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Is Voter Turnout Higher In Election Years?

1. Question Statement

One of the greatest rights extended to American citizens is the right to vote. The centerpiece of our successful democracy is each adult citizen's ability to take part in the decision process and elect the leaders we want to represent us. However, not all people exercise this right as often as it is extended to them. The public generally considers presidential election years to be more crucial than other years, but there are important issues that come up in every election. Through this experiment, *I want to see if the percentage of the voting-age population is higher in presidential election years than in normal election years*.

2. Statistical Plan

The Federal Election Commission has collected comprehensive election data for each election since 1960. In order to streamline my data, I chose to examine elections which took place in *even-numbered* years, which includes both presidential election years as well as congressional midterms (in which every single Senator and Representative are elected). The data I collected will appear in the table below (with presidential election years in bold):

Year	Voter Turnout (%)
*1960	63.1
1962	47.3
*1964	61.9
1966	48.4
*1968	60.8
1970	46.6
*1972	55.2
1974	38.2
*1976	53.6
1978	37.2
*1980	52.6
1982	39.8
*1984	53.1
1986	36.4
*1988	50.1
1990	36.5
*1992	55.1
1994	38.8
*1996	49.1
1998	36.4
*2000	51.3
2002	37
*2004	55.3
2006	37.1
*2008	56.8
2010	37.8
*2012	53.6

Based on a few simple calculations, I was able to determine the following quantities.

- The mean of voting-age turnout in **all** elections was 47.74% ($\mu = 47.74$)
- The standard deviation of voting-age turnout in **all** elections was 8.89% ($\sigma = 8.89$)
- There were 14 presidential elections in this period. ($N = 14$)
- Among these 14 elections, the sample mean was 55.114% ($\bar{X} = 55.114$)
- Among these 14 elections, the standard deviation of the sample was 4.26 ($S = 4.26$)

3. Problem Solution

I am testing to see if the turnout is higher in presidential election years than the average turnout for all elections.

Since the sample mean was higher than the overall mean, I will use a **one-tailed** T-Test to see if the difference between the values is statistically significant.

H_0 (Null Hypothesis): The sample mean and total mean are the same.

- $\mu = 47.74$

H_A (Alternative Hypothesis): The sample mean is greater than the total mean.

- $\mu > 47.74$

I will use a confidence level of 5% to be safe ($\alpha = 0.05$)

THE TEST

From my earlier data:

- N = 14
- $\mu = 47.74$
- $\sigma = 8.89$
- X-Bar = 55.114
- S = 4.26

Formula for One-Tailed T-Test: T = (X-Bar – μ) / (S / sqrt{n})

T= (55.114 – 47.74) / (4.26 / sqrt{14})

T= **6.477**

I will analyze this T value of 6.477 on a T Table with n-1= **13 degrees of freedom**

Under these conditions, a T value of 6.477 has a P-Value less than 0.0005

- P<.0005

4. Conclusion

Since the P-Value (<.0005) is significantly lower than the accepted α value of 0.05, we can safely reject the null hypothesis under a 95% significant level.

In other words, we can conclude that the American public shows up to vote more often in presidential election years than they do in a normal election year. This is a troubling statistic, as it shows that Americans take Congressional elections far less seriously than presidential elections, although both are equally important to government policy. Hopefully this disparity will be addressed in the near future.