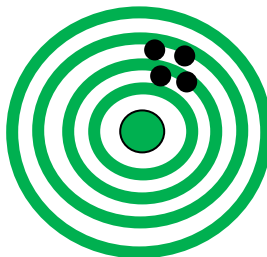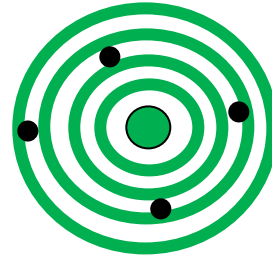# *Tip #17   Precise vs. Insufficient Explanation*

Precision and accuracy differ slightly in concepts. The <u>precision</u> of a measurement system, also called reproducibility or repeatability, is the degree to which repeated measurements under unchanged conditions show the same results. In the fields of science, engineering, industry, and statistics, the <u>accuracy</u> of a measurement system is the degree of closeness of measurements of a quantity to that quantity's actual (true) value.
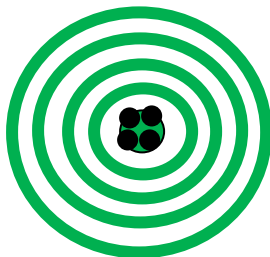
high precision high accuracy	high precision low accuracy	low precision low accuracy

When the raw data is available, be sure to be accurate and precise in presenting the data, especially in sentence form. Stating your interpretation of a result, for example, and its significance "to you" begs the reader to believe you. However, since the writer has the burden to "prove" the significance or truth of a statement and since the reader has no responsibility to "merely believe the writer (speaker)", provide the raw data (or its important, relevant elements when previously stated in more detail) and use the logic of the language that proves the statement's "significance" or "truth".

As a side note, try using raw data in your presentation slides, and interpret the relevance and significance of that data in your oral presentation.

Adjectives（形容詞）and adverbs（副詞）are probably the most subjective parts of speech in English. What may be "good" to one person, may be "bad" to another; what may be "cold" to one person, may be "warm" to another. The solution is simple: writers should define their terms precisely for better understanding. Even if readers disagree with the writer's definition of words, readers can usually evaluate the writer's conclusions based on the writer's definitions, and then perhaps rebut the argument by proving that the terms were "imprecisely" defined.

Insufficient Explanation → Specific, Precise

1.   ORIGINAL

> *But, in <u>many cases</u>, the reflecting force feedback is <u>very difficult</u> to acquire.*

1. REVISED: insufficient explanation

QUESTIONS

Q1: How many is "many"?

Q2: What % of the cases does "many" represent?

Q3: How difficult is "very difficult?

Q4: Why is it so difficult to acquire?

2. ORIGINAL

> *I used the Routh criterion on the system admittance function to acquire a stable area of two parameters.*

2. REVISED: insufficient explanation

QUESTIONS

Q1: What options did the writer have in addition to the "Routh criterion"?

Q2: Why did you choose this particular criterion?

Q3: How did the writer choose this criterion?

3. ORIGINAL

> *The patient's temperature dropped greatly.*

Did the temperature drop
- from 39.9^0C to 33.5^0C? ↓ 6.4^0C
- from 38.6^0C to 36.0^0C? ↓ 2.6^0C
- from 36.0^0C to 34.8^0C? ↓ 1.2^0C

Be precise and specific for better writing!

3. REVISED: insufficient explanation

QUESTIONS

Q1: How greatly is "greatly"?

adult human body temperature ranges

extremely high	40^0C or more
very high	38.6-39.9^0C
high	37.6-38.5^0C
normal	36.0-37.5^0C
low	35.0-35.9^0C
very low	33.1-34.9^0C
extremely low	33^0C or less

Notice how more specific and precise the sentence becomes.

> *The patient's temperature dropped greatly from 38.6^0C to 36.0^0C overnight.*
>
> (include time frame)
>
> *The patient's temperature dropped greatly from 38.6^0C to 36.0^0C as a result of the antibiotics.*
>
> (include cause)
>
> *The patient's temperature dropped greatly from 38.6^0C to 36.0^0C overnight as a result of the antibiotics.*
>
> (include time frame + cause)

4.   ORIGINAL

> *The <u>influenza pandemic</u> had a <u>big impact</u> on the <u>society</u>.*

4. REVISED: include more relevant information

> QUESTIONS
> _____
>
> Q1: Which "influenza pandemic"?
>   *flu pandemic of 1918*
>
> Q2: How big is "big"?   (scale)
>   *one-third of the world's population*
>
> Q3: Was the impact positive or negative?
>   *negative: 50-100M deaths*

> *The flu pandemic of 1918 infected one-third of the world's population and caused some 50-100M deaths from January 1918 until December 1920.*

5.   ORIGINAL

> *Some other NPOs are working in the Niiharu area.*

5. REVISED: include more relevant information

> *<u>Five</u> other NPOs are working <u>within 5 kilometers</u> of the Niiharu <u>Satoyama Park area</u>.*

6.   ORIGINAL

> *Doctors can make <u>more accurate diagnoses</u>.*

6. REVISED: states the importance

> *Doctors can make more accurate diagnoses, <u>leading to a better quality of life for patients</u>.*

7.   ORIGINAL

> *We want to contribute to Japanese patients and hospitals.*

7. REVISED: proper cause-effect relationships

> *We want to contribute to <u>more accurate diagnosis for</u> Japanese patients and to <u>more efficient management</u> for hospitals.*

8. ORIGINAL

> *Starting in the mid-1950s <u>after the Second World War</u>, rapid economic development and land abandonment has caused a decline in secondary nature (Suzuki, 2001).*

8. REVISED: more relevant example

> *Starting in the mid-1950s <u>at the time of the Korean War</u>, rapid economic development and land abandonment has caused a decline in secondary nature (Suzuki, 2001).*

9. ORIGINAL

> *There are relic plants, which survived from the Ice age period, and they are rare to be found in Kanto region.*   (21 words)
>
> awkward wording: weak subject
> needlessly wordy

9. REVISED: reference for better understanding

> *Relic plants that survived the Ice Age <u>some 20,000 years ago</u> are rare, yet found in the Kanto region.*   (19 words)
>
> more precise wording

10. ORIGINAL

> *By the use of aerial photographs taken in 1947, 1975 and 2008, vegetation maps for each period are created through ArcGIS.*
>   (21 words)
>
> awkward wording
> needlessly wordy

10. REVISED

> *Vegetation maps for each period are created by ArcGIS using aerial photographs taken in 1947, 1975, and 2008.*
>   (18 words)
>
> more precise wording

11. ORIGINAL

> *The main research methodologies adopted include a literature review of documents and project reports and in-depth interviews with 16 farmers randomly selected, both <u>males</u> and <u>females</u> in LMIS, as well as <u>local government officials</u>, <u>managers</u> and <u>staff</u> of LMIS, and <u>Japanese experts</u> .*
>
> <u>LMIS</u>: Lower Moshi Irrigation Scheme in the Kilimanjaro region in Tanzania

11. REVISED: provide raw data

> *The main research methodologies adopted include a literature review of documents and project reports and in-depth interviews with 16 farmers randomly selected, both males <u>(8)</u> and females <u>(8)</u> in LMIS, as well as local government officials <u>(12)</u>, managers <u>(5)</u> and staff (4) of LMIS, and Japanese experts <u>(2)</u>.*

12. ORIGINAL

> *The X-49 is a very large semiconductor chip that costs a lot of money. It is much more powerful than its predecessor, the X-45.*
>
> Q1: How large is "large"?
> Q2: How much money is "a lot of money"?
> Q3: What is the power of the X-49 chip?
> Q4: What is (was) was the power of the X-45 chip?

12. REVISED: be specific and precise

> **QUESTIONS**
>
> Q1: How large is "large"?
> **Chip with 1,000 sockets made by InTold**
>
> Q2: How much money is "a lot of money"?
> **$10,250 per unit to manufacture**
>
> Q3: What is the power of the X-49 chip?
> **Unknown: considered "2X" in value**
>
> Q4: What is the power of the X-45 chip?
> **Unknown: considered "X" in value**
>
> **Assumption: when the power of something is doubled (increased by 100%), this is considered to be "much more" power**

> *The X-49 is an InTold 1000-socketed chip that costs $10,250 per unit to manufacture. It is twice as powerful as its predecessor, the X-45.*

13. ORIGINAL

> *Increasing the temperature of the water caused a significant change in the reaction time.*
>
> Q1: Increase temperature by how much?
> Q2: How much is significant?
> Q3: Why is the change amount considered to be "significant"; that is, what criteria were used to determine significance?

13. REVISED: be specific and precise

> **QUESTIONS**
>
> Q1: Increase temperature by how much?
> **by 3°C**
>
> Q2: How much is significant?
> **to halve= reaction time cut by 50%**
>
> Q3: Why is the change amount considered to be "significant"; that is, what criteria were used to determine significance?
>
> **Assumption: a "-50%" change is often considered to be a significant amount in almost any relationship**
>
> *Significance =* **improving performance by 22.4%**

Notice how a restatement of your hypothesis this point helps that much more to communicate the relevance (significance) to the reader.

Increasing water temperature by 3°C halved reaction time, improving performance by 22.4%, and proving our hypothesis that increasing water temperature will cause improved resin performance.