Quirks: Generation Effect (Self-Generation Effect)

The following text borrows from Wikipedia, which offers a helpful synopsis.

The **generation effect** is a phenomenon where information is better remembered if it is generated from one's own mind rather than simply read. Researchers have struggled to account for why generated information is better recalled than read information, but no single explanation has been sufficient.

Research

Begg, I.; Vinski, E.; Frankovich, L.; Holgate, B. (1991). "**Generating makes words memorable, but so does effective reading**". *Memory & Cognition* **19** (5): 487–497.

Abstract

In many experiments, memorial benefits have been found when subjects generate items from fragments rather than read items in their complete forms. Does generation cause-this-difference, or are subjects disposed to adopt different strategies when generating as opposed to reading? If generating causes the difference, items processed in the same way apart from a generative stage should therefore benefit from that generative stage. Our experiments did result in benefits for generating as opposed to reading, but only when the readers processed the words poorly—by pronouncing them. When the readers processed the items well, by imagining them, generating was no better than reading. A new generation effect was found in meta memory. Subjects thought they would remember more generated items than read items; however, the act of making the prediction entailed meaningful processing, and the generated items were not actually remembered better than the read ones.

Crutcher, R.J.; Healy, A.F. (1989). "**Cognitive operations and the generation effect**". *Journal of Experimental Psychology: Learning, Memory, and Cognition* 15 (4): 669–675.

Abstract

The present experiments were designed to test a cognitive operations hypothesis of the generation effect, or memorial advantage for stimuli that are generated rather than simply read. In two experiments two aspects of generation were manipulated independently: (a) whether the to-be-remembered stimulus was absent (and therefore produced by the subject) or present (and therefore not produced) and (b) whether the relevant cognitive operations were performed by the subject or were instead performed by another agent. Specifically, subjects were given simple multiplication problems with the answers either absent or present in the original problems and with the calculations performed either by themselves or by another agent (either the experimenter or a calculator). The first experiment tested immediate recall of the answers, and the second experiment tested both recall and recognition of the answers after retention intervals up to a week. In all cases, a highly significant retention advantage was found for the tasks requiring multiplication operations by the subjects themselves as opposed to another agent, but there was no main effect for whether the answer was absent or present in the original problem. We discuss the theoretical implications of these results with respect to the generation effect as well as the practical implications with respect to using a calculator in learning the multiplication facts.

DeWinstanley, P.A.; Bjork, E.L.; Bjork, R.A. (1996). "**Generation effects and the lack thereof: The role of transfer-appropriate processing**". *Memory* **4** (1): 31–48.

Abstract

We report two experiments designed to test a multifactor transfer-appropriate processing explanation of generation effects, and the lack thereof, in free recall and cued recall. The basic argument is that the act of generating a target enhances the processing of one or more possible types of information (e.g. target-specific information, cue-target relationships, or target-target relationships) and that subsequent retention tests will reveal an advantage (or disadvantage) of such generation (compared to a “read”; control) to the degree that a test is sensitive to the information on which processing was focused during study. Across the two experiments, manipulations of identical stimulus materials forced subjects to process different types of information in order to generate targets, producing a striking reversal in the relative levels of free recall and cued recall for targets that had been generated vs. read, and lending strong support to the transfer-appropriate processing aspect of the proposed framework for explaining generation effects.

DeWinstanley, P.A.; Bjork, E.L. (2004). "**Processing strategies and the generation effect: Implications for making a better reader**". *Memory & Cognition* 32 (6): 945–955.

Abstract

When presented with items that must be generated versus read at encoding, individuals typically remember better those items that they generated versus those that they only read. We examined whether— given the opportunity to experience such differential memorial consequences of generating versus

reading—participants might change how they processed future to-be-read information. In a first set of two experiments, participants were able to profit from such an experience to the extent that a generation advantage was eliminated on subsequent memory tests of generated and read items. Two additional experiments demonstrated the critical nature of this experience in leading to improved processing of future to-be-read information and elimination of a generation advantage. We believe that these results relate to the characterization of the learner emerging from recent metacognitive research and have possible implications for how learners might be induced to process information more effectively.

Jacoby, L.L. (1978). "**On interpreting the effects of repetition: Solving a problem versus remembering a solution**" (PDF). *Journal of Verbal Learning and Verbal Behavior* **17** (6): 649–668.

Summary

When a problem is repeated, the later presentation of the problem sometimes results in the subject responding by remembering the solution rather than by going through the operations that would otherwise be necessary to solve the problem. The means of obtaining the solution is shown to influence subsequent retention performance; retention of the solution suffers if it has been obtained by remembering rather than by solving the problem. The distinction between solving a problem and remembering a solution is used in an account of the effect of spacing repetitions and other standard memory phenomena. The relevance of the distinction to tasks such as word perception is also discussed.

Jurica, P.J.; Shimamura, A.P. (1999). "**Monitoring item and source information: Evidence for a negative generation effect in source memory**". *Memory & Cognition* **27** (4): 648–656.

Abstract

Item memory and source memory were assessed in a task that simulated a social conversation. Participants generated answers to questions or read statements presented by one of three sources (faces on a computer screen). Positive generation effects were observed for item memory. That is, participants remembered topics of conversation better if they were asked questions about the topics than if they simply read statements about topics. However, a*negative* generation effect occurred for source memory. That is, remembering the source of some information was disrupted if participants were required to answer questions pertaining to that information. These findings support the notion that item and source memory are mediated, as least in part, by different processes during encoding.

Kinjo, H.; Snodgrass, J.G. (2000). "**Does the generation effect occur for pictures?**". *The American Journal of Psychology* (The American Journal of Psychology, Vol. 113, No. 1) **113** (1): 95–121.

Abstract

The generation effect is the finding that self-generated stimuli are recalled and recognized better than read stimuli. The effect has been demonstrated primarily with words. This article examines the effect for pictures in two experiments: Subjects named complete pictures (name condition) and fragmented pictures (generation condition). In Experiment 1, memory was tested in 3 explicit tasks: free recall, yes/no recognition, and a source-monitoring task on whether each picture was complete or fragmented (the complete/incomplete task). The generation effect was found for all 3 tasks. However, in the recognition and source-monitoring tasks, the generation effect was observed only in the generation condition. We hypothesized that absence of the effect in the name condition was due to the sensory or process match effect between study and test pictures and the superior identification of pictures in the name condition. Therefore, stimuli were changed from pictures to their names in Experiment 2. Memory was tested in the recognition task, complete/incomplete task, and second source-monitoring task (success/failure) on whether each picture had been identified successfully. The generation effect was observed for all 3 tasks. These results suggest that memory of structural and semantic characteristics and of success in identification of generated pictures may contribute to the generation effect.

Lutz, John; Briggs, A.; Cain, K. (2003). "**An examination of the value of the generation effect for learning new material**". *The Journal of General Psychology* **130** (2): 171–188.

Abstract

The generation effect involves an improvement in memory when learners must complete or modify materials. Several researchers have suggested that this effect involves enhanced access to learners' existing memory representations; therefore, the effect should be less effective with meaningless, low meaningful, or unfamiliar material. In the present study, the authors conducted 4 experiments in which legal nonwords were used, and they found no generation effect. In another 2 experiments in which familiar clichés were contrasted with new sentences and with unfamiliar sentences from textbooks, the results showed a greatly reduced generation effect for the new, unfamiliar material. Those findings suggest that memory strategies that depend on the generation effect will have limited effectiveness when they are applied to new or unfamiliar material.

McDaniel, M.A.; Waddill, P.J.; Einstein, G.O. (1988). "**A contextual account of the generation effect: A three-factor theory**". *Journal of Memory and Language* **27** (5): 521–536.

Abstract

Recent studies have shown that the generation effect (items generated by an individual are better remembered than items that are read) can be diminished or eliminated under between-subjects deployment of the encoding task (generating vs. reading). Three experiments that further delineate the nature of the generation effect in between-subjects designs are reported. Experiments 1 and 2, using a structured word list, found significant generation effects in free recall under certain cue-target conditions and written-response conditions. Generation effects in recognition and cued recall occurred in all conditions. In Experiment 3, with intentional learning instructions, significant generation effects were not obtained. Current accounts of recent failures to find significant generation effects are discussed in light of our results, and all are found lacking to some degree. We propose an extension to the idea that generation enhances both cue-target relational processing and individual-item processing; namely, in some contexts generation will enhance whole-list processing.

McNamara, D.S.; Healy, A.F. (2000). "**A procedural explanation of the generation effect for simple and difficult multiplication problems and answers**". *Journal of Memory and Language* **43** (4): 652–679.

Abstract

Three experiments investigated the generation effect for the free recall of multiplication problems and answers. In Experiment 1, a greater generation effect for answer recall was found for participants presented with simple as compared to those presented with difficult multiplication problems. This finding is inconsistent with an explanation of the generation effect in terms of effort. Experiment 2 replicated Experiment 1 and further demonstrated that participants show an equivalent generation effect for problem operands (i.e., the cues) regardless of problem difficulty. Generation accuracy also influenced the magnitude of the generation effect in the difficult problem condition. Experiment 3 replicated the results of Experiment 1, holding constant problem answers across simple and difficult problems. These experiments collectively demonstrated a generation effect for the answers to arithmetic problems only when participants reinstated at test the cognitive procedures used at study, thus providing further evidence for the procedural account of the generation effect.

McNamara, Danielle. "**The Generation Effect: A Detailed Analysis of the Role of Semantic Processing**" (PDF). Institute of Cognitive Science, University of Colorado.

Mulligan, N.W. (2001). "**Generation and hypermnesia**". *Journal of Experimental Psychology: Learning, Memory, and Cognition* 27 (2): 436–450.

Abstract

The multi-factor account of the generation effect makes detailed predictions about the effects of generation on item-specific and relational encoding, predictions confirmed in 4 experiments using a multiple-test methodology. In pure-list designs with unrelated study items, generation produced more interest item gains (indexing greater item-specific processing) and more interest item losses (indexing less relational processing) relative to the read condition. In a mixed-list design, generation produced more gains but did not affect losses. With categorically-related study items, generation produced more gains but fewer losses (indicating enhanced relational encoding). Generation consistently produced hypermnesia whereas reading did so only for related study items. Also, a significant generation effect emerged on later tests under conditions (between-subjects design, unrelated study items) which typically yield no generation effect.

Mulligan, Neil W. (2004). "**Generation and memory for contextual detail**". *Journal of Experimental Psychology: Learning, Memory, and Cognition* **30** (4): 838–855.

Abstract

Generation enhances item memory but may not enhance other aspects of memory. In 12 experiments, the author investigated the effect of generation on context memory, motivated in part by the hypothesis that generation produces a trade-off in encoding item and contextual information. Participants generated some study words (e.g., hot-___) and read others (e.g., hot-cold). Generation consistently enhanced item memory but did not enhance context memory. More specifically, generation disrupted context memory for the color of the target word but did not affect context memory for location, background color, and cue-word color. The specificity of the negative generation effect in context memory argues against a general item-context trade-off. A processing account of generation meets greater success. In addition, the results provide no evidence that generation enhances recollection of contextual details.

Multhaup, Kristi; Balota, David (1997). "**Generation Effects and Source Memory in Healthy Older Adults and in Adults With Dementia of the Alzheimer Type**" (PDF). *American Psychological Association* **11** (3). Retrieved 10 October 2012.

Abstract

Recognition and source memory were explored in healthy older adults, adults diagnosed with very mild dementia of the Alzheimer type (DAT), and adults diagnosed with mild DAT. Two sentence-completion tasks were used. In

Task 1, half of the sentences were completed (clozed) by the participant, and half by the experimenter. In Task 2, half were participant clozed, and half were participant read (already clozed). Recognition of the cloze words and accuracy of categorizing them as participant generated or experimenter generated (Task 1) and participant generated or participant read (Task 2) were measured (source discriminalion). Contrary to previous reports, the DAT groups showed the generation effect, that is, better recognition for participant-generated words than experimenter-generated words (Task 1) or read words (Task 2). Source discrimination was disproportionately impaired in the DAT groups.

Payne, David; James Neely; Daniel Burns (6 January 1986). "**The Generation Effect: Further Tests of the Lexical Activation Hypothesis**". *Memory & Cognition* **14**: 246–252.

Abstract

Three experiments compared recognition memory for word versus nonword responses when they had been either read or generated using a rhyme rule and either a word or nonword stimulus. That is, either the word*shop* or the nonword*thop* was generated from either the word*chop* or the nonword*phop*. In Experiment 1, the lexicality of the stimulus and response terms was manipulated orthogonally between subjects; in Experiments 2 and 3, it was manipulated orthogonally within subjects. In Experiment 3, subjects also made a lexical (word-nonword) decision about each response term after it had been read or generated. In all three experiments, memory performance was better for generated than read responses. This generation effect occurred only if the response term was a word, regardless of whether the stimulus term was a word or a nonword. These results are discussed in terms of the roles that lexical memory and response unitization play in the generation effect.