

Introduction

Tuesday, January 28, 2020 8:07 PM

Things in this lecture

What makes good writing

- Communicating idea clearly and effectively
- Good writing is elegant and stylish

[What not to do](#)

[Principles of writing](#)

[Cut the clutter](#)

[More Tricks to cut the clutter](#)

[Practice](#)

What makes Good Writer

- Need to say something
- Logical thinking
- A few simple learnable rules

To write a good manuscript:

1. Talk your research with other before
2. Don't bore your readers
3. Quick first draft and then revise a lot
4. Cut words ruthlessly
5. Take risks
6. Find good editor
7. Stop waiting for inspiration

Related Books

William Zinsser in On Writing Well, 1976

What Not To Do

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Ask following questions:

1. Is this sentence easy to understand
2. Is this sentence enjoyable and interesting to read?
3. Is this sentence readable
4. Is it written to obscure information or inform

Don't use nouns, use verbs

Nouns slows down, verbs speeds up

"These findings imply that the rates of ascorbate radical production and its recycling via dehydroascorbate reductase to replenish the ascorbate pool are equivalent at the lower irradiance, but not equivalent at higher irradiance with the rate of ascorbate radical production exceeding its recycling back to ascorbate."

"These findings imply that, at low irradiation, ascorbate radicals are produced and recycled at the same rate, but at high irradiation, they are produced faster than they can be recycled back to ascorbate."

Identifying Noun and Verb

Noun: Name of place, thing etc.

Verb: Action word

Adverb: describe verb (action) e.g. slow --> slowly

Adjective: describe noun

Principles of Effective Writing

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! Principles from examples

Example

Note the use of nouns instead of verbs.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

Example

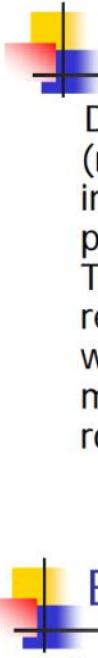
Note the use of vague words.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

Example

Note the use of unnecessary jargon and acronyms.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.



Example

Note the passive voice.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.

Example

Note the distance between the subject and the main verb of this sentence.

Dysregulation of physiologic microRNA (miR) activity has been shown to play an important role in tumor initiation and progression, including gliomagenesis. Therefore, molecular species that can regulate miR activity on their target RNAs without affecting the expression of relevant mature miRs may play equally relevant roles in cancer.



Possible rewrite...

- Changes in microRNA expression play a role in cancer, including glioma. Therefore, events that disrupt microRNAs from binding to their target RNAs may also promote cancer.

Cut the clutter

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"The secret of good writing is to strip every sentence to its cleanest components. Every word that serves no function, every long word that could be a short word, every adverb that carries the same meaning that's already in the verb, every passive construction that leaves the reader unsure of who is doing what—these are the thousand and one adulterants that weaken the strength of a sentence. And they usually occur in proportion to the education and rank."

— William Zinsser in *On Writing Well*, 1976

Cut unnecessary words

1. Be vigilant and ruthless
2. If you can't cut extra words, just cut them temporarily and see how sentence looks without them.

Common Clutter

1. Deadweight words and phrases
 - a. As it is well known
 - b. As it has been shown
 - c. It can be regarded that
 - d. It should be emphasized that
2. Empty words
 - a. Basic tents of
 - b. Methodologic
 - c. Important
3. Long words or phrases that can be short
4. Unnecessary jargon and acronyms
5. Repetitive words
 - a. Studies, example
 - b. Illustrate
 - c. Challenges / difficulties
 - d. Successful solution
6. Adverbs
 - a. Very, really, quite, basically, etc.

Long words and phrases that could be short...

<u>Wordy version</u>	<u>Crisp version</u>
■ A majority of	most
■ A number of	many
■ Are of the same opinion	agree
■ Less frequently occurring	rare
■ All three of the	the three
■ Give rise to	cause
■ Due to the fact that	because
■ Have an effect on	affect

Long words or phrases that could be short...

- The expected prevalence of mental retardation, based on the assumption that intelligence is normally distributed, is about 2.5%.
- → The expected prevalence of mental retardation, if intelligence is normally distributed, is 2.5%.

More tricks to clear clutter

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Tricks

1. Eliminate negatives

Eliminate negatives

- She was not often right.
 - She was usually wrong.
- She did not want to perform the experiment incorrectly.
 - She wanted to perform the experiment correctly.
- They did not believe the drug was harmful.
 - They believed the drug was safe.

Eliminate negatives

■ Not honest	dishonest
■ Not harmful	safe
■ Not important	unimportant
■ Does not have	lacks
■ Did not remember	forgot
■ Did not pay attention to	ignored
■ Did not succeed	failed

2. Eliminate superfluous use of "there are/ there is"

Eliminate there are/there is

There are many ways in which we can arrange the pulleys.

→ We can arrange the pulleys in many ways.

There was a long line of bacteria on the plate.

→ Bacteria lined the plate.



Eliminate there are/there is

- There are many physicists who like to write.
 - Many physicists like to write.
-
- The data confirm that there is an association between vegetables and cancer.
 - The data confirm an association between vegetables and cancer.

3. Omit needless propositions



Omit needless prepositions

For example, "that" and "on" are often superfluous:

- *The meeting happened ~~on~~ Monday.*
- *The meeting happened~~s~~ Monday.*

- *They agreed ~~that~~ it was true.*
- *They agreed~~s~~ it was true.*

Practice

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- Original:** Anti-inflammatory drugs may be protective for the occurrence of Alzheimer's Disease.
My Rewrite:
Instructor Rewrite: Anti-inflammatory drugs may protect against Alzheimer's Disease.

- Original:** Clinical seizures have been estimated to occur in 0.5% to 2.3% of the neonatal population.
My Rewrite:
Instructor Rewrite: Clinical seizures occur in 0.5% to 2.3% of newborns

- Original:** Ultimately p53 guards not only against malignant transformation but also plays a role in developmental processes as diverse as aging, differentiation, and fertility.
My Rewrite:
Instructor Rewrite: Besides preventing cancer, p53 also plays roles in aging, differentiation, and fertility.

- Original:** Injuries to the brain and spinal cord have long been known to be among the most devastating and expensive of all injuries to treat medically.
My Rewrite:
Instructor Rewrite: Injuries to the brain and spinal cord are among the most devastating and expensive.

- Original:** An IQ test measures an individual's abilities to perform functions that usually fall in the domains of verbal communication, reasoning, and performance on tasks that represent motor and spatial capabilities.
My Rewrite:
Instructor Rewrite: An IQ test measures an individual's verbal, reasoning, or motor and spatial abilities.

- Original:** As we can see from Figure 2, if the return kinetic energy is less than 3.2 Up, there will be two electron trajectories associated with this kinetic energy.
My Rewrite:
Instructor Rewrite: Figure 2 shows that a return kinetic energy less than 3.2 Up yields two electron trajectories.

Writing with Strong and Active Verbs

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- Things in this lecture
 - a. [Recognizing passive verb](#)
 - b. [Convert Passive to Active](#)
 - c. [Advantages of Active Voice](#)
 - d. [Is it okay to use passive voice](#)
- [Use of we and I](#)
- [Active voice practice](#)

Handout: <https://lagunita.stanford.edu/asset-v1:Medicine+SciWrite+Ongoing+type@asset+block@Unit-2-slides.pdf>

Recognizing Passive verb

1. Passive verb = a form of the verb **to be** + the past participle of main verb
2. The main verb must be transitive
 - a. That is
 - b. Taken an object
3. **Active Voice:** Cause --> Effect
Passive Voice: Effect --> Cause

“to be” verbs

- | | |
|--------|-------------|
| ■ Is | • could be |
| ■ Are | • shall be |
| ■ Was | • should be |
| ■ Were | • will be |
| ■ Be | • would be |
| ■ Been | • may be |
| ■ Am | • might be |
| | • must be |
| | • has been |
- 4.



Example: passive voice

My first visit to Boston will always be remembered by me.

Recipient of the action

Verb

Agent of the action

Active:

I will always remember my first visit to Boston.

She is loved.

→ Which evokes the question, "Who's loving her?"

The recipient of the love.

Form of "to be"

Past participle of a transitive verb: to love (direct object).

"Cigarette ads were designed to appeal especially to children."

vs.

"We designed the cigarette ads to appeal especially to children."

Responsible party!

Converting passive to active

Ask: who does what to whom

Example

Passive:

By applying a high resolution, 90 degree bending magnet downstream of the laser electron interaction region, the spectrum of the electron beams could be observed.

→

Active:

We could observe the spectrum of the electron beams by applying a high resolution, 90 degree bending magnet downstream of the laser electron interaction region.

Example

Passive:

Increased promoter occupancy and transcriptional activation of p21 and other target genes were observed.

→

Active:

We observed increased promoter occupancy and transcriptional activation of p21 and other target genes.

Passive:

The activation of Ca++ channels is induced by the depletion of endoplasmic reticulum Ca++ stores.

→

Active:

Depleting Ca++ from the endoplasmic reticulum activates Ca++ channels.

Use active voice; be direct!

Additionally, it was found that pre-treatment with antibiotics increased the number of super-shedders, while immunosuppression did not.

→

Pre-treating the mice with antibiotics increased the number of super-shedders while immunosuppression did not.

Advantages of Active Voice

- The active voice is livelier and easier to read
 - No attempt was made to contact non-responders because they were deemed unimportant to the analysis. (passive)
- Emphasizes author's responsibility
 - We did not attempt to contact non-responders because we deemed them unimportant to the analysis. (active)

Vs.

- Improves readability
 - A strong correlation was found between use of the passive voice and other sins of writing. (**passive**)
 - We found a strong correlation between use of the passive voice and other sins of writing. (**active**)
 - Use of the passive voice strongly correlated with other sins of writing. (**active**)

- Reduces ambiguity

General dysfunction of the immune system at the leukocyte level **is suggested** by both animal and human studies. (**passive**)

Vs.

Both human and animal studies **suggest** that **diabetics** have general immune dysfunction at the leukocyte level. (**active**)

Is it okay to use Passive voice?

- Yes
- Use is sparingly and purposefully
 - In methods section
 - Where what done is more important than who did it

Use of We and I

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1. Is it okay to use we and I?
Yes
2. [Journals want us to use we and I](#)
3. Great papers uses it: [Watson and Crick's paper](#)

Active Voice Practice

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Passive: A recommendation was made by the DSMB committee that the study be halted.

Active by me: The DSMB committee recommended to halt the study

Active by Instructor: The DSMB committee recommended that the study be halted.

Passive: Major differences in the reaction times of the two study subjects were found.

Active by me: We found major difference in the reaction time of two study objects

Active by Instructor: We observed major differences in the reaction times of the two study subjects.

OR

The two study subjects differed in reaction times.

Passive: It was concluded by the editors that the data had been falsified by the authors.

Active by me: The editors concluded that the data had falsified by authors.

Active by Instructor: The editors concluded that the authors falsified their data

Passive: The first visible-light snapshot of a planet circling another star has been taken by NASA's Hubble Space Telescope.

Active by instructor: NASA's Hubble Space Telescope has taken the first visible-light snapshot of a planet circling another star.

Passive: Therefore, the hypothesis that the overall kinetics of a double transtibial amputee athlete and an able-bodied sprinter at the same level of performance are not different was rejected.

Active by Instructor: Therefore, we rejected the hypothesis that the overall kinetics of a double transtibial amputee athlete and an able-bodied sprinter at the same level of performance are comparable.

Writing with Verbs

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- Use strong verbs
- Avoid turning verbs into nouns
- Don't bury the main verb

P1: Paragraph 1

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Experimenting with punctuation

Nature Paper using punctuation

Supersymmetry relates each particle of the standard model to another particle called its superpartner; the symmetry is about spin—a standard-model fermion has a bosonic superpartner, and vice versa. By convention, superpartners of fermions gain a prefix 's' (such as selectron, squark and sneutrino), and those related to bosons gain the suffix 'ino'. The prime candidate for dark matter among all of these superparticles is the so-called neutralino—which is a mixture (technically, a mass eigenstate) formed by the superpartners (zino, photino and higgsino) of standard-model bosons. Other candidates are sneutrinos, and gravitinos, which are related to the graviton (although, strictly speaking, gravitinos belong to extended versions of supersymmetric models, known as supergravity models, in which gravity is included.)

Paragraph 1

Edit following Paragraph

In assessing the quality of an instrument we distinguish three quality domains, i.e. reliability, validity, and responsiveness. Each domain contains one or more measurement properties. The domain reliability contains three measurement properties: internal consistency, reliability, and measurement error. The domain validity also contains three measurement properties: content validity, construct validity, and criterion validity. The domain responsiveness contains only one measurement property, which is also called responsiveness. The term and definition of the domain and measurement property responsiveness are actually the same, but they are distinguished in the taxonomy for reasons of clarity. Some measurement properties contain one or more aspects, that were defined separately: Content validity includes face validity, and construct validity include structural validity, hypotheses testing, and cross-cultural validity.

Edited by me.

In assessing the quality of an instrument, we distinguish three quality domains: reliability, validity, and responsiveness. The domain reliability contains three measurement properties: internal consistency, reliability, and measurement error. The domain validity also contains three measurement properties: content validity, construct validity, and criterion validity. The domain responsiveness contains only one measurement property, which is also called responsiveness. Some measurement properties contain one or more aspects, that were defined separately: Content validity includes face validity, construct validity have structural validity, hypotheses testing, and cross-cultural validity.

Difference

1 In assessing the quality of an instrument we distinguish three quality domains, i.e. reliability, validity, and responsiveness. Each domain contains one or more measurement properties. The domain reliability contains three measurement properties: internal consistency, reliability, and measurement error. The domain validity also contains three measurement properties: content validity, construct validity, and criterion validity. The domain responsiveness contains only one measurement property, which is also called responsiveness. The term and definition of the domain and measurement property responsiveness are actually the same, but they are distinguished in the taxonomy for reasons of clarity. Some measurement properties contain one or more aspects, that were defined separately: Content validity includes face validity, and construct validity include structural validity, hypotheses testing, and cross-cultural validity.

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Edited by instructor

Make a map of what paragraph is representing.

Domain	Measurement Property	Aspect
Reliability	consistency	
	reliability	
	measurement error	
Validity	criterion validity	
	content validity	face validity
	construct validity	structural validity
		hypothesis testing
Responsiveness		cross-cultural validity
	responsiveness	

Edited Paragraph

We assess each instrument based on reliability, validity, and responsiveness. These domains may be subdivided into measurement properties: Reliability includes internal consistency, reliability, and measurement error; validity includes content validity, construct validity, and criterion validity; responsiveness is both a domain and a measurement property. Some measurement properties additionally contain multiple aspects; for example, construct validity includes structural validity, hypothesis testing, and cross-cultural validity.

Whole Paragraph has been rewritten by the instructor.

In assessing the quality of an instrument we distinguish three quality domains, i.e. reliability, validity, and responsiveness. Each domain contains one or more measurement properties. The domain reliability contains three measurement properties: internal consistency, reliability, and measurement error. The domain validity also contains three measurement properties: content validity, construct validity, and criterion validity. The domain responsiveness contains only one measurement property, which is also called responsiveness. The term and definition of the domain and measurement property responsiveness are actually the same, but they are distinguished in the taxonomy for reasons of clarity. Some measurement properties contain one or more aspects, that were defined separately: Content validity includes face validity, and construct validity include structural validity, hypotheses testing, and cross-cultural validity

We assess each instrument based on reliability, validity, and

1

2 responsiveness. These domains may be subdivided into
3 measurement properties: Reliability includes internal
4 consistency, reliability, and measurement error; validity
5 includes content validity, construct validity, and
criterion
6 validity; responsiveness is both a domain and a
7 measurement
8 property. Some measurement properties additionally contain
9 multiple aspects; for example, construct validity includes
structural validity, hypothesis testing, and cross-
cultural
10 validity.

P1: Paragraph 2

Tuesday, January 28, 2020 4:23 AM

Edited following paragraph.

The church's record-keeping system and its high level of accuracy has been previously reported (2). Briefly, the church creates and maintains a church record for each individual who is baptized into the church. These records are created at the congregation level at the time of baptism and then forwarded to the general church level where the membership record is added to the church membership database. These records contain minimal information including name, date of birth, parents' names, dates of church ordinances, and current address. Each congregation has a lay membership clerk who is responsible for updating the membership records for the members of the congregation. Such updates would include dates of ordinances received after baptism (e.g., priesthood ordination or marriage), name of spouse when a member marries, change of current address and date of death.

While the accuracy of the church record is dependent upon lay clerks within each congregation, each member has an opportunity to review their membership record once a year to check it for accuracy. For this reason and because the church emphasizes accurate record keeping, the information available from the church records is quite reliable, especially for members who are actively involved in the church. When a member dies and the clerk reports his/her death to the Church Membership Council, the membership record is updated and then archived in the church's deceased membership file.

Purpose of the paragraph: Accuracy of church record keeping and what it contains.

Map of the paragraphs

- Church recordkeeping is good
- Each member's record is created at the time of baptism and then forwarded to general church where it is added to membership data
- Minimal things are recorded: name, dob, etc.
- One member of the church is responsible for each record and its updates (e.g. data of ordinances after baptism, name of spouse etc.). Each member can review his own record once a year for accuracy.

Edited by me

Church's record keeping system has very high level of accuracy and reliability (2). The record of each member of church is created at the time of baptism and forwarded to general church level where it is added to membership database. This record contains minimal information including date of birth, names, dates of ordinance, and current address. A member clerk is responsible for updating (marriage, priesthood ordinance, current address, date of death) the record of each congregation. The reliability of church's record is based on two factors: work of lay clerk and letting member to review his record once a year. When a member dies, the record is updated and archived in the deceased membership file.

Edited by instructor

The church's record-keeping system is accurate and reliable (2). When a new member is baptized, the church congregation creates a member record that includes: name, date of birth, parents' names, current address, and dates of church ordinances. A lay clerk enters these records into a general church database and updates them to reflect dates of new ordinances (e.g. marriage), spouse name, changes of address, and date of death. Members may review their membership records once a year, which helps ensure accuracy. When a member dies, the membership record is archived.

P3: Paragraph 3

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Edit following paragraph

Previous studies have consistently reported increased risk of subsequent drug use associated with conduct problems and antisocial behavior in childhood (1-5), and an association of drug dependence with conduct problems was found in a general survey of young adults (9).

Furthermore, long-term relationships between aggressive, unconventional, and impulsive behaviors have also been found with drug use involvement generally (10-12). **However**, different pathways between early childhood misbehavior and drug involvement may exist. Psychiatric symptoms and cognitive disabilities may be manifest as aggressive behaviors and drug use may be a response to impulsive tendencies that often co-occur with aggression or misbehavior. Distress and failure to adopt responsible conventional roles and behaviors may be important mediators linking childhood misbehavior to late drug dependence (13,14).

The main thesis of paragraph: connection of childhood

However is not appropriate here as ideas are changed but following ideas are not in contrast to earlier ideas

Map of paragraph

- Risk of drug use --> childhood conduct and anti-social behavior
- Long-term relationship between aggressive and unconventional and impulsive behaviors and drug dependence

Edited by me

Increased risk of subsequent drug use is associated with conduct problems and anti-social behavior in childhood (1-5, 9-12). However, they can exist multiple pathways between early childhood behavior and later drug use. Drug use can be a response to impulsive tendencies (aggression, misbehavior) or failing to adopt conventional roles etc.

Edited by instructor (Two paragraphs)

Previous studies have linked early childhood conduct problems with subsequent drug use (1-5). Studies have also found that young adult (9) and adult (10-12) drug users exhibit more aggressive, unconventional, and impulsive behaviors than their peers.

Several pathways may explain our finding: aggressive children may have underlying psychiatric disorders or cognitive disabilities that increase their risk of drug use; misbehavior tends to co-occur with impulsivity, which increases the risk of drug use; and childhood misbehavior may lead to long-term problems, such as persistent distress or a failure to ever adopt conventional roles or behaviors, which may lead to drug dependence (13,14).

Edited by Instructor (1 para)

Previous studies have linked early childhood conduct problems—including aggressive, antisocial, and unconventional behaviors—with subsequent drug use (1-5). Several pathways may explain this link: aggressive children may have underlying psychiatric disorders or cognitive disabilities that increase their risk of drug use; misbehavior tends to co-occur with impulsivity, which increases the risk of drug use; and childhood misbehavior may lead to long-term problems, such as persistent distress or a failure to ever adopt conventional roles or behaviors, which may lead to drug dependence (13,14).

Overview of Writing Process

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After all the data and experimentations, people either of two things:

- Start writing at once
- Procrastinate a lot before starting

Both are wrong approaches

Steps in writing

1. Prewriting

- Collect, synthesize and organize information
- Brain storm take-home message
- Work out ideas away from the computer
- Develop outline/ road map

2. Writing the first draft

- Putting your ideas and facts together in organized prose

3. Revision

- Read your work out loud
- Get rid of clutter
- Do a verb check
- Get feedback from others

4. Checklist Before Final Version

5. Example

How much time to spend on each step

1. Prewriting (70%)
2. Writing the first draft (10%)
3. Revision (20%)

Prewriting Step

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Get Organized first!

- Get information --> Organize Information --> Start writing
- Make an organizational system for you
- **Don't write and gather info at the same time**

Organize Thoughts

- Create a system to organize your thoughts
- Instructor system:
Spend more time on organizing

Develop a Road Map

- | | |
|------------------------------------|---|
| • Make a crude outline | Arrange key facts and citation from the literature into crude outline |
| • Think in paragraphs and sections | |

Brainstorm away from the computer

- Prewrite on the go
 - While exercising
 - Driving alone
 - Waiting
- Work out take-home messages
- Organize in your brain

Compositional Organization

1. Like ideas should be grouped --> one para
2. Like paragraphs should be grouped
3. Don't bait-and-switch your reader
 - a. Argument
 - b. Counter argument
 - c. Rebuttal

Writing Step

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- Write first draft
- Don't be perfectionist
- First draft should have all the ideas in complete sentence in order
- Focus on logical organization
- Write quickly and efficiently

Revision

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Revision is where elegance comes

Read your writing our loud

Do a verb check

Underline main verb in each sentence and observe:

1. **Lackluster verbs:** There are many students
2. **Passive verbs:** The reaction was observed by ...
3. **Buried Verbs:** where main verbs is too far away
(e.g., A careful monitoring of achievement levels before and after the introduction of computers in the teaching of our course revealed no appreciable change in students' performances.)

Cut Ruthlessly

Watch for:

- **Dead weight words** and phrases
 - It should be emphasized that
 - In my opinion
- **Empty words**
 - Basic tenants
 - Important
- **Long words** and phrases that could be short
- **Unnecessary jargons** and acronyms
- **Repetitive words** or phrases
- **Adverbs**
 - Very
 - Really
 - Quite
 - Basically

Organizational Review

1. For each paragraph, write a phrase or sentence that sums up the main point
2. Then move paragraphs to make logical flow

Get outside feedback

- Someone outside of our niche should be able to grasp
 - The main findings
 - Take-home messages
 - Significance of your work

- Ask particular hard-to-read paragraphs
- Find a good editor

Checklist before final draft

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- **Check for consistency**
 - Make facts straight
- Check for **numerical consistency**
 - Check numerical consistency
 - Check numbers in text and tables
 - Match Abstract numbers with paper number numbers
- Check for your references
 - Authors misinterpreted or exaggerated the findings
 - Secondary source
 - Misnumber
- Always go back to original citation before citing

Edit Paragraph

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In the start, use good examples to attract readers

Text for editing, demo edit 4, Module 4.7 (optional)

In a recent work on ‘Interactions with Big Data Analytics’, authors Danyel Fisher et.al. talk about interesting developments in the world of analyzing data. Authors define analytics as a term that refers to any data driven decision. An example of application of analytics is Zynga, an online games company that studies how its audience plays the game and uses that data effectively to modify the games.

The paper reports the state of practice by interviewing sixteen pioneering analysts in this field. The paper discusses about the definition of big data, contemporary ways of analyzing data, challenges peculiar to big data, and proposes a five step workflow type of an approach to analyzing big data. In our digital lives (interactions through information technology devices) we generate huge amounts of data: social relationships, purchasing behavior, watching of videos, etc. Big Data Analytics aims to construct the big picture from the minutia of our digital lives.

The authors draw a refreshing parallel to the old age mainframe computing where the work would be submitted to massive systems and the results would be obtained after a period of time. Big data analytics, argue the authors, is very similar: that it involves hypothesis and needs huge computing power, that it is often submitted and results are available after a period of time, and that the end user computers are only used for viewing the results and not for processing.

Pivotal contribution of the paper is the generalization of how big data analytics can be approached. Acquiring data, choosing the right architecture for analyzing the acquired data, fitting the data for the chosen architecture, coding and debugging, and fine tuning are the five steps suggested by the authors. This five step process repeats itself as many times as necessary until meaningful results are obtained. The paper cautions the skill gap in bringing the right proportion of scientific flavor in models created by business users.

Of immediate significance, is the potential to apply big data analytics to design more user friendly interfaces, enrich customer experience by analyzing the ways customer uses the product, understand healthcare spending, etc. The limitation is only our human ability to think creatively and harness the exploding world of data.

From <<https://lagunita.stanford.edu/courses/Medicine/SciWrite-SP/SelfPaced/courseware/a3c71ec34df3499da43fe295660fa31e/e11d96c280d74939a65966bb7ab1ff81/?child=first>>

Edited by Instructor

In our digital lives, we generate huge amounts of data: social relationships, purchasing behavior, and video watching. Companies are analyzing these data and using them to drive decisions, a practice called “big data analytics.” For example, the onlinegaming company Zynga studies how its audience plays the game and uses that data effectively to

modify the games.

In a recent work on ‘Interactions with Big Data Analytics’, Danyel Fisher and colleagues review the state of the field by interviewing sixteen pioneering big data analysts. The authors discuss the definition of big data, contemporary ways of analyzing data, and challenges peculiar to big data; they also propose a pivotal five-step workflow for analyzing big data. [NOT PARALLEL]

The authors draw a refreshing parallel to the old-age mainframe computing where analysts submitted the work to massive systems and had to wait for hours/days/weeks to obtain results. With big data analytics, the analyses require huge computing power, so scientists must submit the results to a super-computer and wait for the results. End user computers display but do not process the results. [PASSIVE VS ACTIVE] WHAT IMPLICATIONS DOES THIS PARALLEL HAVE?

ADD MORE ABOUT: “definition of big data, contemporary ways of analyzing data, and challenges peculiar to big data.”

The authors propose a general, five-step approach for big data analytics: acquiring data, choosing the right architecture for analyzing the data, fitting the data for the chosen architecture, coding and debugging, and fine tuning. This five-step process is repeated as many times as necessary until meaningful results are obtained. The paper cautions that many business users currently lack many of the skills needed to perform this workflow. They propose XX to address this skill gap?

The potential of big data analytics is vast; for example, companies can design more user-friendly interfaces, enrich customer experience by analyzing the ways customers use the product, and understand healthcare spending. In harnessing this exploding world of data, we are constrained only by the limits of our human ability to think creatively.

From <https://lagunita.stanford.edu/courses/Medicine/SciWrite-SP/SelfPaced/courseware/a3c71ec34df3499da43fe295660fa31e/e11d96c280d74939a65966bb7ab1ff81/?activate_block_id=i4x%3A%2F%2FMedicine%2FSciWrite-SP%2Fsequential%2Fe11d96c280d74939a65966bb7ab1ff81>

Homework 1

Tuesday, January 28, 2020 6:24 AM

In 2012, a paper written by Geoffrey Hinton and colleagues won ImageNet (consisting of 15 million images and labels showing category) competition by a large margin. This was the greatest victory of so-called neural networks since their inception. It triggered a chain reaction of research and development in deep learning: a field that works with neural networks. This research was so groundbreaking that Google bought Geoffrey's company for large sums of money and hired him and his colleagues.

From the times of the very first computer, we are trying to make intelligent machines. Allen Turing was a pioneer who talked about artificially intelligent machines and even gave the idea of the Turing test: a way to distinguish between humans and intelligent machines. For long, research in AI has been steering in many directions. Although the first brain-inspired neural network was introduced in the 60s, it was dismissed for its limitations and research to obtain AI in different ways flourished. It was AlexNet's win that changed the direction of the field towards deep learning.

Deep learning is a sub-field of machine learning which studies neural networks. Artificial Neural networks are computing machines inspired by the brain's structure. The basic unit of this network is a processing unit that takes many inputs and processes them to create one output. These inputs are connections from preceding basic units. The network aims to learn the strength of these connections with data.

For instance, let's say that we want to make a neural network that can distinguish between cat and dog. For this, we first create an artificial neural network with many such basic units and connections between them. Then we train this network: show a labeled example of cat and dog to this network and let it learn connections between these units via an algorithm called backpropagation. Ultimately, we have a neural network that has learned connections between these basic units in such a way that it can distinguish between cat and dog.

The kind of artificial neural network defined in previous paragraphs exists from the 1990s. The problem that AlexNet solved was different. While we were able to create and train small (also called shallow) artificial neural networks, large neural networks were difficult to train and took too much time. This paper introduced a way to leverage Graphic Processing Units (a piece of computer hardware that can do parallel tasks and often used for gaming) to train very large neural networks and showed that larger networks indeed have more learning capacity. This opened many ways to use this kind of neural networks in many fields. Neural networks are now used by almost all the big tech companies.

Writing Manuscript

Thursday, January 30, 2020 9:29 AM

Writing Making Easier

- Break Tasks into small and realistic goals
 - Write one paragraph
 - Write 400 words

Recommended Order of writing

1. Table and figures
 - a. Each should focus on one point
 - b. Polished and good not rough (should look professional)
 - c. All of these should tell a story
2. Results
 - a. Based on tables and figures
 - b. High level summary
3. Methods
4. Introduction
5. Discussion
 - a. Most complex
6. Abstract

- 1. Tables and Figures
- 2. Results
- 3. Methods
7. ■ 4. Introduction
- 5. Discussion
- 6. Abstract

Tables and Figures

Thursday, January 30, 2020 9:37 AM

Tables and Figures are the story

- Tables and figures are the foundation of your story
- People see it after abstract
- Should be self-contained (define experimental details, abbreviations)
- Each should make one clear point
- They should progress according to story

Tips on Tables and Figures

- Fewest possible
- Don't repeat in figure and table

Table vs Figure

- **Figure**
 - Visual impact
 - Show trend and patterns
 - Tell a quick story
 - Tell the whole story
 - Highlight a particular result
- **Tables**
 - Give precise values
 - Display many values

Table Title

- Identify specific topic or point of the table
- Use same key terms in table title, column headings and text
- Keep it brief

Table Footnotes

- Use superscript symbols to identify footnotes, according to journal guidelines;
 - A standard series is: *, †, ‡, #, **, ††, etc.
- Use footnotes to explain statistically significant differences
 - E.g., *p<.01 vs. control by ANOVA
- Use footnotes to explain experimental details or abbreviations
 - E.g., EDI is the Eating Disorder Inventory (reference)
 - Amenorrhea was defined as 0-3 periods per year

Table Formats

- Model on already published papers
- Follow style guidelines
- Some journals have standard on how many line to use
- Number of decimals should depend on confidence and how precise

Table 1. Descriptive characteristics of the study groups, means \pm SD or N (%).

Characteristic	Bad Witches	Good Witches
N	13	12
Age (yrs)	45 \pm 5	36 \pm 6*
Female	11 (85%)	10 (83%)
BMI (kg/m^2)	21 \pm 6	23 \pm 3
Systolic BP (mmHg)	140 \pm 10	120 \pm 9*
Exercise (min/day)	30 \pm 20	60 \pm 30*
Employment status		
Unemployed	4 (31%)	0 (0%)
Part time	3 (23%)	4 (33%)
Full time	6 (46%)	8 (66%)
Smoker (yes/no)	6 (50%)	0 (0%)*

*p<.05, ttest or Fisher's exact test, as appropriate.

Grid Lines

What not to do!

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Inconsistent style

What not to do!

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Units

What not to do!



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*p<.05, ttest or Fisher's exact test, as appropriate.

Too many columns are bad

Give units!

Types of Figures

- Primary evidence
 - Electron graphs gel, photographs
- Graphs
- Drawing and diagram
 - Illustrate experimental setup
 - Illustrate cause/effect relationship
 - Hypothetical model

Figure Legend

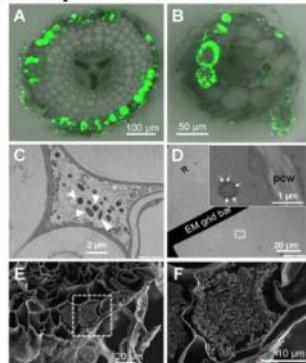
- Allow the figure to stand alone
- May contain
 - Brief title
 - Essential experimental details
 - Definition of symbols or lines
 - Explanation panels
 - Statistical explanation

Example Legend

- **Figure 2. Root transverse sections and electron micrographs of tomato and Arabidopsis show GFP E. coli in the apoplast and inside root cells.** E. coli was detected inside tomato roots (A, C and D, E and F) and Arabidopsis roots (B). (A and B) Fluorescent images of transverse sectioned roots taken by CLSM. (C and D) Images taken by a transmission electron microscope. White triangles in (C) indicate E. coli cell present in apoplast. (D) Roots were probed with immunogold-labeled anti-GFP revealing E. coli in root cortex cells. Sub-image in (D) is a detail of dash-white square box. Gold labeling is marked with white arrows. Rhizodermis cell (R) and plant cell wall (pcw) is indicated. (F) is a detail image of (E) showing plant cells containing E. coli, and both images were taken by SEM.

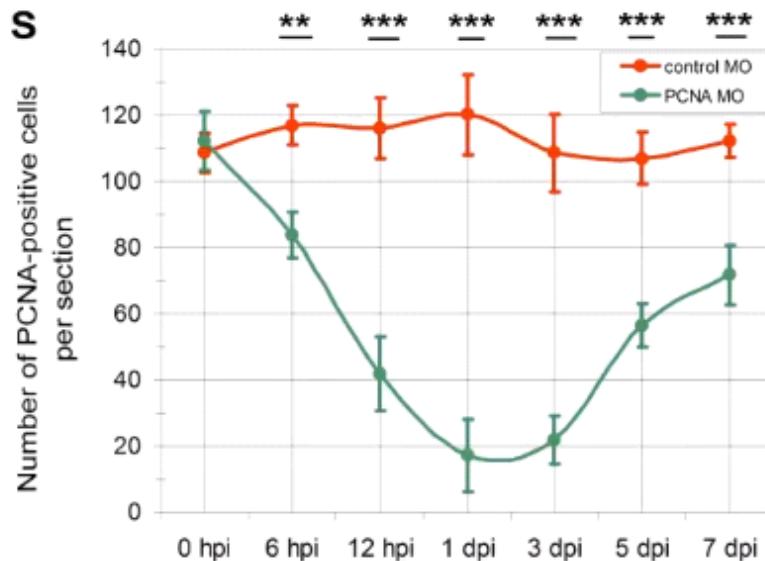
- Primary evidence

Figure 2. Root transverse sections and electron micrographs of tomato and Arabidopsis show GFPE. coli in the apoplast and inside root cells.

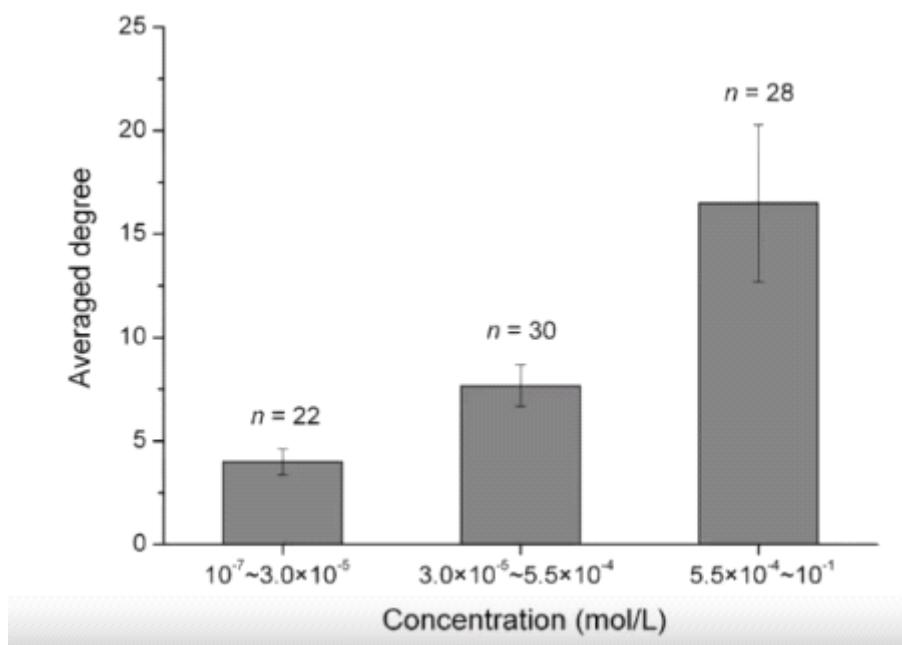


Graphs

- Line graphs: trend

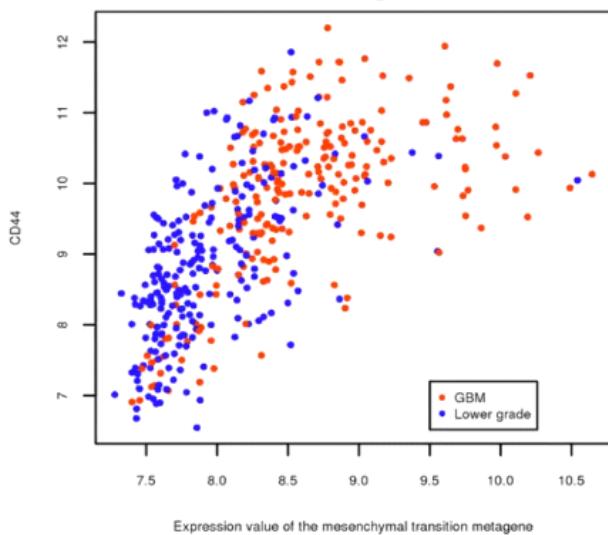


- **Bar plots:** easy to understand



- **Scatter plots:** relationship between continuous data
 - Allow more detailed things
 - Be careful about line showing relationship

Figure 4. Scatter plot for the expression levels of CD44 vs. the mesenchymal transition metagene.



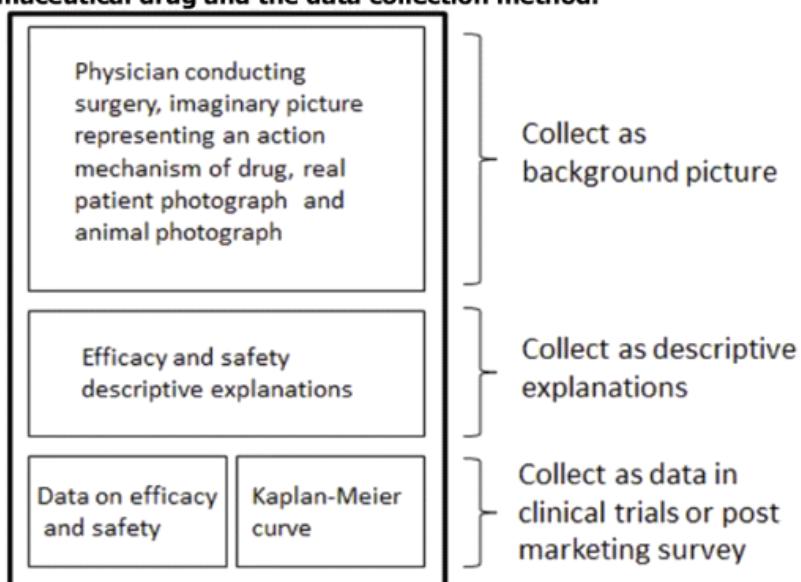
Tips for Graphs

- Tell visual story
- Keep it simple
- Make it easy to distinguish (triangles vs. circle vs squares are not easy)
- If it's too complex --> its belongs table

Diagrams and Drawings

- Should be used to explain things that are difficult to explain in text
- Help reader visualize

- **Figure 1. Example of the content of a typical print advertisement for a pharmaceutical drug and the data collection method.**



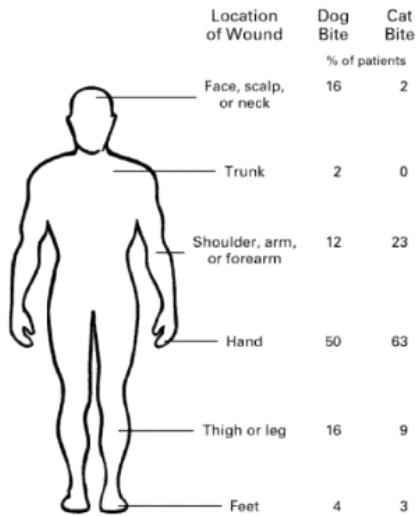
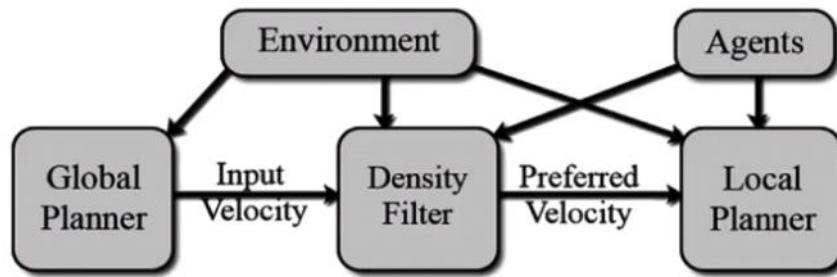


Figure 1. Location of Wound Infections in 50 Patients Bitten by Dogs and 57 Patients Bitten by Cats.



Use videos as well

Results

Thursday, January 30, 2020 10:14 AM

- After nice figures and tables
- **Mistake:** Repeat table and figure numbers

What result section should show

1. Summarize what the data show
 - a. Point out simple relationships
 - b. Describe big picture trends
 - c. Cite figures or tables that present supporting data
2. Avoid repeating number given in table or figure
3. Give take home message

"Over the course of treatment, topiramate was significantly more effective than placebo at improving drinking outcomes on drinks per day, drinks per drinking day, percentage of heavy drinking days, percentage of days abstinent, and log plasma - glutamyl transferase ratio (Table 3)."

"The total suicide rate for Australian men and women did not change between 1991 and 2000 because marked decreases in older men and women (Table 1) were offset by increases in younger adults, especially younger men.⁷"

What not to do?

Hypothetical Example

Table 1. Descriptive characteristics of the study groups, means \pm SD or N (%).

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N	13	12
Age (yrs)	45 \pm 5	36 \pm 6*
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Smoker (yes/no)	6 (50%)	0 (0%)*

*p<.05, t-test or Fisher's exact test, as appropriate.

The characteristics of the bad witches and the good witches are shown in Table 1. There was a significant difference in age between the groups. The mean age of the bad witches was 45 \pm 5; and the mean age of the good witches was 36 \pm 6. There was no significant difference in gender between the groups, with the bad witches having 85% females and the good witches having 83% females. BMI was not significantly different between the groups, which both had normal BMIs. Systolic blood pressure and exercise were significantly different. The bad witches had a mean blood pressure of 140 \pm 10, whereas the good witches had a mean blood pressure of 120 \pm 9. Estimated daily exercise was higher in the good witches (60 \pm 30) than the bad witches (30 \pm 20). Employment was not significantly different between the two groups... 



Edited version...

Original:

The characteristics of the bad witches and the good witches are shown in Table 1. There was a significant difference in age between the groups. The mean age of the bad witches was 45 ± 5 ; and the mean age of the good witches was 36 ± 6 . There was no significant difference in gender between the groups, with the bad witches having 85% females and the good witches having 83% females. BMI was not significantly different between the groups, which both had normal BMIs. Systolic blood pressure and exercise were significantly different. The bad witches had a mean blood pressure of 140 ± 10 , whereas the good witches had a mean blood pressure of 120 ± 9 . Estimated daily exercise was higher in the good witches (60 ± 30) than the bad witches (30 ± 20). Employment was not significantly different between the two groups...

Revised:

The witches were, on average, lean and predominantly female (Table 1). Bad witches were significantly older, had higher blood pressures, exercised less, and were more likely to smoke than good witches.
More bad witches were unemployed, but this difference did not reach statistical significance.

Tips for writing results

- Break into subsections: provide roadmap
- Complement table and results
 - Give precise values if not given in figure
 - Report percent change if absolute values are given
- Repeat/highlight more important results
- Include Negative results
- Significant == statistically significance
- Reserve information about what you did in methods section
- **Result section = What your data show**
Discussion section = what your data mean

What verb/tense to use?

When describing the implications of data, the present tense and active voice are appropriate.

*Use past tense for completed actions:

We found that...

The average reaction time was...

Women were more likely to...

Men smoked more cigarettes than...

*Use the present tense for assertions that continue to be true, such as what the tables show, what you believe, and what the data suggest:

Figure 1 shows...

The findings confirm...

The data suggest...

We believe that this shows...

Example:

Information was available for 7766 current cigarette smokers. Of these, 1216 (16%) were classified as hardcore smokers. Table 1 gives characteristics of all the smokers. The most striking difference was that hardcore smokers were about 10 years older on average and tended to be more dependent on tobacco. Significantly more hardcore smokers had manual occupations, lived in rented accommodation, and had completed their full time education by the age of 16 years. There was no difference by sex.

Use active voice

- More lively
- Talk about different things replace we

Differences in attitudes and beliefs by level of dependence

To test whether it was appropriate to exclude a measure of cigarette dependence from our criteria for defining hardcore smoking, we compared attitudes and beliefs by dependence in hardcore and other smokers (table 4). For most items, beliefs were similar in low and high dependence hardcore smokers but strikingly different from those of other smokers. For example, almost 60% of both low and high dependency non-hardcore smokers agreed that improved health would be a major benefit from quitting whereas among hardcore smokers only 27% of low dependency and 32% of high dependency smokers agreed. Similar differentiation in beliefs by hardcore smoking status, but not dependence level, emerged for other items, especially those related to health.

Practice for Writing Results

Thursday, January 30, 2020 10:39 AM

TABLE 2. Summary of running during pregnancy and breastfeeding.

Running during pregnancy and breastfeeding	Mean \pm SD or	Percent (n)
Ran ever during pregnancy	77 (70.0%)	
Ran during the first trimester	69 (62.7%)	
Ran during the second trimester	57 (51.8%)	
Ran during the third trimester	34 (30.9%)	
Ran while breastfeeding*	90 (84.1%)	
Time to resume running post-partum **		
<1 week	6 (5.7%)	
1-2 weeks	18 (17.2%)	
3-4 weeks	23 (21.9%)	
5-7 weeks	26 (24.8%)	
2-6 months	20 (19.1%)	
>6 months	12 (11.4%)	
Running during pregnancy (n=77):		
Average weekly mileage	20.3 \pm 9.3	
Average running intensity (percent of normal)	47.9% \pm 21.0%	
Sustained a running injury	3 (3.9%)	

The majority of runners ran during pregnancy (70.0%, 77/110), with 62.7% running during the first trimester, 51.8% during the second trimester, and fewer than one third (30.9%) during the third trimester (Table 2). From the 77 women who ran during pregnancy, we observed the average weekly mileage during pregnancy for those who ran to be 20.3 ± 9.3 miles. Average running intensity was reported to be $47.9\% \pm 21.0\%$ as a percent of non-pregnant running effort. A small number (3.9%, 3/77) reported sustaining a running injury while pregnant. About a quarter (24.8%) waited 5-7 weeks to resume running post-partum. A small fraction (5.7%) resumed running less than a week after giving birth. Some women (11.4%) waited more than six months post-partum to resume running.

Edited by me

The majority of runners also ran during pregnancy, while it decreases as pregnancy progresses (Table 2). Pregnant women were half as likely to run as non-pregnant women. Women sustaining injury was small. About a quarter started running after a week and about 10% started it post-partum.

Edited by Instructor

Edited Version:

Seventy percent of runners ran during pregnancy (n=77), and almost one third ran during their third trimester (Table 2). On average, those who ran greatly curtailed their training—running 20.3+/-9.3 miles per week and cutting their intensity to half of their non-pregnant running effort. Three reported sustaining a running injury while pregnant. In the post-partum period, nearly one quarter resumed running by two weeks after giving birth; most resumed running by two months.

Methods

Thursday, January 30, 2020 10:51 AM

- Give clear overview of what was done
- Enough details to replicate
- Be complete but make life easy for reader
 - Break into small sections
 - Cite commonly used methods
 - Display diagrams
- You may use jargon and passive voice

Table 1.

Who, what, when, where, how, and why questions to consider when writing the Methods section.

Who

Who maintained the records? Who reviewed the data? Who collected the specimens? Who enrolled the study participants? Who supplied the reagents? Who made the primary diagnosis? Who did the statistical analyses? Who reviewed the protocol for ethics approval? Who provided the funding?

What

What reagents, methods, and instruments were used? What type of study was it? What were the inclusion and exclusion criteria for enrolling study participants? What protocol was followed? What treatments were given? What endpoints were measured? What data transformation was performed? What statistical software package was used? What was the cutoff for statistical significance? What control studies were performed? What validation experiments were performed?

When

When were specimens collected? When were the analyses performed? When was the study initiated? When was the study terminated? When were the diagnoses made?

Where

Where were the records kept? Where were the specimens analyzed? Where were the study participants enrolled? Where was the study performed?

How

How were samples collected, processed, and stored? How many replicates were performed? How was the data reported? How were the study participants selected? How were patients recruited? How was the sample size determined? How were study participants assigned to groups? How was response measured? How were endpoints measured? How were control and disease groups defined?

Why

Why was a species chosen (mice vs rats)? Why was a selected analytical method chosen? Why was a selected experiment performed? Why were experiments done in a certain order?

What to include

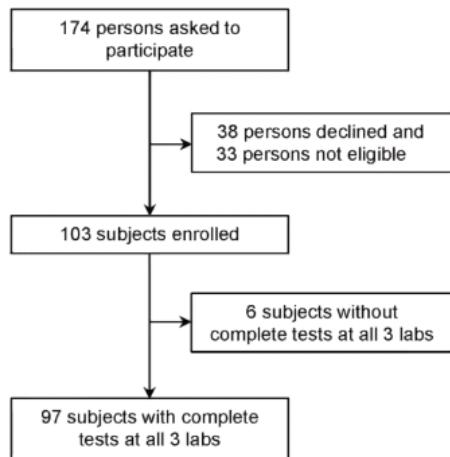
- Materials
- Participants
- Experimental protocols
- Measurements
- Analyses

Make life easy for your reader

- Break into subsections

METHODS

- General Approach
- Biosafety
- Isolation of Virus
- Serologic Analysis
- Pathological and Immunohistochemical Studies
- Molecular Analyses
- Cite a reference for commonly methods
- Use flow diagrams or tables



Tips

- Tense



Report methods in past tense ("we measured"),

But use present tense to describe how data are presented in the paper ("data are summarized as means \pm SD")

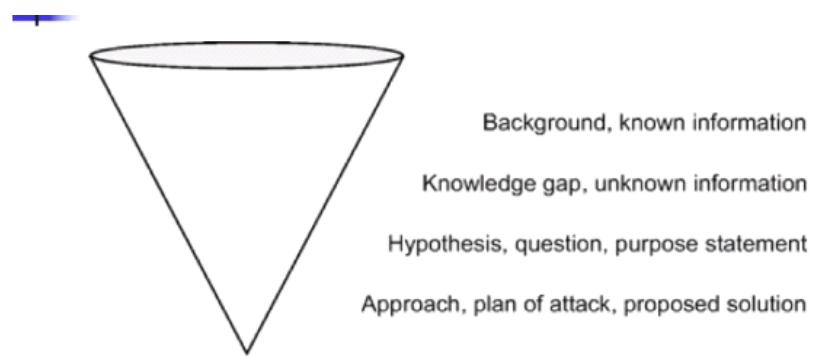
- It is okay to use passive voice
 - Oral temperature were measured
- Jargon is okay

Introduction Section

Thursday, January 30, 2020 11:03 AM

- Easier
- Follow a standard format
- Should be between 3-5 paragraphs
- It is not exhaustive review of your general topic
- It should focus on specific hypothesis/aim of your study

Standard Format



1. What's known } ≈ Paragraph 1
2. What's unknown }
 - limitations and gaps in previous studies≈ Paragraph 2
3. Your burning question
4. Your experimental approach } ≈ Paragraph 3
5. Why your experimental approach is new and different and important (fills in the gaps)

Tips

- 3-5 short and crisp paragraphs
- Write for general audience
- Known --> unknown --> question/hypothesis
- Explicitly state your research
 - "We asked whether"; "Our hypothesis was"; "We tested the hypothesis that"; "Our aim/s were"
- Don't answer research question
- Summarize at high level, leave details for other sections

- The past tense and active voice are appropriate for discussing previous research.

Examples

- Unsolicited and unwanted (spam) electronic invitations to speak at or attend conferences, or to write for or edit journals are a burgeoning aspect of academic life. Colleagues regard such invitations with wry amusement, intense frustration, or resignation. Two of us (AG, ND) have reviewed travel grant applications from colleagues who received spam invitations to give conference presentations.
- Few studies have focused on academic spam. In the Academic Spam Study we investigated the amount, relevance, content, and suppressibility of academic spam emails.

The relations between excess body weight and mortality, not only from all causes but also from cardiovascular disease, are well established.^{1,2,3,4,5,6} Although we have known for some time that excess weight is also an important factor in death from cancer,⁷ our knowledge of the magnitude of the relation, both for all cancers and for cancers at individual sites, and the public health effect of excess weight in terms of total mortality from cancer is limited. Previous studies have consistently shown associations between adiposity and increased risk of cancers of the endometrium, kidney, gallbladder (in women), breast (in postmenopausal women), and colon (particularly in men).^{8,9,10,11,12} Adenocarcinoma of the esophagus has been linked to obesity.^{11,13,14} Data on cancers of the pancreas, prostate, liver, cervix, and ovary and on hematopoietic cancers are scarce or inconsistent.^{7,8,9,10,11,15,16,17} The lack of consistency may be attributable to the limited number of studies (especially those with prospective cohorts), the limited range and variable categorization of overweight and obesity among studies, bias introduced by reverse causality with respect to smoking-related cancers, and possibly real differences between the effects of overweight and obesity on the incidence of cancer and on the rates of death from some cancers.^{18,19}

We conducted a prospective investigation in a large cohort of U.S. men and women to determine the relations between body-mass index (the weight in kilograms divided by the square of the height in meters) and the risk of death from cancer at specific sites. This cohort has been used previously to examine the association of body-mass index and death from any cause.⁵

Practice on Introduction Section

Thursday, January 30, 2020 11:18 AM

Text of practice exercises Module 5.5

Identify sentences that give:

1. The “what’s known” or background
2. The “what’s unknown” or gaps and limitations
3. The aims and approach of this specific study

Example 1

1. Mass media in the form of television, radio and printed material are frequently used to deliver medical information to the public. Research suggests that mass media can improve public knowledge¹ and potentially improve health behaviors.² Television is one of the most important mass media sources of health information.³ However, concerns have been raised about the quality, completeness and accuracy of medical information covered in the news media,^{5 6 7 8} and television news media is no exception.^{7 8} The quality of information outside of the news media has not been examined.

According to Nielsen's report, American citizens spend an average of over five hours a day watching television.⁹ International health information programs, such as *The Dr Oz Show* and *The Doctors* have become a regular part of television broadcasting. In the 2012-13 season, *The Dr Oz Show* was consistently ranked in the top five talk shows in America with an average of 2.9 million viewers per day, while *The Doctors* had a high of 2.3 million viewers.^{10 11} In the 2012 Greatist report, Dr Mehmet Oz and Dr Travis Stork (one of the hosts of *The Doctors*) were both included in the top 100 health and fitness influencers.¹²

Popular television talk shows such as *The Dr Oz Show* often engender skepticism and criticism from medical professionals.^{13 14 15} However, no research has systematically examined the content of the medical information provided on these talk shows. Our objective was to review the most popular medical talk shows on television, to (1) determine the type of recommendations and claims given and the details provided, and (2) search for and evaluate the evidence behind these recommendations.

BMJ 2014;349:g7346

Example 2

2. Scholarly publications are among the most important indicators of academic achievement. While the quantity of papers authored certainly matters, simple publication count is not the only important metric. The reputation of the journal in which a paper is published (often gauged using impact factors), along with the number of citations that a paper receives (i.e., other articles that reference that particular work), are together often seen as proxies for a publication's importance and influence.

Self-citation may have a consequential impact on scholarly careers by both directly and indirectly increasing an author's citation counts. Each additional self-citation yields an additional three citations (though not necessarily to the same paper) from other scholars over a five-year period (Fowler and Aksnes 2007). Given the importance of metrics of scholarly influence in academic hiring, tenure and salary decisions, examining gender differences in citation patterns may shed light on persisting gender discrepancies in faculty hiring and promotion. More broadly, academic publishing

provides an illustrative case for gender differences in evaluation metrics and workplace advancement.

Papers authored by women receive fewer citations than do papers by men, even controlling for tenure status, institution, and journal (Larivière et al. 2013). Fewer citations to female-authored papers could be due in part to gender differences in self-citations (when an author cites his or her own previously published work). Research analyzing 12 journals in the field of international relations from 1986-2000 showed men cite their own papers more than one and a half times as often as women (Maliniak, Powers, and Walter 2013).

To date, studies of self-citation have been few in number and confined to a limited number of disciplines and a relatively small number of papers. Here we examine gender differences in self-citations across 24 broad academic fields with hundreds of subfields and several million scholarly papers, with over a million self-citations. We further examine how the gender ratio self-citation patterns changed over time.

King MM et al. Men set their own cites high: Gender and self-citation across fields and over time, Sept 2016

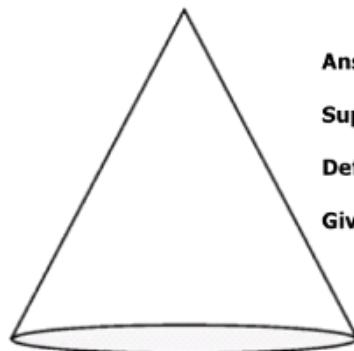
Discussion Section

Thursday, January 30, 2020 11:26 AM

- Most freedom
- Chance to show good writing
- Most challenging

Format

- Invert the format cone



Answer the question asked.

Support your conclusion (your data, others' data)

Defend your conclusion (anticipate criticisms)

Give the "big-picture" take-home message

- What do my result mean and why it matter
- Main things to do

Key finding (answer to the question(s) asked in Intro.)

- Start with: "WE FOUND THAT..." (or something similar)
- Explain what the data mean (big-picture!)
- State if the findings are novel

Key secondary findings

Context

- Give possible mechanisms or pathways
- Compare your results with other people's results
- Discuss how your findings support or challenge the paradigm

Strengths and limitations

- Anticipate readers' questions/criticisms
- Explain why your results are robust

Key finding (answer to the question(s) asked in Intro.)	<ul style="list-style-type: none"> Start with: "WE FOUND THAT..." (or something similar) Explain what the data mean (big-picture!) State if the findings are novel
Key secondary findings	
Context	<ul style="list-style-type: none"> Give possible mechanisms or pathways Compare your results with other people's results Discuss how your findings support or challenge the paradigm
Strengths and limitations	<ul style="list-style-type: none"> Anticipate readers' questions/criticisms Explain why your results are robust
What's next	<ul style="list-style-type: none"> Recommended confirmatory studies ("needs to be confirmed") Point out unanswered questions and future directions
The "so what?": implicate, speculate, recommend	<ul style="list-style-type: none"> Give the big-picture (human) implications of basic science findings Tell readers why they should care
Strong conclusion	<ul style="list-style-type: none"> Restate your main finding. Give a final take-home message.

Tips

- Show writing skills
 - Tell it like a story
 - Active voice
- Start and end with main findings
 - Okay to repeat
- Don't go too far away from data
 - Focus on data and not what you expect
- Focus on limitations that matter, not generic limitations
- Make sure clear and consistent about take home message

Verb Tense

Past, when referring to study details, results, analyses, and background research:

- We found that
- Subjects may have experienced
- Miller et al. found

Present, when talking about what the data suggest:

The greater weight loss suggests

The explanation for this difference is not clear.

Potential explanations include

Examples

Example 1

Discussion

The Academic Spam Study shows that mid-career academics in New Zealand receive on average 2.1 spam invitations each day to publish papers and attend conferences. Unsubscribing had a modest and short lived effect on the quantity of received spam. Sixteen per cent of spam invitations were duplicates, and 83% were of little or no relevance to the recipient. Some organisations send spam invitations without an unsubscribe option, or persist despite recipients requesting unsubscription

Strengths and weaknesses of this study

Our study has limitations. Some invitations were removed by the institutional spam filter, so we might have underestimated the amount of spam. Our sample of researchers was too small to be representative of the academic community. New Zealand is a small, remote country that might not be targeted by academic spam distributors, even though we have held the Rugby World Cup since 2011, and the *Lord of the Rings* movies were filmed here. We received a similar number of spam invitations to colleagues in Poland and Canada who assessed journal invitations, however.^{2 3}

Implications and future research

We suggest further research on academic spam:
“Nobel and prestigious colleagues,
We are enthralled by prospect of novel research focus of academic spam so we make a proposition to improve enlightenment of evidence.
We wish greatly to start journal and convene scientific meeting that focus on academic spam, so illustrious colleagues can form interdisciplinary web of scientific rigour to advance knowledge.
Maybe we will christen soon *Journal of Advances in Interdisciplinary Academic Spam* and launch with alacrity the First Annual International Symposium on Academic Spam (Spam-2017). Once we identify publisher and conference organiser we will email academics to join

Example 2

What to expect from the study

END OF INTRODUCTION:

We performed a study designed to test the hypothesis that severely obese subjects with a high prevalence of diabetes or the metabolic syndrome **[a]** would have a greater weight loss, **[b]** without detrimental effects on risk factors for atherosclerosis, while on a carbohydrate-restricted (low-carbohydrate) diet than on a calorie- and fat-restricted (low-fat) diet.

First para

1. We found that severely obese subjects with a high prevalence of diabetes and the metabolic syndrome lost more weight in a six-month period on a carbohydrate-restricted diet than on a fat- and calorie-restricted diet.

[answer to a]...

2. Subjects in the low-carbohydrate group had greater decreases in triglyceride levels than did subjects in the low-fat group; nondiabetic subjects on the low-carbohydrate diet had greater increases in insulin sensitivity, and subjects with diabetes on this diet had a greater improvement in glycemic control. No adverse effects on other serum lipid levels were observed.

[answer to b]...

4. Many of our subjects were taking lipid-lowering medications and hypoglycemic agents. Although enrolling these subjects introduced confounding variables, it allowed the inclusion of subjects with the obesity-related medical disorders typically encountered in clinical practice. Analyses from which these subjects were excluded still revealed greater improvements in insulin sensitivity and triglyceride levels on a carbohydrate-restricted diet than on a fat- and calorie-restricted diet. [limitations and how they were addressed]

6. The high dropout rate in our study occurred very early and affected our findings. The very early dropout of these subjects may indicate that attrition most closely reflected base-line motivation to lose weight, rather than a response to the dietary intervention itself.

[limitation]

7. Taken together, our findings demonstrate that severely obese subjects with a high prevalence of diabetes and the metabolic syndrome lost more weight during six months on a carbohydrate-restricted diet than on a calorie- and fat-restricted diet. The carbohydrate-restricted diet led to greater improvements in insulin sensitivity that were independent of weight loss and a greater reduction in triglyceride levels in subjects who lost more than 5 percent of their base-line weight. [conclusion; restate answers to a and b] These findings must be interpreted with caution, however, since the magnitude of the overall weight loss relative to our subjects' severe obesity was small, and it is unclear whether these benefits of a carbohydrate-restricted diet extend beyond six months. Furthermore, the high dropout rate and the small overall weight loss demonstrate that dietary adherence was relatively low in both diet groups. [big picture] This study proves a principle and does not provide clinical guidance; given the known benefits of fat restriction, future studies evaluating long-term cardiovascular outcomes are needed before a carbohydrate-restricted diet can be endorsed. [take-home message]

Example 3

Here we examine gender differences in self-citations across 24 broad academic fields with hundreds of subfields and several million scholarly papers, with over a million self-citations. We further examine how the gender ratio self-citation patterns changed over time.



Our study uses an unprecedentedly large dataset of 1.7 million papers across a broad range of academic fields to examine trends in self-citation by academic researchers. Examining 39.4 million author-to-author citations and over 1 million self-citations in this JSTOR database, we uncovered a number of important patterns: (1) In the last two decades, for every seven self-citations by men, women cited themselves four times (a ratio of 1.7). This ratio rose sharply in the 1960s and 1970s, evening out in the 1980s...

Secondary findings



Our study uses an unprecedentedly large dataset of 1.7 million papers across a broad range of academic fields to examine trends in self-citation by academic researchers. Examining 39.4 million author-to-author citations and over 1 million self-citations in this JSTOR database, we uncovered a number of important patterns: (1) In the last two decades, for every seven self-citations by men, women cited themselves four times (a ratio of 1.7). This ratio rose sharply in the 1960s and 1970s, evening out in the 1980s. (2) There is wide variation across fields and subfields, and we found no correlation between the proportion of women in a field and women's self-citation rates in that field. (3) Across the whole JSTOR corpus, about 9.4% of citations are self-citations, indicating that these make up an important fraction of all citations to authors' work. (4) Men and women differ by more than ten percentage points in how likely they are not to cite themselves in a given paper (68.6% for men vs. 78.8% for women).

Possible mechanisms

Why might men academics cite their own previous work more

Possible mechanisms

Why might men academics cite their own previous work more than women academics? While our data include a large number of papers and self-citations, they do not contain variables that allow us to determine the cause of the patterns we identify. However, prior research suggests several mechanisms that are consistent with our results. We review five possible mechanisms here, which may in some combination contribute to the gender self-citation gap: (1) Men may self-cite more because they evaluate their abilities more positively than women. (2) Men face fewer social sanctions for self-promotion. (3) Men specialize more in academic subfields, and specialization may encourage more self-citation. (4) Men publish more papers, particularly earlier in their career, and therefore have more work to cite. (5) Men publish different types of papers, which are the types of papers an academic may be more likely to self-cite.

Limitations

Again, our data cannot reveal the mechanisms behind this temporal trend; here we present hypotheses based on the other scholarly literature to encourage future study. Irrespective of the underlying causal mechanisms, we find statistically significant and socially important gender differences in patterns of self-citation.

Implications

(2 additional paragraphs)

Final paragraph: Historically, women's academic contributions have been undervalued. Rossiter (1993) described the "Matilda Effect," which is the process by which women's scientific ideas are steadily downplayed or ignored and recognition systematically biased in favor of men's intellectual contributions. When interpreting the impact metrics of scholars' work, university hiring and tenure committees should be aware that women are likely to cite their own work less often. Considering other proposed measures for scientific impact that exclude self-citation (Ferrara and Romero 2013) could make evaluation processes less gender-biased and improve equity in the academic community.

Abstract

Thursday, January 30, 2020 12:10 PM

Abstract => ab =out, trahere=pull

What abstract should have

- Overview of the main story
- Give highlight of each section
- Limited
- Self-contained
- Only part people read

Format

1. 1 sentence background
2. Research aim - hypothesis/aim/question
3. Quick summary of key method
4. Key results
5. Brief conclusion
6. Implication, speculation, recommendation

Plagiarism

Monday, February 10, 2020 10:40 AM

Passing off other people's writing as your own

1. Understand the material well enough
2. Work from memory; don't start from other's work
3. Draw your own conclusion

Detect Plagiarism

- Write sentence in quotes in google
- Very small probability of same sentences by two people

Self-Plagiarism

- Copy or slightly rewriting text from your own work
- Adding new data and presenting as new results
- Submitting identical or overlapping data to multiple journals

Authorship

Monday, February 10, 2020 11:06 AM

Acknowledgements

1. Contribute who helped in

Submission Process

Monday, February 10, 2020 11:13 AM

1. Before writing: identify a journal for submission
2. Look at the institutions for authors for writing and formatting
3. Submit your manuscript
4. Possible outcome: accepted, accepted after revisions, reject but re-submission, no resub-possible
5. Read the reviewer comments; change the paper; sent it to another journal

Reviewer Respond

1. Don't act defensibly for the criticism
2. Don't take it personally
- 3.

- Make paper pleasant to read
- Tell reader early on what the paper is about
- Include some element of surprise
- Put example upfront
- Choose an appropriate journal
- Editors may only read Intro and abstract so they are crucial
- Good graphics
- Attractive format
- Massive equations are not good
- Best hook is at the beginning
- Dumb it down at the beginning of the paper
- Don't be fancy
- Make paper shorter and clearer
- Put more attention to writing than submission

Dr. George Lundberg

Monday, February 10, 2020 11:37 AM

1. Don't pick best journal of the field; find right venue
2. Don't write too long
3. Don't draw conclusions beyond data
4. Take chances
5. Find good reviewer before submission
6. Accept rejection as expected outcome
7. Rejection with possible resubmission is good
8. Either do all the things reviewer says or strongly defend it.
9. Follow instructions for authors
10. Find appropriate journal for your paper

Dr. Gary Friedman

Monday, February 10, 2020 8:28 PM

1. Good things in paper?
 1. Novelty: may reject right away based on novelty
2. Over confidence on study is major mistake of new scientists
3. Clarity and conciseness; avoid repetition; avoid excessive verbiage; avoid long discussion in introduction (brief introduction); don't repeat numerical data in the text(describe in words).
4. **Advice to first time authors:**
 1. Write as if you are an established scientist
 2. Avoid making paper as thesis
5. Acceptance with revision is good thing
6. List all the comments of reviewers and respond to them separately
7. Either fix the problem raised by reviewer or give good argument against
8. Give where you have put all the changes
9. Be polite to reviewers
10. Don't be discouraged by negative finding; try to publish as well.

Doing a Peer Review

Monday, February 10, 2020 8:54 PM

- Great way to see back way process of publication
- You can see issues of the other papers; confidence boast

- Tone: Be critical but be positive; have better tone

- E.g. "The authors should delete table 5; not only is it completely irrelevant, but it also reveals their utter lack of statistical understanding."
- vs. "Table 5 contains unnecessary information (for example...), and a Pearson's correlation coefficient may not be appropriate here. The authors should consider revising or omitting the table."

- Don't be journals
- Use positive language, instead of negatives
- Scan the abstract
- Jump to the data; review the data
- Read introduction carefully
- Read the methods carefully
- Read the results carefully; text should complement the data
- Start with a general paragraph of overview
- Give one paragraphs on positives
- 1-2 major limitations of the papers

Predatory Journals

Monday, February 10, 2020 9:10 PM

Sentence Level Rules

Wednesday, February 5, 2020 3:18 PM

- Ask following questions for all the sentences
 - Is this sentence easy to read
 - interesting to read
 - Is this sentence readable
 - Is this sentence informs or obscures information
- Use active voice frequently, passive voice sparingly
 - subject + verb + object
 - Passive verbs: is, are, was, were, be, been, am, could be, should be, will be, has been
- Use I and we instead of passive voice

Provide a review of review

Offer confirmation of confirm

Make a decision decide

Shows a peak peaks

Provide a description of describe

Don't turn verbs into nouns

Write with strong verbs

Compare:

~~X~~ "Loud music came from speakers embedded in the walls, and the entire arena moved as the hungry crowd got to its feet."

With:

"Loud music exploded from speakers embedded in the walls, and the entire arena shook as the hungry crowd leaped to its feet."

Don't bury the main verb

Cut ruthlessly

Avoid hedge words: appreciable change, little improvement

Avoid vague descriptions such as: important , worthwhile

Avoid dead weight words: emphasized, generally

Avoid Unnecessary jargon and acronyms

Avoid Repetitive words or phrases: studies, examples, illustrate, challenges

Avoid adverbs: very, slowly, quite, basically, generally

Long words/ phrases --> short

<u>Wordy version</u>	<u>Crisp version</u>
■ A majority of	most
■ A number of	many
■ Are of the same opinion	agree
<input type="checkbox"/> ■ Less frequently occurring	rare
■ All three of the	the three
■ Give rise to	cause
■ Due to the fact that	because
■ Have an effect on	affect

Use positives instead of negatives: not honest --> dishonest

Eliminate superfluous use "there are/ there is"

There are many ways in which we can arrange the pulleys.

→We can arrange the pulleys in many ways.

There was a long line of bacteria on the plate.

→Bacteria lined the plate.

Omit needless prepositions

The meeting happened on Monday.

The meeting happened Monday

That/which use

If the clause after "that/which" is essential use that.

If the clause after "that/which" is not essential use which.

Writing a Review Article

Monday, February 10, 2020 9:49 PM

Goals:

- Synthesize and evaluate the recent primary literature on a topic
- Summarizes the current state of the knowledge
- Address controversies
- Provide a comprehensive list of citations

Types of Review

1. Non-Systematic Review
2. Systematic review: all the studies on a topic
3. Meta-analysis: A systematic review uses statistical method

Non-Systematic Review:

- Start with broad search --> narrow it down
- Clearly define your thesis or theme
- Invest time getting organized
 - a. Note taking
- Divide into sections
- Consider putting information in tables, figures and/or tables
- Write for a broad audience
- Engaging and lively style of writing

Writing

- Abstract
- Introduction
 - o Clearly state the aim of the review
- Divide
 - o Sections
 - o Summaries the literature, organized based on methodology
- Conclusion
 - o Recommendation s
 - o Gaps
 - o How to fill the gaps
- Citations
- Should have a theme

Grants 1

Monday, February 10, 2020 10:02 PM

Tips:

1. Start early and gather critical information
 - a. Compile possible funding opportunities
 - b. Gather information
2. Identify the review criteria
3. Create a game plan and write regularly
 - a. Create a task list
 - b. Write regularly
 - c. Non-Negotiable writing time
4. Find your research niche
 - a. Deep awareness of your field - identify critical knowledge gaps
 - b. Broad familiarity with the field
 - c. Narrow down your list
 - d. Is relevant to funding agency announcement
5. Specific Aims
 - a. Is the research important
 - b. What is the overall goal
 - c. What specifically be done
 - d. What is expected payoff
6. Build a First-Rate Team
 - a. Leverage the strength of expertise of collaborators
7. Develop a complete research plan
 - a. Is there a need
 - b. How will the specific aims be accomplished
 - c. Time
 - d. Future?
8. Get feedback
9. Follow specific requirements and proofread and errors and readability
- 10.

Grants 2

Monday, February 10, 2020 10:11 PM

Specific aims instructions

Personal Statement

Tuesday, February 11, 2020 12:04 PM

1. Make it personal
 - a. Speak from the heart
 - b. Reveal who you are
2. Give specific examples and stories
 - a. Show, Don't tell
3. Don't read your CV line by line
 - a. Highlight
4. Avoid big words if you don't read them; don't clichés
5. Show interested/ flatter your readers
 - a. Show you done your home work
 - b. Be specific
6. Explain gaps/ failures
 - a. Don't ignore these in the hope reviewers will not notice

Opening

- Start strong (story, scene)
- Be creative
- Be descriptive and story
- Be more personal

Body and Essay

1. Where do you want to go; long and short term goals
2. What experiences have you lead you to this point
3. What make you strong; make your weakness into ...

Talking with Media

Tuesday, February 11, 2020 12:48 PM

1. Journalist