number from 1 to 50 to select the line on the page.

If these numbers correspond to a person,¹ I first contact the person to make sure that he doesn’t mind being Random Person of the Week.² If he doesn’t, I select him to be a future Random Person of the Week, and if he does, I ignore the numbers corresponding to him and generate new numbers.

If they do not correspond to a person, I ignore the numbers and generate new numbers.

2 Bias towards Faculty

For the 2006-07 school year there are approximately **1432 students and 221 faculty members** of Scarsdale High School, which gives a total of about **1653** candidates for Random Person of the Week. Thus, the probability that any particular **person** will be selected on any given week is about $\frac{1}{1653} \approx 0.06\%$, and the probability that a **faculty member** will be selected any particular week is about $(221 \times \frac{1}{1653}) \approx 13.4\%$.

The expected value³ for number of selected faculty members selected for Random Person of the Week would be about $\frac{221}{1653} \times 31 \approx 4$, but **seven** faculty members have already been selected as Random Persons of the Week.⁴ This seems **unusual**, so I performed a hypothesis test⁵ to determine whether the random number generator was actually biased towards faculty.⁶

The probability that at least this many faculty members are chosen randomly assuming that the process is totally random can be

expressed by the *binomial cumulative distribution function*.⁷

$$P(X \geq i) = \sum_{k=i}^n \left(\binom{n}{k} (p)^k (1-p)^{n-k} \right)$$

We substitute in the values for number of faculty members i , number of Random Persons of the Week n and probability of selecting a faculty member assuming the process is random p .

$$P(X \geq 7) = \sum_{k=7}^n \left(\binom{n}{k} \left(\frac{221}{1653} \right)^k \left(\frac{1432}{1653} \right)^{n-k} \right)$$

$$P(X \geq 7) \approx 0.110999$$

There is approximately an **11.1% chance** of picking at least this many faculty members assuming that the process is totally random. While this result is not significant at a standard level of significance of 5% and could have occurred entirely by chance, it does raise concern that the number generation method may biased towards faculty members. This would be understandable as I’ve been using the `randInt()` function on a TI-89 Titanium, which only generates *pseudo*-random numbers.

3 Changes in Random Number Generation Methods

In the future I will use *id Quantique’s Quantis* optical quantum random number generator, which should be truly random, to select Random Persons of the Week.

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4 Acknowledgments

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*Thomas Levine is a philosophy club co-president and runs the French Exchange Club Random Person of the Week.
¹Previous Random Persons of the Week are not excluded from future selections, so a person can theoretically be selected multiple times.
²Of course, I don’t see why anyone would.
³Some students who were selected for Random Person of the Week declined, but they are included in this analysis.
⁴This includes all of the past, present and future Random Persons of the Week who have been picked with the method discussed in section 1. The first two Random Persons of the Week were picked with slightly different methods
⁵A hypothesis test determines how likely the results are to occur by chance assuming that some *null hypothesis* is true. In this case the null hypothesis is that the numbers are random and that, therefore, the probability that a faculty member is selected for Random Person of the Week is $\frac{221}{1653}$.
⁶I did not have the actual numbers saved, so I did not analyze those.
⁷ X stands for number of faculty members randomly selected.