

that are used in encoding, the more likely one or another of them will be available to facilitate retrieval. In addition, assuming the validity of the dual-code theory, the more often encoding cues are generated in both the verbal and imaginal systems, the more likely retrieval will be facilitated.

A common strategy for enhancing retrieval is note-taking (Gagné & Driscoll, 1988). This is sometimes known as an external retrieval strategy (Kiewra, 1985; Kiewra & Frank, 1988; Kiewra et al., 1991) because its product—notes—serves as memory storage external to the learner. Students who elaborate on their notes also tend to perform better than those who simply reread them (Peper & Mayer, 1978), in essence optimizing the effects of encoding together with external retrieval.

Finally, long before the development of information-processing theory, interference was proposed as a cause of forgetting, which meant that *other events or information got in the way of effective retrieval*. McGeoch (1932) described forgetting of verbal materials in terms of two major laws. According to the first, forgetting was considered to be a function of the similarity between the circumstances of learning and testing, much as encoding specificity accounts for retrieval and forgetting now. The second set forth the conditions of interference, i.e., that numerous events and competing information can interfere with the retrieval of target information. Moreover, interference can occur from information learned either before or after the to-be-remembered information is learned. For example, retroactive interference has occurred when you read this chapter, read the next chapter, and then have difficulty recalling information from this chapter. Later learning interferes with the recall of earlier learned material, particularly as practice on the later material increases. This makes sense when we consider that information learned later is more recent and thus probably yields stronger memory traces than information learned earlier.

It is also possible, however, for previous learning to interfere with later learning. This is known as proactive interference, and the degree of interference is related to the amount of practice on the original task. Take, for example, the case of a long-time tennis player trying to learn racquetball. Since both are racket sports, it seems reasonable to believe that knowing one would facilitate learning the other. Instead, the well-learned skill of swinging a tennis racket interferes with the recently learned response of swinging a racquetball racket. Many players will find themselves swinging with the entire arm, as in tennis, rather than with just the wrist.

Proactive interference of a kind has also been demonstrated in the learning and memory of verbal materials by aging adults. Rice and Meyer (1985) investigated so-called memory deficits among older adults. Results of some studies had indicated that older adults remember less from a prose passage than do younger adults. In the series of experiments Rice and Meyer conducted, however, they found no evidence to support a memory deficit. Instead, they found that older adults, because they had so much more