

# Linking Seductive Details and the Isolation Effect

**Meagan P. Padro**

University of North Carolina at Charlotte

## Abstract

This study's purpose was to discover how attention-grabbing material affects memory during learning. Specifically, whether or not the seductive detail effect and the isolation effect function similarly in regard to retention of target material. It was hypothesized that seductive detail statements would be better recalled than control statements. It was also hypothesized that the information before and after the seductive detail would be forgotten. Repeated measures analysis of variance (ANOVA) showed enhanced recall of the seductive detail, as compared to the control items, supporting the first hypothesis. Paired samples t-tests did not yield significant differences in comparing the before and after seductive detail sentences to the before and after control sentences, not supporting the second hypothesis; the anticipated interference effects were not produced.

## Key Words:

seductive details, isolation effect, memory, learning

A big challenge for teachers is keeping the attention of their students. One common method is to include material that is interesting within the lectures and readings. This material is commonly called a *seductive detail* (Garner, Gillingham, & White, 1989; Harp & Maslich, 2005; Harp & Mayer, 1997, 1998; Mayer, Griffith, Jurkowitz, & Rothman, 2008; Rowland, Skinner, Davis-Richards, Saudargas, & Robinson, 2008). Seductive details are not always relevant to the instructional goal, but they are thought to enhance learning because higher levels of interest help learners stay focused, tap into prior knowledge, and stay motivated. Therefore, many teachers began to incorporate seductive details into their lessons in order to keep students engaged (Schraw, 1998).

Readers recall material that is interesting better than uninteresting details (Dewey, 1913; Wade et al., 1993) and tend to use deeper processing strategies on interesting material (Pintrich & Garcia, 1991; Pintrich & Schunk, 2002). Seductive details are well remembered relative to the rest of the material (Garner et al., 1989; Garner, Alexander, Gillingham, Kulikowich, & Brown, 1991; Garner, Brown, Sanders, &

Menke, 1992), but sometimes the uninteresting information is what the students are expected to learn (i.e., target material). Harp and Maslich (2005) played recorded lectures to students and tested them on the target material. The students performed better when the seductive details were excluded from their lecture. So, adding seductive details might actually hinder learning of the target material (Harp & Maslich, 2005; Harp & Mayer, 1998; Mayer et al., 2008) from text passages (Garner et al., 1989) and from multimedia presentations (Harp & Mayer, 1997, 1998).

Garner et al. (1989) administered passages to students, with and without seductive details, and asked them to remember the target material in the text. The seductive details decreased student recall of the target material, even with skilled readers. McCrudden and Corkill (2010) found that seductive details maintain this power of hindering recall of target material regardless of students differing levels of verbal ability. Lehman, Schraw, McCrudden, and Hartley (2007) yielded the same result regardless of the total amount of time it took the student to read the text. Garner et al. (1992) suggests that

including seductive details almost always interferes with learning of target material.

Garner et al. (1992) suggests that this phenomenon is due to learners' limited cognitive resources, which are diverted from the important details. Other researchers have supported this notion (Garner et al., 1989; Harp & Mayer, 1998; Mayer, Heiser, & Lonn, 2001; Mayer & Jackson, 2005). This explanation is similar to cognitive load theory, which proposes that learners have a limited amount of processing capacity available during learning; the seductive details use this capacity but it not benefit the intended learning objectives (Mayer et al., 2008).

Seductive details (or extraneous details) cause the learner to engage in extraneous processing (Mayer et al., 2008). Mayer says this can occur in two ways: seduction or disruption. The seduction hypothesis proposes that the interesting details draw attention, therefore causing the learner to activate extraneous processing. The disruption hypothesis offers the idea that the details disrupt the learner's construction of a mental model, making it difficult to build connections (Mayer et al., 2008).

Researchers have also investigated the placement of seductive details relative to the target material. Harp and Mayer (1998) placed the seductive details prior to a main text passage or at the end of it. The results, consistent with other research (Garner et al., 1989; Harp & Mayer, 1998; Mayer & Jackson, 2005), suggested that placement of the seductive details prior to the main text is most detrimental to learning. Sweller and Chandler (1991) have attributed this to cognitive diversion hypothesis. This hypothesis (like the cognitive load theory) is based on the notion that people have limited cognitive resources and placing the extraneous details at the beginning of the text may divert these resources and cognitive activity. Also, placing seductive details at the beginning may prompt the activations of inappropriate schemas (a schema is an organized pattern of thought or behavior that organizes categories of information and the relationships among them) related to the seductive detail and not to the

target material (Rowland-Bryant, Skinner, C., Skinner, A., Saudargas, Robinson, & Kirk, 2009).

However, there are mixed results because not all researchers have duplicated these placement effects (Beishuizan, Asscher, Prinsen, & Elshout-Mohr, 2003; Mayer et al., 2001). For example, Mayer et al. (2008) placed seductive details at the end of each passage on a PowerPoint presentation and found that the level of interestingness of the detail was more important than the placement of it. Contrastingly, Rowland et al. (2008) placed seductive details at the beginning (primacy) or ending (recency) of a passage and found that the primacy group scored lower. This occurred no matter the type of detail, whether context dependent (details that need the surrounding context in order to be deemed interesting) or context independent (details that are interesting regardless of context), suggesting that placement is more important than type.

These contrasting findings suggest that more research is needed in order to understand the interaction between placement of seductive details and recall of target material.

The seductive detail effect seemingly resembles another phenomenon called the *isolation effect*. Wallace (1965) defines the effect as superior retention of a critical item (this item is isolated or different in some manner; different color, size, spoken in a louder voice, etc.) in an otherwise homogeneous list. Meaning, items or material that are incongruent with the context draw attention and are better remembered than events that are consistent with the context (Hunt & Lamb, 2001). For example, an isolation effect like this could occur in remembering characteristics of people. Atypical, or salient, behavior from someone we know would stand out and be well remembered (Terry, 2009). In application, salience effects like these could help to understand the mechanism for illusory correlations in negative stereotypes (Hunt & Lamb, 2001).

The effect of isolation on memory has been modeled multiple times, in many different ways, in laboratory experiments. In a classic study, Helena von Restorff (1933) (her original paper is not available in English, but Hunt (1995)

provides considerable details), presented a list of to-be-remembered words where she made one item distinctive. For example, if all the words were printed in black, one word would be printed in red. The distinctive item, in the context of the list, was usually learned more quickly and remembered better.

How can we explain this extraordinary memory? Early work (Calkins, 1894, 1896) studied the influence of vividness on memory, tying the paradigm of salience (difference between the isolated and surrounding items) to the isolation paradigm. Jenkins and Postman (1948) explored this paradigm, trying to understand why distinctiveness or salience influences memory. They were the first to propose that the isolation effect resulted from differential attention. Most subsequent work and prominent theories have followed this tradition. For example, Green (1956) proposed that the effect resulted from surprise induced by the sudden change from preceding items.

Ironically, von Restorff's (1933) original research argues against the need of salience at encoding. In her study, she placed the isolated item in the second serial position of the list. Since no context had been given at this point, the item should not be perceived as salient, yet, an isolation effect was obtained (Hunt, 1995). Subsequent research as replicated this effect even when the isolated item is the first item to appear in the list (Pillsbury & Rausch, 1943; Kelley & Nairne, 2001). Therefore suggesting that salience is not necessary for isolation effects on memory.

Another notable aspect of von Restorff's (1933) original data is that her purpose was to study interference effects on the non-isolated items. Her data suggested that rather than enhancing memory for the isolate, perhaps the isolation effect reflects impoverished memory for the non-isolated items induced by their similarity (Hunt & Lamb, 2001). This raises a new research question: What effect does the distinctive item have on the processing of adjacent items?

Tulving (1969) first addressed this question. He presented a list of nouns and instructed the participants to remember the

critical item. He found enhanced memory of the critical item and a new effect: induced retrograde amnesia specifically for the item preceding the critical item. Saufley and Winograd (1970) were able to repeat the outcome even without the instructions.

Ellis, Detterman, Runcie, McCarver, and Craig (1971) were able to produce this interference effect with images instead of words. They placed nudes as a critical item in a series of line drawings and found substantial retrograde (decreased recall of the item immediately before the critical item) and anterograde amnesia (decreased recall of the item immediately after the critical item). They proposed the rehearsal hypothesis: rehearsal of the critical item preempts rehearsal of preceding and following items. Detterman and Ellis (1972) repeated this procedure, with nudes as the critical item, except this time they altered the rate of presentation of the list. They found that the faster the rate of presentation the larger the anterograde amnesia, but this had no effect on retrograde amnesia and was therefore viewed as encoding failure (failure to quickly store new information). They also increased the exposure time of the critical item; this produced large retrograde amnesia, but had no effect on anterograde and was therefore viewed as retrieval failure (other information gets in the way of what we want to remember). These interactions were explained by the differential processing hypothesis, which states that the critical item changes the level of cognitive processing, thus hindering memory. A second hypothesis having to do with disruption of associations between the items has also been proposed, but not well supported (Detterman, 1975). These interactions in Detterman and Ellis (1972) could also be explained by the rehearsal hypothesis proposed in Ellis et al. (1971) where increased rehearsal of the critical item preempts rehearsal of preceding and following items.

Many other researchers have been able to find relationships between the placement of isolated items and their effects on memory. Schultz (1972) studied the effects of high priority events on recognition of adjacent items and found significant decrements of recognition of items placed immediately after. Schultz also

found that this effect was larger when only a single high priority event occurred in the list. Mackay, Shafto, Taylor, Marian, Abrams, and Dyer (2004) studied the relations between emotion, memory, and attention. Taboo words were placed in a list of words and it was found that the taboo words impaired recall of the preceding and succeeding words in the list. Mackay hypothesized that this was because taboo words trigger emotional reactions (similar to Green's (1956) hypothesis). These findings are important in application, especially for research related to eyewitness testimonies and how emotional arousal is related to amnesia.

This research on the isolation may also have important implications for the study of seductive details. There are a lot of similarities between these two phenomena: seductive details and isolated items both enhance memory and are more readily recalled. They also both have detrimental effects; enhanced memory of one piece of information at the cost of other information. Coincidentally, they also share similar hypotheses explaining why each phenomenon works the way it does. Seductive details can be explained by the cognitive load hypothesis, which states that the learners processing capacity is being used up by the extraneous details. This appears to be comparable to the differential processing hypothesis that states that the isolation effect occurs due to changes in level of processing. The second seductive details hypothesis is the disruption hypothesis, which states that there is a break in the mental model being constructed by the learner. This is identical to the other isolation effect explanation that deals with disruption of associations between the items.

Due to the similarities between the two phenomena it is important to consider integrating the research. There is no research currently available that links these two effects and questions relationships between them. This study continues on the assumption that these two effects are linked and therefore produce the same effects.

Seductive detail research has consistently found that inserting extraneous details hinders learning of the intended material. They have also

looked at placement of the details and found some retention and problem-solving transfer deficiencies; the research has focused on overall learning. Also, seductive detail research has looked at placement on a molar level, not precise placement; they have not looked specifically at what is forgotten. On the other hand, isolation research has consistently controlled for placement in order to identify the spread of isolation effect by looking at learning of adjacent target material (they are able to pinpoint exactly which items are forgotten). If we integrated some methodology, we would be able to discover if seductive details work like the isolation effect does.

Thus, this study hypothesizes that seductive detail statements will be better recalled than neutral statements. In addition, it is hypothesized that the information immediately before and immediately after the seductive detail will be forgotten.

## **Method**

### ***Participants***

The participants were college students at a large southeastern university. Fifty-three participants accessed the study through the psychology departments' SONA research system, where the study was advertised as an examination of students' knowledge of well-known psychologists. Students participated for course credit. IRB approval was obtained.

### ***Materials***

The study consisted of an online survey administered via Qualtrics. The survey contained five small passages about different well-known psychologists. Although the psychologists were well-known, the passages contained biographical information that students usually are not familiar with and much of the information was fabricated. Each passage contained the same average number of words ( $M = 255$ ) and consisted of four organized paragraphs. Each passage began with a paragraph of introductory statements, in order to control for primacy

effects, and ended with a paragraph of neutral facts, in order to control for recency effects. Quiz questions were included that addressed the information presented in these paragraphs. Sample passages and quiz questions included in Appendix A.

The seductive detail occurred in one of the two middle paragraphs; the other paragraph had a control sentence. Seductive details referred to early trauma, death, or misfortune. For example: *"Freud himself suffered from bed wetting until his twelfth birthday and his mother would brutally punish him for it"*. The details were placed in the middle of the paragraph in order to allow testing of the information immediately preceding and following them. Each paragraph, seductive detail, and surrounding sentences were equated for word count in order to maintain an average. The seductive-detail passages and control passages were counterbalanced across subjects.

Two forms of the survey were created; Form 1 and Form 2, not only to rearrange the passages but also to counterbalance the seductive detail paragraphs with control paragraphs. The seductive detail paragraph in Form 1 was the control paragraph in Form 2, and vice versa. In the control paragraph, the attention grabbing seductive detail was replaced with a neutral fact of the same average word length. For example: *"Freud himself suffered from bed wetting until his twelfth birthday and his mother would brutally punish him for it."* was replaced by *"This is usually the first experience with the regulation of natural impulses and the necessity for postponing immediate gratification."* So, each paragraph sometimes contains a seductive detail, and sometimes does not, varying in the different forms.

Immediately after each biographical passage, the participants were tested. The test consisted of eight multiple choice questions with four choices. The test questions were designed to specifically pertain to the seductive detail or the control sentence that replaced it, the information presented immediately before it, the information presented immediately after it, and information in the first and last paragraphs. After the quiz on

each passage, the participant then moved on to the next passage.

### **Design**

The design was a 2 x 3 within-subjects design. Each psychologist passage contained a seductive detail (SD) paragraph and a control paragraph. After reading each passage, retention was tested for the SD or control sentences; the sentence that preceded the SD or control sentence; and the sentence that followed the SD or control sentence. Additional questions tested sentences from the buffer paragraphs.

### **Procedure**

Participants signed up for the study via SONA and completed the experiment online. The participants were asked to read the information in preparation for a multiple choice test on the facts and content of the passages. They were told the test would immediately follow each passage and that there would be five selections. The paragraphs of each passage were presented one at a time on the screen. The order of the passages was rearranged in two different forms, so not all participants received the same sequence. The participants were able to control their pacing through the survey, but they were not allowed to move backwards to review. The quiz portion was presented one question on the screen at a time in order to control for referencing among questions.

Following completion of the study, the participants were debriefed. They were thanked for their participation, informed about the purpose of the study, and given contact information for further questions or concerns.

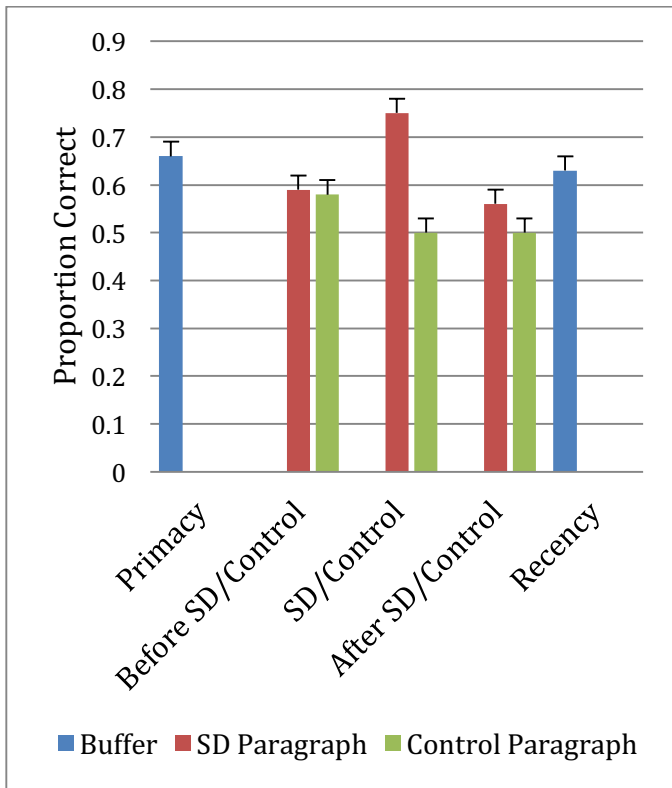
### **Results**

The results are presented in terms of the proportion of correct answers for each type of quiz question: three questions on the seductive detail, the information before, and after it; three questions on the control sentence, the information before, and after it; and two questions on the first and last paragraphs, the buffer items. The results are shown in Table 1.

**Table 1**  
*Mean proportions and standard deviations of correct answers.*

	Before		SD/Control		After	
	M	SD	M	SD	M	SD
Seductive Detail Paragraph	.591	.272	.754	.279	.556	.280
Control Paragraph	.578	.267	.495	.278	.503	.281

The first analysis assessed whether the seductive detail was recalled more than the control item. A paired-t test showed there were significantly more correct seductive details ( $M = .752, SD = .27$ ) than control items, ( $M = .495, SD = .27$ ),  $t(52) = 5.87, p < .000$ . This difference serves as a manipulation check in showing that the seductive detail was more often recalled than the control item. See Figure 1 for a visual representation of the results.



**Figure 1.**  
*This figure serves as a visual representation of the results.*

A 2 (seductive detail paragraph vs control paragraph) x 3 (sentence before, seductive

detail/control, and sentence after) ANOVA was conducted. This analysis showed a significant difference in the proportion of correctly answered questions in the seductive detail and control paragraphs:  $F(1, 52) = 16.80, p = .001$ . More questions were answered correctly from the seductive detail paragraph than from the control paragraph,  $M_s = .633$  and  $.525$ , respectively, standard errors =  $.031$ .

The ANOVA also showed a significant difference among the three questions: the before, after, and the seductive detail/control:  $F(2, 102) = 6.751, p < .001$ . More questions in the middle position (the seductive detail or control sentences) were answered correctly,  $M = .625$ , than were questions on sentences preceding ( $M = .584$ ) before or following ( $.529$ ), standard errors =  $.03$ .

Finally, the analysis also showed that there was a significant interaction between seductive detail/control and the sentences,  $F(2, 102) = 11.00, p < .001$ . The means are shown in Table 1 and Figure 1. As can be seen, the SD was remembered better than the control items. But, the information before or after the SD was not remembered differently than the same information before or after control sentences. These findings show that, even though the SD was better recalled, it did not lead to poorer recall of the preceding or following items. Thus, a seductive-detail effect was not obtained.

Simple comparisons of the same questions in the seductive detail and control paragraphs found there was no significant difference between the sentences before the seductive detail or control,  $t(52) = .34$ ; nor between the sentences after the seductive detail or control,  $t(52) = 1.18$ . These results do not support Hypothesis II; the predicted interference effects did not occur.

Finally, paired t-tests showed that the seductive detail was more often correct than either the item before,  $t(52) = 3.74$ , or after,  $t(52) = 4.54$ . A one-way ANOVA comparing the three items in the control paragraph showed that there was no significant difference,  $F(2, 104) = 1.85, p = .16$ .

Also, supplementary analyses were conducted to test for other moderating variables.

A comparison of the mean number correct across the session, from the first passages to the last passages, showed no significant differences. Means were also compared to see if the position of passages in which the seductive detail occurred, the second or third paragraph, mattered. Again, there were no differences in the SD effect, nor was there suggestion of differential effects on the preceding and following information.

The sentences in the buffer paragraphs were well-remembered relative to the other sentences (except for the seductive detail),  $M_s = .66$  for the first paragraph and  $.63$  for the final paragraph. This could suggest that there were primacy (enhanced recall of the first paragraph) and recency (recall of the final paragraph) effects across the passages.

## Discussion

This study's purpose was to explore how attention-grabbing information affects memory during learning. It was hypothesized that the attention-grabbing information, the seductive detail, would be well-remembered relative to the rest of the material in the passages. It was also hypothesized that the seductive detail would have the same effect as isolated items during a free recall task: there would be interference in recall of the information immediately before and after the seductive detail.

The results of this study support the first hypothesis; the seductive detail was better remembered relative to the rest of the material. This aligns with previous research which states that attention-grabbing information enhances learning (Dewey, 1913; Wade et al., 1993; Schraw, 1998) and also supports findings pertaining to seductive details hindering recall of target material (Harp & Maslich, 2005).

The interference effect hypothesis was not supported in this study. The information immediately before and after the seductive details were not recalled any differently than the same information in the control paragraph. Conversely, the information surrounding the seductive detail was actually better remembered than the same material in the control paragraph

(see Figure 1). The effect is probably due to the seductive detail being better recalled than the control and it suggests that the seductive detail enhanced recall of the other information.

The findings raise many new research questions. Previous research has explained that including seductive details causes the learner to engage in extraneous processing (Mayer et al., 2008), but this study's findings do not support this hypothesis. When the learner was distracted by the detail, their extraneous processing should have hindered them to recall the surrounding material.

Another hypothesis explaining this hindered recall phenomenon has to do with disruption of the mental model being created by the learner (Mayer et al., 2008). The results of this study do not satisfy this theory either; if the learner's model were disrupted then it is likely that the information immediately after the detail would be forgotten, but it was not.

Perhaps, the context of the detail is what matters when deciding whether or not the learners are being sufficiently distracted. Rowland et al. (2008) utilized context-dependent and context-independent details in their study. They discovered that placement of the details mattered more than the type of detail. However, a serious limitation may arise here because they only placed the details at the beginning or at the end of the passage. This does not control for primacy or recency effects. The placement result they found may have been exaggerated not only because of the detail but also because of primacy and recency. Because of this, the current study included buffer paragraphs to control for these effects. The results revealed large primacy and recency effects, which occurred separately from the seductive detail effect.

The present study does recognize a potential limitation in regards to context; the seductive details were presented in a negative tone (e.g. "*Freud himself suffered from bed wetting until his twelfth birthday and his mother would brutally punish him for it.*"). Such negativity could elicit an emotional response in the reader, thus increasing the salience of the information and increasing recall. Future research should aim to replicate these results

utilizing seductive details that are framed more positively.

Therefore, this leaves the issue of detail context unanswered. The seductive details in the current study were relevant to the surrounding material (the details in the current study would satisfy either description from Rowland et al. (2008) given that they were relevant to the surrounding material but would nevertheless be interesting if they were not imbedded in the passage) and the results showed superior recall of the detail relative to the control paragraph. Perhaps this indicates that interesting, but relevant details can actually aid retention of target material. Given that this result pattern occurred throughout all the passages, it can be implied that including multiple seductive details in a lecture could aid memory. Future research should test this new hypothesis by manipulating placement further. Multiple details could be placed in longer passages with alternating control paragraphs in order to see if retention is grouped around the seductive details. This could have important implications for teachers and professors by instructing them how to present material during a lecture in order to maximize student learning.

## References

- Beishuizen, J., Asscher, J., Prinsen, F., & Elshout-Mohr, M. (2003). Presence and place of main ideas and examples in study texts. *British Journal of Educational Psychology, 73*, 291-316.
- Calkins, M.W. (1894). Association. *Psychological Review, 1*, 476-483.
- Calkins, M. W. (1896). Association: An essay analytic and experimental. *Psychological Monographs, 1*, 1- 56.
- Chandler, P., & Sweller, J. (1991). Cognitive load theory and the format of instruction. *Cognition and Instruction, 8*, 293-332.
- Detterman, D. K. (1975). The von Restorff effect and induced amnesia: Production by manipulation of sound intensity. *Journal of Experimental Psychology: Human Learning and Memory, 1*, 5, 614-628.
- Detterman, D. K., & Ellis, N. R. (1972). Determinants of induced amnesia in short-term memory. *Journal of Experimental Psychology, 95*, 308-316.
- Dewey, J. (1913). *Interest and effort in education*. Boston: Houghton Mifflin.
- Ellis, N. R., Detterman, D. K., Runcie, D., McCarver, R. B., & Craig, E. M. (1971). Amnesic effects in short-term memory. *Journal of Experimental Psychology, 89*, 357-361.
- Garner, R., Alexander, P., Gillingham, M., Kulikowish, J., & Brown, R. (1991). Interest and learning from text. *American Educational Research Journal, 28*, 643-659.
- Garner, R., Gillingham, M., & White, C. (1989). Effects of "seductive details" on macroprocessing and microprocessing in adults and children. *Cognition and Instruction, 6*, 41-57.
- Garner, R., Brown, R., Sanders, S., & Menke, D. (1992). "Seductive details" and learning from text. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 239-254). Hillsdale, NJ: Erlbaum.
- Green, R. T. (1956). Surprise as a factor in the von Restorff effect. *Journal of Experimental Psychology, 52*, 340- 344.
- Harp, S., & Maslich, A. (2005). The consequences of including seductive details during lecture. *Teaching of Psychology, 32*, 100-103.
- Harp, S., & Mayer, R. (1997). The role of interest in learning from scientific text and illustrations: On the distinction between emotional interest and cognitive interest. *Journal of Educational Psychology, 89*, 92-102.
- Harp, S., & Mayer, R. (1998). How seductive details do their damage: A theory of cognitive interest in science learning. *Journal of Educational Psychology, 90*, 414-434.
- Hunt, R. R. (1995). The subtlety of distinctiveness: What von Restorff really did. *Psychonomic Bulletin and Review, 2*, 105- 112.
- Hunt, R. R., & Lamb, C. A. (2001). What causes the isolation effect? *Journal of Experimental*



- Psychology. Learning, Memory, and Cognition*, 27, 6, 1359-66.
- Jenkins, W. O., & Postman, L. (1948). Isolation and the spread of effect in serial learning. *American Journal of Psychology*, 61, 214- 221.
- Kelley, M. R., & Nairne, J. S. (2001). Von Restorff revisited: Isolation, generation, and memory for order. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 27, 54- 66.
- Lehman, S., Schraw, G., McCrudden, M. T., & Hartley, K. (2007). Processing and recall of seductive details in scientific text. *Contemporary Educational Psychology*, 32, 569- 587.
- MacKay, D. G., Shafto, M., Taylor, J. K., Marian, D. E., Abrams, L., & Dyer, J. R. (2004). Relations between emotion, memory, and attention: evidence from taboo stroop, lexical decision, and immediate memory tasks. *Memory & Cognition*, 32, 3, 474-88.
- Mayer, R., Heiser, J., & Lonn, S. (2001). Cognitive constraints on multimedia learning: When presenting more material results in less understanding. *Journal of Educational Psychology*, 93, 187-198.
- Mayer, R., & Jackson, J. (2005). The case for coherence in scientific explanations: Quantitative details can hurt qualitative understanding. *Journal of Experimental Psychology: Applied*, 11, 13-18.
- Mayer, R. E., Griffith, E., Jurkowitz, I. T., & Rothman, D. (2008). Increased interestingness of extraneous details in a multimedia science presentation leads to decreased learning. *Journal of Experimental Psychology: Applied*, 14, 4, 329-39.
- McCrudden, M. T., & Corkill, A. J. (2010). Verbal ability and the processing of scientific text with seductive detail sentences. *Reading Psychology*, 31, 3, 282-300.
- Nordby, V. J., & Hall, C. S. (1974). *A guide to psychologists and their concepts*. San Francisco: W.H. Freeman; trade distributor: Scribner, New York.
- Pillsbury, W. B., & Rausch, H. L. (1943). An extension of the Koler-Restorff inhibition phenomenon. *American Journal of Psychology*, 56, 293- 298.
- Pintrich, P. R., & Garcia, T. (1991). Student goal orientation and self-regulation in the college classroom. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement: Goals and self-regulatory processes* ( Vol. 7, pp. 371- 402). Greenwich, CT: JAI.
- Pintrich, P. R., & Schunk, D. H. ( 2002). *Motivation in education* ( 2nd ed.). Upper Saddle River, NJ: Merrill Prentice Hall.
- Rowland, E., Skinner, C. H., Davis-Richards, K., Saudargas, R., & Robinson, D. H. (2008). An investigation of placement and type of seductive details: the primacy effect of seductive details on text recall. *Research in the Schools*, 15, 2, 80-90.
- Rowland-Bryant, E., Skinner, C. H., Skinner, A. L., Saudargas, R., Robinson, D. H., & Kirk, E. R. (2009). Investigating the interaction of graphic organizers and seductive details: can a graphic organizer mitigate the seductive-details effect? *Research in the Schools*, 16, 2, 29-40.
- Saulfley, W. H., Jr., & Winograd, E. (1970). Retrograde amnesia and priority instructions in free recall. *Journal of Experimental Psychology*, 85, 150-152
- Schraw, G. (1998). Processing and recall differences among seductive details. *Journal of Educational Psychology*, 90, 3-12.
- Schulz, L. S., & Straub, R. B. (1972). Effects of high-priority events on recognition of adjacent items. *Journal of Experimental Psychology*, 95, 2, 467-469.
- Sweller, J., & Chandler, P. (1991). Evidence for cognitive load theory. *Cognition and Instruction*, 8, 351-362.
- Terry, W. S. (2009). *Learning and memory: Basic principles, processes, and procedures*. Boston: Pearson/Allyn and Bacon.
- Tulving, E. (1969). Retrograde amnesia in free recall. *Science*, 164, 88-90.
- von Restorff, H. (1933). Uber die Wirkung von Bereichsbildungen im Spurenfeld. *Psychologische Forschung*, 18, 299- 342.
- Wade, S., Schraw, G., Buxton, W., & Hayes, M. (1993). Seduction of the strategic reader:

Effects of interest on strategies and recall.  
*Reading Research Quarterly*, 28, 93-114.

Wallace, W. P. (1965). Review of the historical, empirical, and theoretical status of the von Restorff phenomenon. *Psychological Bulletin*, 63, 410- 424.

## Appendix A

### Piaget Passage(s)

#### Form 1: seductive detail in 2<sup>nd</sup> paragraph, control in 3<sup>rd</sup>

Jean Piaget is regarded as a child and educational psychologist. His chief interest lies in the area of intellectual or cognitive behavior as it is manifested during childhood and adolescence. He is interested in the relationships that are formed between the individual as knower and the world which he tries to know. He examined child development for a majority of his career. He considered himself to be a genetic epistemologist; an investigator of the nature of the origin of knowledge. **Many of his first observations were made on his twin daughters; he would experiment on them even though his wife protested.** Piaget attributes his reputation to these observations and from them grew his lifelong preoccupation with the intellectual growth of children. Among the wealth of concepts that Piaget has contributed, one stands out: functional invariants.

Piaget identified three functional invariants, collectively called the Accommodation-Assimilation Model of intelligence. Functional invariants are those cognitive processes that are inborn, universal, and independent of age. **His model (the AAM) proposes that the outcome of any intellectual encounters depends on the individual and the environment.** The AAM consists of accommodation, assimilation, and organization. This model is widely supported and can be found in most child development text books.

Piaget is widely cited and a prolific writer; his publications number in the hundreds. He has been investing intellectual development and theorizing about his findings since the early

1920's. He has traveled to many countries sharing his findings and even found time to be active in UNESCO and the educational affairs of Switzerland.

#### Form 2: seductive detail in 3<sup>rd</sup> paragraph, control in 2<sup>nd</sup>

Jean Piaget is regarded as a child and educational psychologist. His chief interest lies in the area of intellectual or cognitive behavior as it is manifested during childhood and adolescence. He is interested in the relationships that are formed between the individual as knower and the world which he tries to know.

He examined child development for a majority of his career. He considered himself to be a genetic epistemologist; an investigator of the nature of the origin of knowledge. **He observed many children and took notes on their differing levels of problem solving; he was mostly concerned with how it developed.** Piaget attributes his reputation to these observations and from them grew his lifelong preoccupation with the intellectual growth of children. Among the wealth of concepts that Piaget has contributed, one stands out: functional invariants.

Piaget identified three functional invariants, collectively called the Accommodation-Assimilation Model of intelligence. Functional invariants are those cognitive processes that are inborn, universal, and independent of age. **His mother, who was chronically ill and dying of syphilis, helped him come up with the acronym AAM.** The AAM consists of accommodation, assimilation, and organization. This model is widely supported and can be found in most child development text books. Piaget is widely cited and a prolific writer; his publications number in the hundreds. He has been investing intellectual development and theorizing about his findings since the early 1920's. He has traveled to many countries sharing his findings and even found time to be active in UNESCO and the educational affairs of Switzerland.

### Piaget Quiz

1. Jean Piaget is regarded as a:

- a. Therapist
- b. Child and adolescent psychologist
- c. School psychologist
- d. Child and educational psychologist

2. Piaget considered himself to be:
- a. A problem solver
  - b. Explorer of environmental confounds
  - c. An investigator of the origin of knowledge
  - d. An observer of child development

SD: Many of his first observations were based on:

- e. Mollusks
- f. Literature reviews
- g. His children
- h. His wife

C: When observing children, Piaget was mostly concerned with?

- i. The development of problem solving
- j. The development of intellect
- k. The development of memory
- l. The development of motor skills

3. To what does Piaget attribute his reputation?
- a. The intellectual growth of children
  - b. The AAM
  - c. Curing his mother
  - d. His observations of children

4. Invariants are:
- a. In dependent of age
  - b. Cognitive processes
  - c. Universal
  - d. All of the above

SD: What is the origin of the acronym AAM?

- e. His roommate came up with it
- f. It's simply more convenient
- g. AAM is a direct translation from Swiss
- h. His chronically ill mother came up with it

C: The AAM proposes that the outcome of intellectual encounters depends on?

- i. Culture and society
- j. The individual and the environment
- k. Cognitive processes
- l. The environment

5. Given accommodation and assimilation, what else does the AAM consist of?

- a. Adaptation
- b. Organization
- c. Intellect
- d. Development

6. Despite being busy with all his publications, Piaget has found time to?

- a. Be involved in the educational affairs of Switzerland
- b. Be involved in the International Congress of Psychology
- c. Be involved in the World Health Organization
- d. Be involved in volunteer work

#### Freud Passage(s)

Form 1: seductive detail in 2<sup>nd</sup> paragraph, control in 3<sup>rd</sup>

Sigmund Freud proposed that each individual passes through five different developmental stages on their path to adulthood. As a child matures, the sex instinct (the libido) shifts from one part of the body to another. Successful completion of a stage results in healthy emotional development. Unsuccessful completion results in abnormal and dysfunctional development.

The first stage is the oral stage; the mouth as a source of pleasure. Throughout infancy, a baby's pleasures and frustrations revolve around the mouth; the mouth is said to be an erogenous zone. **Freud's mother never breastfed him; he became very defensive when a student suggested this habit of smoking was a result of this.** The child must receive oral gratification through their mother to pass through the stage. Adult characteristic traits, such as gullibility, have also been known to stem from unsuccessful completion of this stage.

Next is the anal stage; the libido is focused on the anus. The child must learn to control biological urges in order to comply with societal demands; toilet training is a main conflict. **This is usually the first experience with the regulation of natural impulses and the necessity for postponing immediate gratification.** Successful completion of this stage leads to the phallic stage. Unsuccessful completion of this third stage may result in lack of moral development.

The fourth stage is the latency period; the libido is latent, or quiet. Now, children can focus on schoolwork and developing same-sex friendships. The last stage, the genital stage, begins at adolescence and continues for the remainder of a person's life. As children reach puberty, they must learn to develop healthy romantic relationships.

Form 2: seductive detail in 3<sup>rd</sup> paragraph, control in 2<sup>nd</sup>

Sigmund Freud proposed that each individual passes through five different developmental stages on their path to adulthood. As a child matures, the sex instinct (the libido) shifts from one part of the body to another. Successful completion of a stage results in healthy emotional development. Unsuccessful completion results in abnormal and dysfunctional development.

The first stage is the oral stage; the mouth as a source of pleasure. Throughout infancy, a baby's pleasures and frustrations revolve around the mouth; the mouth is said to be an erogenous zone. **Unsuccessful gratification in this stage results may manifest later in adult life by overeating or talking too much.** The child must receive oral gratification through their mother to pass through the stage. Adult characteristic traits, such as gullibility, have also been known to stem from unsuccessful completion of this stage.

Next is the anal stage; the libido is focused on the anus. The child must learn to control biological urges in order to comply with societal demands; toilet training is a main conflict. **Freud himself suffered from bed wetting until his twelfth birthday and his mother would brutally**

**punish him for it.** Successful completion of this stage leads to the phallic stage. Unsuccessful completion of this third stage may result in lack of moral development.

The fourth stage is the latency period; the libido is latent, or quiet. Now, children can focus on schoolwork and developing same-sex friendships. The last stage, the genital stage, begins at adolescence and continues for the remainder of a person's life. As children reach puberty, they must learn to develop healthy romantic relationships.

Freud Quiz

1. In Freud's theory, what results in healthy emotional development?
  - a. A strong libido
  - b. Successful completion of a developmental stage
  - c. Unsuccessful completion of a developmental stage
  - d. Maturity
2. In the first stage, the mouth is said to be a/an:
  - a. Erogenous zone
  - b. Fixation zone
  - c. Libido zone
  - d. Eros zone

SD: Which is true?

- e. Freud's mother never breastfed him
- f. Freud talked too much
- g. Freud's father beat him
- h. Freud loved his younger sister

C: Insufficient oral gratification may manifest in adult life via:

- i. Hoarding
- j. Emotional dependence
- k. Overeating
- l. Lying

3. If a child receives oral gratification from their mother:
  - a. They develop incestuous feelings
  - b. They digress developmentally
  - c. They develop bad habits later in life

- d. They pass to the next developmental stage
4. What is the main conflict in the anal stage?
- a. Controlling urges
  - b. Toilet training
  - c. Complying with societal demands
  - d. All of the above

SD: Why did Freud's mother punish him?

- e. Because he was a bed wetter until he was 12
- f. Because she had psychological problems
- g. Because he was difficult to toilet train
- h. Because he ate too much as a child

C: During the anal stage, the child first experiences:

- i. Insufficient gratification
  - j. Morality
  - k. Postponing immediate gratification
  - l. Libido
5. The third stage is called:
- a. The phallic stage
  - b. The anal stage
  - c. The latency stage
  - d. The genital stage
6. During which stage can children focus on school work?
- a. The latency period
  - b. The genital stage
  - c. The phallic stage
  - d. Puberty