The Three Laws of Professional Communication

Interface

—Feature by
JEAN-LUC DOUMONT,
SENIOR MEMBER, IEEE

Fantasy stories, whether magic tales, science fiction, or others, are often strikingly inconsistent: wizards, aliens, and other marvelous or monstrous creatures seem to be endowed with largely ad hoc powers. Even celebrated epics such as *Lord of the Rings*, best selling novels such as *Harry Potter*, or famous television serials such as *Star Trek* leave the critical reader or viewer with an uneasy sense of illogic: "Well, if he has the power to do **that**, why didn't he use it in this other case?"

One science-fiction author, however, stands out for the logic of his narrative and, especially, the consistency of his robot stories. Isaac Asimov's robots indeed have "positronic brains" that are governed entirely by three "laws of robotics" (Fig. 1). These three laws are enough to explain the behavior of any robot at any time in any of Asimov's novels or short stories. Far from restricting the possible plots, they are the building blocks of rich, complex, varied scenarios.

The search for simple, fundamental, "atomic" constituents to explain complex phenomena is, of course, at the heart of science: physical chemists have established three laws of thermodynamics (Fig. 2); physicists are looking for elementary particles and for fundamental interactions between these particles, etc. The scientific slant in Asimov's literary contribution should come as no surprise: Asimov was an Associate Professor of Biochemistry at the University of Boston School of Medicine before retiring to full-time authorship. In turn, the number of laws, three, is no surprise either: the shaping of knowledge into axioms and principles is but a construction of the mind, and a set of three simply communicates well [2].

The search for fundamental laws, unfortunately, has seldom, if ever, been applied to professional communication. Most how-to books on the subject seem content with long lists of phenomenological principles. Useful as each of these might be, a long list of them will always be hard to assimilate, at least without some perception of a simpler underlying logic. Even

Fig. 1.   Isaac Asimov's famous "three laws of robotics" appeared explicitly for the first time in his short story "Runaround," first published in *Astounding Science Fiction*, March 1942 [1].

First law	A robot may not injure a human being, or, through inaction, allow a human being to come to harm.
Second law	A robot must obey the orders given it by human beings except where such orders would conflict with the first law.
Third law	A robot must protect its own existence as long as such protection does not conflict with the first or second laws.

acclaimed guides such as Strunk and White's *Elements of Style* [3] offer no less than 11 rules of usage and 11 principles of composition, globally numbered from 1 to 22. Such a succession of 22 items not otherwise structured into a hierarchy is hard to comprehend and hard to remember.
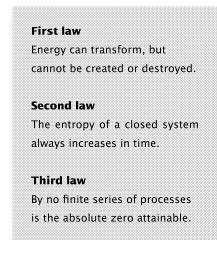
This article, then, proposes three fundamental "laws of professional communication," on the model of Asimov's three laws of robotics. It motivates them on the basis of a simple premise, illustrates them with examples of oral, written, and graphical communication, and discusses their precedence and their subordination to a zeroth law.

GETTING MESSAGES ACROSS

Communicating professionals and professional communicators alike rather readily agree that effective communication is about "getting messages across." This robust starting point nevertheless leaves us in need of two definitions: what does "getting across" mean and, especially, what is a "message"?

The expression "getting across" necessarily implies an audience, an "other person"—a statement of the obvious that we too easily forget when this audience is out of sight, as when we draft a

Fig. 2.   The three laws of thermodynamics can be expressed in many different ways; here is a simple one.

First law
Energy can transform, but cannot be created or destroyed.

Second law
The entropy of a closed system always increases in time.

Third law
By no finite series of processes is the absolute zero attainable.

written document. It also suggests that we get our audience to understand something. While understanding is usually central to communication, it is but one component of the process. To ensure understanding, we first need to get our audience to pay attention to our content. In turn, the audience's understanding is usually but a means to an end: we may want our audience to remember the content, to be convinced of it, or, ultimately, to act or at least to be able to act on the basis of it.

Similarly, a message can be seen as differing from raw information in that it presents intelligent added value, that is, something to understand about the information. A message interprets the information for a specific audience and for a specific purpose. It conveys the "so what," when the information merely conveys the "what." It thus differs from information the way that conclusions differ from results in a research paper. As an example, the statement "our sales dropped by 15%" is information, perhaps the result of a bookkeeping consolidation exercise; it conveys no message. By contrast, the conclusion "we should advertise more" is a message: it clarifies what a sales drop of 15% means for the marketing department. For a different audience or purpose, the same information can lead to a different (if compatible) message, for example "we should improve our product" to the design engineers.

Getting a simple message across is hardly a challenge. Difficulties begin when the messages to convey are either numerous (quantity) or complex (quality), especially when the situation moreover carries numerous or severe constraints. Among such constraints are space (a 150-word limit on an abstract), time (a 15-minute limit on an oral presentation), and audience (background, motivation, language, culture, etc.).

Effective communication can thus be seen as an instance of optimization under constraints (Fig. 3). We try to maximize, not what we write, say, or draw, but how much our audience gets out of our documents, presentations, and graphs, in quantity or in quality—all this with a specific purpose in mind and under specific constraints. Because of these constraints, we cannot be perfect. We can, however, be optimal.

The notion of optimization under constraints applies, of course, to any professional activity. In a sense, its application to professional communication is already self-evident. Even so, it is the premise on the basis of which the three laws can be established and motivated.

FIRST LAW: ADAPT TO YOUR AUDIENCE

A straightforward embodiment of the idea of getting messages across is a Shannon-like communication model (Fig. 4), displaying me, my audience, and the channel (or possibly the coding) between the two. The model, clearly, is simplistic; for example, it suggests one-way communication, with no feedback from my audience to me. Yet it satisfactorily describes at least part of the communication process. In synchronous processes, such as public speaking, it matches formal

Fig. 3.   The three laws of professional communication can be established on the basis of a simple premise: optimization under constraints.
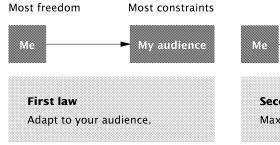
Optimize under constraints
Get your audience to
▨   pay attention to,
▨   understand,
▨   (be able to) act upon
a maximum of message(s),
given constraints.

presentations, when the speaker speaks and the audience does not interrupt. In asynchronous processes, such as written or graphical communication, it describes the designing and drafting (or drawing) part, before any audience feedback. With all its limitations, it still allows one to derive useful principles that engineers, among other professionals, can easily relate to.

The first law of professional communication, ADAPT TO YOUR AUDIENCE, is one of empowerment: it states that I should take responsibility for the success of my acts of communication. Indeed, to optimize under constraints, I must identify what is and what is not under my control, and, of course, concentrate on what is. As a consequence, if I want to optimize the communication, I am the one who should adapt, simply because adapting to my audience is an action under my control whereas their adapting to me is not. Taken to an extreme, this first principle implies that, if the audience does not get the message, it is my fault (or, more positively, my problem), not theirs. Perhaps more simply, if I am the one who wants something from my audience (our premise), then I should be the one making the effort and not the other way around.

Adapting to my audience also suggests that, if one strategy does not work, I should try another—again, an apparently obvious statement that we so easily lose sight of. If the audience did

not understand what I said, merely repeating is unlikely to help: I must rephrase. As the saying goes, if I always do what I always did, I will always get what I always got.
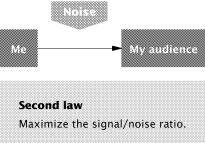
The first law may seem instinctive. Spontaneously, for example, we do not address children the way we address adults: we adapt. Yet failures to adapt are amazingly frequent: teachers who stick to what they had rehearsed—no matter whether students pay attention, no matter whether students understand, no matter whether students develop skills—are simply not adapting to their audience.

SECOND LAW: MAXIMIZE THE SIGNAL-TO-NOISE RATIO

The model used so far (Fig. 4) is ideal: it suggests that information sent from one side reaches the other side intact. In practice, however, information falls victim to interferences, perturbations, atmospherics—in a word, noise (Fig. 5).

Noise is more than unwanted sound: It is anything that can distract the audience. In oral presentations, it can come from the room (audience members coming in late or chatting among themselves, a noisy air conditioner, mobile phones going off), from the visual support (irrelevant clip art, dazzling colors, hard-to-read fonts), or from the speakers themselves (verbal hesitations, a constantly fast rate, meaningless gestures). In written

documents, it can come from the text (inconsistent paragraphs, complicated sentences, faulty spelling), from the page layout (unclear structure, inconsistent typography, unusual fonts), or from the illustrations (too many details on a schematics, too many rules in a table, too many tick marks on a graph).

Noise can be a major impediment to communication. In oral presentations, numerous filler words such as "um," "er," "you know," "I mean," or "like" can take the audience's attention entirely away from the messages: as students, many of us tallied our professors' filler words rather than listening to the content of their lectures. In written documents, language mistakes can be just as distracting. Those of us who value correct language may quickly find themselves on the lookout for the next mistake rather than for the next message. In graphical communication (visual aids, page layouts, graphs), noise can shift the attention from content to technology: when we start wondering what software produced the graph rather than what experiment produced the data, we are probably missing the point.

Noise can be fought in two ways: It can be filtered out, or it can be compensated for with an increased signal. If outside noise comes through an open window, I can filter it out by closing the window. If residual noise comes through the closed window, I can speak louder. The ratio between signal and noise indeed matters more than either signal or noise alone: up to a point, we easily tolerate a continuous background noise, and tend to notice it only when it disappears, so that the signal-to-noise ratio suddenly increases.

The second law of professional communication, MAXIMIZE THE SIGNAL-TO-NOISE RATIO, is one of contrast: it recognizes that, in communication, nothing is neutral. Audience members see

Fig. 4. If I want to optimize what my audience gets out of the communication, I must adapt to them.

Most freedom   Most constraints

Me → My audience

First law
Adapt to your audience.

Fig. 5. To prevent losses, I must filter out the noise and increase the signal.

Noise

Me → My audience

Second law
Maximize the signal/noise ratio.

and hear everything, so everything matters: whatever does not help us (signal) hinders us (noise), if only by diluting the message. The second law is thus close to Tufte's well-known recommendation to maximize the data–ink ratio in graphs [4].

Clearly, the most satisfying approach to contrast is to reduce or eliminate noise: breaking the silence in a whisper is more pleasant than covering the noise in a shout. Recognizing that nothing is neutral, we should thus question the relevance of anything we plan to include: gestures in an oral presentation, words in a written document, lines in a graphical display. To improve a text or a graph, we may be better advised to suppress, not add. By removing every unnecessary drop of ink, we ensure that the audience pays attention to nothing but the message.
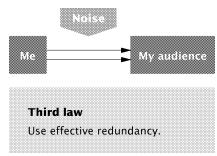
THIRD LAW: USE EFFECTIVE REDUNDANCY

The second law is a prevention principle. It assumes that we can anticipate noise and either eliminate it or make the message strong enough to withstand it. Sometimes, however, noise cannot be predicted, and losses ensue. If an open window slams shut because of a gust of wind, audience members may not hear what I say at the time; moreover, they may not listen to what I say immediately afterwards, for their attention is elsewhere: for example, they might try to recall if they have left any window open at home.

The third law of professional communication, USE EFFECTIVE REDUNDANCY, compensates for the losses resulting from noise. In a sense, it recognizes that "saying things once" is usually not enough. "Saying" things several times, moreover, can suggest both repetition within one channel and duplication across channels (Fig. 6). Mere repetition or duplication, however,

is suboptimal: if we are going to "say" something several times, we might as well say it in different ways. Phrases such as "advance reservations" and "oval in shape" are ineffectively redundant.

Opportunities for effective redundancy abound. An oral presentation can usefully include a preview, to outline the upcoming structure, and a review, to recap the main points before concluding. Moreover, messages can be both stated by the speaker and illustrated on slides. A written document can similarly include an abstract or executive summary, telling the whole story again, yet with a different point of view or level of detail. It can also reveal its structure through the page layout, the set of headings, and the preview paragraphs. A graph can convey the same information through both shape, color, and label, as in a stop sign [2].

Effective redundancy works through both compensation and collaboration. First, each channel or coding gives the audience a chance to get the message. Colorblind motorists may not identify the color of a stop sign as red, but they can read the label "STOP." If the sign is covered with snow or mud so the label is hidden, motorists can still recognize it by shape. By offering several chances, effective redundancy helps not only compensate for the effects of noise, but also address inhomogeneous audiences. Second, all channels or codings work together in synergy: color, shape, and label, when all

Fig. 6.   To compensate for losses, I must be redundant, within or across channels.

Third law
Use effective redundancy.

identified, complement each other for faster recognition.

What constitutes a different channel or coding is partly a view of the mind. Even though they are both verbal codings on the same paper medium, the text and the set of headings of a document can be viewed as independent channels, used for different purposes. When looking for a specific part of the document, we indeed flip through the pages and read the headings but not the text. When we have decided to read a document linearly, we read the text and skip the headings, as evidenced by the fact that proofreaders typically overlook blatant typos in headings. The situation is perhaps clearer still for incoming electronic mail: we often decide to read the body text on the basis of the sender's name, without reading the subject line; later, we may decide to file or delete on the basis of subject (and sender), without reading the body again. Redundancy between subject and body is therefore essential.

Whereas redundancy is a deliberate choice, the multiplicity of channels or codings is not. Whether they want it or not, speakers physically facing an audience communicate through what they say (the verbal component), how they say it (the vocal component), and everything that they let the audience see about themselves (the visual component). If any of these components escapes their control, it can carry noise or, worse, convey messages that work against their intent—an instance of cognitive dissonance.

ZEROTH LAW: HAVE A PURPOSE

The preceding three laws of professional communication, like Asimov's three laws of robotics, have an order or precedence. Strictly speaking, the second law should state to maximize the signal-to-noise ratio, except where the resulting levels would conflict

with the first law. For example, a car radio playing pleasantly loud on the freeway may seem unbearably loud at a stop sign, when the noise level is much lower. The signal-to-noise ratio is now so high that it is no longer adapted. In a sense, it introduces a new form of noise (saturation), so perhaps the explicit reference to the first law is unnecessary. Similarly, the third law should state to use effective redundancy, as long as such redundancy does not conflict with the first or second law. As a counterexample, a slide displaying text conflicts with what the speaker is saying, for the audience can only process one stream of text at a time: it is noise for those who want to listen (or, conversely, the speaker is noise for those who want to read). Of course, such redundancy would clearly be ineffective, so, here again, an explicit reference to higher order laws seems superfluous.

Interestingly, most systems of laws, such as the laws of robotics or the laws of thermodynamics, eventually add a "zeroth law," capturing a principle so obvious that it had long been overlooked (Fig. 7). The premise to our laws of professional communication can be turned into a zeroth law, too: define your purpose or, almost equivalently, have messages.

Applying all three laws requires the motivation to optimize the communication, and there can be no motivation without a clear purpose.

CONCLUSION

The three (or four) laws of professional communication successfully underpin any of my training programs on speaking, writing, or graphing. Because of their immediate analogy with electronic transmissions, they obviously appeal to participants with a technical background. Interestingly, they seem to work equally well with nontechnical audiences. I believe the reason for this success is that they constitute a simple, objective, logical basis: I have not met anyone so far who disagreed with them. By contrast, I know many (including myself) who resist recommendations presented as dogmatic, such as "write short sentences" (why?), even when such advice is claimed to be supported by empirical research.
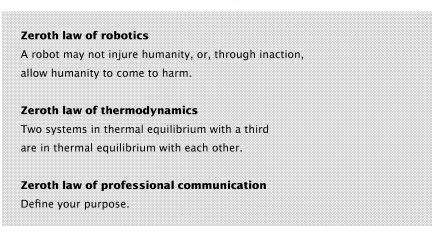
The three laws, fortunately, are rarely at odds with mainstream advice on professional communication. Often, though, they motivate the advice differently. As an example, I often hear public-speaking consultants recommend to vary the tone, rate,

and volume of the voice "to keep the audience interested." I find this motivation unconvincing, as I do not want my audiences to be interested in my voice, but in my messages. The three laws would recommend to vary the tone, rate, and volume of the voice, too (so they carry a signal), but according to content (for effective redundancy)—stressing important parts or slowing down for complex ones. Same advice, different motivation.

The three laws have served me well for many years, and I cannot but hope that they serve you well, too. Still, I do not doubt that professional communication can be usefully approached by alternate sets of laws, the same way that a given mathematical object can be described equally accurately in different coordinate systems. Effective laws, no doubt, have characteristics in common: they are simple; they are few; they are self-sufficient.

ACKNOWLEDGMENT

Fig. 7.   Systems of laws often evolve a "zeroth law," capturing an obvious or implicit premise.

Zeroth law of robotics
A robot may not injure humanity, or, through inaction, allow humanity to come to harm.

Zeroth law of thermodynamics
Two systems in thermal equilibrium with a third are in thermal equilibrium with each other.

Zeroth law of professional communication
Define your purpose.

REFERENCES

[1] I. Asimov, *The Complete Robot*.   London, U.K.: HarperCollins, 1983.
[2] J.-L. Doumont, "Magical numbers: The seven-plus-or-minus-two myth," *IEEE Trans. Prof. Commun.*, vol. 45, no. 2, pp. 123–127, 2002.
[3] W. Strunk Jr. and E. B. White, *The Elements of Style*, 3rd ed.   New York: MacMillan, 1979.
[4] E. R. Tufte, *The Visual Display of Quantitative Information*.   Cheshire, CT: Graphics, 1983.

Jean-luc Doumont (S'90–M'93–SM'00) teaches and provides advice on professional speaking, writing, and graphing. He also trains trainers and facilitates any process that requires structuring and effective communication. For over 15 years, he has helped audiences of all ages, backgrounds, and nationalities structure their thoughts and construct their communication. He graduated as an engineer from the Université Catholique de Louvain and obtained a Ph.D. in applied physics from Stanford University.