

# Daily Vocabulary and Grammar Learning (13 Dec 2023)-Part 1

In this note, I will comprehensively analyze a scientific research paper, dissecting each section from its inception to its conclusion. This discussion will encompass a variety of elements, including basic grammatical structures, tense application, diverse sentence structures, academic vocabulary, phrases, and the effective use of linking words.

Additionally, I will demonstrate proper grammatical structure, coherence, and cohesion throughout. Let's embark on this exploration of academic writing based on a scientific research paper.

**Title:** QUANTITATIVE FLOW CHARACTERISTICS FOR SIDE-BY-SIDE SQUARE CYLINDERS VIA PIV

Published in 2012 by EDP Science

## Abstract

Vocabulary	Part of speech	Type of verb	Meaning	Synonyms	Collocation	Example
Instantaneous ( <b>in.stə'n</b> <b>'teɪ.ni.əs</b> )	Instant (n) Instant (n) Instantaneous (adj) Instantaneously (Adv) Instantly (adv)		Happening immediately, without any delay	Immediate, Instant	<b>Adverb</b> nearly instantaneous almost instantaneous virtually instantaneous  <b>Noun</b> Instantaneous result	The new technology provides nearly instantaneous results. With the upgraded internet connection, downloads are nearly instantaneous. The response from the system is nearly instantaneous, improving efficiency. Advances in communication allow for nearly instantaneous transmission of information.
Downstream ( <b>daʊn'stri:m</b> )	Downstream (Adj) Downstream (adv)		Used to describe something that happens later in a process or series			

of events	Lower, further along, following, subsequently, afterwards	move downstream flow downstream Downstream effects Downstream processing	The pollution affected not only the immediate area but also downstream. The company is involved in both upstream and downstream activities in the production process. The decision had downstream consequences for the entire project.			
Immerse (ɪ'mɜ:rs)	immensely (adv) immensity (n) immerse (v) immersion (n)	Immerse (v1) Immersed (v2) Immersed (v3) Immersing (g)	To become completely involved in something	Submerge, dip, dunk, saturate, involve deeply, engross, absorb	Immerse in a new culture Immerse in water Immerse in a project Fully immerse	She decided to immerse the vegetables in cold water to keep them fresh. To learn a new language effectively, it's beneficial to immerse yourself in conversations with native speakers.

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## Grammar Associated with Abstract Section

### **Present Simple**

#### **Active Form:**

Structure:

Sub + v1 + Obj

Examples:

1.

#### Examples from paper:

1. Depending on the gap spacing between two SCs, the interaction results of time-averaged vorticity, velocity vector, Reynolds stress correlations and streamline patterns in the wake region **form** a distinguished flow structure.

#### **Passive Form:**

Structure:

Obj or Action + am/is/are + v3 + (by + Sub) [optional]

Examples:

1.

#### Examples from paper:

1. Strouhal numbers for the single square cylinder for  $1050 < Re < 3400$  **are found** in the range of 0.12 - 0.13.

### **Past Simple**

#### **Active Form:**

Structure:

Sub + v2 + Obj

Examples:

1. She completed the project on time.
2. They built a new bridge across the river.
3. He wrote an interesting article for the magazine.
4. We visited the museum last weekend.

## Passive Form:

Structure:

Obj or Action + was/were + v3 + (by + Sub) [optional]

Examples:

1. The project **was completed** on time.
2. A new bridge **was built** across the river.
3. An interesting article **was written** for the magazine.
4. The museum **was visited** last weekend.

## Examples from paper:

1. In this study, instantaneous and time-averaged flow structures downstream of the sharp-edged single and two and three side-by-side square cylinders (SCs) immersed in a uniform open channel water flow **were studied** by a technique of particle image velocimetry (PIV).

### Explanation:

**Action:** were studied

**Subject:** Instantaneous and time-averaged flow structures downstream of the sharp-edged single and two and three side-by-side square cylinders (SCs) immersed in a uniform open channel water flow

The subject in this sentence is a **complex noun phrase or a compound subject**. It consists of multiple elements that work together to form a cohesive unit describing what is being studied.

2. Experimental results of wake flow structures **were presented** for gap ratios (G/D) in the range of  $1.0 < G/D < 3.0$  for Reynolds number values of 1050, 2450 and 3400.
3. Flow structures depending on the square cylinder (SC) configurations and Reynolds number **were discussed**.
4. Asymmetrical and biased wake structures **were observed** because of the jet-like flow between the SCs for two SCs cases for the gap ratio less than 2.0.

## Present Perfect

## Active Form:

Structure:

Sub + has/have + v3 + Obj

Examples:

1.

### Examples from paper:

1. The present results **have supported** the previous works by providing detailed quantitative experimental information with PIV in the wake region of the SC and might be helpful for validation of numerical studies and designers.

## Passive Form:

Structure:

Obj or Action + have/has + been + v3 + (by + Sub) [optional]

Examples:

1. It has been found.

### Examples from paper:

1. It **has been found** that the development of the vortex shedding as well as the flow structure were substantially altered for side-by-side SCs comparing to the single SC.

#### **Explanation:**

It is **complex sentence** that combines **two independent clauses** with a conjunction ("as well as").

**Main Clause:** It has been found that the development of the vortex shedding

**Subordinate Clause:** as well as the flow structure

## Past Perfect

### Summary

Present Simple (Active): 1

Present Simple (Passive): 1

Past Simple (Passive): 4

Present Perfect (Active): 1

Present Perfect (Passive): 1

In this abstract, approximately **50%** of the sentences are constructed using the **past simple in passive form**, while 12.5% are in the present simple (both active and passive), and another 12.5% use the present perfect (both active and passive).

### Some guidelines about the tense we should consider while drafting any scientific paper

The choice of tense in the abstract of a scientific paper often follows a standard convention. Here are general guidelines:

1. **Present Simple Tense:**

- Use the present simple tense to describe **established facts, general truths, or the current state of knowledge in your field.**
- Example: "This study examines the impact of climate change on biodiversity."

2. **Present Perfect Tense:**

- Use the present perfect tense for actions that are completed but have relevance to the present.
- Example: "Previous research has explored the relationship between X and Y."

3. **Past Simple Tense:**

- Use the past simple tense for describing specific methods, results, and conclusions of your study.
- Example: "We conducted experiments to investigate the effects of variable A on B."

The abstract can also be written using only the present simple tense in both active and passive forms.

An example of abstract of recently published article:

**Title:** An intelligent deep learning based capsule network model for human detection in indoor surveillance videos

At present times, indoor surveillance becomes a hot research topic among researchers and business sectors. Human detection is one of the vital areas of focus in the

surveillance system owing to its significance in proper person detection, human activity identification, and scene classification. Since the indoor spaces comprise poor lighting, variable illuminations, shadowing, and complex background, the human detection process becomes a tedious task. The advent of computer vision and deep learning (DL) models is commonly employed for human detection. This article presents a new intelligent deep learning model for human detection in indoor surveillance videos (IDL-HDIS). As data augmentation process is one of the most renowned ways to increase the size of the dataset which is highly essential for enhancing the prediction accuracy of the model, the same is carried out as a part of even this research work which includes performing rotation, translation and flipping. The IDL-GDIS model uses Faster Region Convolutional Neural Network (Faster R-CNN) model for human detection. The Faster R-CNN comprises of Fast R-CNN and Region Proposal Network (RPN). The RPN uses Capsule Networks (CapsNet) model as a shared convolution neural network (CNN), which acts as a feature extractor and generates the feature map. Besides, dropout is employed to avoid overfitting problem in the CapsNet architecture, the validation of IDL-HDIS model is done by a comprehensive simulation analysis under different aspects. The validation is supported by the evident results of the IDL-HDIS model which is given in the paper.

Red Color: Present Simple in **Active Form**

Blue Color: Present Simple in **Passive Form**

## 1. Established Facts:

- "At present times, indoor surveillance becomes a hot research topic among researchers and business sectors."
- "Human detection is one of the vital areas of focus in the surveillance system owing to its significance in proper person detection, human activity identification, and scene classification."
- "The advent of computer vision and deep learning (DL) models is commonly employed for human detection."
- "The IDL-GDIS model uses Faster Region Convolutional Neural Network (Faster R-CNN) model for human detection."

## 2. General Truths:



- "Since the indoor spaces comprise poor lighting, variable illuminations, shadowing, and complex background, the human detection process becomes a tedious task."

### **3. Current State of Knowledge:**

- "This article presents a new intelligent deep learning model for human detection in indoor surveillance videos (IDL-HDIS)."
- "As data augmentation process is one of the most renowned ways to increase the size of the dataset which is highly essential for enhancing the prediction accuracy of the model, the same is carried out as a part of even this research work which includes performing rotation, translation and flipping."
- "The Faster R-CNN comprises of Fast R-CNN and Region Proposal Network (RPN)."
- "The RPN uses Capsule Networks (CapsNet) model as a shared convolution neural network (CNN), which acts as a feature extractor and generates the feature map."
- "Besides, dropout is employed to avoid overfitting problem in the CapsNet architecture, the validation of IDL-HDIS model is done by a comprehensive simulation analysis under different aspects."
- "The validation is supported by the evident results of the IDL-HDIS model which is given in the paper."