CLEAR EXPRESSION
IN TECHNICAL WRITING

E100-250: Microprocessors & Toys Technical Communication
Winter 2019
CLEAR EXPRESSION writing in a way that is no harder to read than necessary
THINGS THAT MAKE WRITING HARD TO UNDERSTAND?

(OTHER THAN HARD/UNFAMILIAR CONCEPTS)
THINGS THAT MAKE WRITING HARD TO UNDERSTAND

abstraction
long sentences
compressed phrases
unfamiliar vocabulary
mistakes of grammar or syntax
poor organization of ideas at any level (sentence, paragraph, section, report)
ABSTRACTION

When unnecessary, it leads to vagueness & uncertainty
THERE ARE DEGREES OF ABSTRACTION

COACH

ATHLETIC COACH

BASKETBALL COACH

JOHN BEILEIN

VERY ABSTRACT

CONCRETE
abstract

words tend to be longer than concrete words in English
are often three or more syllables
the more abstract words a text uses, the harder it is to understand
“The more syllables per 100 words, the harder a text is to read.”


Creator of Flesch Reading Ease test and co-creator of Flesch-Kinkaid readability test
“The more ‘hard words’ (words of three or more syllables) in a text, the harder it is to grasp.”


Creator of Gunning’s Fog Index Readability Formula
NUMBER OF 3-SYLLABLE WORDS
NUMBER OF WORDS = READABILITY (SIMPLIFIED)
the length of sentences is also considered
ABSTRACT

WORDS can also be strung together in difficult or meaningless phrases
“Capital One is on a mission to help our customers succeed by bringing ingenuity, simplicity, and humanity to banking.”

Capital One job ad for EE and CS interns
“Capital One is on a mission to help our customers succeed by bringing ingenuity, simplicity, and humanity to banking.”

Capital One job ad for EE and CS interns
“We believe that innovation is powered by perspective and that teamwork and respect for each other lead to superior results. We elevate each other and obsess about doing the right thing. Our associates serve with humility and a deep respect for their responsibility in helping our customers achieve their goals and realize their dreams.”

Capital One job ad for EE and CS interns
“We believe that innovation is powered by perspective and that teamwork and respect for each other lead to superior results. We elevate each other and obsess about doing the right thing. Our associates serve with humility and a deep respect for their responsibility in helping our customers achieve their goals and realize their dreams.”

Capital One job ad for EE and CS interns
“We believe that innovation is powered by perspective and that teamwork and respect for each other lead to superior results. We elevate each other, obsess about doing the right thing, our associates serve with humility and a deep respect for their responsibility in helping our customers achieve their goals and realize their dreams.”

Capital One job ad for EE and CS interns
Compression in writing packing too much information into too few words, often done by stringing together nouns
“A motor tachometer angular velocity versus time graph was constructed from the ‘Coasting Stop with Motor Engaged’ data for all trials.”
“A motor tachometer angular velocity versus time graph was constructed from the ‘Coasting Stop with Motor Engaged’ data for all trials.”

Noun string from a senior-level report
“A graph was constructed of the data taken from all trials during which the motor was allowed to coast to a stop. The graph shows the angular velocity of the motor tachometer across time.”

Longer, yet clearer, version of the text on the previous slides.
a unified paragraph deals with a single topic

a coherent paragraph’s sentences follow logically from one to the next

(this, therefore that; this, because of that)
Terrorists will use technology against us, so we have to fight fire with fire. We should use any technological means to fight terrorism. We shouldn’t be afraid of infringing on people’s civil rights because new technologies should allow us to fight terrorism without violating privacy. Only technology will allow us to fight an enemy who can hide in any country, and so we have no choice anyway. Information mining is actually a good intelligence technique because it pinpoints suspects for surveillance ....
WE ARE OBLIGED TO USE TECHNOLOGY TO FIGHT TERRORISM.

Terrorists will use technology against us, so we have to fight fire with fire. We should use any technological means to fight terrorism. We shouldn’t be afraid of infringing on people’s civil rights because new technologies should allow us to fight terrorism without violating privacy. Only technology will allow us to fight an enemy who can hide in any country, and so we have no choice anyway. Information mining is actually a good intelligence technique because it pinpoints suspects for surveillance ....
Technology will allow us to fight terrorism without undue violation of people’s rights.

Terrorists will use technology against us, so we have to fight fire with fire. We should use any technological means to fight terrorism. We shouldn’t be afraid of infringing on people’s civil rights because new technologies should allow us to fight terrorism without violating privacy. Only technology will allow us to fight an enemy who can hide in any country, and so we have no choice anyway. Information mining is actually a good intelligence technique because it pinpoints suspects for surveillance ....
Terrorists will use technology against us, so we have to fight fire with fire. We should use any technological means to fight terrorism. We shouldn’t be afraid of infringing on people’s civil rights because new technologies should allow us to fight terrorism without violating privacy. Only technology will allow us to fight an enemy who can hide in any country, and so we have no choice anyway. Information mining is actually a good intelligence technique because it pinpoints suspects for surveillance ....

INFORMATION MINING IS A GOOD INTELLIGENCE TECHNIQUE.
“An atomic force microscope is a scanning probe microscope capable of resolving objects on the order of fractions of a nanometer. It uses a cantilever with a very sharp tip to trace out the profile of the sample. A laser is focused on the cantilever ...”

A senior-level report that defines and describes an unfamiliar piece of equipment
should be used sparingly and with care. It is less direct, so less forceful than active voice. Passive voice hides the agent acting upon a passive subject unless an additional phrase is added to indicate it.
Avoid nominalization instead, use verbs to express action.
Instead, use verbs to express action (unless the action itself is the subject or object of the sentence).
The state was engaged in the construction of a suspension bridge.
The state was engaged in the construction of a suspension bridge.

The state constructed a suspension bridge.
The state was engaged in the construction of a suspension bridge.

The state constructed a suspension bridge.

The state built a suspension bridge.
“Because the predicted ambient total suspended particulate concentrations met Department of Environment, Lands, and Parks’ Level B ambient air quality objectives, a further evaluation was not required.”

27-word Canadian government document. Flesch-Kinkaid index: 20.29
"Because the predicted ambient total suspended particulate concentrations met Department of Environment, Lands, and Parks’ Level B ambient air quality objectives, a further evaluation was not required."

Problem: Adjective-noun string overuse phenomenon
Because the total of the predicted ambient suspended particulate concentrations that were predicted met Level B of the ambient air quality objectives of the Department of Lands and Parks, a further evaluation was not required.
The total of the predicted ambient suspended particulate concentrations that were predicted met Level B of the ambient air quality objectives of the Department of Lands and Parks. Therefore, a further evaluation was not required.
The Department of Lands and Parks has set ambient air quality objectives. The total of the ambient suspended particulate concentrations that were predicted met Level B of those objectives; therefore, no further evaluation was required.
The car’s antilock brake system is designed for emergency situations.

The CD’s lands and pits were small in size.

The laser beam was red in color.
The car’s antilock brake system is designed for emergency situations.

The CD’s lands and pits were small in size.

The laser beam was red in color.
The multimeter works by following a few simple steps.

Considering all of the equipment in the lab, the oscilloscope proved the most resistant to abuse.
The multimeter works by following a few simple steps.

Considering all of the equipment in the lab, the oscilloscope proved the most resistant to abuse.

Neither red-marked phrase actually modifies anything in the sentence.
DON’T SEPARATE TOO FAR A SUBJECT FROM ITS VERB
This is the division into which most cars, until about five years ago when manufacturers started including blind-spot detection and other safety devices on ordinary models, would have been placed.
Restrictive Clauses

necessary to the sentence in order to identify clearly the thing being modified

often use “that” (or “who” or “whom”) and no comma to set them off from the main clause

example: We calibrated the atomic force microscopes that we used in class.
adds incidental information about the subject that is not necessary to identify the thing modified.

use "which" and a comma to set them off from the main clause.

example: We calibrated the atomic force microscopes, which had been in the laboratory for a year.
Restrictive Clause or Non-Restrictive Clause

Distinguish clearly between the two
incorrect punctuation leads to confusion because it changes the meaning of the sentence—sometimes quite radically
"Let's eat Grandma!"

"Let's eat, Grandma!"

PUNCTUATION SAVES LIVES.
The pivot power strip is a variation on the common power strip that is able to bend into different shapes.
The pivot power strip is a variation on the common power strip that is able to bend into different shapes.
The pivot power strip, which is a variation on the common power strip, is able to bend into different shapes.

This corrected sentence now positions and uses the restricted clause and corresponding punctuation correctly.
use plain, short words when you can
write manageable sentences
do not compress your statements too much
be sure your paragraphs are both unified and coherent
explain unfamiliar terms
use passive voice sparingly and with care
avoid nominalization

CLEAR EXPRESSION
WRITING TIPS
use a clause, phrase, or sentence to be clear
avoid logical doublets
avoid dangling phrases
don’t separate too far the subject of a sentence from its verb
distinguish clearly between restrictive and nonrestrictive clauses
use proper punctuation
The material in this lecture was adapted from a lecture given by Dr. Erik Hildinger for E100-250 in previous years.