Tutorial: Learning Trials

[See also Tutorials in Instructional Routines; Instructional Pacing; Errorless Learning]

WHAT IS A LEARNING TRIAL?

A learning trial is any event designed to facilitate the learning of a skill, procedure, piece of information, or other content. Learning trials can vary from repeated practice of specific facts with the goal of internalizing those basic facts to a discussion of a novel to a scientific experiment. In each case, the goal is student learning as an outcome of the activity.

WHY ARE LEARNING TRIALS IMPORTANT FOR MANY STUDENTS AFTER TBI?

Many students with TBI have attentional, organizational, memory, learning, and other cognitive problems – and possibly also emotional and motivational problems – that together necessitate thoughtful planning and modification of learning trials. Among other things, students with TBI typically need considerable repetition – very large numbers of learning trials – in order to learn and internalize new material. They may also need considerable review of what they have learned and cumulative review as they learn more. The best approach is for teachers to provide the repetition and review that the students need while also embedding the teaching in application of these skills within new activities to ensure generalization (transfer) and maintenance of the learning. And successful teachers also make the lessons interesting (intrinsically motivating), fun, and success-oriented. **[See Tutorials on Instructional Routines; Errorless Learning]**

WHAT ARE THE MAIN FEATURES OF LEARNING TRIALS THAT ARE IMPORTANT FOR MANY STUDENTS WITH TBI?

What follows is a set of dichotomies that may help in making decisions about how best to teach students with some combination of cognitive, learning, and motivational problems. Thoughtful decision making is necessary in every individual case, guided by the considerations in this discussion.

MASSED VERSUS DISTRIBUTED LEARNING TRIALS:

Video Illustration: Massed vs. Distributed Learning Trials

Massed Learning Trials: intensive, repeated, back-to-back practice of a target behavior or skill

> **advantages:** relatively quick learning; may be needed for habit formation or internalization of a skill or process

> **disadvantages:** well documented problems with generalization and maintenance in many cases if the practice activities are not connected in a meaningful way to the activity contexts in which the skills are meaningful; possible boredom or other negative reactions

Distributed Learning Trials: practice trials are distributed among activities throughout the day:

> **advantages:** potentially facilitate generalization and maintenance (see "contextualized" below)

> **disadvantages:** may be inefficient in early stages of learning (i.e., not enough learning trials to have an effect)

Combination: It is possible and often desirable to create massed learning trials along with distributed learning trials in naturalistic settings. This combination may be critical for students who have learning

problems that necessitate large numbers of learning trials, but who also are concrete thinkers and learners and therefore have difficulty with transfer or generalization.

DISCRETE VERSUS EMBEDDED LEARNING TRIALS

Video Illustration: Discrete vs. Embedded Learning Trials

Discrete Learning Trials: The target skill is removed (for practice) from its place within integrated activities (e.g., practice specific grammatical forms or word meanings outside of the context of semantically and pragmatically meaningful communication)

> **advantages:** Some children may require discrete trials to discriminate and attend to the specific learning target; discrete trials may lend themselves to greater ease in "massing" the trials – creating adequate practice

> **disadvantages:** By removing the learning target from its meaningful context, one may inadvertently teach the wrong meaning (e.g., John learns to say "help" in response to "John, say 'help'" rather than in response to the need for help); well-documented problems with generalization; boredom

Embedded Learning Trials: Practice is embedded within activities natural for the targeted behavior (but not necessarily natural settings – e.g., could take place in "pull-out" therapy)

> **advantages:** potentially facilitate generalization and maintenance (i.e., the stimulus cues for the target behavior and responses to the target behavior are those that will elicit and maintain the behavior in natural activities)

> **disadvantages:** child may fail to focus on the learning target if the activity is too complex

Discrete: associated loosely with traditional behavioral approaches to teaching

Embedded: associated loosely with "naturalistic" language therapy activities

But please note: Many behavioral psychologists advocate the use of embedded learning trials for scientific behavior analytic reasons.

Combination: It is possible to combine discrete and embedded learning trials by having the student practice a targeted skill in a discrete manner, followed immediately by embedding the skill in a functional activity.

CONTEXT-SENSITIVE VERSUS DECONTEXTUALIZED LEARNING TRIALS

Video Illustration: Context-Sensitive vs. Decontextualized Learning Trials

Context-Sensitive Learning Trials: Learning takes place within a context (place, activity, people, stimuli and reinforcers) that is natural for the learner and the learning target. For example, learning reading comprehension strategies for specific types of reading takes place within the student's content classes, using the reading texts of the various content curricula (versus in a clinic room using materials other than curricular materials)

> **advantages:** potentially facilitates generalization and maintenance; stimuli and reinforcers are more likely to be natural, thereby promoting generalization/maintenance

disadvantages: may be difficult to achieve an adequate number of learning trials; may be difficult to ensure that the learner is focused on the learning target

Decontextualized Learning Trials: Practice is offered in a training context (place, activity, people, stimuli and reinforcers) without features of the natural environment

    advantage: easier to ensure large numbers of learning trials; may be easier to ensure focus

    disadvantage: may block generalization and maintenance

Combination: Again, it is possible to combine approaches, perhaps introducing a strategy outside of a natural application context, and subsequently applying and practicing the strategy in context. However, in the case of students who are concrete thinkers and learners (very young or frontal lobe injury), one must always be concerned about transfer of training (generalization).

PLANNED VERSUS INCIDENTAL LEARNING TRIALS

Video Illustration: Planned vs. Unplanned Learning Trials

Planned learning trials: The time, place, and activity for learning, as well as the specific teaching procedures, are planned by the teacher

    advantages: easier to achieve an adequate number of efficient learning trials; easier to organize the teaching targets in an effective manner

    disadvantages: if not natural, may interfere with generalization and maintenance

Incidental learning trials: teachers, parents, and others seize teachable moments when the opportunity to learn occurs naturally ("follow the child's lead")

    advantage: may facilitate motivation and generalization/maintenance

    disadvantages: may not provide for sufficient practice unless everyday people are included as teachers; may not support well organized teaching

Combination: Again, it is possible for teachers to plan specific learning trials, but also encourage other adults (e.g., assistants, parents) to capitalize on incidentally occurring teaching opportunities within a generally planned approach.

DELIBERATE VERSUS INVOLUNTARY LEARNING

Video Illustration: Deliberate vs. Incidcental Learning Trials

Deliberate: The learner's conscious goal is to learn or remember the information or acquire the skill (e.g., a student memorizes material in preparing for a test)

    advantage: quicker learning for those capable of "trying to learn" (e.g., memorizing)

disadvantages: learning is less deep and therefore may not endure; impossible for children who lack the cognitive ability to understand learning as a goal and/or who lack deliberate access to learning strategies that need to be used when one is "trying to learn"

Involuntary ("incidental" in a second sense of this term): The learner's conscious goal is not necessarily to learn anything, but rather to complete the activity; learning is a bi-product of processing the learning target as a means to achieve the activity's goal (e.g., students write a "social story" with a goal of writing a nice little story, but incidentally learn a social skill in the process).

advantage: promotes deeper processing (understanding) and therefore endures longer

disadvantage: may require teacher creativity to design learning tasks

CONSEQUENCE-ORIENTED VERSUS ANTECEDENT-SUPPORTED LEARNING

Video Illustration: Consequence-Oriented vs. Antecedent-Supported Learning Trials
Consequence-oriented: The learner is asked to perform, with learning resulting from the feedback/reinforcement provided after the performance; improvement is indicated by increasing percentage of correct responses. **[See Tutorial on Traditional Training Model versus Apprenticeship Teaching]**

advantage: There is a long history of theory and evidence supporting this approach to teaching for several populations and teaching targets

disadvantage: This approach necessarily includes considerable failure, which is dangerous for some learners; "errorless learning" is known to be best for some populations of learners and requires antecedent supports

Antecedent-supported: The learner is provided with whatever support is necessary to produce the correct response, with improvement indicated by systematically decreasing levels of support (see "apprenticeship model" – also associated with "positive behavior supports" in behavioral psychology and some heavily scripted and support-oriented approaches to teaching)

advantage: There is little failure, which is important for those who need errorless learning because of their cognitive or emotional profile

disadvantages: Some people find it harder to document progress (not a real disadvantage); hard to mobilize needed supports in all contexts; for some people and some learning targets, failure is useful for efficient learning (i.e., trial and error learning)

Consequence-oriented: associated loosely with traditional operant behavioral approaches; however, not all "behaviorally oriented" teaching relies largely on consequences

Antecedent-supported: associated loosely with apprenticeship approaches and other "support" approaches

Combination: Many "behavioral" teaching approaches advocate rich antecedent supports (e.g., for errorless learning) along with organized consequences. Similarly apprenticeship teaching that focuses on antecedent supports does not neglect natural and logical consequences.

EXTRINSICALLY VERSUS INTRINSICALLY REINFORCED LEARNING TRIALS

Video Illustration: Extrinsically vs. Intrinsically Reinforced Learning Trials Extrinsically reinforced: Success is rewarded with a sticker, token, points or other reinforcer that is not naturally and logically related to the behavior in question

> **advantage:** Highly desirable extrinsic reinforcers may have the effect of engaging the student and changing behavior quickly

> **disadvantage:** Extrinsic reinforcers do not facilitate transfer to natural activities and may foster dependence on extrinsic reinforcement in the long run; many experiments with many populations have shown that reliance on extrinsic motivation destroys internal motivation

Intrinsically reinforced: Success is rewarded with the logical and natural outcome of the behavior. For example, communication success is rewarded with satisfying interaction; academic effort is rewarded with a good grade;

> **advantage:** Intrinsic reinforcement facilitates transfer to natural contexts and blocks undesirable dependence on extrinsic reinforcers;

> **disadvantage:** Natural and logical consequences of a behavior may not initially be strong enough to motivate the behavior in the case of a person with a long history of failure

Combination: Combining approaches may again be useful, for example using extrinsic reinforcers initially to engage the student, but then shifting as quickly as possible to intrinsic reinforcement because of the dangers associated with long term use of rewards that are not naturally and logically related to the behavior that is being taught. **[See Tutorial on Extrinsic and Intrinsic Motivation]**

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