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Five ways to reduce PowerPoint overload

by Cliff Atkinson and Richard E. Mayer

Executive Summary

Many people have had enough of PowerPoint. That's no surprise to many of us who have seen PowerPoint slides that simply present too much information for the human mind to handle. Typical slides filled with busy backgrounds, endless bullet points, and a tangle of diagrams clearly shut down understanding, instead of opening it up.

This problem of *PowerPoint overload* is a serious issue for organizations trying to make themselves more transparent and their information easier to understand. Not only can it put an organization's strategy at risk, but it can also degrade productivity, intellectual assets, and interpersonal relationships.

A growing body of research explains the science behind PowerPoint overload, and lays out recommendations to reduce the load. In light of the science, it is up to us to make a fundamental shift in our thinking – we can no longer expect people to struggle to try to adapt to our PowerPoint habits. Instead, we have to change our PowerPoint habits to align with the way people learn.

Five specific PowerPoint techniques lay out a pathway for reducing PowerPoint overload, each of which applies a research-based principle. By taking these five steps, you will be well on your way to communicating more effectively on the PowerPoint platform.

PowerPoint overload is a common problem in many organizations

Unconventional Wisdom

It may be surprising that PowerPoint has been so widely adopted in a short 17 years, but it is even more surprising that there is little research that informs its use. This research vacuum has been filled by conventional wisdom – commonly accepted beliefs that guide behavior.

For example, it is conventional wisdom to put no more than six lines of text on a PowerPoint slide, six words per line. But that convention is no longer wise in the light of research that shows that even that amount of text on a slide can be a recipe for information overload.

The same holds true for a number of other PowerPoint conventions, including using Titles and shrinking text and visuals to make them fit on a slide. Many of these techniques can result in *PowerPoint overload* – a condition in which the mind shuts down because it is overwhelmed.

Although we can all relate to the problem and tell our own personal stories about it, the problem of PowerPoint overload is actually a very big problem with equally big implications for organizations.

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This problem stands in the way of effective strategy, sales and learning

The Toxicity of Overload

What is the price we pay for PowerPoint overload? Ineffective communication at every level presents a major strategic risk for every organization:

The board of directors of a major investment bank misses a questionable accounting practice because they were not clear about the financials in a PowerPoint presentation.

The senior management of an engineering company makes a wrong decision because they misinterpreted the research findings in a PowerPoint presentation.

A VP of sales at a pharmaceutical company loses a $20 million deal because the sales prospect was overwhelmed by a PowerPoint presentation.

Clearly, PowerPoint-based miscommunication can be toxic to an organization's bottom line. In addition to strategic risk, PowerPoint overload commonly impacts an organization at many other levels including diminished productivity, lost intellectual assets, and degraded relationships.

To many organizations, PowerPoint overload has been a vague problem they know anecdotally, but have not yet pinned down with numbers. The landscape has now changed with some important research in the field of cognitive science.

Fortunately, there is research that presents a pathway for solutions

A PowerPoint Turning Point

Through the 1990s and beyond, Rich Mayer and his colleagues at the University of California, Santa Barbara, have been conducting dozens of research studies on multimedia learning – the potential of using words and pictures together to promote human understanding. The studies have resulted in a substantial body of research with clear recommendations for multimedia design principles.

Surprisingly, during the same time period virtually no research has been conducted on PowerPoint and its most appropriate uses within organizations. Now, as the growing problem of PowerPoint overload has begun to cause problems, it turns out that the UCSB research is highly relevant to the problem.

This research marks a PowerPoint turning point because it centers not on technology, but on the way the human mind works.

To solve the problem we have to understand how the mind works


Aligning PowerPoint with the Mind

Most PowerPoint presentations look a particular way because the PowerPoint tool has features that make particular tasks easy. PowerPoint makes it easy to use templates, so we use templates. PowerPoint makes it easy to use bulleted lists, so we use bulleted lists. PowerPoint makes it easy to paste many items on a screen, so we paste them onto the screen. By using these features, we are making specific assumptions about the way people learn.

Unfortunately, many PowerPoint features and techniques contradict current research in cognitive science. We can no longer expect our audiences to adapt to our PowerPoint features; instead we have to change our own thinking to conform to a more relevant principle:

The design of PowerPoint presentations should be compatible with how people learn.

There is a well-established understanding of how the mind works. An overview of human cognitive processing is explained in the book *Multimedia Learning*, by Rich Mayer, but its core elements break down into three concepts: *dual channel*, *limited capacity*, and *active processing*.

Cognitive scientists say the mind processes information in 2 channels
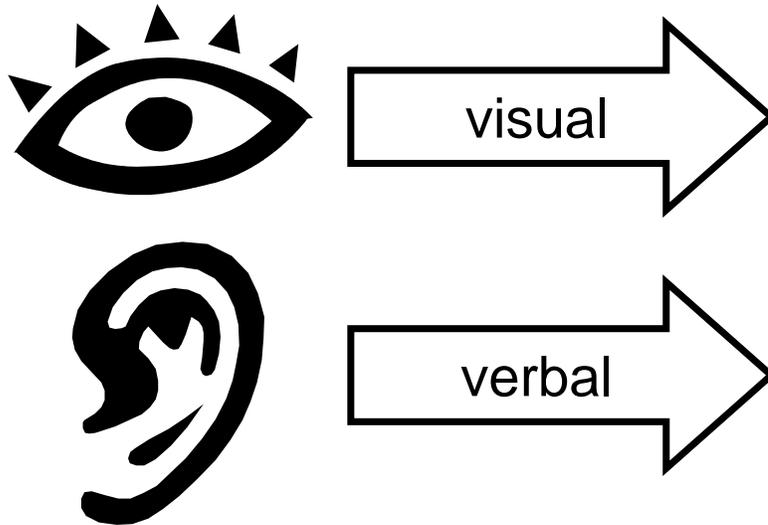
visual

verbal

One Mind, Two Channels

Dual channels is the concept that people have separate information processing channels for visual material and verbal material.

The visual channel handles information presented to the eyes (such as illustrations, animation, video, or on-screen text). The verbal channel handles information presented to the ears (such as narration or nonverbal sounds).

The constraints on our processing capacity force us to make decisions about which pieces of incoming information to pay attention to, and the degree to which we should build connections between selected pieces of information and our existing knowledge.

In a PowerPoint context, the question is: Does the presentation take advantage of the dual-channel structure of the human information processing system, by presenting complementary material in words and pictures?

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The mind pays attention to only a few pieces of information in each channel
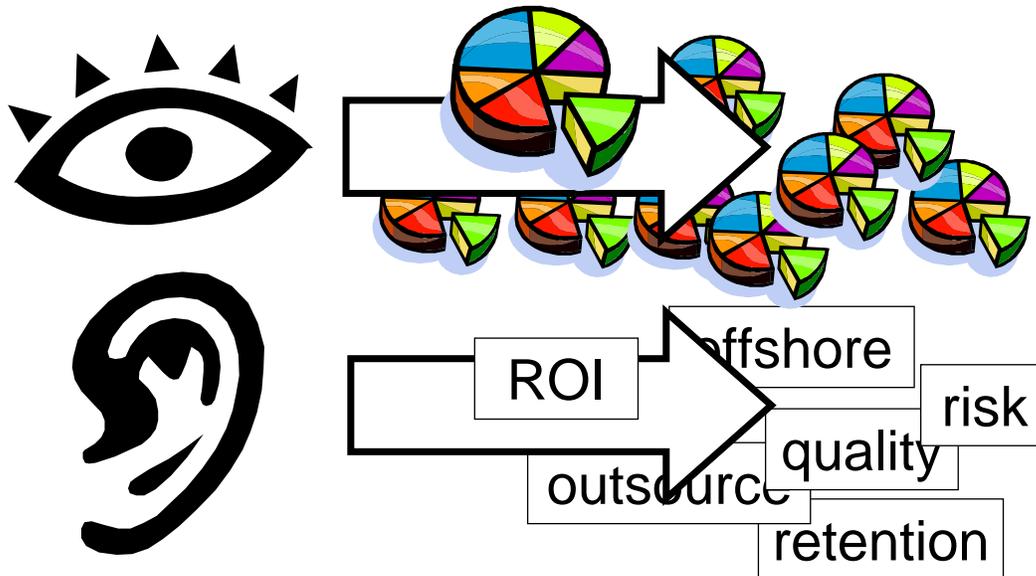
The Limitations of Perception

Limited capacity is the concept that people can pay attention to only a few pieces of information in each channel at a time.

When an illustration or animation is presented, the learner is able to hold only a few images in working memory at any one time. These images reflect portions of the presented material rather than an exact copy of the presented material. When a narration is presented, the learner is able to hold only a few words in working memory at any one time.

In a PowerPoint context, the question is: Does the presentation take into consideration the limited capacity of the information processing channels, by minimizing the chances of overloading the cognitive system?

The mind needs space to select, organize & integrate what's important
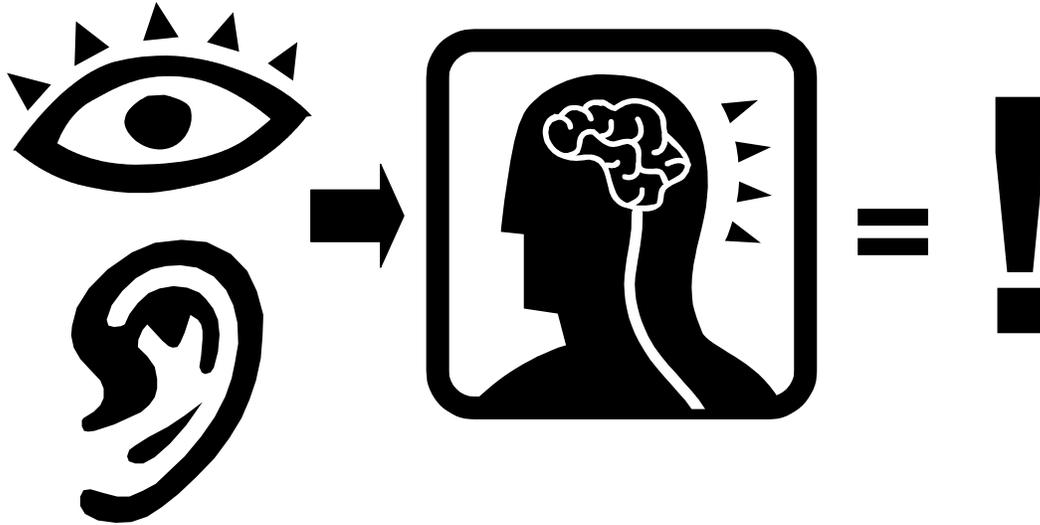
Learning by Acting

Active processing is the concept that people understand the presented material when they pay attention to the relevant material, organize it into a coherent mental structure, and integrate it with their prior knowledge.

Humans are active processors who seek to make sense of multimedia presentations. This view of humans as active processors conflicts with a common view of humans as passive processors who seek to add as much information as possible to memory.

In a PowerPoint context, the question is: Does the presentation promote active cognitive processing by guiding the processes of selecting, organizing, and integrating information?

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Five research-based techniques can help you reduce the PowerPoint load


Five Solutions

Our understanding of the way the mind works has three implications for PowerPoint: 1) PowerPoint presentations should use both visual and verbal forms of presentation; 2) filling the slides with information will easily overload people's cognitive systems; and 3) the presentations should help learners to select, organize, and integrate presented information.

A set of research-based techniques take these implications into account, and can help reduce cognitive load in PowerPoint:

1. The Signaling Principle
2. The Segmenting Principle
3. The Modality Principle
4. The Multimedia Principle
5. The Coherence Principle

The following pages describe ways you can apply the techniques by using familiar PowerPoint features in new ways. The end result is less cognitive load on your audiences, which can result in more effective communication of your story.

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1. Write a clear headline that explains the main idea of every slide

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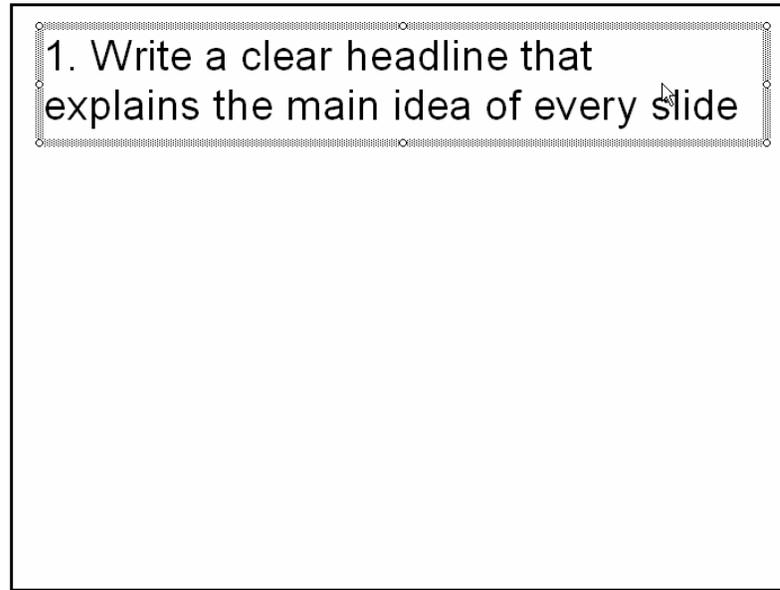
The Signaling Effect

It's common to find PowerPoint slides with a "Title" at the top, such as *Marketing Objectives*, or *Second Quarter Projections*. Titles usually serve as signposts to tell you where you are, but they don't offer explanations of the idea on your slide. There is a better way to help your audience understand more clearly:

> *Research finding: people learn better when the material is organized with clear outlines and headings (the Signaling Effect).*

Instead of writing a Title, write a *Headline* that explains the main idea of every slide. Just as in newspapers, write your PowerPoint headlines in active voice, with a subject and verb. Summarize the single overriding idea of the slide in clear and conversational language. This process of writing a headline will help you distill and clarify your own thinking about your topic.

In the PowerPoint document you're reading, the headlines are constrained to 40 point type over 2 lines, so they can be read from the back of the room and can also be read from Slide Sorter view. When you accept consistent constraints such as these, you challenge yourself to keep your words tight and the experience understandable.

One technique to practice headlines is to look at your slide, then turn to someone else and tell them the main idea of the slide. That's your headline.

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2. Break up your story into digestible bites in the Slide Sorter view
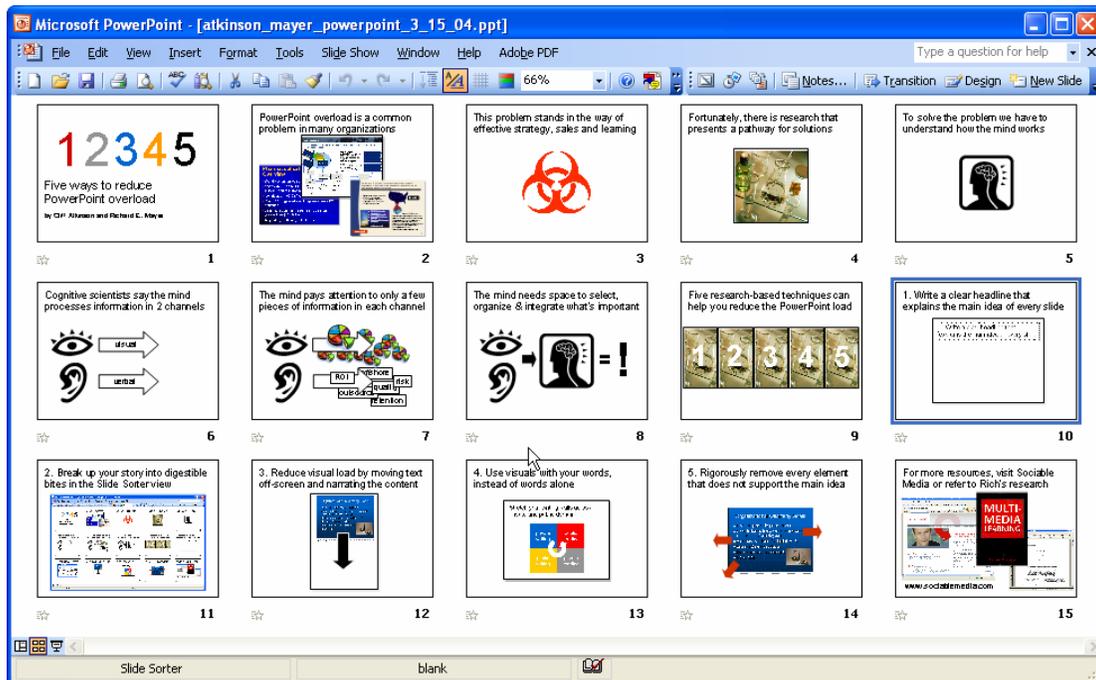
The Segmentation Principle

It's easy to get caught up in the design of any single PowerPoint slide, since the "Normal" view of the program is the place where you design individual slides.   But when you focus on a single slide, it's easy to pile on the information which only serves to shut down understanding. Another view can give new insight:

> *Research finding: People learn better when information is presented in bite-size segments (the Segmentation Principle).*

Break up information through your PowerPoint by referring back frequently to the Slide Sorter view. From this perspective, you can read the headlines you've written and see how your story flows. Your story should have an even pace from one slide to the next, without long pauses on any single slide.

Where your pauses are long, or you have much to say, those are signs that you need to break up that slide into more slides. One technique is to duplicate the offending slide, then cut the amount of information on each slide in half.

If you have too many slides for the time you have to speak, return to Slide Sorter view and think about ways you can distill your story down to its essence.

3. Reduce visual load by moving text off-screen and narrating the content
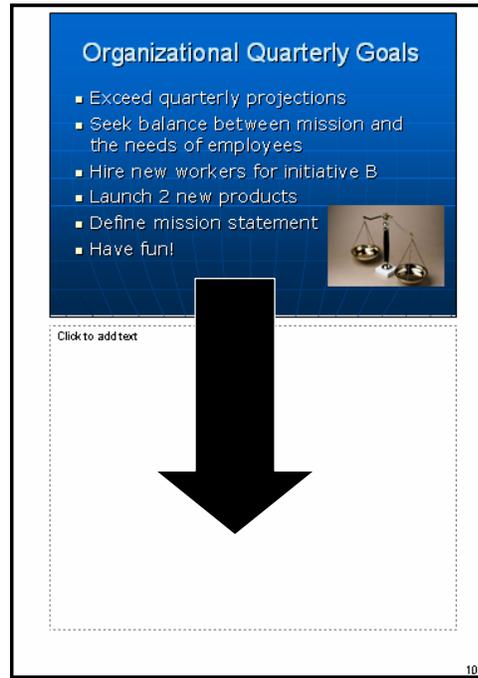

The Modality Effect

If we approach a PowerPoint slide as a Word document, we will naturally fill it up with large amounts of text. But when we display or project PowerPoint onscreen, multimedia principles are a better fit than print principles. A screen full of text overloads the mind's visual channel:

> *Research finding: People understand a multimedia explanation better when the words are presented as narration rather than on-screen text (the Modality Effect).*

Reduce visual overload by moving text off-screen, and shift processing to the auditory channel by narrating the content instead. The elegant way to accomplish this in PowerPoint is to use the Notes Page view. Although it's not designed for this purpose, think of the Notes Page view as a partnership between a visual area above, and a verbal area below. But instead of just including "Notes" below, write out your story there in narrative form. This document is an example of this technique.

Writing out your story helps you think through your ideas, increases your confidence in your topic, reduces your need for notes when you narrate, and provides comprehensive and useful handouts when the PowerPoint is printed in Notes Page format.

4. Use visuals with your words, instead of words alone
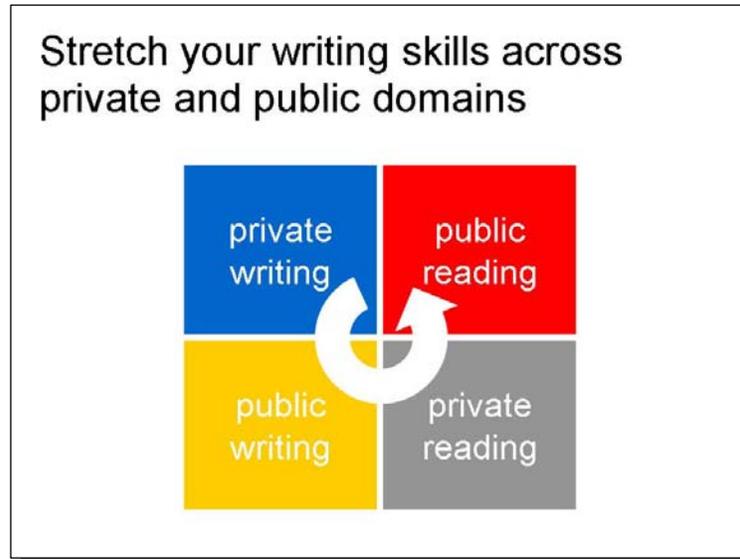

The Multimedia Principle

It's common to see a series of PowerPoint slides filled with bullet points and no visuals besides a logo and a colored background. There are a number of reasons we put bullets alone on a slide: They are easier to produce than graphics. They remind us of what we want to say when we speak. They provide a record that we covered the things we want to say. But for whatever reasons we use bullets, text alone on a screen is simply not effective:

> *Research finding: people learn better from words and pictures than from words alone (the Multimedia Principle).*

It's not easy to turn your words into pictures, but the first three techniques in this paper can help set the stage: 1) writing headlines helps you clarify what you want to illustrate, 2) breaking up your story into digestible bites reduces the amount of information to visualize , and 3) moving text off screen opens up more space in the area above for images.

Select photographs and clip art from your organization's art department, or use commercial sources such as Corbis.com or Hemera.com. Build diagrams or charts yourself from within PowerPoint. Remember that your primary job is to communicate something, and if it works for *your audience*, it works for you.

5. Rigorously remove every element that does not support the main idea
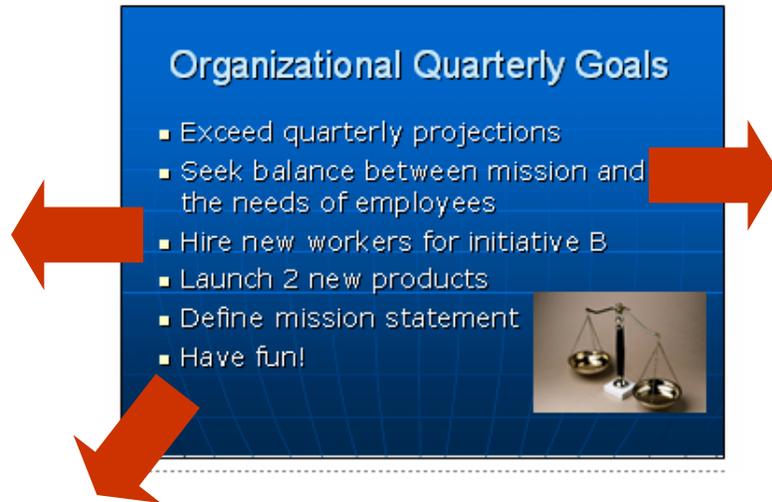
The Coherence Principle

When you think you're impressing people by putting everything you know on your PowerPoint slide, you're actually doing the opposite by shutting down their cognitive processing. And when people are sitting there bored, they're likely not thinking positive thoughts. When it comes to PowerPoint, less is more:

> *Research finding: people learn better when extraneous material is excluded rather than included (the Coherence Principle).*

Cut everything out of your PowerPoint slides that does not support your main idea. One of the hardest things to do is to keep things simple. We have so much to say, we want everyone to know it too. But as the science of the mind explains, if you put too much on a slide, people quickly become overwhelmed.

One technique is to load up your first draft without regard for information load, then make a copy and start rigorously cutting:

1. Cut all text on screen you are not going to narrate.
2. Remove corporate logos unless you think people will forget who you are.
3. Delete complex, patterned backgrounds in your PowerPoint template that have nothing to do with the content of your slide.

A general rule of thumb is if you're not sure, cut it. You can always add it back later.

For more resources, visit Sociable Media or refer to Rich's research
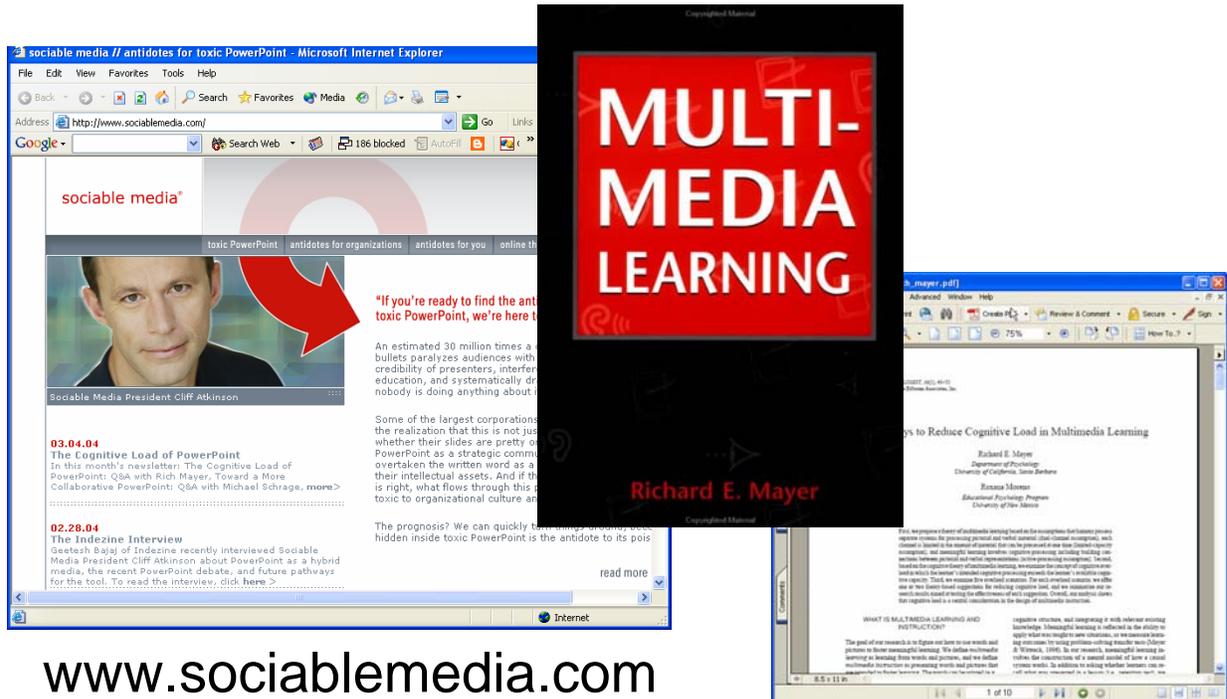
www.sociablemedia.com

Beyond the Five Ways

These are five of many ways to reduce cognitive load, and to improve the communication effectiveness of PowerPoint. More resources are available from the authors' websites:

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