# Discussion Forum Response

Word Count: 398

1. Errors in the Hypotheses  
The hypotheses stated as H₀: P̂ > 0.20 and Hₐ: P̂ ≥ 0.25 are incorrect because hypotheses must be formulated about the population parameter (p), not the sample statistic (P̂). Furthermore, the null hypothesis (H₀) must involve equality ( =, ≥, or ≤), while the alternative hypothesis (Hₐ) should involve strict inequality (≠, >, or <). A corrected form would be:  
- H₀: p = 0.20  
- Hₐ: p > 0.20  
  
2. Issue with the Statement  
The statement “If the p-value is small, we reject the null hypothesis and accept the alternative hypothesis” is misleading. Although a small p-value leads us to reject the null hypothesis, it does not mean we absolutely accept the alternative. We simply conclude that there is sufficient evidence to support the alternative hypothesis (Navidi & Monk, 2019).  
  
3. Research Question and Hypothesis Testing  
Research Question: "Do individuals aged 50–70 tend to vote for the government more than individuals aged 20–40?"  
- Population Parameter: The proportion (p₁) of voters aged 50–70 and the proportion (p₂) of voters aged 20–40 who vote for the government.  
- Statistics: Sample proportions (P̂₁ and P̂₂) from the two age groups.  
- Hypotheses:  
 - H₀: p₁ = p₂ (no difference in proportions)  
 - Hₐ: p₁ > p₂ (proportion is greater in the 50–70 age group)  
  
To collect data, I would randomly sample registered voters within the two age groups, administering a survey asking if they voted for the government. I would conduct a two-proportion z-test at a 5% significance level. If the resulting p-value is less than 0.05, I would reject H₀ and conclude that the 50–70 age group is more likely to vote for the government compared to the 20–40 age group.  
  
4. Margin of Error and Sample Size  
To decrease the margin of error and achieve a more precise confidence interval, we must increase the sample size. A larger sample size reduces variability, leading to a narrower and more accurate confidence interval (Navidi & Monk, 2019). For instance, surveying 1,000 people instead of 100 would decrease the margin of error and strengthen the reliability of the conclusions.  
  
References  
Navidi, W., & Monk, B. (2019). Elementary statistics (3rd ed.). McGraw-Hill Education.