

Section 4. Results as an IMRD component

Unit 2. Results: Grammar peculiarities

Today we are going to talk about Grammar peculiarities of the Results section.

This unit will cover three language areas which are important in the Results: Sequence, Frequency, Quantity and Causality.

First, let's consider **Sequence**.

Authors must be very precise in describing the order and timing of what they did and what they discovered so that other researchers could accurately reproduce their studies and compare their results with those in the paper. The time sequence indicates how long each step took and at what point in the sequence the events occurred. However, it does not provide information about how long each event lasted, how quickly the next event occurred, or where in the sequence it occurred. A clear understanding of the chronology helps us, readers, visualize it and repeat it themselves. But apart from "Then" or "Next" there are other ways to establish the sequence.

I would like you to find examples of how the Sequence is expressed in the model. Now, when you are back, let's count the instances of the Sequence in the given model. Did you identify them all?

Words and **phrases that convey order** can be categorized into eight groups:

1) The first group contains words or phrases that refer to *events that occur before starting the experiment/simulation* or observing the results.-

"It was already clear beforehand that lowering the temperature was the desired result."

2) The second group indicates *the beginning of the experiment/simulation* or the first results to be described.

"As expected, the temperature was stable at the beginning."

3) The third group contains words/phrases that convey *the order of events*, but give no information about chronology.

“The temperature rose to 49°C and then dropped to 30°C.” In this case, after the temperature reached 49°C, the temperature drop could have happened quickly or it could have taken a long time. This word only tells the reader the order in which these events happened.

4) The fourth group is used to convey that there was a (very) *short period of time* between two events.

“The temperature rose to 49°C, but soon dropped to 30°C.”

5) The fifth group reports that *the time between events was long* or that the events occurred near the end of the sequence.

“The temperature rose to 49 °C and later dropped to 30 °C.”

6) The sixth group is very useful and important. It contains words and phrases used to convey that *events happened at the same time*, about the same time, or during the same time period. Elements are sometimes used to convey possible causal relationships between events.

“When the pressure was lowered, the temperature dropped sharply.”

7) The seventh group marks *the end of the series of events*.

“There was a noticeable drop in temperature at the end.”

8) The last group refers to *events that occurred after the experiment/simulation was finished* or after the results were observed.

“There was a noticeable temperature drop at the end, but this was afterwards omitted from the input data.”

On the screen you can see a group of words. Try to categorise them into 8 groups presented below. Continue watching to check yourself. Great! We are moving on. The keys are on the screen. You may need to pause the video again to compare your answers with the ones on the screen.

Let's now consider **Frequency**.

It's important for writers to clearly communicate the number of times a particular event or outcome has occurred.

If they get a certain result every time they run a test, that's a very reliable result. If this problem occurs occasionally while running the test, the results will be unreliable.

This time, try to find the examples of how the Frequency is expressed in the model. Now, check if you have identified the same instances: "Consistently", "consistent with", "not consistent with", "were in line with", "generally", "there were instances". Great, let's move on!

Here, you can observe language frequencies arranged in descending order starting from 100% frequency (on every occasion) and decreasing to zero frequency (never). However, it should be noted that frequency language is often used subjectively. If something is described as occurring frequently, it may be in relation to how often it was expected to occur. For example, if previous research suggested that a particular result was unlikely to occur at all, but in this study it is found on as many as 18% of occasions, it may be considered a frequent occurrence. Conversely, if previous research indicated that something is highly likely to occur, but in this study it is found on only 57% of occasions, it may be viewed as relatively rare. While frequency terms have an objective meaning, they can also be used subjectively.

To feel how these words affect the meaning, let's consider some examples:

1. If the alloy composition always includes a high percentage of nickel, you will observe it in the sample today.
2. If the alloy generally exhibits good tensile strength, you expect to find it in the specimen today, and you will be surprised if it is not present.
3. If the alloy regularly demonstrates excellent corrosion resistance, you will probably find it in the material today.

4. If the alloy often displays superior conductivity, there is a good chance that you may find it in the sample today.
5. If the alloy is known to have greater hardness more often than not, you should start by examining the material for it, but it may not be there today.
6. If the alloy demonstrates equal chances of being malleable or brittle, you may find it in the sample today – or you may not. It's impossible to predict because the chances are equal; it exhibits malleability as often as it does brittleness.
7. If the alloy sometimes shows exceptional heat resistance, perhaps you will find it in the material today (but you won't be surprised if it isn't there).
8. If the alloy occasionally possesses magnetic properties, it might be present in the sample today, but it's unlikely.
9. If the alloy rarely exhibits high corrosion resistance, it probably won't be present in the material today (so don't bother to look for it).
10. If the alloy hardly ever demonstrates good conductivity, do not expect to see it today.
11. If the alloy never shows resistance to oxidation, it won't show it today as well.

So, now I think everything is clear with Frequency. Let's move on to **Quantity**. The words that writers use to describe their results have as much power as the tables and graphs themselves, perhaps even more. If commenting the line graph on the screen the writer denotes "*As can be seen in the graph, the two curves are very similar*", the reader will focus on the **similarity** between the curves, and they will therefore seem similar. However, if he writes "*As can be seen in the graph, the two curves are noticeably different*", the reader will focus on the **difference** between them, and the curves will therefore seem different.

Your turn. Try to find the instances of quantity in the model and continue watching to check yourself. Have you found the same instances? And we are moving on!

So, results do not speak for themselves. Consider this sentence: “As can be seen in Fig. 1, the effect occurred in 23% of cases. It does not add anything to us.” However, this sentence can communicate this result as a **strong** one by adding “*as many as*”. “As can be seen in Fig. 1, the effect occurred in as many as 23% of cases.” Or, it can communicate this result as a **weak** one by adding “*only*”. “As can be seen in Fig. 1, the effect occurred in only 23% of cases.”

Results can be interpreted in two ways:

Way 1: by using the language of Frequency.

“The effect was seen frequently” – if you believe that 23% of occasions is evidence of a high level of frequency. Or “The effect was seen occasionally” – if you believe that 23% of occasions is evidence of a low level of frequency.

Way 2: by using the language of Quantity: to replace numbers “many” or to comment on numbers “as many as 45”.

“The effect was seen many times (23%).” or “The effect was seen in as many as 23% of cases.”

These words can be categorized into 5 groups:

1. The first group includes words or phrases which make *the size/quantity look big*: A considerable amount of residue remained in the pipe.
2. The second group includes words or phrases which make *the size/quantity look small*: “Barely 23% of the residue remained in the pipe.”
3. The words in the third group are used *to emphasize how big/small/high/low the size/ quantity is*: “The amount that remained was even higher/even lower than predicted.”

4. The words of the fourth group *communicate that the size/quantity is similar/close to another*: “Almost all/Almost half of the residue remained in the pipe.”
5. The words in the fifth group are used to say *something about the quantity* but when writers do not want to commit themselves to an interpretation of how big or small it was: “Some of the residue remained in the pipe.”

Here you can see the Quantity words. Now I would like you to try to categorize them into the five groups we have identified. Continue watching to check yourself. Now that you are back – look at the keys and compare your ideas with the answers. So, you can find this table in the additional material to this lesson. And now we continue.

The last but not the least is Causality. It indicates the relationships or connections between the events observed. Try to find the instances of Causality in our model. Back to me? Check yourself. Great! And we are moving on!

Some verbs/phrases in the list below communicate a clear/strong causal connection (cause, produce, be due to). Some refer to a partial cause (be a factor in, contribute to), some refer to the initial or first cause in a causal chain (originate in, initiate). There are also verbs and phrases in the list which communicate a weak causal connection (be related to, link). Sometimes writers may not even be certain that the connection between them is definitely a causal connection (accompany/(be) accompanied, associate/(be) associated, connect/(be) connected, relate/(be) related, link/(be) linked) – come in handy.

Uncertainty can also be expressed through phrases like the ones you can see on your screen “For instance”, “It appears that”, “It seems that” and so on. To express uncertainty scientists sometimes use a frequency qualifier: X often caused Y. Or a quantity qualifier: X caused Y in many cases. Or a modal verb: X may have caused Y.

To sum up, you have learnt that results do not speak for themselves and that's why Results are always commented on. Also, results can be made to look/sound strong or weak. Uncertainty can be expressed to make the writer sound scientifically diplomatic. So, in this lesson we discussed the ways to express: Sequence, Frequency, Quantity and Causality.

To sum up, in this lesson we discussed the ways to express Sequence, Frequency, Quantity and Causality. Now you know that Sequence accurately describes the order and timing of events. Furthermore you have learnt 8 groups of words/phrases that convey different aspects of sequence. We also found that Frequency communicates how often events occur. So, in the research a certain result is always a reliable result. Quantity is what influences the interpretation of results, because words can make quantities seem big, small or similar. And finally, Causality is the relationships or connections between the events observed. This is what can make the results look/sound strong or weak. And uncertainty can be expressed to make the writer sound scientifically diplomatic. Buy for today. See you in the next video on Vocabulary features of the Results Section.