

CONCEPT 7.5

The timing of augmented feedback relates to concurrent or terminal presentation and to the intervals of time preceding and following terminal presentation

Key Terms

concurrent augmented feedback	biofeedback KR-Delay Interval	subjective error estimate
terminal augmented feedback		Post-KR Interval

Applications

Two important issues related to the timing of augmented feedback are whether it should be presented concurrently or terminally, and how time and activity during intervals preceding and following the presentation of augmented feedback affect it.

When you are learning to play golf you could receive augmented feedback at several different times. Feedback could be given while you swing, which is known as concurrent feedback, or it could be given after you have hit the ball, which is known as terminal feedback. If you receive feedback after you hit the ball, three time intervals become important to you. First, there is the time interval from

when you have finished hitting the ball until your instructor tells you what you did wrong or right. The second is the time that elapses from the instructor's giving you that information until you are allowed or able to hit another ball. Finally, there is the entire time period from hitting one practice ball and hitting another ball. These three periods of time are important to you because it is during these intervals that you have the opportunity to use the information you have received both from your own feedback systems and from augmented feedback.

Some very important practical questions must be considered in relation to these timing issues of providing augmented feedback. For example, does it matter if the feedback is given during or after a movement is completed? Does it matter how long a person must wait to get augmented feedback after completing a movement? How important is the amount of time between completing the movement and when the next movement is made? What will be the effect of doing something else during one of those intervals? These questions will provide the basis for the discussion in the following section.

Discussion

Two key issues relate to the timing aspects of augmented feedback. The first is whether it is better to give augmented feedback while the person is practicing, which is known as **concurrent augmented feedback**, or to give it at the end of a practice attempt, which is known as **terminal augmented feedback**. The other issue relates to terminally given augmented feedback. There are

two intervals of time created between the end of one practice attempt and the beginning of the next when augmented feedback is given after a practice attempt. These two intervals are illustrated in Figure 7.5-1. The interval of time between the end of a practice attempt and the giving of augmented feedback is typically referred to as the **KR-Delay Interval**. The interval that follows the augmented feedback and the beginning of the next practice

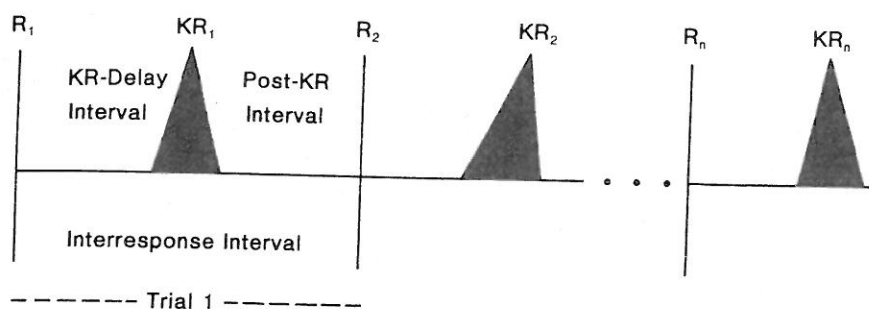


FIGURE 7.5-1
Intervals of time related
to KR during the
acquisition of a skill.

trial is the Post-KR Interval. Note that the terminology used to describe these two intervals is based on the traditional labels used to identify them. The use of the term KR shows that historically, the research investigating these intervals has focused on the use of KR as augmented feedback. However, these intervals are also relevant to the other forms of augmented feedback as well.

Concurrent Augmented Feedback

When augmented feedback is given concurrently with performing a skill, it is usually in the form of augmented sensory feedback. Two types are most common. One involves enhancing the feedback available in the environment and is called augmented environmental feedback. Examples of this type include having a buzzer sound when a target is hit or having a light go on when a response is off-target. The other type, popularly known as **biofeedback**, involves providing information about physiological processes through the use of instrumentation. Thus, sensory feedback can be augmented by providing an external source of information. Two examples of biofeedback that relate to motor skill learning are having a buzzer sound along with an electromyographic (EMG) signal from a muscle group, and augmenting the heartbeat so the person can hear each beat.

Augmented environmental feedback. There is evidence of two types of effects when augmented environmental feedback is provided after a skill is performed. One is that initial performance is very good, but then performance asymptotes and can

actually decline on transfer trials where the augmented feedback is removed (e.g., Annett, 1959, 1970; Fox & Levy, 1969; Patrick & Mutlusoy, 1982). In these situations, it appears that learners direct their attention away from the critical sensory feedback related to the movement being made and direct it toward the augmented feedback so that it becomes a crutch and therefore necessary for future performance (e.g., Karlin & Mortimer, 1963; Lintern & Roscoe, 1980).

The other effect is that the concurrent use of augmented environmental feedback can be an effective training device. Examples of this effect have been reported by Lintern and his colleagues in work related to the training of flight skills for airplane pilots (e.g., Lintern, 1980; Lintern, Roscoe, Koonce, & Segal, 1990; Lintern, Roscoe, & Sivier, 1990). In those experiments, augmented environmental feedback was provided by instrumentation on the control panel of the aircraft. Specific benefits of visual augmentation of feedback have been reported for training pilots in landing and bombing skills. It is worth noting that in these studies, Lintern and his colleagues also found situations where augmenting feedback is of no benefit and can actually hinder performance. They argue (Lintern, Roscoe, & Sivier, 1990) that learning with augmented feedback will benefit to the extent that the feedback sensitizes the learner to properties or relationships in the task that specify how the system being learned can be controlled.

Another perspective on the type of effect to expect from using concurrent augmented environmental feedback has been provided by Annett

(1959, 1969, 1970). He hypothesized that there is probably a maximum amount of value in augmented feedback, which can be related to the informativeness of feedback intrinsic to the task itself. If the task intrinsic feedback is high, such that the skill could actually be learned without augmented feedback, then to augment this feedback and provide it concurrently while performing can lead to improved learning, and does not establish dependence on the augmented feedback. On the other hand, when the task intrinsic feedback is low, providing augmented sensory feedback concurrently appears to develop a dependency on the augmented feedback. In this latter case, there appears to be a tendency for people to become dependent on the augmented feedback and not try to discover the critical feedback that their own sensory system is receiving while performing the task.

Biofeedback. The most commonly used form of biofeedback in motor skill learning research has been EMG biofeedback. Most of what we know about the effect of EMG biofeedback on skill learning comes from research done in rehabilitation settings. The typical results of this work show beneficial effects (see Inglis, Campbell, & Donald, 1976; Leiper, Miller, Lang, & Herman, 1981; Sandweiss & Wolf, 1985; Wolf, 1983, for examples and reviews of research on biofeedback related to motor skill rehabilitation).

This research can be illustrated by an example of a study reported by Mulder and Hulstijn (1985). In this experiment, subjects practiced a movement that required the abduction of the big toe while keeping the other toes of the foot from moving. While this may seem to be a strange task, the researchers argued that the task required subjects to control a specific muscle group to enable the action to occur, which was common to many motor skills people must learn. Five different feedback conditions were compared. One condition allowed normal proprioceptive feedback, but subjects could not see their foot and received no verbal feedback about their performance. Another condition involved proprioceptive and visual

feedback where subjects could see their foot but received no verbal feedback. The third condition provided subjects with proprioceptive, visual, and tactile feedback where they could see their foot and also received tactile feedback from a force meter, but received no verbal feedback. Two additional groups received augmented sensory feedback in the form of biofeedback. These groups saw either an EMG signal or a force meter display in addition to normal proprioceptive and visual feedback. Results showed that the two augmented biofeedback groups performed better than the nonaugmented groups on each of the two days of training. However, it is important to note that, as in many other biofeedback studies, tests of learning were not provided. As a result, we can only speculate about the effects on learning, that is, whether the observed effects were temporary performance or long-lasting learning effects.

Another form of biofeedback that has been used in motor learning research can be seen in an experiment reported by Daniels and Landers (1981) involving rifle shooting training. They presented augmented heartbeat information auditorially to subjects during their shooting performance. The goal of using this feedback was to assist subjects in learning to squeeze the rifle trigger between heartbeats, which had been established as a characteristic of elite shooters. Results indicated that the use of biofeedback facilitated acquisition of this important shooting skill and led to improved shooting scores.

Concurrent vs. terminal augmented feedback.

Because both concurrent and terminal augmented feedback have been considered in this discussion, it will be helpful to consider how these two presentation timing characteristics for augmented feedback compare. The most useful basis for comparison comes from research in which both types of augmented feedback have been considered in the same experimental setting. Research in which this comparison has been made has typically considered augmented environmental feedback where a mechanical device was used to signify some performance characteristic, such as being on- or off-

target. Some examples of these types of experiments were discussed earlier in this discussion. The experiments described earlier that were reported by Goldstein and Rittenhouse (1954) and by Annett (1959) provided evidence that terminal feedback for two different types of tasks led to better learning than did concurrent feedback. This result is typical of the research comparing concurrently and terminally presented augmented feedback.

The KR-Delay Interval

The interval of time between the completion of a movement and the presentation of augmented feedback traditionally has been termed the **KR-Delay Interval**, although it also has been called the information feedback (IF) delay interval. This time interval has led to much confusion in its relationship to learning. For example, Ammons (1958) proposed that lengthening the KR-Delay Interval would lead to poorer learning because the information value of the KR would diminish over time. On the other hand, Adams (1971) concluded that the delay of KR has little or no effect on skill learning. Since the time of these two conclusions, researchers have provided a clearer picture of the actual influence of various manipulations that can be associated with this interval.

To appropriately discuss this interval, it will be best to consider two variables that are commonly manipulated in investigations of the role of the KR-Delay Interval on skill learning. These two variables are time, or variations in the length of the interval, and activity, which involves investigating cognitive and motor activity during the interval.

The length of the KR-Delay Interval. One outcome of early research involving the KR-Delay Interval was that distinct contrasts were evident between human and animal learning (see Adams, 1987). Human research established that KR was more than a reward, because KR had informational value that humans used to solve problems,

such as to learn a skill. And it became evident that the effect of delaying KR in human skill learning led to different results than occurred when rewards were delayed in animal learning. Whereas animal learning studies showed that delaying reward led to decreased learning (e.g. Roberts, 1930), human skill learning studies showed that delaying KR did not influence learning. Perhaps the most striking example of this latter finding is a study by Bilodeau and Bilodeau (1958b). They reported five experiments in which they used tasks such as lever positioning and micrometer dial turning. The KR-Delay Interval varied from a few seconds to seven days. The consistent results in all of these experiments was that KR delays, even up to one week, did not affect the learning of those skills.

While delaying the presentation of KR does not appear to affect skill learning, there does seem to be a minimum amount of time that must pass before KR is given. A recent study by Swinnen, Schmidt, Nicholson, and Shapiro (1990), showed evidence that giving KR too soon after a movement was completed had a negative effect on learning. Two experiments involved learning a task in which subjects moved a lever through a two-reversal movement to achieve a specific movement time goal (Experiment 1), and learning a coincident timing task where subjects had to move a lever, coincident in time with the appearance of a target light, that passed by the light with the appropriate rate of speed (Experiment 2). In each experiment, KR was given "instantaneously," which meant the subjects saw their score immediately upon the completion of the required movement, or KR was delayed for 8 sec after completing the movement in Experiment 1 or for 3.2 sec in Experiment 2. The results of these two experiments can be seen in Figure 7.5-2. In both experiments, the two KR-delay conditions were not different from each other at the end of the practice trials but were significantly different on retention tests given 10 min later and 2 days later (Experiment 1) and 10 min, 2 days, and 4 months later (Experiment 2).

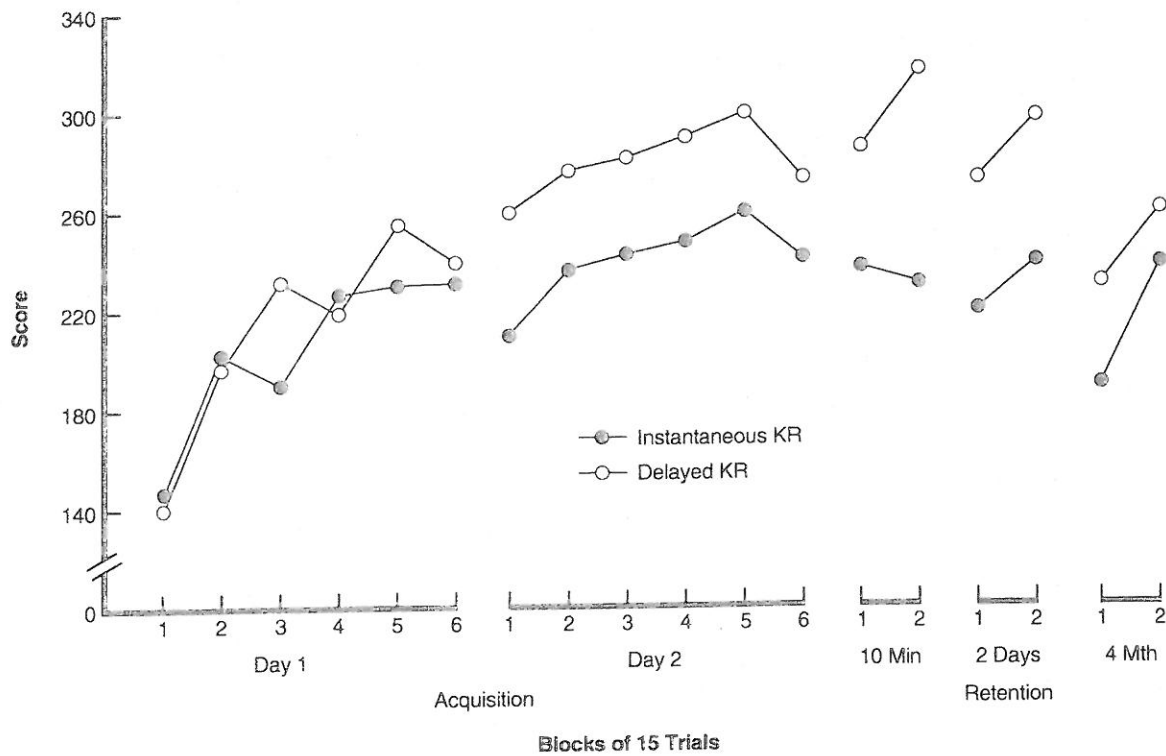


FIGURE 7.5-2 Results of an experiment by Swinnen, et al., showing the effect of instantaneous KR compared to delayed KR for learning an anticipation timing task that required accurate timing and force production.

The authors proposed that the degrading of learning that resulted from providing KR too soon after the completion of a movement was due to the need for learners to engage in the subjective analysis of response-produced feedback, which is essential for developing appropriate error detection capabilities. This poorly developed capability was not evident until retention tests were given in which subjects had to respond without KR and therefore had to rely on their own error detection capabilities to respond. Delaying KR by only a few seconds appeared to be sufficient to enable subjects to develop this capability, whereas providing KR immediately after completing a movement hindered the development of this capability.

Activity during the KR-Delay Interval. The evidence that has accumulated from the research of the effects of activity during the KR-Delay Interval has provided a variety of results. In some cases, activity has no effect on skill learning, while in other cases, activity has been shown to both hinder and benefit learning. Rather than establish a confusing state of affairs, these different results have provided insight into the learning processes in which a learner engages during the KR-Delay Interval, and they have provided distinct implications for developing effective instructional strategies.

The most common effect of activity during the KR-Delay Interval on skill learning is that it has

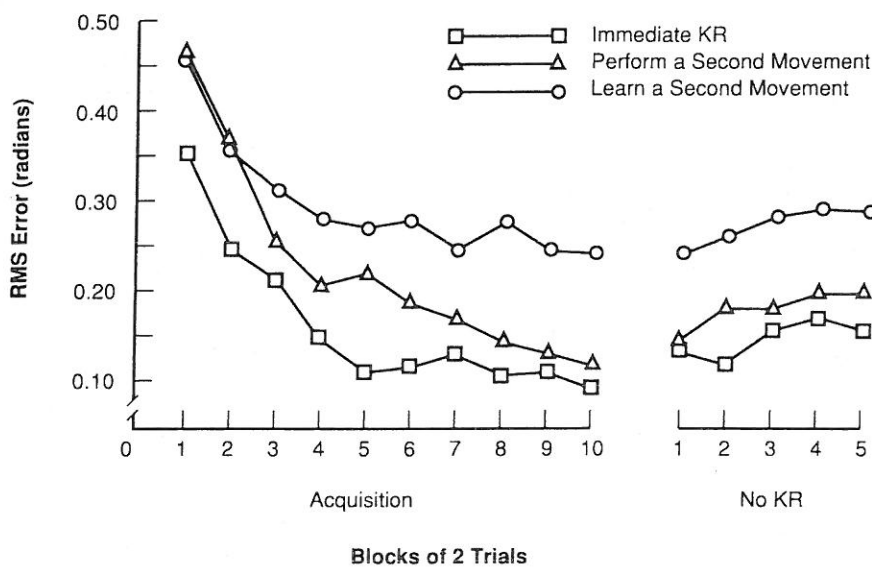


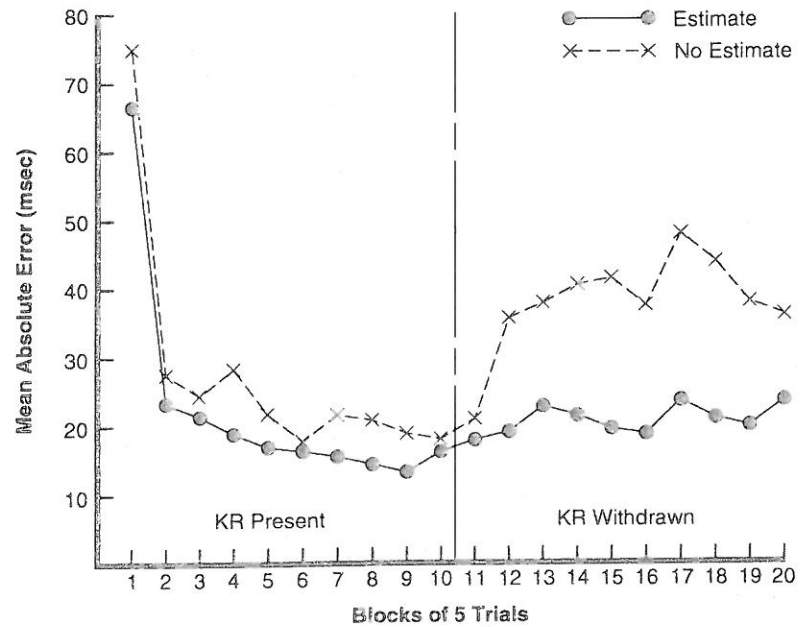
FIGURE 7.5-3
Results from the experiment by Marteniuk showing the interference effects of learning another complex movement during the KR-delay Interval.

no influence on learning. Experiments investigating the activity effect have demonstrated this result for over twenty years (e.g., Bilodeau, 1969; Boulter, 1964; Marteniuk, 1986). The experiment by Marteniuk will serve as an appropriate example of the research yielding this conclusion. Subjects practiced a complex lever movement that required them to move a lever to produce a specific sine-wave-like pattern that had both spatial and temporal goals. A control group received KR within a few seconds after completing the movement and engaged in no activity during the KR-Delay Interval. Another group had a 40-sec KR-Delay Interval, but did not engage in any activity during the interval. The third group also had a 40-sec KR-Delay Interval, but engaged in a lever movement task in which the subjects attempted to reproduce a movement pattern that the experimenter had just performed. The results of this experiment indicated that during acquisition trials and on a no-KR retention test given 10-min later, there were no differences among the groups.

Another effect of activity during the KR-Delay Interval is that it *hinders learning*. An example of

an experiment demonstrating this effect is one that was a part of the study by Marteniuk (1986) referred to in the preceding paragraph. Marteniuk reasoned that the activity of reproducing a movement pattern during the KR-Delay Interval did not interfere with learning because the activity did not demand the same type of learning processes as did learning the lever movement task. He hypothesized that if the KR-Delay Interval activity were to interfere with learning, it would have to interfere with the same learning processes as those required by the primary task being learned. Therefore, in two follow-up experiments Marteniuk added a condition in which subjects had to learn another skill during the KR-Delay Interval. In one experiment, the skill was another lever movement skill, while in the other experiment, the skill was a cognitive skill that was a number-guessing task. Results of the experiment in which subjects either learned another movement or simply repeated a movement made by the experimenter are presented in Figure 7.5-3. The results of this experiment resemble those of the one in which the number learning task was involved. In

FIGURE 7.5-4 Results of the experiment by Hogan and Yanowitz showing the effects of having subjects guess (Estimate) or not guess (No Estimate) their error after each response and before receiving KR for trials when KR was present or withdrawn.



both experiments the results indicated that learning another skill during the KR-Delay Interval interfered with learning the primary skill. This interference effect has also been reported by Shea and Upton (1976), in which subjects engaged in short-term memory tasks during the KR-Delay Interval, and by Swinnen (1990) in two experiments in which subjects were required to estimate the movement time error of the experimenter's lever movement performed during the KR-Delay Interval.

Finally, results of some experiments indicate that certain activities during the KR-Delay Interval can actually *benefit learning*. The first evidence of this beneficial activity effect was reported by Hogan and Yanowitz (1978). Subjects practiced a task where the goal was to move a handle along a trackway a specified distance of 47 cm in 200 msec. One group did not engage in any activity before receiving KR while a second group was required to give a *subjective error estimation*, which is a verbal estimate of their own error for each trial before receiving KR for that trial. The results of this experiment can be seen in Figure

7.5-4. Although there were no differences between groups at the end of the 50 trials of practice, the group that had engaged in the error estimation activity during the KR-Delay Interval performed significantly better on retention trials where no KR was provided. These same error estimation benefits have been reported in two experiments by Swinnen (1990).

What do these different effects of activity in the KR-Delay Interval reveal about learning processes that occur during this interval of time? Swinnen (1990; Swinnen et al., 1990) has argued that the learner is actively engaged in processing movement information and in detection of errors during the KR-Delay Interval. He bases this argument on the experiment mentioned earlier that replicated the one by Hogan and Yanowitz (1978). However, Swinnen extended their experiment by adding a group of subjects that had to guess the experimenter's error during the KR-Delay Interval. In this situation, the experimenter made a movement after the subject finished his or her movement. Before receiving KR about his or her own movement, the subject had to estimate the

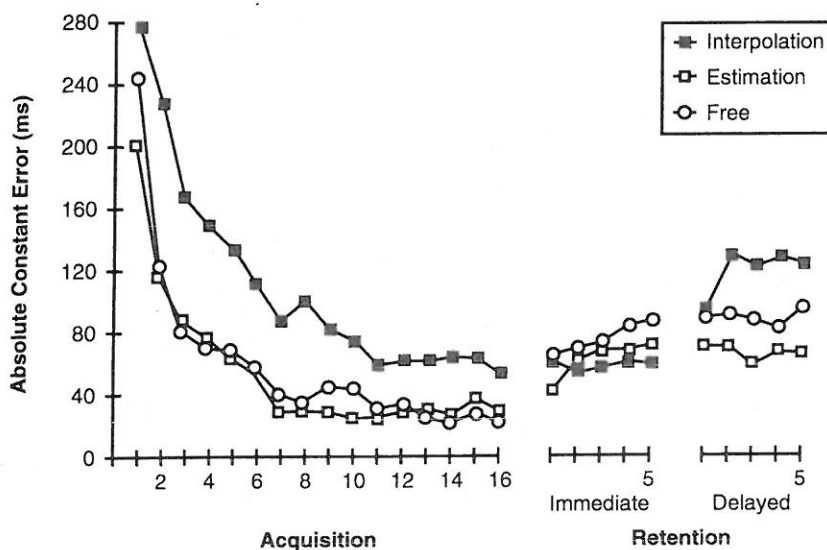


FIGURE 7.5-5 Results from the experiment by Swinnen showing the influence of estimating the experimenter's movement error (interpolation group) and of estimating the subject's own error (estimation group) during the KR-delay Interval compared with no activity during the interval (free group).

experimenter's error. As you can see in the results of this experiment shown in Figure 7.5-5, this estimation did not lead to learning the skill as well as when the subjects estimated their own error. However, it was better than not estimating error at all during the KR-Delay Interval.

Thus, there is evidence that during the KR-Delay Interval, learners are involved in self-generated error estimation activities that may benefit future performance. If the evidence described earlier is viewed from this perspective, the three different effects of activity during the KR-Delay Interval would be expected. When learners are encouraged to engage in this type of error-detection activity, as occurred in the experiments by Hogan and Yanowitz (1976) and Swinnen (1990), the learner's error detection capability is enhanced, which benefits learning. However, if learners are engaged in activity that does not permit such self-generation of error estimation, as would appear to have occurred in the experiments by Marteniuk (1986), Shea and Upton (1978), and Swinnen, et al. (1990) where attention-demanding activity was required during the KR-Delay Interval, then learning is hindered. Finally, if the activity engaged in during the KR-Delay

Interval is not attention demanding to the degree that the learner can still engage in appropriate error-estimation processing, then learning will not be influenced by the KR-Delay Interval activity, which was demonstrated in the experiments by Marteniuk (1986) and others.

For instructional purposes the most significant implication of these results is that students can be engaged in activity that will benefit them after they complete a movement and before they receive augmented feedback from a teacher or coach. This activity should require them to actively attempt to determine what they did wrong on that particular trial. They should try to answer the question, "What do you think you did wrong?" before they are told what they did wrong. Based on the research evidence, this type of activity will have a positive influence on skill learning because it forces the learner to subjectively evaluate his or her own sensory feedback in relation to the response that was just made.

The Post-KR Interval

The interval of time between the presentation of augmented feedback and the beginning of the next trial, or practice attempt, is commonly called the

Post-KR Interval. This interval of time became the focus of research interest after research and comments by the Bilodeaus (e.g., Bilodeau & Bilodeau, 1958b; Bilodeau, 1969) and Adams (1971) that this interval may be the most important interval of time during skill acquisition. The basis for this view is that the Post-KR Interval represents the period of time during which the learner has both his or her own sensory feedback and the externally provided augmented feedback. He or she must use this information to develop a plan of action for the next trial. Accordingly, the amount of time available for the processing and the activity that may occur concurrently with this processing became the variables of interest for research about the Post-KR Interval.

The length of the Post-KR Interval. The expectations of how the length of the Post-KR Interval would influence skill learning are similar to those discussed earlier for the KR-Delay Interval. That is, there would appear to be an optimal range of time during which the next trial should occur after KR is given. If the next trial occurs too soon after KR, the important processing activities would not have sufficient time to be carried out. Or, if the next trial is delayed for too long after KR is given, some forgetting will occur and the next response will not be as good as it would have been otherwise. This reasoning seems logical, and indeed has been stated before by others (e.g., Adams, 1971).

What is interesting is that the only empirical support for these expectations relates to the "too early" end of the time continuum just described. This evidence was reported by Weinberg, Guy, and Tupper (1964) who demonstrated that for learning a limb positioning movement, a 1-sec Post-KR Interval led to poorer acquisition than did a 5-, 10-, or 20-sec interval. None of these latter three interval lengths revealed any differences. A similar finding that indicated the need for a minimum Post-KR Interval length was reported by Rogers (1974). It is interesting to note that Gallagher and Thomas (1980) reported similar results for children.

Thus, similar to the KR-Delay Interval, there appears to be a minimum amount of time needed to engage in the learning processes required during the KR-Delay Interval if optimal learning is to be achieved. What is not known, and will await further research, is how this minimum amount of time changes as a function of the skill being learned or as a function of the stage of learning of the learner.

With respect to the other end of the optimum range of time for the next trial to begin following KR being given, there is no evidence indicating that too long a delay will hinder learning. An example of the type of research addressing this question was reported by Magill (1977) who compared Post-KR Interval lengths of 10- and 60-sec for subjects learning three limb positions on a curvilinear positioning device. Results showed no differences between the two interval lengths.

Activity during the Post-KR Interval. The effect of engaging in activity in the Post-KR Interval is similar to what was seen for the KR-Delay Interval. Depending on the kind of activity, activity can interfere with learning, benefit learning, or have no influence on learning. An interesting feature of these effects is that they are not in line with traditional predictions of the effect of activity during the Post-KR Interval. Earlier views of KR (e.g., Adams, 1971; Bilodeau, 1969; Newell, 1976) typically expected that because so many important information processing activities occurred during this interval, engaging in other activity during this time would interfere with learning. But more recent evidence has shown that this is only one of three effects that can occur.

That activity during the Post-KR Interval has *no effect on skill learning* has clearly been the most common finding. An example of this result is seen in an experiment reported by Lee and Magill (1983). Subjects practiced making an arm movement through a series of three small wooden barriers in 1050 msec. During the Post-KR Interval, one group engaged in a motor activity of learning the same movement in 1350 msec, one group engaged in a cognitive activity involving number guessing, and a third group did not do any

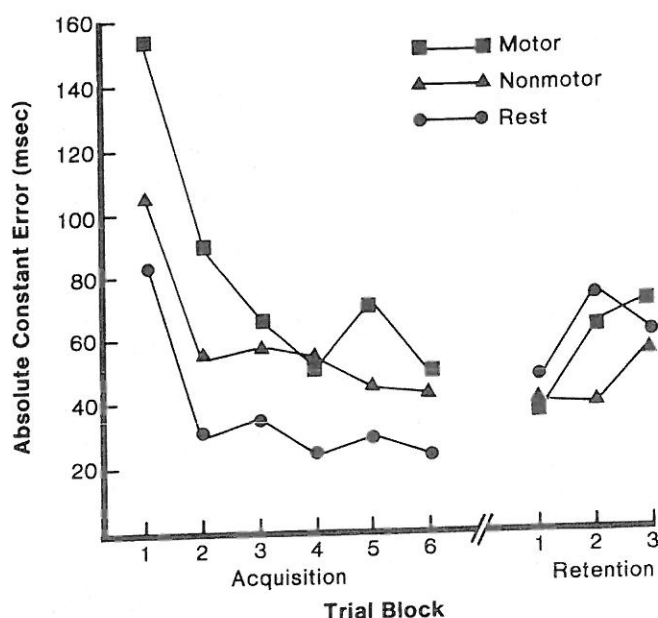


FIGURE 7.5-6 Results of the experiment by Lee and Magill showing acquisition and retention performance for absolute constant error (ICE) as a function of activity during the post-KR interval. Retention performance is without KR.

activity. As can be seen from the results presented in Figure 7.5-6, at the end of the practice trials the two activity groups showed poorer performance than the non-activity group. However, on a no-KR retention test, the three groups did not differ from each other.

Results indicating that activity during the Post-KR Interval *hinders learning* have been reported by several researchers (e.g., Benedetti & McCullagh, 1987; Boucher 1974; Hardy, 1983; Swinnen, 1990, Expt. 3). Of these experiments, only those by Benedetti and McCullagh (1987) and Swinnen (1990) included an appropriate test for learning. In both of these experiments, the interfering activity was a cognitive activity. Subjects in the experiment by Benedetti and McCullagh engaged in a mathematics problem-solving task, whereas subjects in the experiment by Swinnen were involved in guessing the movement time error of the experimenter's lever movement made during the Post-KR Interval.

Only one experiment has reported *beneficial learning effects* for activity in the Post-KR Interval. An experiment reported by Magill (1988) involved subjects learning to perform a two-

component movement in which each component had its own criterion movement time. One group was required to learn two additional two-component movements during the Post-KR Interval and one group was required to learn a mirror-tracing task. A third group did not engage in activity during the Post-KR Interval. Results showed different effects for retention and transfer. When subjects were asked to perform the skill on a no-KR retention test given one day after practice, there were no group differences. However, on a transfer test where subjects had to perform a new two-component task similar to the one they had learned, the two Post-KR Interval activity groups performed better than the no-activity group. These beneficial transfer effects were proposed to be due to the increased problem solving activity experience during practice by the Post-KR Interval activity groups. The activity enabled them to more successfully transfer to a situation that required new problem-solving activity of a kind similar to that experienced in practice.

In terms of instructional implications, the evidence related to the Post-KR Interval suggests that

it does not need to be given much direct consideration in teaching settings. Although there appears to be a minimum Post-KR Interval length, the minimum does not seem problematic when applied to the typical teaching situation. And although some activities have been found to be both detrimental and beneficial to skill learning, more evidence is needed to address the effects before instruction applications can be made with confidence.

Summary

One of the benefits of investigating issues related to the timing of providing augmented feedback is that it provides a means of addressing questions about learning processes involved between trials during practice. It seems clear from the evidence discussed in this section that attention to processing of sensory feedback critical to performing the skill is important for effective skill learning. Evidence for this was provided in studies showing the problems that can result from providing augmented feedback concurrently with performing the skill. The typical finding seems to be that this form of presentation of augmented feedback establishes a dependence on the availability of it by

shifting the learners' attention away from sensory feedback related to task performance to the augmented feedback itself. Also, processing of the sensory feedback seems critical because both the KR-Delay and Post-KR Intervals can be too short to allow optimal learning. Further support of this need for processing sensory feedback was seen in experiments where subjects who estimated their own error prior to receiving KR learned the skill better than those who did not.

Related Readings

- Adams, J. A. (1971). A closed-loop theory of motor learning. *Journal of Motor Behavior*, 3, 111-149. (Read pp. 132-136.)
- Bilodeau, E. A., & Bilodeau, I. M. (1958). Variation of temporal intervals among critical events in five studies of knowledge of results. *Journal of Experimental Psychology*, 55, 603-612.
- Lee, T. D., & Magill, R. A. (1983). Activity during the post-KR interval: Effects upon performance or learning? *Research Quarterly for Exercise and Sport*, 54, 340-345.
- Salmoni, A. W., Schmidt, R. A., & Walter, C. B. (1984). Knowledge of results and motor learning: A review and critical reappraisal. *Psychological Bulletin*, 95, 355-386. (Read section on the Temporal Locus of KR, pp. 364-372.)

STUDY QUESTIONS FOR CHAPTER 7

1. What is meant by the term "modeling" as it relates to motor skill instruction? What are three important issues that must be considered when determining how to provide an effective model?
2. What are two proposed reasons why modeling benefits motor learning?
3. How can you decide whether a skill would be learned best if it were practiced as a whole or in parts? Give a motor skill example to show how these rules can be applied to a teaching situation.
4. What are three different methods of practicing skills following a part method of instruction and practice? Give a motor skill example of each.
5. What are the two types of information referred to by the terms KR and KP? Give two examples of each.
6. Describe skill learning conditions where augmented feedback would be necessary for learning, not be necessary for learning, facilitate learning, and be a hindrance to learning.

