

Wheeler's rules of writing

(These rules were assembled over several years by Edwin F. Taylor, one of many collaborators with John Archibald Wheeler (JAW). JAW has read these and generally approved them, but he has not edited them.)

Motivate! Motivate! Motivate! The text should read like a detective story, keeping the reader on the edge of her chair, gasping for the next handout. Every sentence quotable! Book design must contribute to the rich, headlong plunge.

Simplify! Simplify! Simplify! JAW: "Everything important is, at bottom, utterly simple." Einstein: "I want to know His [God's] thoughts, the rest are details."

The power and generality of the singular, the specific, the committed: Avoid plurals. "those designing Earth satellites" becomes "anyone designing an earth satellite." Use *the* rather than *a*: "Center of the black hole," not "center of a black hole." No "if," no "suppose;" instead, use "when."

The power of the present: Avoid past tense unless talking about history. Avoid unnecessary future tense.

The power of the active: Avoid passives.

The dullness of simply being: Suppress the use of the verb "to be."

JAW: "Whenever I have an 'is' in a sentence, I know there is something wrong with that sentence."

"...is not an harmonic oscillator" becomes "...does not rate as an harmonic oscillator."

"He is happy" becomes "He beams happiness."

"Schwarzschild spacetime geometry is distinguished from all other conceivable geometries..." becomes "Schwarzschild spacetime geometry distinguishes itself from all other conceivable geometries..."

Avoid the subjunctive ("We would like to express the metric as...") except in cases in which you are presenting something with which you do not agree ("Some would conclude incorrectly that...").

Avoid "ing" words. "before escaping or plunging" be-

comes "before it escapes or plunges"; "The Earth is rotating" becomes "The Earth rotates."

Put the key word first or early in the sentence or at the end of the sentence, not in the middle.

Rhetorical rule of threes. Use three descriptions to establish a triangle that spans the idea being presented: "proper time, interval, wristwatch time" or "Schwarzschild radial coordinate, r , reduced circumference." It is also a reminder of the different descriptors of the same thing.

Use "we" to include the student, rather than "you," which is not so friendly: "As we plunge into a black hole..."

However...

Use infinitive construction: "To find", "to learn", "to determine" rather than "we do so and so" or "let us do so and so," which is condescending because the author is going to do it anyway.

"We use the Principle of Relativity to derive the invariance of the interval." or "Let us use the Principle of Relativity to derive the invariance of the interval." or "Use the Principle of Relativity to derive the invariance of the interval." all become "To derive the invariance of the interval, use the Principle of Relativity."

Use commands to stir the blood—but sparingly.

"Find..."

"Determine..."

"Reckon..." (rather than "compute" or "calculate," which seem technical)

"Plunge..."

But not so much as to seem bossy.

Appeal to experiment or logic—not to the professions. Do not invoke "scientists" to enforce a point.

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FOOTNOTES

The number of external friends the text comes with is a good indication of its strength, but there is a surer sign: references to other documents. The presence or the absence of references, quotations and footnotes is so much a sign that a document is serious or not that you can transform a fact into fiction or a fiction into fact just by adding or subtracting references.

The effect of references on persuasion is not limited to that of 'prestige' or 'bluff'. Again, it is a question of *numbers*. A paper that does not have references is like a child without an escort walking at night in a big city it does not know: isolated, lost, anything may happen to it. On the contrary, attacking a paper heavy with footnotes means that the dissenter has to weaken each of the other papers, or will at least be threatened with having to do so, whereas attacking a naked paper means that the reader and the author are of the same weight: face to face.

Bruno Latour, *Science in Action—How to Follow Scientists and Engineers Through Society* (Harvard University Press, Cambridge, Massachusetts, 1987), p. 33.