Homework 02 - 2.6, 2.8, 2.20, 2.30, 2.38, 2.44

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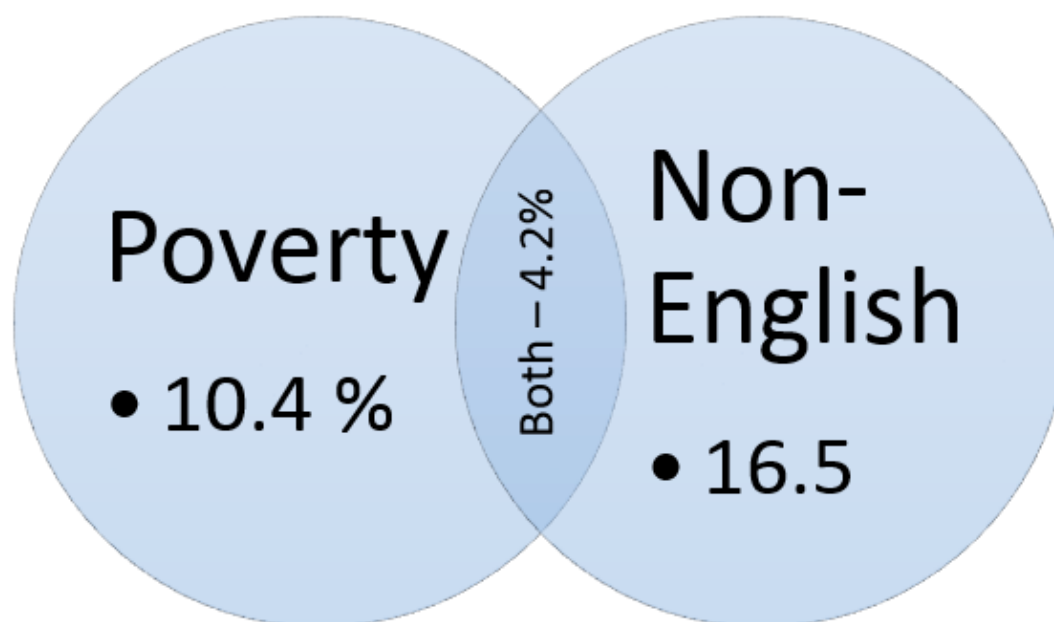

2.6

    a. 0, the lowest sum is 2

    b. 0.1111111

    c. 0.0277778

2.8

    a. The events can occur at the same time, so they are not disjoint.

    b.

    c. 10.4%

    d. 26.9%

    e. 89.6%

    f. 0.030222 does not equal .042, so they are dependent.

2.20

    a. (114 + 108 - 78) / 204 = 0.7058824

b. 78 / 114 = 0.6842105

c. brown male x blue female: 19 / 54 = 0.3518519, green male x blue female: 11 / 36 = 0.3055556

d. P(Fb|Mb) = 78 / 114 = 0.6842105, while P(Fb) = 108 / 204 = 0.5294118, so the events are not independent, and eye color affects partner eye color.

2.30

a. $(28/95) * (59/94) = 0.1849944$

b. $.22((72/95) * (28/94)) + .88((72/95) * (27/94)) = 0.2412363$

c. $(72/95) * (28/95) = 0.2233795$

d. If the sample size is large enough that losing 1 book doesn't largely change the probabilities.

2.38

a.

```
zero <- 0 * .54
one <- 25 * .34
two <- 60 * .12
expected <- zero + one + two
expected
```

```
## [1] 15.7
```

```
z1 <- ((zero - expected) ^ 2) * .54
o1 <- ((one - expected) ^ 2) * .34
t1 <- ((two - expected) ^ 2) * .12
var <- z1 + o1 + t1
var
```

```
## [1] 159.4002
```

```
sd <- sqrt(var)
sd
```

```
## [1] 12.62538
```

b.

```
zero <- 0 * .54 * 120
one <- 25 * .34 * 120
two <- 60 * .12 * 120
expected <- zero + one + two
expected
```

```
## [1] 1884
```

```
z1 <- ((zero - expected) ^ 2) * .54
o1 <- ((one - expected) ^ 2) * .34
t1 <- ((two - expected) ^ 2) * .12
var <- z1 + o1 + t1
var
```

```
## [1] 2295363
```

```
sd <- sqrt(var)
sd
```

```
## [1] 1515.046
```

2.44

   a. it is slightly skewed to the right

   b. 62.2

   c. assuming that everyone in the sample works, 0.25502

   d. 0.29438, I think this value is reasonable, if some females do not work, the percentage that make under
      50k a year would be higher, and this reflects that.