

Probability

3.4 Additive Rule of Probability

1. A paper published in 2008 looked at ethnic, gender, and acculturation influences on sexual behaviors. A total of 1,348 undergraduate students (429 men, 919 women) at a large, public Southwestern university participated in this study for course credit in an introductory psychology course. The sample was composed of 67% Euro-American, 17% Hispanic, and 16% Asian participants. Participants ranged from 18 to 42 years old with a mean age of 19.03 for men (range, 18–32) and 18.79 for women (range, 18–42). As part of the study, men and women were asked, “with how many partners have you had sexual intercourse, or oral sex, in your lifetime?” The results for women are included below:

	Women			
Number of lifetime sexual partners	Euro-American	Hispanic	Asian	Totals
0	92	23	55	170
1	111	31	36	178
2 – 5	253	66	44	363
6 – 10	111	19	9	139
More than 10	49	17	3	69
Totals	616	156	147	919

Use the data to estimate the probability that one randomly selected female undergraduate attending the university was Hispanic or had 2 - 5 sexual partners.

2. Use the same table of data below to estimate the probability that a randomly selected woman has had only 0 or 1 sexual partners in their lifetime.

	Women			
Number of lifetime sexual partners	Euro-American	Hispanic	Asian	Totals
0	92	23	55	170
1	111	31	36	178
2 – 5	253	66	44	363
6 – 10	111	19	9	139
More than 10	49	17	3	69
Totals	616	156	147	919

3. If a single six-sided die is rolled once, what is the probability that an even number is rolled or a number that is divisible by 3?

Answers:

$$1. P(H \cup 2-5) = \frac{156}{919} + \frac{363}{919} - \frac{66}{919} \approx 0.493$$

$$2. P(0 \cup 1) = \frac{170}{919} + \frac{178}{919} \approx 0.379$$

$$3. P(E \cup div3) = \frac{3}{6} + \frac{2}{6} - \frac{1}{6} \approx 0.667$$