

## Writing Scientific Papers in English

### - Advice to Japanese Scientists

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第7回NIMSオープンセミナー「Writing Scientific Papers」  
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2009年3月9・10日 (独)物質・材料研究機構 千現地区 第一会議室 主催: 科学情報室  
注: プレゼンテーションと一部異なる場合があります。

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## Two Important Considerations:

- Accuracy
- Impression

What is often necessary for accurate manuscript correction?

- Consultation with the author.

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## Fact-checking in *The New Yorker*

the Internet and more time in libraries to determine what to do or not to do.

Penn's daughter Margaret fished in the Delaware, and wrote home to a brother asking him to "buy for me a four joynted strong fishing Rod and Real with strong good Lines . . ."

The problem was not with the rod or the real but with William Penn's offspring. Should there be commas around Margaret or no commas around Margaret? The presence or absence of commas would, in effect, say whether Penn had one daughter or more than one. The commas—there or missing there—were not just commas; they were facts, neither more nor less factual than the kegs of Bud or the color of Santa's suit. Margaret, one of Penn's several daughters, went into the book without commas.

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## William Penn



ウィリアム・ペン — 1644年10月14日 - 1718年7月30日)は、ペンシルバニア植民地とフィラデルフィア市を建設した人物。ペンが示した民主主義重視は、アメリカ合衆国憲法に影響を与えた。

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## “Facts” and “Commas”

- “*Penn’s daughter Margaret fished in the Delaware (River), ... .*”
- “*Penn’s daughter, Margaret, fished in the Delaware (River), ... .*”

Should there be commas around Margaret or no commas around Margaret? The presence or absence of commas would ... say whether Penn had one daughter or more than one. The commas ... were not just commas; they were facts. ... Margaret, one of Penn’s several daughters, went into the book without commas.

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## Example Title

- Direct observation of **the** energy gap generating the 1/3 magnetization plateau in **the** spin-1/2 trimer chain compound  $\text{Cu}_3(\text{P}_2\text{O}_6\text{OD})_2$  by **inelastic neutron scattering measurements**

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Direct observation of **the** energy gap generating the 1/3 magnetization plateau in **the** spin-1/2 trimer chain compound  $\text{Cu}_3(\text{P}_2\text{O}_6\text{OD})_2$  by **inelastic neutron scattering measurements**



Use of **inelastic neutron scattering measurements** in direct observations of the energy gap generation of **a** 1/3 magnetization plateau in **a** spin-1/2 trimer chain compound, (?)  $\text{Cu}_3(\text{P}_2\text{O}_6\text{OD})_2$

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## An Example Abstract

We **studied** magnetism of  $\text{Cu}_3(\text{P}_2\text{O}_6\text{OD})_2$  using inelastic neutron scattering measurements on a powder sample. **This** cuprate **has** spin-1/2 trimer chains with  $J_1 - J_2 - J_2$  interactions, where  $J_1$  and  $J_2$  denote two antiferromagnetic (AF) exchange interaction parameters, **and shows** a 1/3 magnetization plateau. We observed an energy gap of 9.8 meV (114 K) **that generated** the magnetization plateau. **The gap corresponds to** singlet-triplet-like excitation of an AF dimer formed by **the** dominant  $J_1$  interaction. We have determined **the parameters**  $J_1 = 111$  K and  $J_2 = 30$  K which can reproduce the gap value as well as the magnetization.

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## An Example Polishing

We have studied magnetism in  $\text{Cu}_3(\text{P}_2\text{O}_6\text{OD})_2$ , using inelastic neutron scattering measurements on a powder sample. The cuprate exhibited spin-1/2 trimer chains with  $J_1 - J_2 - J_2$  interactions, where  $J_1$  and  $J_2$  denote two antiferromagnetic (AF) exchange interaction parameter values, and it showed a 1/3 magnetization plateau. We observed an energy gap of 9.8 meV (114 K), which generated the magnetization plateau. The characteristics of this gap agree with (?) singlet-triplet-like excitation of an AF dimer formed by the (?) dominant  $J_1$  interaction. We have determined that parameter values of  $J_1 = 111$  K and  $J_2 = 30$  K reproduce both the gap value and the magnetization.

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## Example First Sentence from Introduction

- The magnetization plateau is one notable phenomenon in quantum spin systems and has been studied extensively in this decade.[1–4] Origin of the magnetization plateau is an energy gap in the magnetic excitation spectrum. Thus, in order to understand physics of the magnetization plateau, it is necessary to investigate the gap by other methods. → The magnetization plateau is a notable phenomenon in quantum spin systems and has been studied extensively over the past decade.[1–4] Magnetization plateaus originate from energy gaps (?) in magnetic excitation spectra. Thus, in order to understand the physics of a magnetization plateau, it is necessary to investigate gaps using other methods (?).

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## Example Continuation of Introduction

Existence of the gap is proved explicitly by exponential decay of magnetic susceptibility on cooling without theoretical supports.[8–10] On the contrary, we cannot confirm existence of a gap, which generates a finite-magnetization plateau, from temperature dependence of any physical quantity without aid of theoretical calculations.[11–13] (???)

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## Partial Correction

- While the existence of the gap has been proven without theoretical support on the basis of the exponential decay of the magnetic susceptibility that occurs with cooling[8–10], we are unable, without the aid of theoretical calculations, to confirm on the basis of the temperature dependence of any physical quantity, the existence of a gap that generates a finite-magnetization plateau.[11–13] (???)

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## Main Problem-Areas in the Writing in English of Japanese Authors

1. 冠詞と数
2. 時制
3. 仮定法
4. 関係代名詞とそのロジカルな世界
5. 受身とby
6. 前置詞
7. 論理的関係

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## 冠詞と数

### The Possibilities:

- We have found **a way** to get high performance.
- We have found **the way** to get high performance.
- We have found **ways** to get high performance.
- We have found **the ways** to get high performance.
- × We have found **way** to get high performance.

**a metal** 例: Silver is **a metal**.

**the metal** 例: **The metal** that she likes most is platinum.

**metals** 例: Platinum, silver, and gold are all **metals**.

**the metals** 例: **The metals** that she likes most are platinum, silver, and gold.

**metal** 例: Almost all of these products contain **metal**.

### Some Expressions:

**some, a few, various, a variety of, a number of, several, many**<sub>4</sub>

## 時制

### Lack of distinction between past and present perfect

- Suzuki et al. **(have) proposed** a method for ....
- **In 2003**, Suzuki et al. **proposed** a method for ....

### Lack of understanding of the present tense as expressing “habitual, repeated activity.”

We **adopt** the method proposed by Suzuki et al.



We **chose to adopt** the method proposed by Suzuki et al.

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## 仮定法

- 1.If we **employ** that method, the temperature **will** rise. ( ? )
- 2.If we **employed** that method, the temperature **would** rise. ( ○ )
- 3.If we **were to have employed** that method, the temperature **would have** risen. ( ○ )

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## 関係代名詞とそのロジカルな世界

制限用法・非制限用法（限定用法・非限定用法）  
と教科書に見られる教え方

- Alice likes soft drinks. + Soft drinks are sweet.  
→ Alice likes *soft drinks which* are sweet. (×)  
(アリスは、甘い味のするソフトドリンクが好きです)  
先行詞 + 関係代名詞 + 形容詞節
- Alice likes *soft drinks, which* are sweet. (○)  
先行詞 + コンマ + 関係代名詞 + 形容詞節
- Some soft drinks are sweet. + Alice likes soft drinks of that kind.  
→ Alice likes *soft drinks which* are sweet. (○)  
(アリスは、甘い味のするソフトドリンク **だけ**が好きです)  
先行詞 + 関係代名詞 + 形容詞節

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## 限定と非限定：基本的な使い分け

- **The passengers who were American citizens** were all taken off the plane and arrested. (アメリカ国籍の乗客はみな飛行機から降ろされ、逮捕された)  
というと、降ろされず、逮捕されていない乗客もいたということになるのに対して、カンマ有りの
- The **passengers, who** were American **citizens, were** all taken off the plane and arrested.  
は、「乗客は（全員アメリカ国籍だったが）みな飛行機から降ろされ、逮捕された」ということになります。カンマ無しで「乗客の中にいたアメリカ人だけ」と限定している英語とは違って、カンマ有りの方は「ちなみに」といった感じで、乗客について「みなアメリカ人だった」という情報を付け加えているだけで、何の限定もしていません。

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## 限定と非限定

「2007年に終わった我々の研究で得たデータは、決定的なものではなかった」

- The data obtained in our **research which** ended in 2007 were inconclusive.  
(2007年に終わった研究で得たデータは決定的なものではなかったが、我々は、その後も研究を**続けている**)
- The results obtained in our **research, which** ended in 2007, were inconclusive.  
(我々の研究で得たデータは決定的なものではなかった。**ちなみに**、我々の研究は、2007年に終わった)

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## Commas or No Commas?

- The morphology of a phase-separated binary film during spinodal **decomposition, whose evolution is limited on the growth surface, is studied.**



- **We have studied** the morphology of a phase-separated binary film during spinodal **decomposition whose evolution was limited to the growth surface. ??????????**

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## 受身とby

S V O

能動態: Villagers built the house themselves.



S V

受動態: The house was built by villagers themselves.

### Example from student writing:

- Shirakawa is well known in Japan as a one of world heritages. There are many of beautiful houses which are built by traditional ways.

### Corrected version:

- Shirakawa is well known in Japan as being a World Heritage Site. It has many of beautiful houses which are built in traditional ways.

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受動態: The theory was developed by Einstein.

能動態: Einstein developed the theory.

The photoinduced chirality of the PCDY50 thin film was analyzed in detail by elliptical analysis on the basis of either circular or linear polarization. [by → using]

S V O

能動態: ... analysis analyzed ... the film



We used elliptical analysis to analyze the photoinduced chirality of the PCDY50 thin film in detail in terms of both circular and linear polarization.

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## 「～によって」

- 校則によって携帯電話の持込が禁じられている。  
Students are forbidden by school regulations from bringing cell phones on campus.
- 彼女は、音楽によって、自分の気持ちをうまく表現できている。  
She is able to express her feelings well through music.
- この章はマーク・ピーターセンによって書かれたものだ。  
This chapter was written by Mark Petersen.
- そのコンサートは、チケットの売上不調によって、中止になった。  
The concert was cancelled due to poor ticket sales.

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## 能動態 or 受動態?

**The General Rule:** Avoid the passive voice as much as possible.

### For easier reading:

The optimal temperature for fabricating the device to be used in the newly developed IC so as to maximize performance under actual conditions was calculated.



We calculated the optimal temperature for fabricating the device ....

### To avoid misunderstanding:

例: ○ This unexpected reaction appeared to be due to ....

× This unexpected reaction was considered to be due to ....

○ We assumed this unexpected reaction to be due to

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### 主語と動詞との長距離

Langmuir–Blodgett (LB) **films of retinoic acid and LB films of retinoic acid mixed with a peptide that contains an alanine–lysine–valine (AKV) amino acid sequence deposited on a hydrogenated amorphous silicon (a-Si:H) film prepared by electron cyclotron resonance (ECR) plasma sputtering were fabricated.**



**We have fabricated** Langmuir–Blodgett (LB) films of retinoic acid and LB films of retinoic acid mixed with a peptide that contains an alanine–lysine–valine (AKV) amino acid sequence deposited on a hydrogenated amorphous silicon (a-Si:H) film prepared **using** electron cyclotron resonance (ECR) plasma sputtering.

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### • But:

○ Because the temperature **was** precisely **controlled**, the device remained undamaged.

✗ Because **one of my assistants** precisely **controlled** the temperature, the device remained undamaged.

△ Because **we** precisely **controlled** the temperature, the device remained undamaged.

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### 前置詞

#### Over-use of “of” as a result of the all-powerful nature of 「の」.

An improvement **of** the performance **of** the device **of** Figure 6 **of** 12.5% **of** frequency ....



An improvement **in** the performance **of** the device (**shown**) **in** Figure 6 **of** 12.5% **in** frequency ...



A **12.5% improvement in** the **frequency performance of** the device **shown in** Figure 6 ...

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### 論理的関係

#### Indicators of Causal Relationships:

therefore; since; because; as; for; accordingly; consequently; so; then; thus; as a result; hence など

1. The sample showed no reaction, **so** we increased the temperature by 3.5°C.
2. The sample showed no reaction. **Therefore**, we increased the temperature by 3.5°C.
3. The sample showed no reaction. **Consequently**, we increased the temperature by 3.5°C.
4. The sample showed no reaction. **Accordingly**, we increased the temperature by 3.5°C.
5. The sample showed no reaction, **and** we increased the temperature by 3.5°C.
6. We increased the temperature by 3.5°C. **Because** the sample showed no reaction.
7. The sample **having** shown no reaction, we increased the temperature by 3.5°C.

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## 「原因や理由を表す分詞構文」

大学生が読めばよくわかる、馴染みやすいように思われる言い方:

- **Noticing my nosebleed**, she gave me a tissue. (彼女は、私の鼻血が出ているのに気づいて、ティッシュをくれた)  
ところが、英作文を見ると、ほとんどの人は同じ「因果関係」をなぜか
- She noticed my nosebleed, **so** she gave me a tissue.  
や
- She gave me a tissue. **Because** she noticed my nosebleed.  
などのように、分詞を使わずに表現しようとするので、この馴染みやすい形にしても、あまり記憶に残っていないのかもしれない。また、
- She noticed my nosebleed **and** gave me a tissue.  
も出てきません。

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## 「～による」

**according to; depending on; due to; など**

- **Commonly encountered sentence construction:**

**According to** a case, the results varied.

(あるケースの話によると、その結果は変わった)



- **Assumed intended meaning:**

Results varied **depending on** individual circumstances.

(結果はケースによって変わった)

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「～に依る」彼が世界一流選手としてカムバックできるかどうかは、あくまでもリハビリの成功**による**でしょう。

Whether or not he is able to come back as a world class player surely **depends on** the success of his rehabilitation therapy.

「～に拠る」それはあくまでも当て推量**による**結論にすぎない。

That conclusion is **based on** mere conjecture.

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「～に由る」『週刊文春』**によると**、彼女の発言はあくまでも旧敵に復讐する作戦の一端にすぎない。

**According to** the *Shukan Bunshun*, her statement was merely part of a strategy for getting revenge on an old enemy.

「～に因る」その墜落はあくまでもパイロットの不注意**によるもの**だった。

The crash was entirely **caused by** pilot carelessness.

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