使用正確的說法陳述統計檢定的結果

在敘述檢定結果時，應使用拒絕(reject)或不拒絕(do not reject，fail to reject)虛無假設這樣的講法，而不說拒絕(reject)或接受(accept)虛無假設。原因是不拒絕只是代表從樣本中沒有足夠的證據顯示虛無假設是錯的，但這未必代表虛無假設是對的! (講接受意謂認定該虛無假設是對的)

好有一比: 在法院判決時，為何判被告是 guilty 或 not guilty，而不講 guilty 或 innocent 呢? 因為 not guilty 未必表示該被告是 innocent，只是代表檢察官沒有找到足夠的證據證明該被告有罪

參考以下說明:

- Warpole, 6ed, p.320

***reject* H_0** in favor of H_1 because of sufficient evidence in the data or ***fail to reject* H_0** because of insufficient evidence in the data.

Note that the *conclusions do not involve a formal and literal "accept* H_0*."* The statement of H_0 often represents the "status quo" in opposition to the new idea, conjecture, and so on, stated in H_1, while failure to reject H_0 represents the proper conclusion. In our binomial example, the practical issue may be a concern that the historical defective probability of 0.10 no longer is true. Indeed, the conjecture may be that p exceeds 0.10. We may then state

$$H_0\colon\ p = 0.10,$$
$$H_1\colon\ p > 0.10.$$

Now 12 defective items out of 100 does not refute $p = 0.10$, so the conclusion is "fail to reject H_0." However, if the data produce 20 out of 100 defective items, then the conclusion is "reject H_0" in favor of H_1: $p > 0.10$.

Though the applications of hypothesis testing are quite abundant in scientific and engineering work, perhaps the best illustration for a novice lies in the predicament encountered in a jury trial. The null and alternative hypotheses are

$$H_0\text{: defendant is innocent,}$$
$$H_1\text{: defendant is guilty.}$$

The indictment comes because of suspicion of guilt. The hypothesis H_0 (the status quo) stands in opposition to H_1 and is maintained unless H_1 is supported by evidence "beyond a reasonable doubt." However, "failure to reject H_0" in this case does not imply innocence, but merely that the evidence was insufficient to convict. So the jury does not necessarily *accept* H_0 but *fails to reject* H_0.

以下說明取自另外兩本書，意思相同，如英文閱讀不造成困難可以讀一讀！

- Gujarati, p.506

A Word about Accepting or Rejecting a Null Hypothesis In this book we have used the terminology "reject" or "do not reject" a null hypothesis rather than "reject" or "accept" a hypothesis. This is in the same spirit as a jury verdict in a court trial that says whether a defendant is guilty or not guilty rather than guilty or innocent. The fact that a person is not found guilty does not necessarily mean that he or she is innocent. Similarly, the fact that we do not reject a null hypothesis does not necessarily mean that the hypothesis is true, because another null hypothesis may be equally compatible with the data. For our P/E example, for instance, from Eq. (D.7) it is obvious any value of μ_X between 19.57 and 26.93 would be an "acceptable" hypothesis.

- Hill, p.712

> **WARNING:** Care must be taken here in interpreting the outcome of a statistical test. One of the basic precepts of hypothesis testing is that finding a sample value of the test statistic in the nonrejection region does not make the null hypothesis true! Suppose another null hypothesis is $H_0: \mu = c^*$, where c^* is "close" to c. If we fail to reject the hypothesis $\mu = c$, then we will likely fail to reject the hypothesis that $\mu = c^*$. In the example above, at the $\alpha = 0.05$ level, we fail to reject the hypothesis that μ is 17, 16.8, 17.2, or 17.3. In fact, in any problem there are many hypotheses that we would fail to reject, but that does not make any of them true. The weaker statements "we do not reject the null hypothesis" or "we fail to reject the null hypothesis" do not send a misleading message.

- 總而言之

「無法拒絕虛無假設」未必代表「虛無假設是對的」
只是代表目前的資料「沒有足夠的證據推翻虛無假設」

就好像

「無罪」未必代表「被告沒犯那個罪」(或「被告是無辜的」)
只是代表目前的證據「不足以將該被告定罪」

因此，當 p-value> α 時:

要講「無法拒絕虛無假設」，而不可講「接受虛無假設」