American Alliance of Museums

ANNUAL MEETING HANDOUT

Lessons Learned from Five Decades of Experience in Visitor Studies

A museum director, an in-house evaluator, an outside evaluator and a university researcher recounted personal experiences that led to important lessons learned in visitor studies, including advocating for quality visitor experiences, conducting visitor evaluation, and carrying out visitor research in museums.

Moderator

- **Stephen Bitgood**, Professor Emeritus of Psychology, Jacksonville State University

Presenters

- **Minda Borun**, Director of Research & Evaluation, The Franklin Institute
- **Alan Friedman**, Consultant, The Museum Group
- **Beverly Serrell**, Director, Serrell & Associates

Annual Meeting & MuseumExpo

As the museum field's premier professional development opportunity, the Alliance's Annual Meeting & MuseumExpo showcases the best thinking from practitioners and visionaries on major issues confronting museums and the communities they serve.

This session handout is from the 2013 Annual Meeting in Baltimore.

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LESSONS LEARNED FROM FIVE DECADES OF EXPERIENCE IN VISITOR STUDIES

American Alliance of Museums Annual Conference, May 21, 2013, Baltimore, MD

Chair: Stephen Bitgood

Panel: Alan Friedman Minda Borun Beverly Serrell

INTRODUCTION

Why the session?

- Experience is not always the best teacher, but it can fill many of the gaps left by formal education and training
- We can learn from others' experiences, especially lessons that cannot be obtained from formal education

Who are we?

- We are four professionals with many combined years of experience in visitor studies and exhibition centers.
- Our experiences are varied and include: (1) a science center director (Alan Friedman); (2) outside consultants to museums, zoos, science centers, and other exhibition centers (all of us); (3) grant recipients & reviewers; (4) in-house evaluator and educator (Minda Borun); (5) former museum board member (Steve Bitgood); and (6) researchers in visitor studies (all of us); (7) in the past, prominent roles served in the Visitor Studies Association; and (8) numerous publications on topics related to visitor studies

Categories of lessons learned can be divided into:

- *Political survival knowledge*: issues related to decision-making and working effectively with people
- *Beliefs & attitudes*: beliefs that either facilitate or impede actions such as using evaluation outcomes to improve exhibitions
- *General empirical principles*: principles that are reliable and valid predictors of either visitor or museum professional behavior

LESSONS LEARNED FROM A VISITOR RESEARCH PERSPECTIVE

Stephen Bitgood, Professor Emeritus of Psychology
Jacksonville State University

The research perspective

- ✖ Research perspective should include at least one data-oriented lesson
- ✖ The first lesson selected here has been replicated again and again in several different ways, yet few seem to appreciate its value.

LESSON #1: The Value of The Value Ratio

- ✖ The **value ratio** = benefit divided by cost
  - + Benefit = expected utility, reward, or satisfaction
  - + Cost = time, effort, and/or money
  - + Choices based on expected benefit per cost expended
  - + This lesson falls within the "general empirical principle" category
- ✖ Value ratio is part of many theories:
  - + Optimal foraging theory
  - + Temporal and probabilistic discounting
  - + Prospect theory
  - + Attention-value model of visitors

The Attention-value model [for details see Bitgood, 2010; 2011; 2013]:

- + Attention is a continuum of 3 stages: capture, focus, engagement
- + Each stage is influenced by a different set of variables
- + **Value ratio** is the most important variable in facilitating engaged attention and, ultimately, providing a satisfying visitor experience

Applications of the value ratio to a museum setting

1. Who visits the museum
2. Pathway visitors take through the museum
3. Reading interpretive text
4. Experience with interactive devices
5. Videos imbedded in exhibitions

1. Who visits?

- ✖ To attract visitors, a museum visit must provide large benefits at a reasonable cost (admission fee, ease of understanding exhibits, distance travelled, etc.)
- ✖ Evidence:
  - + Distance traveled to museum
  - + Admission fee and frequency of visitation
  - + Satisfaction per cost [e.g., Disney constantly assesses value – What will the market bear?]

2. Pathways taken

- ✖ Visitor circulation follows the "fewest steps" principle
- ✖ Perceived benefit must be high for visitors to take extra steps
- ✖ Evidence: [See Bitgood, 2006]
  - + Turning at intersections: take fewest steps (if walking on right side, strong tendency to turn right or go straight ahead)
  - + Lack of backtracking: unless there is high perceived attraction to other exhibits, visitors tend to resist backtracking to see any exhibits missed
  - + Exit gradient (inertia) & one-sided viewing

3. Reading Interpretive Text

- ✖ **The small chunk theorem**: small investment of time-effort for each alternative increases overall attention
- ✖ Bitgood & Patterson (1993): label with 150 words divided into three labels of 50 words each (reading increased from 11 to 28 percent of visitors)
  - + Visitors read more text when information was presented in small chunks than all at once

[Reducing the cost may be more important than increasing the interest according to a number of studies we have conducted (see Bitgood, 2011; 2013)]

4. Interactive devices

- ✖ Interactives generally fail if they require too much time-effort
- ✖ *Falling Feather* device (Bitgood, 2011c)
  - + Too many steps
  - + Explanatory label too long
- ✖ Payoff for making a response (getting feedback) increases the value

- ✖ See "Guidelines for Designing Interactive Devices" in Bitgood (2011, Vol. 2)

5. Videos embedded within exhibitions

- ✖ Visitors spend little time viewing videos embedded within exhibitions
- ✖ Long duration videos rarely get much attention
- ✖ **Available-alternative theorem**: Visitors rarely invest in activities that require large cost when lower cost alternatives are available
- ✖ See Serrell (2002) for summary of studies and one of my upcoming presentations at Visitor Studies Conference (commitment & temptation)

LESSON #2: Belief trumps facts

- ✖ No matter how much data you show some people, they won't accept the predictive power of the value ratio. When strong belief is pitted against reason and fact, belief triumphs over reason and fact every time.
- ✖ This lesson falls within the belief-attitude category of lessons learned
- ✖ [If you've tried to persuade people to accept global warming, evolution, or gun control, you already know this lesson!]

[For a more detailed paper on the value ratio, please send an e-mail request (steveb@jsu.edu) for the paper titled: "Lesson Learned: The Value of the Value Ratio"

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[Demonstrates the impact of reducing length of text passages while providing same amount of information]

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[Reviews literature on patterns of visitor movement or circulation through museums and other public places.]

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[Describes the attention-value model and some of the supporting evidence]

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[Summary of the attention-value model and its evidence]

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[Rationale and evidence for the importance of the value ratio]

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[Reports an evaluation of the *Falling Feather* exhibit]

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[Provides a detailed description and evidence for the attention-value model including the value ratio]

Bitgood, S. (2013b). Value as a combination of quality and duration. In *Attention and value: Keys to understanding museum visitors*. Walnut Creek, CA: Left Coast Press. Pp. 77-82.
[Reports a study involving choices between a shorter, lower-rated film and a longer, higher-rated film]

Serrell, B. (2002). Are they watching? Visitors and videos in exhibitions. *Curator,* 45(1), 50-64.
[Reviews studies that used videos embedded within museum exhibitions]

Lesson Learned: The Value of the Value Ratio

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[This paper supplements a paper presented at the 2013 AAM presentation
For the session, "Lessons Learned from Experiences in Visitor Studies"]

Studying visitors over the years has taught me, time after time, that what visitors do in museums is motivated primarily by **value**. Evidence for this lesson comes from several sources: (1) visitation patterns; (2) the circulation pathways visitors take as they move through museums; (3) The willingness of visitors to read (or not) interpretative text; (4) visitor reactions to interactive exhibit devices; and (5) visitor attention to the presence of videos embedded within exhibitions.

I use an economic definition of value: *it is a ratio of utility (benefit, satisfaction, reward, etc.) divided by cost (investment of time, effort, and/or money)*. The larger the ratio of utility to cost, the higher the personal value to the visitor. In museums, visitors are strongly motivated to obtain the largest benefit at minimal costs (e.g., the time and effort required to engage with exhibits). In order to avoid confusion with other possible definitions of value, the term, "value ratio," will be used in this paper to indicate an economic approach.

Much has been written on how to provide provocative, interesting and satisfying visitor experiences (e.g., Bitgood, 2000; Rand, 1985; Rounds, 2004; Screven, 1992; 1999; Serrell, 1996). Many of the same writers have also expressed concern with the costs or obstacles faced by visitors when they attempt to make sense of their museum experience. While there has been recognition that both benefits and costs influence the visitor experience, there has been little discussion in the literature about the nature of this relationship. The **value ratio** concept suggests that the best predictor of engaged attention derives from dividing benefits by costs. Other mathematical relationships (e.g., costs subtracted from benefits) would result in a different form of the relationship between costs and benefits[1] .

The value ratio is an essential element of the attention-value model of museum visitors (e.g., Bitgood, 2010; 2011; 2013). The model argues that:

(1) Attention is a continuum of three stages: capture, focus, and engagement. Cognitive and emotional processing increase as attention moves from the capture to the engagement stage. Engagement requires more time and effort and deeper processing of content than the first two stages and is likely to result in learning or some other desirable outcome.
(2) Each stage of attention is characterized by a unique set of attention indicators (look at, approach, stop, read, talk about, etc.) and antecedent variables (influence of past history, setting context (e.g., exhibit design, architecture, social influence).
(3) The value ratio (perceived benefit, satisfaction divided by perceived time and effort) is the most powerful predictor of engaged attention, once visitors have detected an exhibit element. The ratio can be quantified and calculated by assigning a numerator (e.g., interest rating) and a denominator (e.g., length of a text passage) to represent utility and costs.

REVIEW OF THE EVIDENCE FOR THE VALUE RATIO

According to the attention-value model, the value ratio (benefit/cost) is a critical part of the visitor decision-making process. Whether it describes how information is processed when conducting an internet search (information foraging) or how people assess the value of an immediate versus a delayed reward (temporal discounting), the benefit/cost ratio appears to be a powerful motivator. In museums, based on the expected ratio of benefit/cost, people choose to invest (or not invest) time and effort to process the content of exhibits.

Pattern of Museum Visitation

Choosing to visit a museum is influenced by both the perceived benefits of the experience and the costs required for the visit. Falk and Dierking described the benefits and costs of museum visitation in the following way:

> "Leisure decision-making is always a negotiation, a consideration between the relative costs, such as the investment of time and money, and the benefits, such as value and importance, attached to the activity. " (Falk & Dierking, 2012; p. 42)

The benefits of a museum visit have been closely associated with leisure goals (e.g., Hood, 1984). People visit museum because they expect to obtain a satisfying experience

by accomplishing their leisure goals. The cost of museum visitation, on the other hand, include time, money, and convenience. Analysis of the costs often focus on an economic analysis of admission fees (e.g., Luksetich & Partridge (1997) and/or the problem of accessibility (e.g., Weber & Sultana, 2013).

The value ratio concept suggests that perceived benefits and costs of visitation can be expressed as a ratio of benefit divided by costs. While economists are likely to take this approach to value, a quantitative analysis of the costs and benefits of visitation has rarely been conducted by others.

Circulation Pathway

The movement patterns of museum visitors can also be explained in terms of the value ratio. The major benefit associated with visitor movement within exhibitions may include feelings of satisfaction associated with viewing exhibit. People expect to find enjoyment and/or satisfaction from the exhibition experience, but it requires moving through the exhibit spaces to obtain the experience.

The costs of movement through exhibitions may not be quite as clear. In an article published in *Curator* (Bitgood, 2006), I reviewed the literature on visitor circulation or movement patterns through exhibition centers. Movement patterns described in the literature include: (1) patterns of turning at intersections; (2) a reluctance to retrace steps to view all of the exhibits; (3) a tendency to view only one-side of an exhibit pathway; and (4) walking in a straight line from the entrance to the exit of an exhibit gallery (called the "exit gradient" or inertia).

Direction of turning. While there are a number of research reports that indicate a strong tendency for visitors to turn right at intersections, there are also conflicting studies that show a tendency to turn left. Resolution of this conflict can be found in which side of the pathway people are walking. Prior to our pedestrian mall study (Bitgood & Dukes, 2006), researchers did not record which side of the pathway people were walking before they reach the choice point or intersection. If visitors are walking on the right side of a walkway, turning right or going straight requires fewer steps (lower cost) than turning left. This explanation of turning at intersections has been replicated in several shopping mall studies (Bitgood & Dukes, 2006; Bitgood, Davey, Huang, & Fung, 2012; Spilkova & Hochel, 2009).

Retracing steps. The design of many exhibitions requires that visitors retrace their steps in order to view all of the exhibits. Consistent with the benefit-cost ratio, visitors often resist doubling back to see missed exhibits. The perceived value of exhibits must be high to entice visitors to deviate from their fewest-steps path to retrace their steps.

Walking in straight lines ("exit gradient" or inertia). Similar to "J" walking to cross a street or walking across a lawn instead of following a winding sidewalk, museum visitors have a tendency to save steps by walking in a straight line from the entrance to the exit of an exhibit gallery. Melton (1935) called this the "exit gradient" and I have called it inertia since it operates much like the principle of physics (Bitgood, 2011a). My premise is that visitors must perceive a powerful incentive to take the extra steps to divert from their straight-line path.

Taken together, the literature on visitor movement patterns is easily explained by, and is consistent with, the value ratio. In some of our studies, the difference in just a few steps results in the fewest-steps strategy. This strategy often occurs without awareness and there are many such examples in everyday life. I have already noted "J" walking and walking across the lawn. In addition, people search for parking places as close as possible to the entrance of a "big box" store. Or, those who walk on a track for exercise often cut the corners on the curves of the track.

Reading Interpretive Text

Reading interpretive text in an exhibit environment promises the benefit of satisfying curiosity or learning something new, but it also comes with costs, i.e., the time and effort required to read and process the interpretive material. The fact that visitors rarely read long interpretive passages has been known for many years (e.g., Bitgood, 2000; Screven, 1992; 1999; Serrell, 1983; 1996). These and other writers (e.g., Rand, 1985) have offered suggestions to increase the benefits or appeal of interpretation. In addition, there have been frequent calls to decrease the reading workload by reducing the number of words or by presenting the material in a way that decreases cognitive processing (e.g., bullet the major points instead of using paragraphs).

Bitgood & Patterson (1993) tested the impact of several modifications to interpretive material including presenting the information in smaller chunks, increasing the size of the font, and placing the text closer to the objects it described. When a text label of 150 words was divided into three, fifty-word labels, the percentage of readers more than

doubled. Visitors appear to be more willing to invest a small amount of time and effort even if they do not anticipate a large benefit. If the small investment turns out beneficial, they are likely to continue engaging with the exhibit, especially if only a small commitment of time and effort is required each time (Bitgood, 2013b).

Placing the labels closer to the objects it described resulted in another significant increase in reading. [See Bitgood (2013d) for additional evidence that placement close to objects receives more attention. Presumably, it takes less time and effort to read interpretive text when it is close to the object it describes. Of course, closer placement may also make the text easier to detect and/or associate with the object.]

In a series of art museum simulation studies, my students and I (e.g., Bitgood, 2011a; 2013a) have examined the relative predictive power of interest rating, workload (total number of words in an interpretive text passage), and the value ratio (interest rating divided by number of words in the passage). In every case, the value ratio was a more powerful predictor of reading than either interest rating or workload by themselves. An analysis of the data also revealed that the ratio of interest divided by workload was a much better predictor of reading that interest rating minus workload.

Responding to Interactive Devices

Science Centers have become an important force in the museum world. They offer small bits of science much like an appetizer before a meal. Unfortunately, the "meal" is not always digestible once the appetizers have been consumed. Communicating difficult-to-understand scientific concepts is not an easy task.

Over the years when evaluating interactive exhibits, we have found that: (1) visitors are reluctant to spend the necessary amount of time required to understand difficult scientific principles; (2) people will often not take the necessary time to figure out how an interactive device works; (3) typically, visitors approach the interactive device, form an immediate conceptual model of how the device should work, and try it (usually without reading the instructions); (4) if their conceptual model is not accurate and nothing happens (no feedback), the visitor is likely to give up and move on to another exhibit. If it's not visually obvious how the device works, it is not likely to engage the visitor.

In addition, effort, including the number of steps required to complete the instructions, contributes to the "cost" of the exhibit experience. We found that the number of steps required to complete the instructions for a version of the Exploratorium's *Falling Feather* device, was apparently too great a cost for most visitors (Bitgood, 2011c).

Guidelines for design interactive devices include several suggestions that involve reducing the time and effort required by visitors. Here are a few examples from Bitgood (2011d):

1. Provide implicit cues for the response: it should be obvious what response is expected by looking at the interactive device.
2. Controls should be mapped so that their position tells what is being controlled.
3. Keep text to a minimum.
4. Separate instructions from explanations and place instructions close to controls.
5. Both incorrect and correct responses should receive feedback so visitors know when they have responded appropriately.

Viewing Video Embedded Within Exhibitions

Serrell (2002) compared 45 museum video presentations from a data base of studies she collected for a previous project. Unfortunately, specifics of design for these studies were not available from Serrell's data base. For example, we do not know how much the videos/films were isolated from competing exhibits. Nor do we know if there was seating available, etc. The videos ranged across different types of museums and topics. Serrell reported attracting power (percent of visitors who viewed the video) and holding power (ratio of average viewing time divided by the duration of the film). The findings clearly indicate that visitors do not spend long time periods viewing videos embedded within exhibitions. Why are people willing to sit in a movie theater for a couple of hours to watch a film, but not more than a couple of minutes when a film or video is embedded in an exhibition? I believe the value ratio helps to explain the apparent paradox.

The value ratio argues that benefit divided by cost predicts visitor attention. There are two theorems that are relevant to the use of videos (Bitgood, 2011; 2013): (1) *available-alternative* and (2) *small-chunk*. We can use the concepts of *temptation* and *commitment* to understand what happens. *Temptation* is the degree to which objects or events pull attention away from one source because of the high relative value of the *available*

alternatives. If other highly attractive or salient exhibit elements are competing for visitor attention, choosing to view the video/film is likely to suffer. We are more easily distracted from viewing a film on television at home that we are in a movie theater. To successfully engage visitor attention, exhibit design must somehow reduce temptation to switch attention to other exhibit elements until viewing of the video is complete (assuming the interest level to the video is adequate).

The *small-chunk* theorem suggests that people are more willing to process small chunks of information even if the benefit is relatively low. This theorem suggests that it is better to break down information into small units than to offer it in one large chunk.

Commitment involves: (1) having an intention to do something and/or (2) making an overt response that increases the chances of completing an activity. A visitor who commits to viewing a film (e.g., by paying a fee) is more likely to complete the activity. In fact, people who pay for a bad film at a movie theater often sit through it anyway because of "sunk costs" ("I've paid for it and need to get my money's worth!").

I am now ready to offer an explanation of when and why people view entire video/films. Viewing a film in a movie theater has few competing *temptations* and requires *commitment* (ticket price, mental determination to view the film, as well as a physical commitment to go to the theater). While the cost (money and time) may be substantial, the level of commitment and the lack of temptation is usually enough for the viewer to stay in the theater. In a museum setting, viewing a video/film in an exhibition generally lacks commitment and is likely to be associated with many temptations (competing alternatives).

We tested the influence of perceived benefits and cost on film choice in a study using a film festival scenario (Bitgood, 2013c). Participants were asked to choose between films based on a combination of quality and duration of the film. An example of the choices was: "Would you rather view a 5-minute low quality film or a high quality, 10-minute fild?" When film choice involved short durations (5-20 min), higher-quality, longer films were chosen more often; however, when films choices were of long duration (more than 40 min), people chose the shorter, lower-quality film. This outcome clearly indicates that people are sensitive to the cost of their choice and that cost may be more important than benefit when the cost is very high.

The available alternative theorem helps explain the difference between viewing a film in a movie theater, and viewing a film at a film festival (or embedded within a museum exhibition). When there are other choices available at any moment, commitment to view

a long film is decreased even if the film is rated high quality. The duration of the film becomes more important than the quality when the "cost" (time) is high and alternatives that require a lower investment in time are available.

There are two other concepts related to cost and benefit that are likely to influence choice: accessibility and isolation.

Accessibility. We can examine accessibility in at least ways. Is there free access to the video or is it controlled? Controlled access can take many forms: purchasing timed tickets, having visitors queue in line, etc. Controlled access usually increases commitment to completing the activity. However, controlled access may also have increased costs which discourage some visitors from viewing, thus reducing the attracting power. Empirical studies would be helpful to confirm this hypothesis.

Isolation. Does the video presentation compete (via vision or sound) with other media? To reduce temptation and increase commitment, videos should be isolated from competing stimuli. A movie presented in a theater area rather than in an open space may be the best way to accomplish this principle. Melton (1935) was perhaps the first to note the importance of isolation as a variable to better manage visitor attention.

CONCLUSION

This paper reviews five sources of evidence that visitors are strongly motivated by the value ratio. Those who design visitor experiences should realize that visitor decision making follow the same principles as are followed in everyday life. People are constantly assessing the value of a purchased item, or financial investment, or leisure activity based on the expected benefits per costs. It is a serious miscalculation to ignore the importance of cost (time, effort, money) in these daily decisions. The potential benefit in terms of quality or satisfaction of exhibition content, must be considered in the context of its time, effort, and financial cost.

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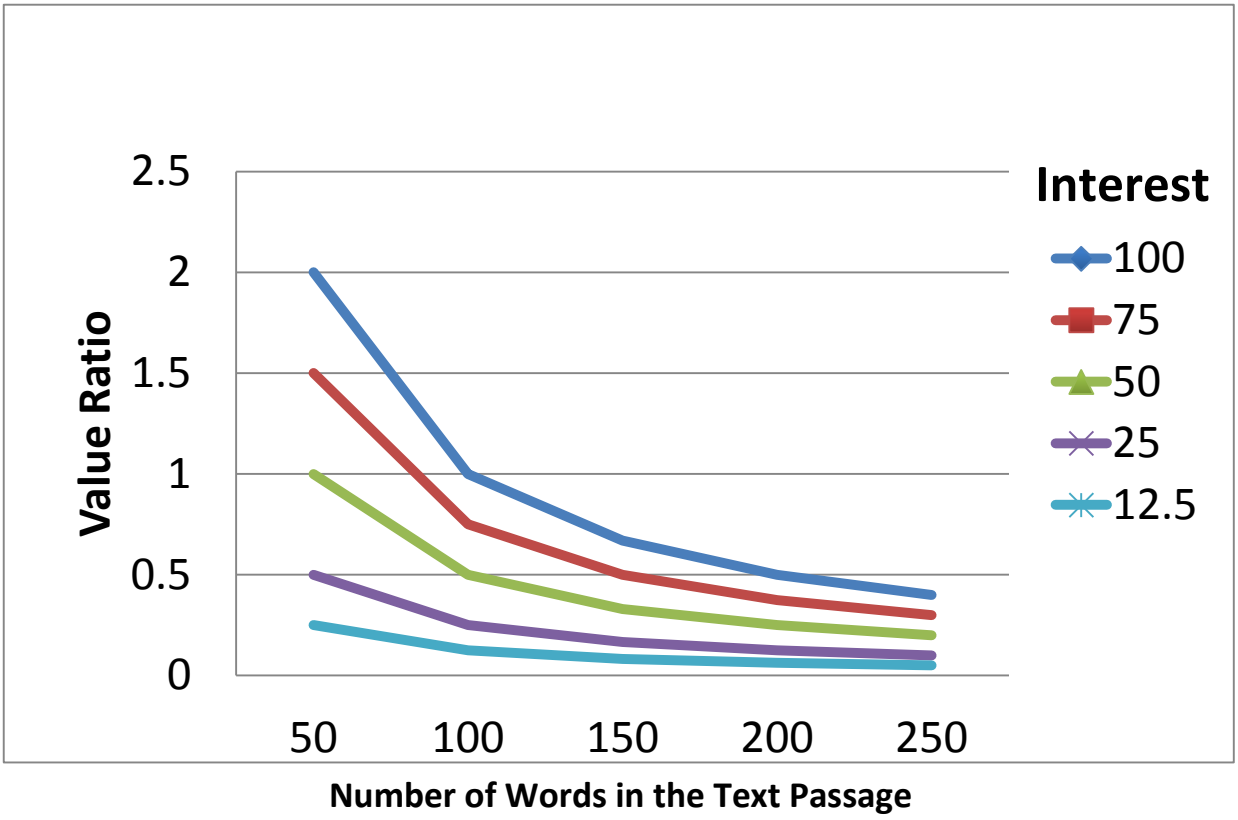
FOOTNOTES

1 – A subtractive relationship between benefits and costs would be expressed as a straight line across different levels of costs and benefits indicating the same relative influence of benefit on value whether the cost is high or low. If the relationship is ratio, on the other hand, then there is a larger difference between value ratios when the cost is low and benefit held constant than when the cost is high for the same benefit. The following figure illustrates the value ratio curves for various combinations of interest and workload (Number of words per passage). Note that when the cost is low (50 words) the value ratios for different levels of interest are spread farther apart than when the cost is high (250 words). Interest level has much less importance when the workload is high.


2.5
2
1.5
1
0.5
0
Value Ratio
50
100
150
200
250
Number of Words in the Text Passage
Interest
100
75
50
25
12.5