

Workshop Statistics: Discovery with Data, Second Edition

Topic 7: Comparing Distributions II: Categorical Variables

Activity 7-6: Suitability for Politics (*cont.*)

Answers will vary from class to class.

Activity 7-7: Suitability for Politics (*cont.*)

According to the data, about 15% of liberals, 23% of moderates, and 29% of conservatives polled agreed with the statement on suitability for politics. The increase in percentage as we increase the amount of conservatism makes sense from what we know of the general beliefs of liberals, moderates, and conservatives. Therefore, I would say that the more conservative a person is, the more likely they are to agree with the statement.

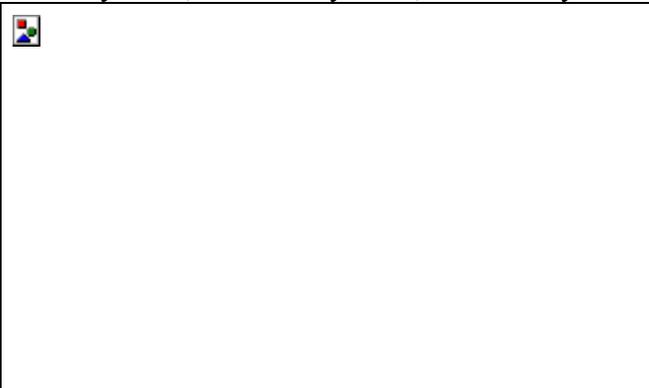
According to the data, about 23% of men, and 23% of women polled agreed with the statement on suitability for politics. Therefore, this data suggests that gender does not play an important role in influencing one's decision regarding the statement.

Activity 7-8: Gender-Stereotypical Toy Advertising

(a) boy shown: 97; girl shown: 86; traditional "boy" toy: 74; traditional "girl" toy: 26; neutral gender toy: 83

(b) male toys: .60; female toys: .02; neutral toys: .37

(c) male toys: .16; female toys: .27; neutral toys: .54



(d)

(e) It would seem that toy advertisers tend to present pictures of boys in advertisements

for traditionally "male" toys, and girls in advertisements for traditionally "female" toys.

Activity 7-9: Gender-Stereotypical Toy Advertising (*cont.*)

- (a) .09
- (b) .88
- (c) .11
- (d) Toy advertisers tend to show girls with traditionally "male" toys when they choose to defy gender stereotypes.

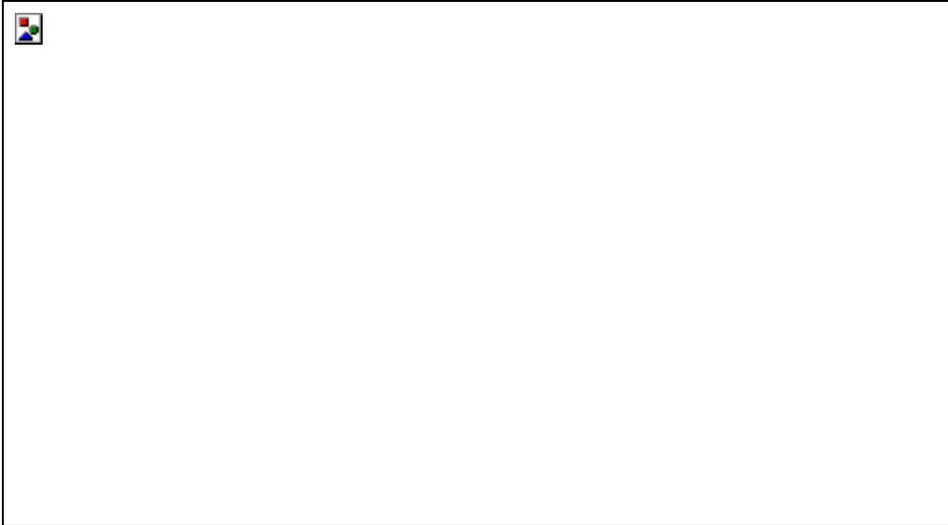
Activity 7-10: Gender of Physicians (*cont.*)

- (a) under 35: .30; 35-44: .22; 45-54: .13; 55-64: .08



- (b)
- (c) The percentage of women physicians decreases with the increase of age. This may be due to previous pressure to start and take care of a family at home.

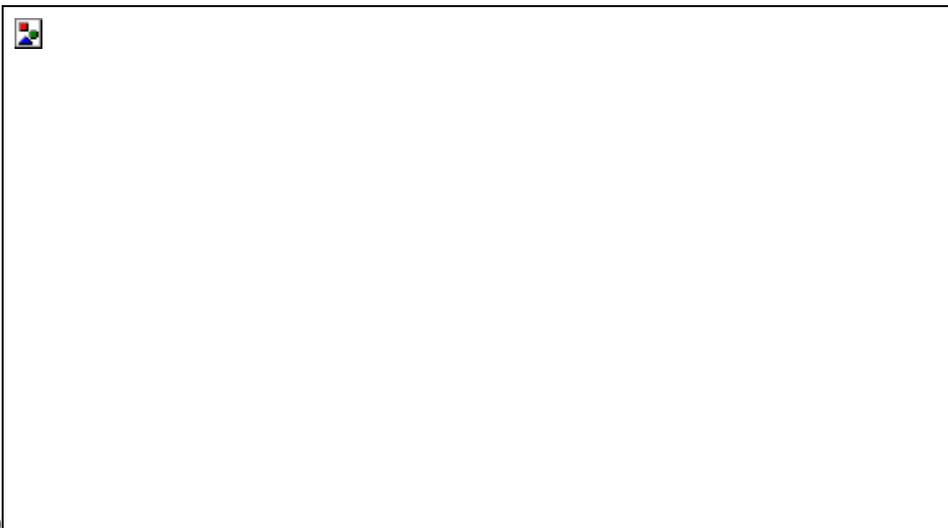
Activity 7-11: Children's Living Arrangements



Of the white children counted, 77% lived with both parents, while 64% of Hispanic children, and only 36% of black children could say the same. Clearly, one can see by looking at the graph that white children are more likely to live with both parents than either black or Hispanic children. However, Hispanic children are more likely to live with both parents than any other living arrangement. Black children, on the other hand, are more likely to live with just the mother.

Activity 7-12: Baldness and Heart Disease

- (a) .67
- (b) .37
- (c) .57



- (d)
- (e) The data suggests that men with less hair may be more likely to have heart disease.
- (f) The relative risk of having heart disease for bald men is 1.23 times greater than men with hair.

Activity 7-13: Driver Safety (*cont.*)

Younger drivers are about 2.57 times as likely to be involved in a fatal crash as older drivers.

Activity 7-14: Gender and Lung Cancer

(a)

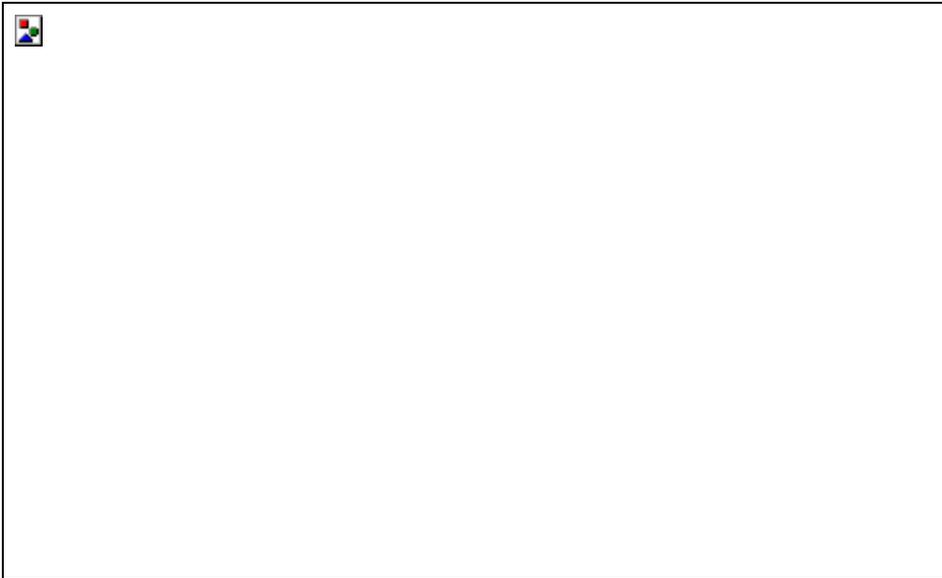
- explanatory: gender
- response: lung cancer

(b) There are some typos in the text. The following table reflects the corrected values.

	men	women	row totals
lung cancer	10	19	29
no lung cancer	531	440	971
column totals	541	459	1000

(c) men: .018; women: .041;

(d)



(e) Women are about 2.3 times as likely to get lung cancer than men.

(f) Women who smoke are more than twice as likely to get lung cancer by the time they are 60 than men with same addiction.

Activity 7-15: Friendly Observers (*cont.*)

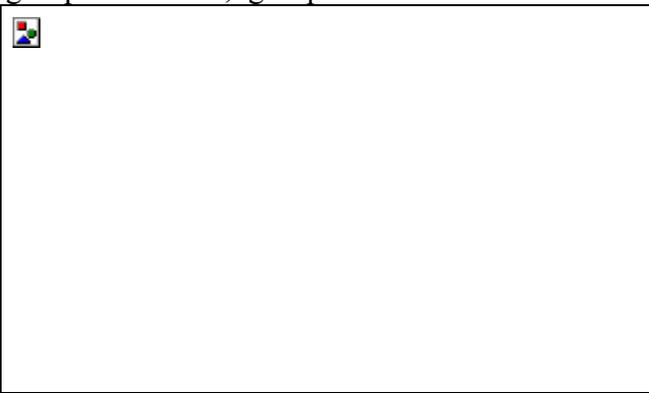
(a)

- explanatory: group A or B
- response: win or lose

(b)

	group A	group B
win	3	8
lose	9	3

(c) group A win: .25; group B win: .72



(d)

(e) The data seem to support the researchers' conjecture that group B would perform better.

Activity 7-16: Top American Films (*cont.*)

(a) Data for students will vary.

	won BP	did not
year 1960	20	28
year \leq 1960	12	40



(b)

According to the data, of those movies that won an Academy Award for Best Picture, the proportion that were produced after 1960 is .62. Of those movies that did not win an Academy Award for Best Picture, the proportion that were produced after 1960 is .41.

Activity 7-17: Penny Thoughts (*cont.*)

Answers will vary from class to class.

Activity 7-18: Lifetime Achievements (*cont.*)

Answers will vary from class to class.

Activity 7-19: Hypothetical Hospital Recovery Rates (*cont.*)

- (a) Overall, a patient is twice as likely to die at hospital A than hospital B.
- (b) Fair condition patients are twice as likely to die at hospital B than hospital A.
- (c) Poor condition patients are about 1.47 times as likely to die at hospital B than hospital A.

Activity 7-20: Graduate Admissions Discrimination

(a)

	admitted	denied	total
men	1195	1486	2681
women	559	1276	1835
total	1754	2762	4516

(b) About 44% of the men were admitted. About 30% of the women were admitted. There is a difference of approximately 14 percentage points in favor of the men. This may indicate that men were given preferential treatment in admissions decisions.

(c)

	proportion of men admitted	proportion of women admitted
program A	.61	.82
program B	.62	.68
program C	.36	.34
program D	.33	.35
program E	.27	.24
program F	.05	.07

(d) No, in fact women have higher rates in most of the programs.

(e) Many more men applied to the programs with higher acceptance rates, whereas most women applied to programs with lower acceptance rates.

Activity 7-21: Softball Batting Averages

Answers will vary from student to student.

Activity 7-22: Employee Dismissals

Answers will vary from student to student.

Activity 7-23: Hypothetical Employee Retention Predictions

(a) .16

(b) .16

(c) no

(d) no

(e) Yes, the employee's action is independent of the test's prediction. The proportions reported in (a) and (b) are identical. Since they represent separate categories of one variable against the other variable, the two variables are said to be independent.

(f) 

(g) 

(h) 

Activity 7-24: Women Senators (*cont.*)

- (a) .09
- (b) .45
- (c) No, it is not fair to say that most Democratic Senators are women because the proportion of Democratic Senators that are women is about .13.
- (d) Yes, it is fair to say that most women Senators are Democrats because the proportion of women Senators that are Democrats is about .66.

Activity 7-25: Politics and Ice Cream

	chocolate	vanilla	strawberry	row total
Democrat	108	96	36	240
Republican	81	72	27	180
Independent	36	32	12	80
column total	225	200	75	500

Activity 7-26: Variables of Personal Interest (*cont.*)

Answers will vary from student to student.