

Coherence Analysis  
John Palmer EDTECH 513

***What is the Coherence Principle and its most important constraints/criteria?***

The Coherence Principle is pretty simplistic. According to Clark & Mayer, “you should avoid adding any material that does not support the instructional goal” (Clark & Mayer, 2011, p.151). This additional material that should be avoided could be in the form of onscreen text, audio narration, or sounds/music. Instructors have a variety of reasons as to why they add extra information, but research has shown that any material that is not part of the instructional goal actually makes learning more difficult than easier. The reason why additional information inhibits learning is because of the cognitive load the human brain can handle. Cognitive load refers to the amount of working memory a person’s brain has. When there is music, sounds, or information that is not needed, the brain cannot ignore it and focus on the relevant information. This focus on irrelevant information causes the brain's working memory to become filled and unable to learn new information. This cognitive overload makes it difficult to learn (Clark & Mayer, 2011, p.41).

***Describe and/or include one example of successful and one example of unsuccessful attempts to apply the Coherence Principle in actual instruction and training you have experienced, especially as it might be implemented in PowerPoint-based instruction and training.***

Since I feel there are more examples of unsuccessful than successful applications of the Coherence Principle, I’ll start with one example in which my cognitive load was overloaded based on too much additional information. Every year before school starts teachers have several different professional development sessions that are mandatory. During these sessions, there is a variety of information presented from positive behavior support to diversity. A particular session on diversity had me frustrated. The presenter had prepared a powerpoint presentation to help explain his personal experiences with racism and diversity. There were two problems with his presentation, the first being the background music. For each time period in his life he had music in the background that was popular for that era and accompanied his

narration. The problem was that I could not fully listen to his presentation because I was listening to the music in the background. The second problem was that he kept saying, “you know” after every spoken sentence. I found myself listening to the background music while keeping a tally of every time he said, “you know.” I can't even imagine taking an assessment after his presentation, I would have surely failed.

The positive example of using the Coherence Principle came from a training session on how to write expository text. The presenter developed a presentation that was very well thought out. The powerpoint had key points on each slide, not just a repeat of the narration. There was no music, sounds or extra information. Everything in the presentation was related to the learning goal of teaching how to write expository text. One particular thing I liked was the use of examples in the presentation. The examples were completely appropriate and really helped to illustrate the concept.

***Have you ever seen this principle violated or abused? Identify the violations, including citations as needed from your textbook.***

As much as I would like to say that I have not violated or abused the Coherence Principle, I would be lying. I seem to abuse this principle frequently! One of the ways I have violated the Coherence Principle is by having additional information in many of my presentations. In my social studies class I create a variety of instructional materials designed to teach content and keep my students engaged. There have been several Prezis that have had side information such as surprising facts or funny video clips. The content of this additional information has nothing to do with the learning goal. According to Moreno and Mayer (2000), “Students learn better when extraneous material is excluded rather than included in multimedia explanations. In my attempt to add interest and engagement, I have produce cognitive overload and made learning more difficult. My students may remember the oldest person in Southwest Asia , but not the type of economy.

***Discuss the relationship of the Coherence Principle to other Multimedia Learning Principles examined thus far in your readings.***

The Coherence Principle fits the theme of most other multimedia learning principles in less is more. The Redundancy Principle states that people learn better from animation and narration than from animation, narration, and text (Moreno and

Mayer, 2000). Both of these principles are pretty clear in that extra information is not beneficial for learning.

All of the multimedia principles examined in the readings thus far, multimedia, contiguity, modality, redundancy, and coherence were created with learning in mind. In creating these principles, researchers discovered how the brain works and how learning occurs. The Cognitive Theory of multimedia learning is the idea that humans have separate visual and verbal information processing systems. These multimedia principles seek to utilize both the visual and audio channels to enhance learning (Mayer, 1999). When there is too much information, information is poorly organized, too much audio or visual information, learning is compromised. These principles serve as a guideline on how to design multimedia to be as effective as possible.

***Discuss the relationship of the Coherence Principle to fundamental theories of psychology as described by Clark & Mayer in your textbook.***

The Coherence Principle is about avoiding extra information in instruction. As stated above, the human brain can only process a limited amount of information. There are visual and auditory channels and once they are used, the brain cannot process more information. If you're filling your students' brains with additional information, they won't be able to learn the actual content. The reasoning for this ties into psychology. Clark & Mayer (2011) point out that to include audio in a presentation for engagement is the premise for the Arousal theory. The Arousal theory believes that adding adjuncts can interest the learner, but the cognitive theory of multimedia learning says the brain cannot handle it.

One of the more interesting points in the book was presented in 1912 by Dewey, "When things have to be made interesting, it is because interest itself is not wanting" (Clark & Mayer, 2011, pg. 156). This statement goes into the motivation of the learner. In order for learning to have meaning, the student has to provide that meaning. Constructivism states that the motivation for wanting to learn comes from the learner. If the learner will make connections and value the content, extra sounds are not needed.

***What do you personally like or dislike about this principle? Present a coherent, informed opinion and explain why you hold this opinion.***

Going back to when I was a student in middle school, high school, and my undergrad I really can relate to this principle. I have always learned concepts better when it was presented in a way that was factual. What do I exactly need to know was a question that I often asked myself.

As a teacher I find myself in more of a dilemma. I constantly battle with student engagement. Middle school students don't typically adopt the constructivist style of learning. Motivation and engagement is not self initiated, it comes from parents and teachers. So one of my questions is that if learners are not engaged in the content itself, which is likely to happen in middle school, nothing can be done? I think there is a time and place for additional information, more of an application at a different time.

***Are there any limitations or qualifications of the principle (caveats) which the authors did not consider and, if so, what are they?***

I have to admit, when I first read about this principle, I was a bit disappointed. I use music a lot in my classroom. I find students tend to work better when I have music on in the background. According to the authors, I should not be doing this. I really had to think about what this meant and I applied it to myself. If I need to write a paper or read something, I cannot have any noises. The television completely distracts me and I cannot focus. I never really took this into consideration. I would like to see some more research on this concept. I feel the younger the learners, the more sounds can help enrich learning. Perhaps the effect of the coherence principle is subject and could change for each individual case.

## References

- Clark, R. C., & Mayer, R. E. (2011). *e-Learning and science of instruction: Proven guidelines for consumers and designers of multimedia learning*. San Francisco: Pfeiffer.
- Mayer, R. E. (1999). Multimedia aids to problem-solving transfer. *International Journal of Educational Research*, 31(7), 611-623.
- Moreno, R., & Mayer, R. E. (2000). A learner-centered approach to multimedia explanations: Deriving instructional design principles from cognitive theory. *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, 2(2). Retrieved from <http://imej.wfu.edu/articles/2000/2/05/index.asp>