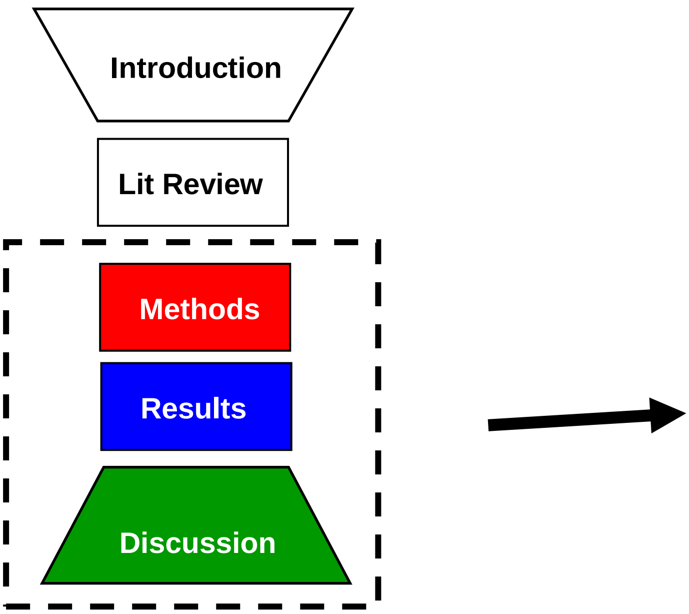
Results-Discussion Chapters

All research is driven by **results** that are obtained and evaluated using **methods** specific to that field of science. However, the emphasis given to these methods can differ according to the field and its **purpose** for carrying out that research. For example, **Explanatory Science (ES)** aims to describe **how** and **why** a certain phenomenon works in the real world. To explain these phenomena, ES seeks to create theories that can be experimentally confirmed by producing consistent results that support the hypothesis. Thus, the validity of ES theories is based on the principle of **replicability** (i.e., the ability to reproduce the same results when using the same methods). In ES, this has led to an emphasis on detailed description of the methods used.

In contrast, **Design Science** (e.g., engineering) focuses on creating new solutions to human needs and verifying that these will work with sufficient reliability. Thus, verification by ***numerical*, *experimental* and *analytical* methods** are key to developing and evaluating these solutions in engineering, whereas finding similar results when using **the same methods** (i.e., *replication* of findings) is of less importance in design sciences.

Therefore, it is not surprising that these differences are most clearly seen in the reporting of *what* was found (*results*), *how* these results were produced (*methods*), and what is their significance in terms of work done by earlier researchers (*Discussion*). In Figures 1 and 2, note how explanatory research, because of its emphasis on replication of methods and results, typically requires separate *methods*, *results* and *discussion* chapters, while these same elements are usually combined in engineering research to form a single chapter.



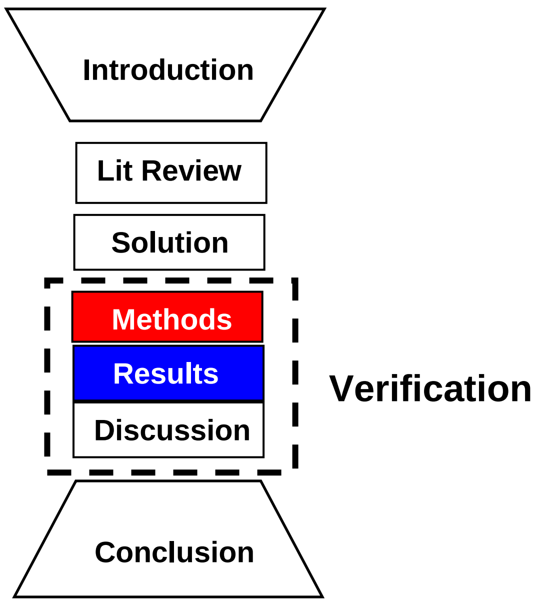
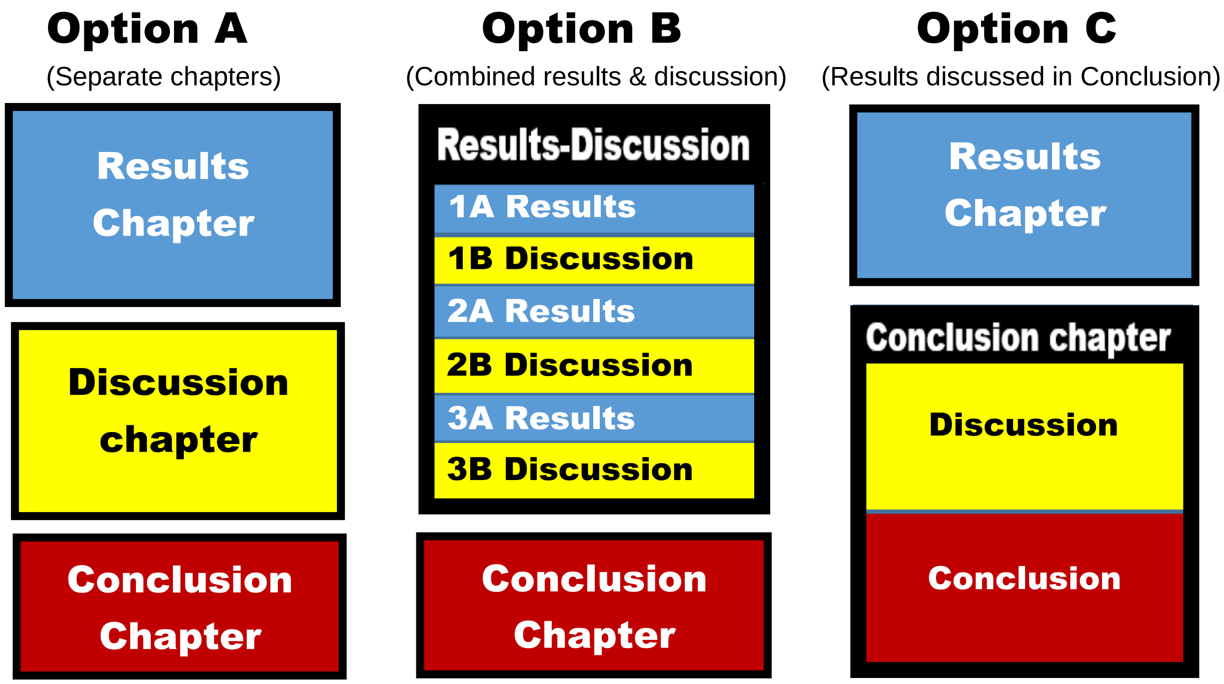


Figure 1. IMRaD research structure typical of *explanatory science* fields (Swales & Feak 1994)

Figure 2. Characteristic structure of theses in *design sciences* for the development of solutions

1. Organization

Depending on the writer's engineering field and type of research, three strategies can be used to organize and combine **results**, **comments** on the results (i.e., discussion) and **conclusions** drawn from the entire thesis:



Option A The thesis evaluates the solution/contribution in separate **"Results", "Discussion"** and **"Conclusion"** chapters.

Option B The results are presented and discussed in a single chapter, often referred to as a **"Results and Discussion"** chapter. It is this second strategy that is more commonly used in engineering for presenting results, often with titles such as *"Experimental Results"*, *"Validation of…",* or *"Simulation Results".*

Option C The results are presented in a separate **"Results"**chapter, and the *comments* about these results (if there is any commentary) are combined with the *achievements*, *limitations* and *recommendations for future work* into a separate **"Conclusion"** chapter.

An **eight-move structure** was proposed by Swales (1990) to describe the *Results and Discussion* sections in research articles. However, this model was based primarily on research fields in the Explanatory Sciences (i.e., biology, medicine and linguistics). Therefore, it was not deemed adequate for describing the structure of the Results-Discussion chapters in Design Sciences, since engineers rarely rely on the findings of earlier researchers to justify and support their own results. Instead, we shall use a modified version of this model (Figure 3) for describing the structure and content of results-discussion sections written by engineering students.

Move 1: Background

This is a free-standing move that can emerge at any point in the cycle, though it typically occurs at the beginning of a cycle introducing a set of results.

Step 1: Methods

The writer briefly (re)states the **purpose**, **methods**, **experimental design and setup**.

Step 2: Theory

The writer briefly (re)states the **theoretical background** or other **technical details**.

Move 2: Presenting Results

Step 1: Data location

In this step, the writer directs the reader to the **location of a figure or table** containing the data that will be discussed in that particular part of the results section. Although this move is compulsory, it may sometimes be only minimally signaled by a *parenthetical reference* to a figure or table, e.g., *"(Fig. 5)"* or *"…, as shown in Figure 5, …"*

Step 2: Stating Results

This is an obligatory move and forms the starting point for a recurrent cycling of Move 2 and Move 3. Here, the writer points out specific results, or more importantly **trends** in the results, to be discussed and commented on.

Move 3: Discussion of Results

In order to evaluate the results, the writer must compare them to results from external sources. In engineering, this can take two forms:

Step 1A: Comparison to previous research

This step, compulsory in **explanatory science**, involves comparing the writer's results to the results presented by earlier researchers. If the results are consistent or agree with those of other researchers, comparison provides important support for the writer. Conversely, unexpected results require **explanation (Step 2).**

AND / OR

Step 1B: Comparison for Verification/Validation

This step is typical in engineering research, where testing or validation plays a vital role in evaluating the results. This is achieved by comparing the results to reference data from simulations, theoretical models or actual measurements.

Step 2: Explanation

This step is common when the writer suggests possible reasons for **unexpected results**: results that either differ from those of earlier studies (**Move 3-1A)** or differ from related reference results (**Move 3-1B)**.

Step 3: Making Claims

Here, the writer makes a claim deduced/concluded from the results (i.e., spoken English: *"what we think this means is that…"*) and is usually signaled by epistemic verbs, such as ***demonstrate***, ***indicate***, ***show***, ***suggest*** and ***imply***.

Step 4: Corrective Actions

In this step, the writer suggests changes that might **correct**/**improve** the results.

Figure 3. Three-move structure for thesis results-discussion sections (adapted from Swales & Feak 1990).

Move 1: Background

Move 1-1: Methods

Although this move can begin a results section by describing **theoretical background** or other technical details, it is far more common to state the **methods**, including the *purpose*, *experimental design* and *setup* used to carry out measurements. Therefore, this section will focus only on the language features for describing methods.

Tense and voice in Methods

A section or chapter presenting methods should answer the question *"How did you carry out your work?"* by describing and justifying your choice of *materials*, *tools*, *procedures*, *measurements* and *methodological approach* (e.g., case study). Since these activities have already occurred before the writing of the thesis, it is not surprising that most fields of science, especially the natural sciences, use the **past tense** to report these activities. However, check the writing conventions in your own field in order to confirm this, since some engineering fields, such as *electrical engineering*, may use the **present tense** to describe these past actions taken to arrive at their results.

In addition to tense, some fields may allow the writer to introduce their methods using the **personal pronouns** "**WE**" or "**I**". However, this is generally avoided, since it weakens the **objectivity** valued in science by putting un-needed focus on a *subjective* human agent. It is for this reason that the **passive voice** is so common in methods sections. The main exception to this avoidance of a human agent is seen in statements **justifying methodological choices**. Note below in Figure 4 how the writers justify their choices by first describing a complicating **problem** as the **reason** (signaled through the use of cause-effect connectors ***"Therefore"*** and ***"since"***) before describing their response to overcome the problem.

> For even moderately-sized networks with tens of nodes, it is **extremely difficult** to analytically model the interactions between all the nodes. **THEREFORE,** **WE** used the network simulator in [17] to evaluate LEACH and compare it to other protocols.
>
> **SINCE** the dependence of signal strength on orientation creates **a challenge** for location estimation**,** **WE** analyze how well the empirical method would perform if orientation were not an issue.
>
> Because this parameter space has a rather high dimension, the gradient descent optimization can get stuck in local minima. **IN ORDER TO avoid this,** **I** incorporate a relaxation technique into **MY** optimization.

Figure 4. Examples showing the use of "we" and "I" to justify methodological choices in *research articles*.

However, unlike research papers, which are usually written by more than one person, masters' theses must be the product of independent thought and therefore can never be written by more than a single author. In order to avoid the use of "**I**" or "**WE**", use an ***inanimate research subject*** (e.g., **"this thesis/ study/ work"**) or the ***passive voice***.

THEREFORE, this thesis **used** the network simulator in [17] to evaluate LEACH and compare it to other protocols.

SINCE …, the empirical method **was analyzed** to determine its ability to perform if orientation were not an issue.

In order to **avoid this,** a relaxation technique **was incorporated** into our optimization.

Figure 5. Improved versions of the methodological statements presented in Fig. 4, which use *inanimate objects* or the *passive voice* to avoid the personal pronouns "we" and "I".

Language patterns

As already discussed in Appendix 3, the two most important sentence patterns used for discussing methods are *results-means* and *means-purpose*:

The analytical results **were** verifi**ed** **using** FEM simulation. **[Result-Means]**

FEM simulation **was** us**ed** **to verify** the analytical results. **[Means-Purpose]**

How to express "Means"?

One function that is fundamental to all description of methods is expressing **"how"** the researchers was able to carry out their research in that particular way. This **how**, also known as the **"means"** (Finnish: *keinot*), forms an important element in methodological statements and is used to describe the **procedures**, **tools**, **equipment**, and **materials** used to implement a process. A preliminary analysis of IEEE journals based on the number of "hits" using Google Scholar revealed that the following twelve prepositional structures were used to signal the ***actions*** or ***tools*** used in describing methods (Pennington and McAnsh, 2006). The results are listed in descending order of frequency (Table 1).

Table 1. Relative frequency of twelve strategies for expressing "means" in IEEE research articles

[RESULT(S)**]**	was / were is / are	obtained measured prepared	**using** + [TOOL] / [PROCEDURE]	**42%**
			by + [ACTION] / [PROCEDURE]	**34%**
			with + [TOOL]	**13%**
			by using + [TOOL]	**3%**
			through + [ACTION]	**2%**
			via + [PROCEDURE]	**2%**
			on + [TOOL]	**1.5%**
			by means of + [PROCEDURE]	**1%**
			through the use of + [TOOL]	**> 1%**
			by the use of + [TOOL]	**> 1%**
			with the aid / help of + [TOOL]	**> 1%**
			with the use of + [TOOL]	**> 1%**

As can be seen from the table, the twelve prepositions can be divided into **three groups** based on whether the *means* is a **tool**, an **action** or a **procedure**. Accounting for more than three-quarters of all use of the prepositions, the two most common strategies for expressing *means* are "**using**" and "**by**", which are used with **tools** and **actions**, respectively. However, in addition to serving these two functions, both of these prepositions can also show some overlap in their use in describing **procedures**.

USING + [TOOL 90%] / [PROCEDURE 10%]

TOOL:

Tools include *devices, machinery, software* and other *equipment* needed to carry out research.

> The electrical properties of the capacitors **were measured** **using** a **Hewlett-Packarad impedance analyzer** in the range of (100 Hz–4 MHz).
>
> The layout **was designed** **using** the **Symbad CAD tool**.

PROCEDURE:

Procedures include *methods, processes, techniques* and other *approaches* used to reach the research goal.

> Thin-film Ta2N resistors **have been developed and deposited** on polyimide flex **using** a **horizontal batch process** [1].
>
> Intracellular RF DNA **was isolated** from several TCR transformants **using** the **boiling method of Jones and Hu** (2002).

BY + [ACTION 81%] / [PROCEDURE 19%]

ACTION:

The **preposition "by"** is the second most common preposition used to introduce the *means*. When used to express actions, *by* most often occurs with the gerund (-*ing*) form of a verb, though other nominalized (noun) forms can also occur.

> High dielectric constant composites **may be obtained** **by** increas**ing** the ceramic content in the polymer matrix.
>
> The silylated powders **were washed** in ethyl alcohol **by** repeated **centrifugation**.

PROCEDURE:

The **preposition "by"** can also be used to introduce the *methods, processes, techniques* and other *procedures* used to reach the research goal.

> The samples **were measured** **by** the guarded heat flow meter **method**.
>
> The patterns of Cu traces **were formed** **by** **photolithography** of etch resist.

WITH + [TOOL]

Tools can include *devices, machinery, tools, instruments* and other *materials* and *equipment* needed to successfully carry out research.

> Thermal conductivity **was measured** **with** the **TCA-200 thermal conductance tester** from Holometrix Micromet (Metrisa Company).

BY USING + [TOOL]

Similar to the preposition **"with"**, **"by using"** can also be used to introduce tools used to implement a procedure, including *devices, machinery, tools, instruments* and other *equipment*.

> The Mars descent module will deliver the rover to a specific location **by using** an **inflatable braking device or parachute system.**

THROUGH + [ACTION]

Unlike the preposition **"by"**, **"though"** cannot be used with **gerund** (*-ing*) forms but rather with **noun phrases** describing a procedure.

> This is possible **by** introduc**ing** a local 3-D model. (gerund)
>
> This is possible **through** **the** introduc**tion** **of** a local 3-D model. (noun phrases)

VIA + [PROCEDURE]

"Via" differs from the prepositions **"by"** and **"though"** in that it cannot be used with *actions* but is used instead to introduce **"procedures"**.

> Carbon fiber materials produced **via** **catalytic decomposition** of hydrocarbon vapors have also recently been reported to exhibit exceptionally high hydrogen adsorption capacity [15].

ON + [TOOL]

Tools can include *devices, machinery, tools, instruments* and *equipment* needed for research.

> The motion model **was implemented** on a **laptop computer**.

BY MEANS OF + [PROCEDURE]

"By means of" is more formal than **"through"** or **"via"**.

> Quantization of this problem **is accomplished** **by means of** the **finite element procedure**.

THROUGH THE USE OF + [TOOL]
BY THE USE OF + [TOOL]
WITH THE AID/HELP OF + [TOOL]
WITH THE USE OF + [TOOL]

Although less commonly used, these expressions can also introduce the **tools** or **equipment**.

> Semiconductor nanoparticle size **can be controlled** **through the use of** **particle-capping techniques** (Smith 2003).
>
> Significant savings **can be achieved** **by the use of** **open-source software**.
>
> A far higher resolution **can be achieved** **with the aid of** **electron microscopy**.
>
> Data reading **can be achieved** **with the use of** **a low-power cw laser**.

Move 2: Presenting Results

Move 2-1: Data location

In engineering, the most important means for communicating numerical results are ***figures*** and **tables**. Therefore, it is important that before describing the trends seen in your results that you point your reader to the ***location*** where the data is represented in graphical form.

Many data commentary sections in Results-Discussion chapters begin with a sentence containing a **location** element and a brief **summary**, as shown in Table 1. Location elements refer readers to important information in a ***table*** or other ***figure***.

Table 2. Starting a Data Commentary (Adapted from *Swales and Feak 1994*)

Location (active verbs)	**Summary** (the ***topic*** or ***content***)
a. **Table 5** shows	the final recognition results for the proposed method.
b. **Table 2** provides	a comparison between the various algorithms.
c. **Figure 4** gives	the simulation results for this system.
d. **Figure 2** plots	the flux and torque linkage trajectory.

Summary (a ***result*** or ***claim*** arising from the data)	**Location** (passive verbs)
a. The final recognition results	are shown in **Table 5**.
b. A comparison between the various algorithms	is provided in **Table 2**.
c. Simulation results for this system	are given in **Figure 4.2**.
d. The flux and torque linkage trajectory	is plotted in **Figure 2**.

As shown in Table 2, location elements are characterized by two language features. First, like other types of metalanguage, location elements are always expressed in the ***present tense***. Second, both the **active** and **passive** forms are appropriate in English. However, a number of languages, including Finnish, Estonian and Korean, find it unnatural to say that an **inanimate agent** (e.g., a *table or figure*) could *reveal*, *present* or *suggest* something:

Taulukossa 2 kuvataan *uusiutuvan energian käytön kehittyminen sähköntuotannossa Suomessa viime vuosina.*

~~**In Table 2 is described** the recent development of renewable energy use in the electricity production of Finland.~~

Table 2 describes the recent development of renewable energy use in the electricity production of Finland.

Ken Hyland (2000) used a corpus of 80,000 words comprising 80 research articles from biology, physics, electrical engineering, mechanical engineering, marketing, applied linguistics, sociology, and philosophy to determine which verbs are most frequently used in full sentences to refer to *figures* and *tables*. Table 3 shows the results of his analysis. All of the verbs in this table were in the ***active voice*** and ***present tense***.

Table 3. Active Verbs in Reference to a Visual (reported in *Swales & Feak 1994*)

	Reference to **Figure**	Reference to **Table**	Total
shows	**31**	15	46
presents	6	**7**	13
illustrates	**7**	3	10
summarizes	2	**4**	6
demonstrates	2	3	5
contains	0	**5**	5
provides	0	**3**	3
depicts	**2**	0	2
lists	0	2	2
reports	0	2	2
Total			94

The same study examined verbs in the passive voice used to refer to figures and tables. The results are given in Table 4.

Table 4. Passive Verbs in References to a Visual (reported in Swales & Feak 1994)

	Reference to **Figure**	Reference to **Table**	Total
shown in	21	23	44
illustrated in	**29**	5	34
presented in	2	**10**	12
given in	2	**4**	6
listed in	0	**6**	6
seen in	**3**	1	4
provided in	1	**3**	4
summarized in	1	**3**	4
seen from	3	0	3
Total			117

Examine a research article in your field of study, and underline all of the verbs used in the sentences that refer to **tables**, **figures**, or **illustrations**. How do the results in Tables 3 and 4 compare with the verbs used to refer to figures and tables in your own field?

Move 2-2: Stating Results

After introducing the **location** of the results in a figure or table, it is easy to identify when the writer is describing results, since these are most commonly described by using the **past tense**. Apart from using tense to signal that you are talking about your own results, several structural strategies are also available to you as a writer. A common strategy used in engineering for is to use the **dummy "it"** subject together with the passive form of verbs having the meaning of **"find"** or **"see"**.

DUMMY "it" (Past tense)

It was	**found** (74%) **observed** (16%)	**that**…

DUMMY "it" (can be)

It can be	**seen** (74%) **observed** (16%) **noted** (5%) **concluded** (2%) **inferred** (2%) **discerned** (1%)	**from**	Figure 1 Table 1	**that**…

From Figure 1, **it can be seen that**…

Linking *AS*-clauses

In addition to *Dummy "it"*, one of the most common methods is to use linking ***as*-clauses**. Note how the same examples in Table 6 can easily be changed into linking *as*-clauses:

> ***As shown in Table 5,*** the recognition rate increased with an increase in window size.
>
> The amount of polystyrene formed was strongly dependent on the amount of adsorbed surfactant***, as clearly illustrated in Fig. 4.***

These linking clauses (where ***as*** ≠ *since* or *because)* are exceptional in English grammar because they have **no subject**. A common mistake is to use an *active* rather than the correct *passive* form without a subject.

> **As ~~Figure 4 shows~~,** simulation results agree well with theoretical calculations.
>
> **As ~~It is~~ shown in Figure 4,** simulation results agree well with theoretical calculations.
>
> **As Ø shown in Figure 4,** simulation results agree well with theoretical calculations.

Seven **verbs** are most commonly associated with linking *as*-clauses:

As	**shown** (91%) **seen** (8%)	**in**	Figure 1, … Table 1, …
As can be	**seen** (95%) **observed** (4%) **noted** (1%)	**in**	Figure 1, … Table 1, …
As can be	**seen** (91%) **observed** (6%) **inferred** (1%) **noted** (1%) **concluded** **discerned**	**from**	Figure 1, … Table 1, …

The partitive “of”

When reporting numerical results, novice writers often simply **“label”** the results using the verb to **“to be”** similar to an **equal sign (=)**. Unfortunately, this moves the focus of the sentence away from the real topic by putting **new information** into subject position: the variable that was measured (e.g., *thickness*). To avoid this overuse of the verb “***to be***”, use the **partitive “of”** to report **numerical results**.

The **thickness** of the copper cladding on both sides of the dielectric **was** **35 mm**. (The text is not about “thickness”!)

The **copper cladding** on both sides of the dielectric **had** **a** **thickness** **of** **35 mm**. (The text is about “copper cladding” or “the dielectric”!)

Move 3: Discussion of results

In order to validate the results of your study, you need to evaluate them by **comparing** your results against some either already existing values, such as results from *earlier studies* (**Move 3-1A**), or against *reference values*, such as measurements from a real system or a simulation (**Move 3-1B**). If the results are unexpected (i.e., do not match *earlier results* or *reference values*), the writer needs to provide an **explanation (Move 3-2)** for why the outcome/results deviate.

Figure 6 shows an example where both Moves 3-1A and 3-1B can be seen in the **“expected” outcomes** reported by the authors. In sentence 3, the authors validate their experimental results through comparison with theoretical values that shows the **similarity** between these two sets of data (Move 3-1B). This validation is then further strengthened in sentence 4 by comparing and showing the similarity of this finding to that of an earlier study (Move 3-1A). Note that the authors in Fig. 6 do not need any separate **Stating Results (Move 2-2)**, since the result is already implicitly understood in Move 3.

T. Ang, G. Reed, A. Vonsovici, A. Evans, P. Routley, and M. Josey “Effects of grating heights on highly efficient unibond SOI waveguide grating couplers” IEEE Photonics Technology Letters, vol. 12, no. 1, pp. 59–61, 2000.

Move 1-1 — [1]**Using** perturbation theory **developed by Chang [8]**, **we** have predicted the output efficiencies of our grating couplers,

Move 2-1 — as shown in Fig. 3 (continuous curve). [2]Also in Fig. 3, the measured output efficiencies of our samples (Table I) are represented by the data points.

Move 3-1B — [3]**It can be seen from Fig. 3 that** the experimental data **are close to the theoretical curve**, and hence **it can be deduced that** the theory **agrees well with** the measured values, even for the case of a deep grating and a large refractive index difference dielectric material, such as SOI.

Move 3-1A — [4]This outcome **agrees well with Chang’s simulation results [8]** and **confirms the claim made by Chang that** the perturbation theory gives sufficient accuracy to the output efficiency calculations which are comparable to the exact theory **[8]**.

Figure 6. Excerpt from the results section of a research article from electrical engineering showing **“expected” results** that are validated by comparison to both reference results (Sen. 3) as well as results from an earlier study (sen. 4).

In contrast to Fig. 6, Figure 7 shows from the same research article that **"unexpected" results** (sentences 6 and 8) demand an **explanation** (sentence 9).

Move 2-1 | **Move 1-1** | **Move 2-1** | **Move 3-1B** | **Move 3-2**

[1]The experimental setup **is shown in Fig. 9**. [2]The antenna was glued to a holder and attached to a 6-degrees-of-freedom positioning stage. [3]It was then aligned and inserted into a metal waveguide using a positioning stage. [4]An open ended waveguide (OEWG) probe was used to sample the far field. [5]The vertical (E-plane) and horizontal (H-plane) cuts **are shown in Figs. 10–15** together with the simulation data. [6]The simulated radiation patterns of the OEWG probes **differ from the calculated radiation patterns in [21]** by a factor of 1.5 for E plane radiation pattern and factor of 0.75 for H plane radiation pattern. [7]**The figures show that** the measurement results **correspond well with** the simulation results. [8]**However,** at frequencies 280 and 310 GHz, **the discrepancy between the measured and simulated data** is higher. [9]This **can be explained by** the quality of the tip of the antenna and asymmetry.

Figure 7. Excerpt from the results section of a research article from electrical engineering showing **"unexpected"** results and their explanation.

Move 3-1A/ 1B: Comparison to other results

A major function in the Results-Discussion sections of research articles is the comparison of the writer's own results with those of other researchers. **Similar** results can help support or corroborate the writer's claims, whereas **different** (unexpected) findings require **explanation** *(See Move 3-2)*. The following **adjectives** and **verbs** are typically used to compare results:

(A) Similar Results

An important way to prove the validity of your results or claims is to gain support by from similar results found by other researchers.

ADJECTIVES

These results are This result is	**consistent with** **comparable to** **compatible with** **equivalent to** **identical to** **lower/greater than** **in agreement with** **in accord with** **in line with** **similar to**	**those** **that**	reported described documented	previously for [SAMPLE] by [RESEARCHER]

VERBS

This	value result finding observation outcome trend	**agrees** well **with** **accords with** **coincides with** **concurs with** **conforms with** **corresponds to** **compares** favourably **with**	that those	observed found noted seen	*in* [sample] by [researcher] *for* [area] by [researcher]

These data	**match** **parallel** **confirm** **corroborate** **support** **substantiate** **strengthen** **validate** **verify**	the **findings** of **those** of	[RESEARCHER] [SIMULATION]

(B) Different results

The work of other researchers can also be cited in order to contrast it with one's own results. In this case, it is usually considered necessary to give a reason for this **discrepancy** *(See Move 3-2 below)*.

ADJECTIVES

This value is	**dissimilar** to **contrary** to **in contrast** to **inconsistent** with	that	presented established reported	earlier for [SAMPLE] by [RESEARCHER]

VERBS

This value This result	**differs from** **contrasts with** **conflicts with** **contradicts**	that	presented established found reported	previously for [SAMPLE] by [RESEARCHER]

Move 3-2: Explanation

Unexpected results always require an explanation of the possible reasons for why they may have happened. For this purpose, science has developed specific language, as shown below in Figure 8.

This	**finding** **result** **discrepancy** **difference**	can could may might	be **explained by**… be **attributed to**… be **due to**…	[reason]
		most likely could have may have might have	**resulted from**… been **caused by**… been **due to**…	

One **explanation** for	this finding this result	could might	be… be that…	[reason]

Figure 8. Typical language used to explain unexpected results, errors and other discrepancies.

Move 3-3: Making Claims

Note that the examples of **location elements** presented earlier in Table 2 only provided **general summaries** of a table/figure, since they only summarize either the ***content*** or the ***topic*** area. We have been told nothing yet about *what* the *results* might be, *what* differences were found between the algorithms, *what* trends were evident from the *trajectory,* or *what* the results of the simulation were. In order to focus on **individual results** or to **interpret** what the results mean (i.e., make a ***"claim"***), the writer would need to follow the verb with the conjunction ***that***, as in the following.

Table 5. Using *that*-clauses to introduce claims and interpretations drawn from data presented in figures and tables. (Swales & Feak 1994)

Location (active verbs)		**Interpretation / Claims**
a. **Table 5 shows**	**that**	the recognition rate increases with an increase in window size.
b. **Table 2 illustrates**	**that**	the honeybee algorithm can perform consistently better than the other algorithms as system diversity increases.
c. **Figure 4 suggests**	**that**	the simulation accuracy could be still improved.
d. **Figure 2 confirms**	**that**	the low bandwidth modulation schemes do not suffer from additional outage degradation due to second-order PMD.

Note that the above sentences using *that*-clauses (Table 5) differ from those introduced earlier (Table 2) in that these *that*-clauses cannot easily be changed into the passive voice. The choice of verb used is also important in order to show the strength of your claim. For this purpose, science uses **epistemic verbs** to indicate the degree of *certainty*, or *strength*, of your claim:

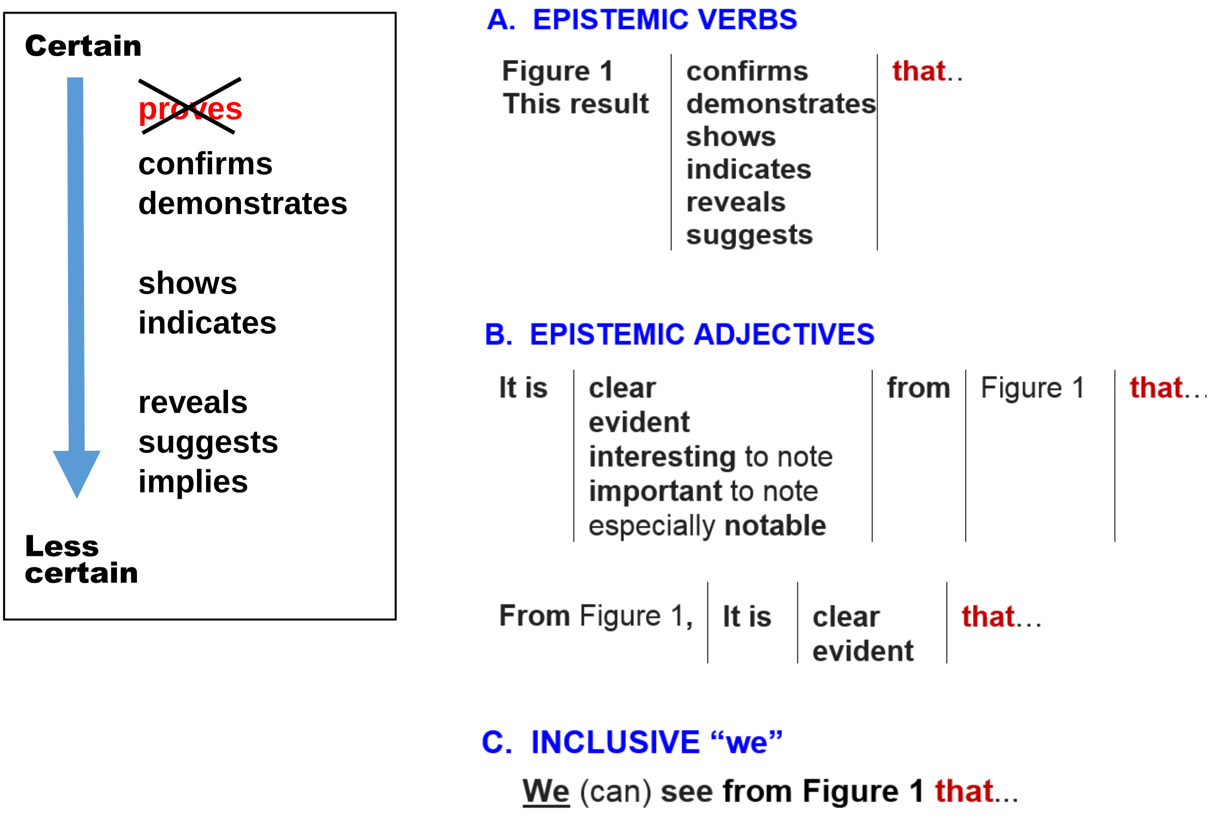


Figure 9. Common structures used together with *that*-clauses to introduce claims and interpretations drawn from results presented in figures and tables.

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