

# **Miniature Bowling: Strikingly Fun!**

## **Miniature Bowling**

One of America's favorite pastimes is bowling. People of every age can enjoy this activity, whether you're bowling on a team, or on a date you can have a great time at the bowling alley. The thrill of getting a strike for the first time is an amazing experience. Recently, I acquired a package that contained miniature bowling supplies, complete with ten tiny pins, and two small green bowling balls. So, I figured if I wanted to compare the bowling scores of boys and girls, rather than bring them to the bowling alley, I would bring the bowling alley to them. I set up a miniature bowling alley in the back of my math classroom, and with real bowling score cards I printed off the internet, I had students ranging from 10<sup>th</sup> to 12<sup>th</sup> grade, and ages 15 thru 18 bowl. I also wanted to see if older students were better than younger ones. This experiment might have turned out differently if I had compared scores of people bowling with their right hand, and then their left hand, but I figured that would take up too much time.

## Data: Females

Gender	Grade	Age	Score
M	11	16	131
M	11	16	133
M	10	15	107
M	10	15	230
M	11	17	110
M	11	16	133
M	12	17	191
M	11	17	108
M	10	16	193
M	11	16	144
M	11	17	160
M	11	17	139
M	12	17	138
M	12	18	125
M	10	15	138
M	10	15	127
M	11	16	142
M	12	18	193
M	10	16	121
M	10	16	117
M	10	15	147
M	10	15	224
M	11	17	111
M	12	17	147
M	12	17	110
M	12	18	191
M	12	18	52
M	12	18	122
M	10	15	132
M	11	17	124

## Data: Males

Gender	Grade	Age	Score
F	11	16	147
F	11	17	169
F	11	16	129
F	11	16	111
F	11	16	87
F	12	17	75
F	12	18	115
F	11	16	151
F	11	16	55
F	11	17	74
F	11	17	111
F	11	16	142
F	12	18	153
F	11	16	168
F	11	16	135
F	11	17	110
F	10	15	132
F	10	16	114
F	10	16	184
F	12	17	57
F	11	17	68
F	11	17	76
F	10	15	193
F	11	16	135
F	11	17	100
F	11	16	169
F	10	17	180
F	10	17	72
F	12	17	194
F	12	18	84

**Step 1**

**Null Hypothesis:** The bowling scores are independent of the age and gender of the students

**Step 2**

**Observed Values:**

	15-16	17-18	
Male	2219	2021	4240
Female	2052	1638	3690
	4271	3659	7930

**Expected Values:**

	15-16	17-18	
Male	$\frac{(4240 \cdot 4271)}{7930} = 2284$	$\frac{(4240 \cdot 3659)}{7930} = 1956$	
Female	$\frac{(3690 \cdot 4271)}{7930} = 1987$	$\frac{(3690 \cdot 3659)}{7930} = 1703$	

**Step 3**

**5% significance level**

**Step 4**

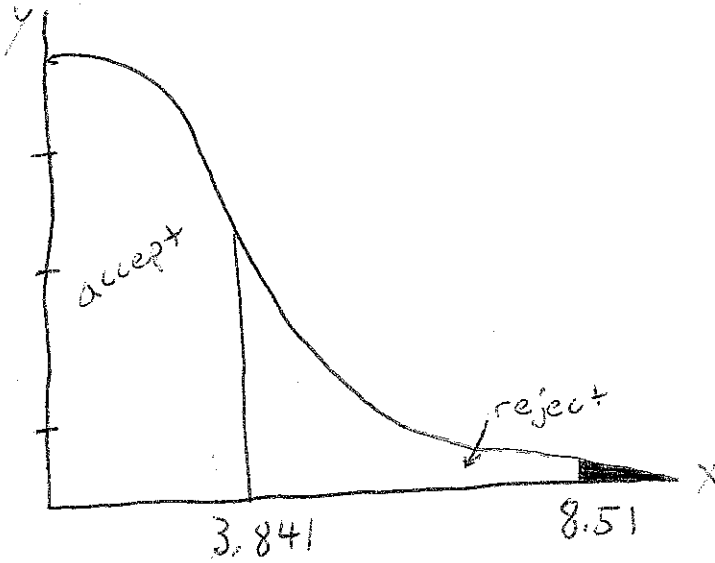
**Critical Value: 2**  
 **$X \geq 3.841$**

**Step 5**

$$X = \frac{(2219-2284)}{2284} + \frac{(2052-1987)}{1987} + \frac{(2021-1956)}{1956} + \frac{(1638-1703)}{1703}$$

$$X = 8.51$$

**Step 6**



### Conclusion

In conclusion, the Null Hypothesis is rejected because the chi-square: 8.51, is greater than the critical value: 3.84, therefore the bowling scores are not independent of age or gender. There appears no data that suggests that boys are better at miniature bowling than girls, or visa versa. The scores varied from person to person because most everyone had different bowling techniques. Some would gently let the ball roll out of their hand and into the pins, others would literally throw the ball underhanded and it would crash violently into the pins. There were also distractions in and around the classroom, such as the construction outside, or the noise level from the students in the room that might have caused a shift in focus among some people while they were bowling. I also had to rush some people because time was running out, and that too may have affected their performance. This experiment, though it was challenging, was still fun and I gained better knowledge through the experience. I tried to aim for something that would be unique and would stand out, and I think got just that.