

# **Section 3. Methodology as an IMRD component**

Unit 2. Methodology: Grammar peculiarities

# Outline

- Passive Voice and Tenses
- Use of «a» and «the»
- Adverbs and their location

# **Voice and Tenses**

# Which tense is used? Why?

## Changes in the chemistry of alloys in the sites of Norilsk

### Methodology

- 1.** The current investigation involved sampling and analysing six sites to measure changes in the properties of new alloys. **2.** The sites were selected from the Norilsk area, which is located in the north of Russia and has been frequently used to distinguish the composition of different alloys.<sup>2,3,4</sup>
- 3.** A total of 18 samples was collected and then analysed for their physical and chemical properties. **4.** Samples 1–9 were collected in thoroughly-rinsed 25 ml brown glass bottles which were filled to the top and then sealed tightly to prevent contamination.
- 5.** The filled bottles were shipped directly to two separate laboratories at MISIS University, where they were analysed using standard methods suitably miniaturised to handle small quantities of alloy material.<sup>5</sup>
- 6.** Samples 10–18 were prepared in our laboratory using a revised version of the smelting method established by the NNN Institute in France.<sup>6</sup> **7.** This method obtains the desired alloy through the combination of different metals; the resulting alloy can be cooled and stored easily. **8.** The samples were subsequently shipped to NNN for analysis by X-ray diffraction (XRD). **9.** All tubing used was stainless steel, and although two samples were at risk of oxidation as a result of brief contact with air, variation among samples was negligible.

# The instances of the Passive Voice in the model

## Changes in the chemistry of alloys in the sites of Norilsk

### Methodology

**1.** The current investigation involved sampling and analysing six sites to measure changes in the properties of new alloys. **2.** The sites **were selected** from the Norilsk area, which **is located** in the north of Russia and **has been** frequently **used** to distinguish the composition of different alloys.<sup>2,3,4</sup>

**3.** A total of 18 samples **was collected** and then analysed for their physical and chemical properties. **4.** Samples 1–9 **were collected** in thoroughly-rinsed 25 ml brown glass bottles which **were filled** to the top and then **sealed** tightly to prevent contamination.

**5.** The filled bottles **were shipped** directly to two separate laboratories at MISIS University, where they **were analysed** using standard methods suitably miniaturised to handle small quantities of alloy material.<sup>5</sup>

**6.** Samples 10–18 **were prepared** in our laboratory using a revised version of the smelting method established by the NNN Institute in France.<sup>6</sup> **7.** This method obtains the desired alloy through the combination of different metals; the resulting alloy **can be cooled and stored** easily. **8.** The samples **were** subsequently **shipped** to NNN for analysis by X-ray diffraction (XRD). **9.** All tubing used was stainless steel, and although two samples were at risk of oxidation as a result of brief contact with air, variation among samples was negligible.

Why Past Simple  
Passive?

# What is the difference?

**A.** A flexible section is inserted in the pipe.



**Present Simple Passive**  
= standard procedure

**B.** A flexible section was inserted in the pipe.



**Past Simple Passive**  
= what the writer did

# Passive Voice

Passive Voice = *agentless*

How can a reader identify the writer's contribution?

**Tenses make difference!**

## What was the writer's innovation?

Two metal samples **are** placed in the alloy furnace. A heating element is then activated by an electric current, and the temperature **is** controlled to obtain the desired melting point. The molten metal **is** poured into a mold and allowed to solidify. The resulting alloy **is** extracted from the mold and cooled to room temperature. The composition of the alloy is confirmed using spectroscopic analysis. The alloy **was** subjected to X-ray diffraction to determine its crystal structure. The resulting diffraction pattern **was** compared to a database of known crystal structures to identify the alloy.

## What was the writer's innovation?

Two metal samples **are** placed in the alloy furnace. A heating element is then activated by an electric current, and the temperature **is** controlled to obtain the desired melting point. The molten metal **is** poured into a mold and allowed to solidify. The resulting alloy **is** extracted from the mold and cooled to room temperature. The composition of the alloy is confirmed using spectroscopic analysis. The alloy **was** subjected to **X-ray diffraction to determine its crystal structure**. The resulting diffraction pattern **was** compared to a database of known crystal structures to identify the alloy.



**X-ray diffraction!**

## Example

*Samples for gas analysis were collected using the method described by Brown (1999), which uses a suction tube.*

# Whose procedure?

## How to differentiate?

1. By adding phrases like:
  - *In this study*, the samples were collected using a suction tube.
  - *In our experiments* the samples were collected using a suction tube.
2. By identifying the procedure used by other researchers with careful references at the appropriate place in the sentence:
  - *In Brown (1999)* the samples were collected using a suction tube.

## Why three tenses in one sentence?

The sites were selected from the Norilsk area,  
which is located in the north of Russia and has been  
frequently used to distinguish the composition  
of different alloys.<sup>2,3,4</sup>

# Why three tenses in one sentence?

The sites **were selected** from the Norilsk area, which **is located** in the north of Russia and **has been** frequently **used** to distinguish the composition of different alloys.<sup>2,3,4</sup>

# Why three tenses in one sentence?

The sites **were selected** from the Norilsk area, which is located in the north of Russia and has been frequently used to distinguish the composition of different alloys.<sup>2,3,4</sup>

**were selected** (*Past Simple*) = the writer did this

# Why three tenses in one sentence?

The sites were selected from the Norilsk area, which is located in the north of Russia and has been frequently used to distinguish the composition of different alloys.<sup>2,3,4</sup>

is located (*Present Simple*) = fact

# Why three tenses in one sentence?

The sites were selected from the Norilsk area, which is located in the north of Russia and has been frequently used to distinguish the composition of different alloys.<sup>2,3,4</sup>

has been frequently used (*Present Perfect*) = still relevant (this site was used and is used for research)

# Articles

# Articles (determiners)

Singular countable nouns need a determiner

# What is a *countable* noun?

table

desk

bottle

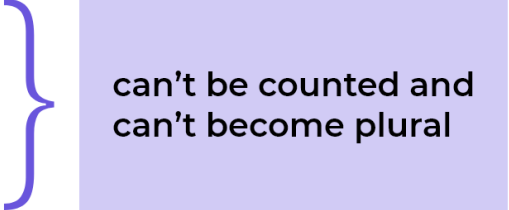
furnace



can be counted and  
can become plural

# What is an *uncountable* noun?

- liquids (water)
- materials (iron)
- abstract notions  
(death, industry)



can't be counted and  
can't become plural

# What is an *uncountable* noun?

But!

There have been three **deaths** this year from pneumonia.

Many **industries** rely on fossil fuels.

Some **steels** are used in the manufacture of medical instruments.

If used in general → uncountable

If something particular/types → countable

# The definite article «the»

**The** = only one possible referent

We removed **the** softest layer of membrane.

Government policy is committed to protecting **the** environment.

**The** sun's altitude is used to determine latitude.

## The article «a»

- it doesn't matter
- you don't know
- the reader doesn't know which thing/person is being referred to

## The article «a»

- A. A 35 ml brown glass bottle was used to store the liquid.



It doesn't matter which 35 ml brown glass bottle was used

- B. It works on the same principle as a combustion engine.



It doesn't matter which combustion engine

# How can «a» or «the» change the meaning?

- A. This effect may hide **a** connection between the two.



Potential connection, not visible

- B. This effect may hide **the** connection between the two.



Definite connection, obscured by effect

## One more try

- A. The nodes should be attached to  $\emptyset$  two adjacent receptor sites.



Many receptors, adjacent pairs effective

- B. The nodes should be attached to **the** two adjacent receptor sites.



Only two receptor sites

# Adverbs

# Ambiguous meaning

*Look at that dog with one eye.*



using one eye = have a quick look

having one eye = a dog with one eye only

# Ambiguous meaning

*He gave a lecture about liver cancer  
at the hospital last January.*

Was the lecture in the hospital —  
or the cancer?



Did the lecture refer to cancer cases  
occurring in January?

Did the lecture itself occur in January?

# Way out?

1. Adverb relates to whole sentence (e.g. *clearly, last January, as a result*)



**place at sentence start**

*Last January he gave a lecture about liver cancer at the hospital.*

# Way out?

2. If ambiguity remains



**break sentence into units  
with individual adverbs**

*Last January he gave a lecture at the hospital;  
his subject was liver cancer.*

# Summary

- Tenses make difference
- Articles «a» or «the» can change the meaning
- Adverbs can confuse