APPLIED THEORY

SUMMARY

- Reviews the extreme claims that have been made about PowerPoint
- Sets forth practical design ideas that are especially applicable to technical presentations
- Explains three ways in which PowerPoint can subtly influence the intended meaning of deck authors and shows how these problems can be addressed

Managing Three Mediation Effects that Influence PowerPoint Deck Authoring

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INTRODUCTION

No communication technology is simply a conduit for information. Rather, every communication technology has its own mediation effects—its own ways of influencing communication (Kaptelinin and Nardi 2006). A presentation supported by PowerPoint (or another slideware application) and the process of preparing it will be very different from a presentation not supported by visuals and significantly different from a presentation visually supported by another means such as a flipchart or whiteboard.

PowerPoint has met with much harsh criticism during the last 8 or so years (Farkas 2006, 2008). The main theme is that PowerPoint readily reduces the effectiveness of oral presentations. Statements like this are prevalent: "PowerPoint inherently ruins a presentation in 95 percent of cases" (Kewney 2007). These phrases appear widely on the Internet: "Death by PowerPoint" and "PowerPoint corrupts absolutely." Given the enormous prevalence of PowerPoint in business, government, education, and other areas of life, the possibility that PowerPoint is interfering with our efforts to communicate with one another is a serious matter. If we can identify and address PowerPoint's harmful mediation effects, we should do so.

In this study, I investigate three of PowerPoint's many mediation effects. Each pertains to the layout of slides and the process of authoring decks (sets of slides). I have chosen these three because they are important and because they are closely related and can be addressed in a unified, economical way. I argue that these mediation effects pose problems to authors of PowerPoint decks but are ultimately manageable. Here are the mediation effects and the problems they can cause:

- Content cutting: deck authors may eliminate informative text and graphical content planned for a slide to fit the available space.
- Overflow distortion: when deck authors let text flow from one slide to another, they may violate the deck's logical hierarchy by promoting a bullet point to the level of a slide title.
- Slide title flattening: because all the slide titles in a deck generally have the same visual appearance, deck authors may unwittingly mask hierarchical distinctions. This requires the audience to discern these distinctions (or fail to do so) without the visual support of the deck.

These effects are not hard to notice, but they have received no more than passing attention. My procedure is as follows: (1) Elaborate briefly on the concept of mediation as it pertains to PowerPoint. (2) Review the most important and pertinent claims that have been made regarding PowerPoint's mediation effects. (3) Introduce two relevant considerations: PowerPoint's slide metaphor and the standard and alternative slide layouts. (4) Explain content cutting, overflow distortion, and slide title flattening. (5) Suggest that we continue to study PowerPoint by carefully investigating its many mediation effects.

MEDIATION AND POWERPOINT

The concept of mediation is very broad. Applied to PowerPoint, it asks: What are the consequences of this technology? What does PowerPoint do and what does it enable? Here "PowerPoint" encompasses the Microsoft software application with its many features, other slideware applications, our practices in authoring and rehearsing presentations, the prevalent conventions for designing decks but also individual design choices, the diverse styles of individual presenters, and the societal contexts surrounding PowerPoint. It is therefore possible to identify a vast number of mediation effects in PowerPoint.

These mediation effects vary across different dimensions. For example, mediation effects reside somewhere on a continuum of beneficial versus harmful and also strong versus mild. For the sociologists Stark and Paravel (2008), the ability of political activists to copy and reuse the content of a deck once it's been published on the Internet is a beneficial and strong mediation effect.

Mediation effects also reside on the dimension of author control. Stark and Paravel (2008) note that reusability of content is a mediation effect that cannot be controlled by

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deck authors. In direct opposition, a broad category of mediation effects consists of design choices that are entirely controlled by deck authors. For example, arguments have been put forward that slide titles should be phrased as succinct sentences (Alley and others 2006; Atkinson 2005). Whether or not doing so improves presentations, PowerPoint does not influence syntactical choices. The three mediation effects I examine here fall mid-way on this continuum: although the influence of PowerPoint is significant, these potentially harmful effects can be countered by savvy deck authors.

DEBATES ABOUT POWERPOINT'S MEDIATION EFFECTS

It is necessary to situate the three mediation effects that I examine within the context of the broad argument that PowerPoint exerts harmful mediation effects. This argument—although it has often been expressed very casually and with hyperbole—takes two reasonably distinct forms. The first is that PowerPoint has cognitive effects—it shapes the presenter's message. A frequent claim in this regard is that PowerPoint encourages presenters to simplify their content; it "dumbs down" thought. The second form of the mediation argument is that PowerPoint influences the affective domain—it reduces the presenter's connection with the audience and makes presentations boring (Bly 2001). The three mediation effects that I deal with are cognitive.

There are also many questions and arguments that pertain to learning in educational settings. Although findings differ (Levasseur and Sawyer 2006), it seems that students learn more from PowerPoint-supported lectures (Blokzijl and Andeweg 2005, 2006, 2007) and that students have a positive attitude toward the use of PowerPoint in their classes. Note that these findings do not contradict the claim that PowerPoint encourages presenters to simplify their content or the claim that PowerPoint reduces engagement in corporate settings.

The first significant formulation of the message-shaping argument is by Parker (2001). In a loosely structured essay for *The New Yorker* magazine, Parker asserts that PowerPoint, in particular bullet points, "edits ideas." Complexities and nuances of expression are lost: "even the most easygoing PowerPoint template insists on a heading followed by bullet points, so that the user is shepherded toward a staccato, summarizing frame of mind." Parker adds, "The world [is] condensed into a few upbeat slides, with seven or so words on a line, seven or so lines on a slide."

In 2003, graphics guru Edward Tufte self-published a monograph, *The cognitive style of PowerPoint.* The monograph was revised in 2006 (Tufte 2006a) and included (with minor changes) in his book *Beautiful evidence* (Tufte 2006b). The monograph (in conjunction with Tufte's frequent public lectures) has been enormously influential and has often been echoed in the mass media (Rawsthorn 2006; Thompson 2003). Several of Tufte's arguments parallel Parker's, but whereas Parker expresses his concerns about PowerPoint in a rueful and bemused manner, Tufte delivers fierce, hyperbolic shotgun blasts. He is often shrewd and perceptive, but his arguments (like Parker's) are not systematically formulated or (in many cases) soundly argued. Among those who have challenged Tufte's arguments are Doumont (2005), Shwom and Keller (2003), and Norman (2005).

One of Tufte's core claims is that PowerPoint "dumbs down" the presenter's message because PowerPoint limits the amount of slide text that the presenter can display to the audience. At the same time, PowerPoint leaves the presenter's meaning unspecified and open to misinterpretation. A major flaw in this argument is that Tufte largely ignores the oral dimension of the presentation. When (as is normally the case) PowerPoint is being used to support a live presenter, the slides are not supposed to display all the information the presenter will communicate (Doumont 2005; Norman 2005). Rather, the primary role of slide text is to display the superstructure of ideas; the more detailed information is conveyed when the presenter provides what Gold (2002) calls the "oral gloss" on the slides. Along similar lines, Tufte condemns PowerPoint's inability to display large, complex graphics. His disdain does not diminish even when he acknowledges that presenters can solve this problem simply by distributing a handout. Tufte is certainly correct when he asserts (2006a) that a PowerPoint deck should not be any organization's sole archival record of an issue. Indeed PowerPoint should not replace reports (although PowerPoint's Notes Page can be used to elaborate on slide content).

Tufte claims that PowerPoint encourages very deep hierarchies of bullet points, which lead presenters to inadvertently or willfully hide information from the audience. He cites a complex and misleading slide from a deck that was used in 2003 when NASA overoptimistically assessed the damage that had been sustained by the Columbia Space Shuttle. However, the slide Tufte cites is atypical in the depth of its bullet point hierarchy, and there are ways in any medium to obfuscate or withhold information from an audience. Finally and most important for the present discussion, although PowerPoint allows deep hierarchies (nine levels), it is hard to see how it encourages deep hierarchies. The author is in full control.

Other media experts condemn PowerPoint in similar ways. E-learning authority Eliot Masie called PowerPoint "the single most dangerous tool invented on the planet" (2006). Citing Colin Powell's use of PowerPoint at the United Nations, Masie argues that "the level of ambiguity is so large that people die." Here Masie marshals the argument that slide text underspecifies the author's meaning.

Masie also makes one of the common arguments regarding the affective domain: "Storytelling stops; engagement decreases."

Another group of commentators argues that presenters should depart from standard deck design by greatly decreasing the amount of slide text. For these commentators, there is no problem of underspecified meaning. Rather their concern is that slide text readily cripples performance. They emphasize the likelihood of presenters filling their slides with unnecessary slide text that they will then read or closely paraphrase. Atkinson (2005) rejects bullet points altogether in favor of slides consisting only of a slide title and a stock media (e.g. "clip art") graphic. Reynolds (2008) advocates slides with minimal text and demonstrates simple, elegant graphic design.

Certainly, minimal slide text allows for visual elegance and may therefore be desirable when the content is easy for the audience to grasp and when the key goals are selling, persuading, or eliciting an emotional response (Godin 2001). However, for more complex content, and especially for technical presentations, audiences benefit from slide layouts that display the superstructure of ideas. In the words of cognitive psychologist Steven Pinker, "When properly employed, PowerPoint makes the logical structure of an argument more transparent" (Parker 2001, 86). My main concern is mediation effects that result in the wrong visual hierarchy and the elimination of words that the audience should see.

And what of the consequences of slide text and the standard layouts on the presenter's performance? Here I follow Gold in the idea that presenters can and do work effectively and creatively with standard slides. Vast numbers of people give presentations that extensively employ slide titles and bullet points (along with visuals), and most people will admit to having witnessed effective presentations of this kind. Even Tufte allows that PowerPoint benefits the very worst presenters and "probably doesn't cause much damage" to first-rate presenters (2006a, 4). A great many presenters have poor communication skills, and so their decks and presentations are bad for a broad range of reasons. Presenters often misgauge what their audience needs to know about the topic at hand. They often give "end-to-end" PowerPoint presentations when there should be intervals of discussion (in addition to the question and answer period). And many presenters do indeed use too many bullet points and excessively long bullet points and then read or paraphrase these bullet points rather than use them as a springboard for an oral gloss that is expansive enough to engage the audience (Farkas 2005a). Therefore, in brief, I argue for the value of visual hierarchies of slide text, at least for complex subject matter, reject the message-shaping arguments of Parker, Tufte, and Masie, and put forth more nuanced message-shaping arguments.

TWO PERTINENT CHARACTERISTICS OF POWERPOINT

Two characteristics of PowerPoint must be mentioned because they bear directly on content cutting, overflow distortion, and slide title flattening. These characteristics are (1) the slide metaphor that underlies PowerPoint and (2) PowerPoint's default slide layouts and the nonstandard alternatives.

The slide metaphor

The defining characteristic of PowerPoint (and similar applications) is the metaphor of the slide. Content is segmented into a series of discrete "display units" (Delin, Bateman, and Allen 2002–2003; Farkas 2005b). Slides, furthermore, have strong display unit boundaries. This contrasts to the weak display unit boundaries of novels, textbooks, reports, and most other genres in the print media. In such print genres, readers barely notice as they turn pages. PowerPoint's strong display unit boundaries are a major constraint in the deck authoring process. Designing slides resembles the layout effort required in certain print genres (for instance, many children's books) that are individually formatted as one- or two-page spreads.

Standard and alternative slide layouts

Although PowerPoint allows deck authors to create blank slides and format them as they please, the default slide layouts are very widely used. These layouts typically use a slide title and one or more levels of bullet points (sometimes in two columns) along with various options for placing graphics. I regard listed items without dingbats as "bulletless bullet points."

PowerPoint 2007's SmartArt graphic options (in particular, the List options) function as visually elaborate alternatives to the standard layouts, greatly increasing the range of prepackaged slide layout options available to deck authors. A typical slide is shown in Figure 1. The text is still arranged hierarchically, but in a different way—the first level of (bulletless) bullet points is arranged horizontally. The question then arises: what nowadays is a standard layout? I will assume that at least into the near future the standard layout for lists remains a vertical list of bullet points— although SmartArt layouts may well become prevalent. With the alternative layouts, the mediation effects I describe take a somewhat different form. I turn now to the core of this article: my examination of content cutting, overflow distortion, and slide title flattening.

CONTENT CUTTING

Content cutting consists of eliminating informative text and graphical content planned for a slide to fit the available space. It is a straightforward instance of PowerPoint editing ideas—the layout tail wags the content dog. The root cause of content cutting is our impulse to respect (or over-

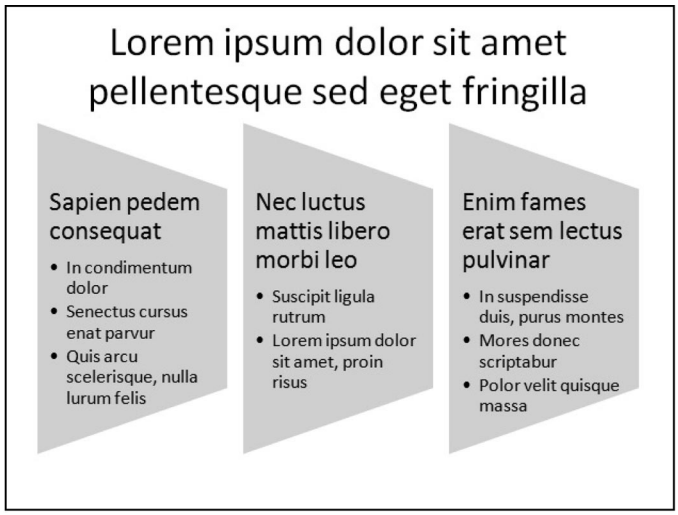

Figure 1. A typical slide created with SmartArt graphics.

respect) PowerPoint's strong display unit boundaries or, in other words, our impulse to achieve closure on each slide. Content cutting, of course, is not a problem in scrolling displays. In print, it is usually only a minor consideration, because when print pages are composed, text is usually allowed to pour freely across the weak display unit boundaries with only minor adjustments such as avoiding typographic widows (University of Chicago Press 2003, 94–95).

There are various ways to cut content. With regard to text, a deck author might delete qualifiers such as "somewhat" or "partly" to trim a two-line bullet point to one line. But perhaps the idea warranted qualification. A deck author might also change the deck's meaning by combining two bullet points or deleting a bullet point altogether. Or a quotation (not a bullet point) might be deleted. With regard to graphics, content cutting refers to deleting informative (as opposed to purely decorative) graphics, cropping informative content, or shrinking a graphic so that some of its informative content can no longer be seen.

Whenever we see a slide in which the content just barely fits the slide, we may wonder if content cutting took place. However, because we cannot look into the mind of the deck author, we cannot know for sure. This phenomenon of content cutting has been noted by Tufte: "How is it that each elaborate architecture of thought always fits *exactly* on one slide?" (2006a, 12). Because SmartArt graphics consume a lot of screen real estate (Figure 1), PowerPoint 2007 may increase the prevalence of content cutting.

I have heard people say that the need to fit their text to the constrained space of a slide forces them to cut excess verbiage. Indeed, content cutting may at times serve as a beneficial heuristic for achieving terse phrasing. On the other hand, we must not allow space constraints to usurp our control of what we put on our slides.

Fortunately, deck authors are always aware when they are content cutting—which is not true of overflow distortion and slide title flattening. Furthermore, there are various means to fit text to slides without the risk of distorting our meaning. One solution is to adjust the layout of the slide. A deck author can reduce font sizes, tighten spacing, or delete or shrink a decorative graphic to create more space on a slide. The potential problem, of course, is that the deck's visual design may be degraded. Clumsy adjustments in layout may create unattractive inconsistency within a single slide or among the slides in a deck. Microsoft's AutoFit feature, when turned on, reduces the font size of slide text when the text threatens to overfill a particular placeholder region. AutoFit, however, allows a deck author to reduce font size right down to illegibility.

Another technique is to resist the influence of PowerPoint's strong display unit boundaries through the use of continuation slides—that is, allowing content from one slide to spill onto an additional slide (or slides). With continuation slides, we see slide titles such as these:

Theory	Theory—2
Theory—1	Theory—2
Theory	Theory—cont'd

Because of the impulse for closure, continuation slides are less often used than they should be. We should be willing to use continuation slides even when there will only be a single bullet point on the continued slide.

OVERFLOW DISTORTION

Despite the impulse to fit the content to the boundaries of a single slide, deck authors will, at times, allow text and graphics to spill over to an additional slide or slides. As noted, one good design technique is the use of continuation slides. Another possibility is to reorganize the troublesome slide by moving some of its content to a slide with an altogether different slide title. Overflow distortion is the violation of logical subordination (along with related problems) that arises when unskillful deck authors handle this reorganization badly. Overflow distortion is especially likely in these circumstances: (1) the deck author has a poor grasp of visual rhetoric, in particular how logical subordination is expressed through visual means; (2) the deck author lacks a firm grasp of his or her own ideas—possibly because the author is developing these ideas while constructing the deck or simply because he or she is an undisciplined thinker. I now illustrate two different kinds of overflow distortion with two scenarios, one hypothetical and the other from my own experience.

A hypothetical realtor who lacks good deck authoring skills is planning a presentation that includes warnings for homeowners who are considering acting as their own real

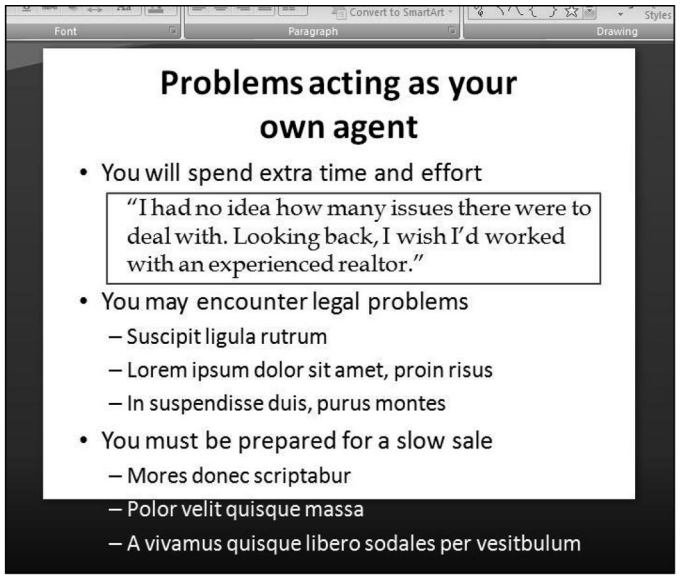

Figure 2. A deck author dealing with too much text.

estate agent when they sell their home. The realtor is working on a slide that will use a slide title and three bullet points to warn of these three problems:

- You will spend extra time and effort
- You may encounter legal problems
- You must be prepared for a slow sale

The realtor supports his first bullet point with a quotation from a homeowner. The second and third bullet points are each supported by three second-level bullet points. As shown in Figure 2, the realtor has too much content to fit on a slide.

An appropriate solution, shown in Figure 3A and B, is to ignore PowerPoint's strong display unit boundaries and let the last set of bullet points spill over to a continuation slide (Problems acting as your own agent—2).

The realtor, however, chooses a bad solution, perhaps because he is unaware or uncomfortable with the technique of continuation slides. As shown in Figure 4A and B, he makes the sentence "You must be prepared for a slow sale" the title of the overflow slide. He thus artificially and illogically promotes what had been a bullet point to a higher level in the logical hierarchy of the deck. Similarly, the supporting bullet points are now first-level bullet points. Note that in purely visual terms the bad solution is less cluttered and more attractive.

Because of this logical error, the problem of a potentially slow sale is unmoored from the issue of acting as your own real estate agent. It reads as a concern that must be faced whenever a home is sold. Although the realtor will probably make his intended meaning clear as he glosses

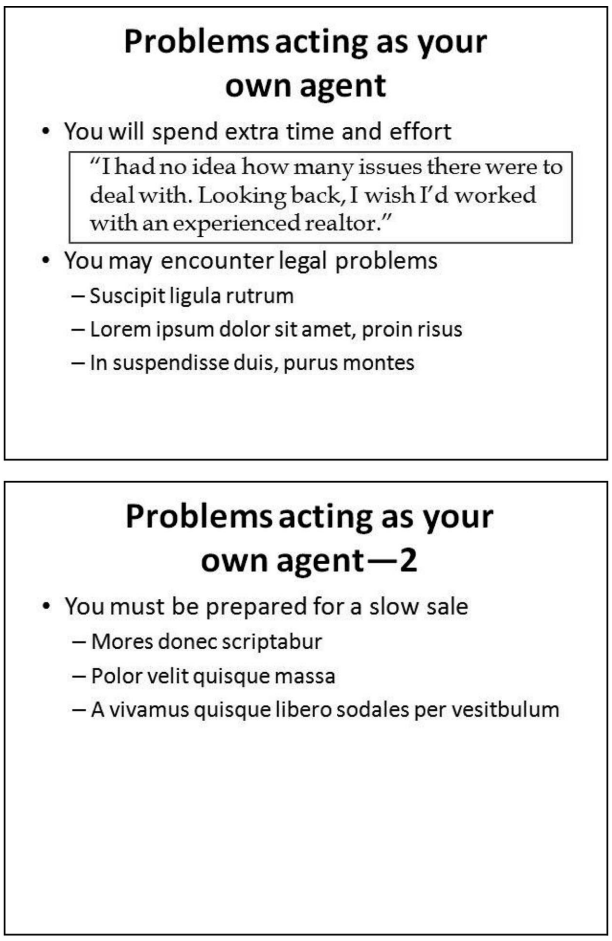

Figure 3. (A and B) Dealing with too much content by means of a continuation slide.

the slides, the mediation effect of overflow distortion is working against him. In the case of emergent ideas or a truly undisciplined thinker, rehearsing with and speaking from illogical and misleading slides may alter the deck author's own understanding of his or her own ideas. Fortunately, this form of overflow distortion (and content cutting as well) has become somewhat less likely because in PowerPoint 2007 two new commands (available on Smart Tags) encourage the creation of continuation slides: Split Text Between Two Slides and Continue on a New Slide.

Another cause of overflow distortion is the need to illustrate a bullet point with a graphic, especially a large graphic. Here I draw on my own experience as a deck author to show how this can happen. Having completed the slide shown in Figure 5A, I decided to illustrate my penultimate bullet point ("PowerPoint exacerbates the problems we find in bureaucracies") with the visual, shown

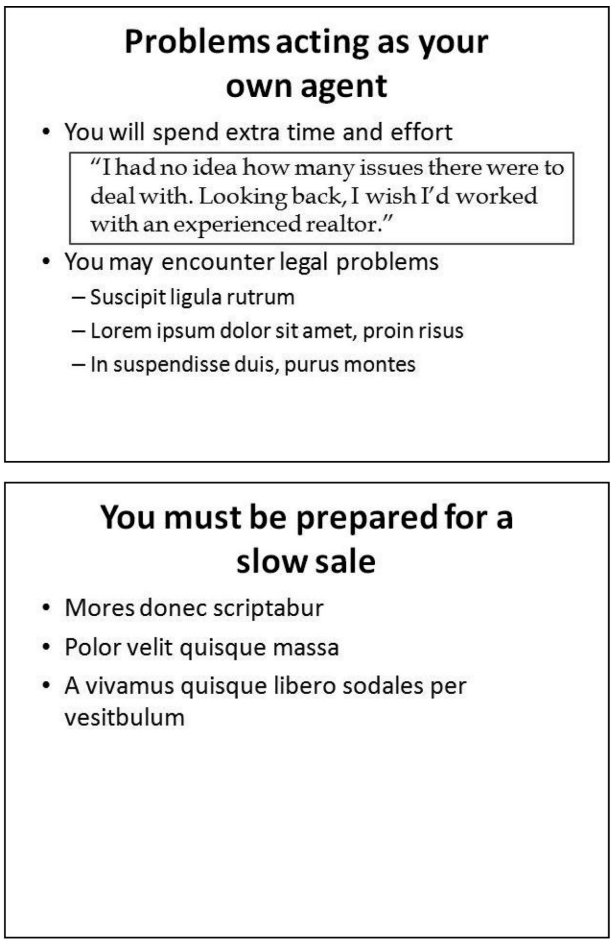

Figure 4. (A and B) Overflow distortion caused by promoting a bullet point to a slide title.

in Figure 5B (Edward Tufte's photograph that metaphorically connects PowerPoint to a military parade under Stalin). But where should the visual go?

I considered shrinking the photograph and using one of PowerPoint's standard two-column layouts, but with this solution significant information on the photograph becomes invisible to the audience—a content cutting problem.

I then considered the idea, shown in Figure 6A and B, of deleting the final ("recall") bullet point, promoting the "PowerPoint exacerbates" bullet point to the status of slide title, and placing the graphic under the slide title. Although this solution is visually clean and attractive, it is also illogical insofar as "PowerPoint exacerbates" is no longer one of five bullet points introduced by its logical parent, the slide title "A sampling of Tufte's arguments." Now it seems like a separate idea. Note also that deleting the "recall" bullet point is another instance of content cutting.

Rejecting this flawed design idea, I returned to my original plan, the slides shown in Figure 5A and B, in conjunction with a forward-and-back presentation technique: I began to gloss the "PowerPoint exacerbates" bullet point, I jumped ahead to the photograph to complete the gloss, and then returned to the earlier slide to gloss the final "recall" bullet point. An invisible hyperlink on Figure 5A enabled me to skip past the photograph rather than having it display a second time.

Another solution is the use of continuation slides: The first slide would end with the "PowerPoint exacerbates" bullet point, the second slide would consist of the parade photograph, and the third slide would complete the list of bullet points (the "recall" bullet point). In contrast to the hypothetical realtor, I won my wrestling match with PowerPoint. I have heard other deck authors note problems they have faced when trying to place a large graphic under its bullet point.

SLIDE TITLE FLATTENING

Slide titles are very often at the top of the deck's visual hierarchy of text elements, much like the first-level headings in standard print documents. Slide titles, however, frequently represent the second, third, and fourth levels of the deck's logical hierarchy. Because a deck's slide titles almost always have the same font attributes and, hence, the same visual appearance, hierarchical distinctions are very often masked. This is the mediation effect I call "slide title flattening." It has been glancingly noted (Yates and Orlikowski 2007) but never examined. In contrast to overflow distortion, slide title flattening does not result from poor design. Rather, it stems directly from PowerPoint's standard layouts and hinders communication in many decks, especially those that deal with complex ideas. To grasp the implications of slide title flattening, imagine that the conventions of the book had evolved in the Middle Ages and Renaissance such that authors were obligated to use a first-level heading at the start of each new page. Or imagine that some computer glitch reformatted all the second- and third-level headings in your document files so that these headings became identical in appearance to your first-level headings. Fortunately, there are various means to mitigate this potentially harmful mediation effect.

Let us consider a PowerPoint deck in which university faculty members receive guidance on conducting research with human subjects. As shown diagrammatically in Figure 7, a major section of the presentation explains the ethical principles that underlie human subjects research. This section divides into three branches, each explaining one of three ethical principles: respect, beneficence, and justice. (Only the slides pertaining to respect are considered here.) As the faculty members will learn, the key aspect of respect is informed consent, which the presenter breaks down

A sampling of Tufte's arguments

- PPT makes us stupid because it doesn't permit enough slide text
- PPT makes us stupid because it doesn't permit enough detail in graphics
- PPT encourages deception (easy to hide stuff)
- PPT exacerbates the problems we find in bureaucracies
- PPT should be "recalled" (joking)

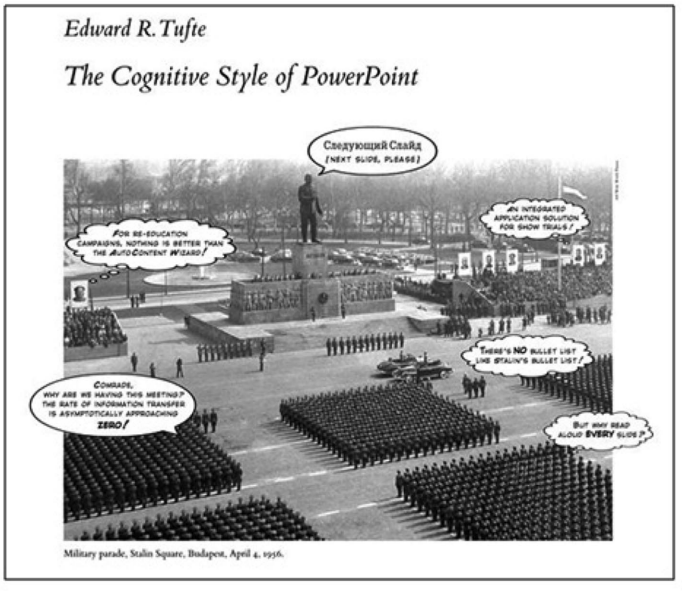

Figure 5. (A and B) A text slide and a visual that is meant to illustrate the penultimate bullet point of the text slide.

A sampling of Tufte's arguments

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- PPT makes us stupid because it doesn't permit enough detail in graphics
- PPT encourages deception (easy to hide stuff)

PPT exacerbates the problems we find in bureaucracies

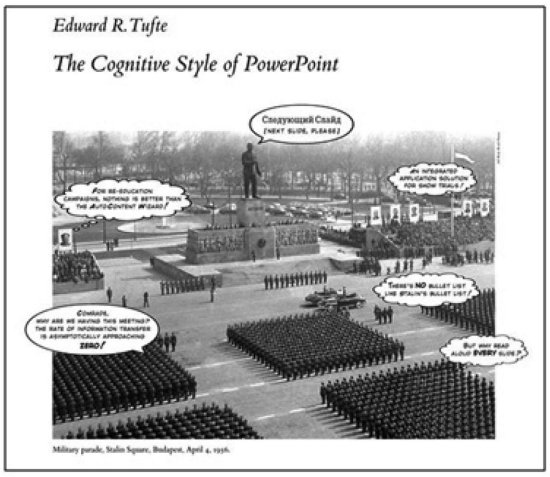

Figure 6. (A and B) A faulty deck design exhibiting overflow distortion. Why did the "PowerPoint exacerbates" bullet point become a slide title?

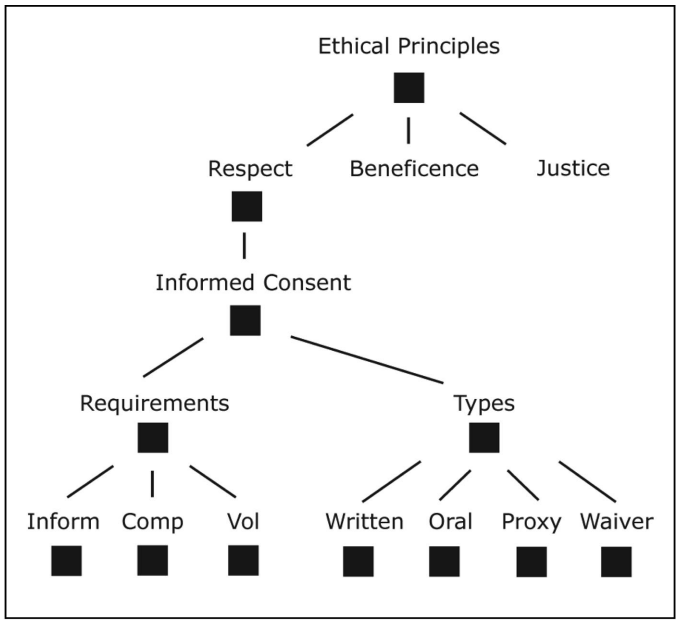

Figure 7. The logical hierarchy of a PowerPoint deck.

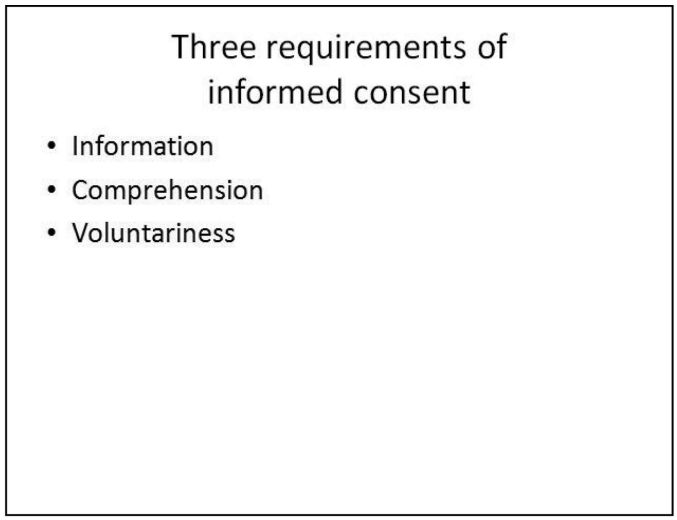

Figure 8. A category slide that previews three upcoming slides and clarifies the deck's logical relationships.

further into two lower-level hierarchies. The first consists of the requirements for informed consent: information, comprehension, and voluntariness. The second consists of the types of informed consent: written, oral, proxy, and waiver of consent.

Because of the visual flattening that occurs when these concepts become slide titles, audiences will certainly encounter at least some difficulty keeping track of the logical subordination (for example, that informed consent is an aspect of respect rather than a principle and that waiver of consent is a type of informed consent rather than a requirement). Of course, in many PowerPoint genres, logical relationships are less complex and logical categories are more familiar. Furthermore, presenters should carefully clarify logical relationships in their oral gloss. But even assuming a careful presenter, the visual channel should communicate rather than mask slippery logical relationships.

As deck authors, we need to be aware of slide title flattening and, whenever necessary, take measures to counter it. Fortunately, there are techniques that, especially when used together, can largely mitigate this harmful mediation effect. I divide these into global and local techniques. Global techniques pertain to the entire deck; local techniques pertain to any sequence of slides.

Two global techniques, often used in tandem, are to make the main sections of the deck explicit at the start of the presentation by listing them in an overview slide and to add section slides within the deck. Section slides use large fonts and isolate the section name in the middle of the slide so that it is visually superordinate to the deck's slide titles. In addition, the section names may appear as running heads at the top of the slides. These (and similar) techniques establish an additional level in the visual and logical hierarchy: The ideas previewed in the overview slide and spotlighted on the section slides represent the top level of the hierarchy, and the slide titles are now at level 2 and below. In the human subjects deck, Ethical Principles might well become a section slide that is previewed on an overview slide. These global techniques, however, do not suffice because there are still multiple logical levels of the hierarchy that need disambiguation. Deck authors, therefore, routinely use various local techniques to reveal hierarchical relationships.

One local technique is the use of a "category" slide. The titles of category slides make clear the logical category the next few slides belong to. Very often a category slide will also preview in a bullet list the items belonging to this category—items that correspond closely to the titles of those next few slides (Kosslyn 2007). In Figure 8, we see a category slide that introduces the logical category "requirements of informed consent" and previews three slides that deal with these requirements.

In this example, the audience gets one opportunity to view information, comprehension, and voluntariness as aspects of informed consent before the visual flattening occurs. Note that the use of category slides (and similar techniques) is not inevitable. Indeed, presenters may reject such slides as slow-paced or lacking in visual appeal and may rely instead on the oral channel.

There are other local techniques for indicating logical subordination. Below we see how, through careful phrasing, a deck author shows us two logical levels in one slide

Figure 9. (A and B) Two visual weights of slide titles.

title. The first slide title indicates that informed consent is an aspect of respect; the second that waiver is a type of informed consent:

Implementing the principle of respect: informed consent

Informed consent by waiver

Finally, I will mention two unlikely but interesting design possibilities. The first is to specify the logical status of each slide title by using decimal numbers: "2.1.1.2.3 Proxy Consent." A major drawback here is that decimal numbers do not accord with the visual conventions of deck design. The second design possibility is to use two visual weights of slide titles, as shown in Figure 9A and B. It is not certain, however, that audiences would notice or understand the distinction—at least until this technique became an established convention.

CONCLUSION

A vast number of mediation effects are associated with PowerPoint. Many are design choices. As noted, one such design choice is the phrasing of slide titles. Another is whether and how to use build slides. What are the consequences of progressively revealing text and graphical elements on a slide? Under what circumstances do build slides usefully direct the audience's attention and generate suspense? When do they irritate or disempower (Doumont 2005; Yates and Orlikowski 2007)?

There are also harmful or potentially harmful mediation effects that are not design choices but rather inherent influences of PowerPoint. I have explained three such mediation effects—content cutting, overflow distortion, and slide title flattening. Another of these mediation effects can be termed "inflexible linearity." This mediation effect, a consequence of the slide metaphor, is the reluctance of presenters to skip slides or move from one section to another in response to such circumstances as time pressure or discovering that the audience is already familiar with parts of the presentation (Yates and Orlikowski 2007). Still another is the stop-and-go rhythm enforced or at least encouraged by the succession of slides (Parker 2001). Indeed, this mediation effect very often lessens a presenter's momentum and dynamism.

PowerPoint is a very complex hybrid of writing, speaking, visual communication, and the features of sophisticated software. It is not easy to study. However, by carefully identifying and investigating PowerPoint's many mediation effects, we can better understand PowerPoint and promote better PowerPoint use. T**C**

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