



# Motor Learning for Dance Teachers and Performers

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## Introduction

Motor learning is a major component of every human's life, including the professional hairdresser, the recreational basketball player, the tattoo artist, and the elite dancer. In dance, motor learning describes how dancers learn both basic and complex skills. These skills are not the ones acquired through the motor development that children typically experience, such as walking, running, hopping, skipping, and grasping objects. They may include turns, large jumps, tap dance sequences, and balances that are not part of everyday movement. Motor learning involves acquiring skills so that they are executed with smoothness, expressivity, coordination, and accuracy, and so that they are retained in the dancer's memory.

Motor learning describes the relatively permanent changes associated with practice or experience that govern a person's capability for generating a motor skill (Krasnow & Wilmerding, 2015). The motor system can change throughout the life span, making the person resilient through the aging process. Motor learning refers to the acquisition of skills and also to changing aspects of motor control, such as how to use core support during fast movement or how to improve the aesthetic quality of a balance. Additionally, learned patterns or rules can be transferred, so that if dancers are taught how to do jumps in first position, they can apply the rules to jumping in other positions. Motor learning of higher-level skills can also emphasize interaction with the environment. For example, young children in dance classes can fine tune jumping and leaping skills by jumping over real or imaginary objects. This paper explores theories in developing an understanding of motor learning as it applies to dance, and it will provide a variety of possible teaching and learning strategies to enhance effective dance training.



## Part 1: Theories and Concepts of Motor Learning

### Theories of Motor Learning

#### *Adams Closed Loop Theory*

In the 1970s, psychologist Jack Adams was the first researcher to create a motor learning theory. Although it is now viewed as limited, its basic principles help to form the basis for some of the later theories. In Adams' theory, people need information from senses such as vision and touch to monitor movement outcomes. This feedback is particularly important in the early stages of learning in order to achieve the movement, and to detect and correct errors. Through repeated practice and correction of errors, attempts at movements become more accurate. According to Adams' theory, the way to create strong movement memory is to practice doing the identical movement over and over with ongoing error correction. Practice does not make perfect; practice makes permanent.

It is now known that people can make intentional movements in a total absence of sensory feedback. Further, the brain can compare ongoing motor actions with stored memories without sensory information during the movement. Adams' theory does not account for these situations, hence its limited scope.

**Figure 1. The calypso leap / Photo by Jake Pett**



#### *Schmidt's Schema Theory*

Cognitive psychologist Richard Schmidt developed a theory stressing the open-loop process (also called an open-loop system), which does not use sensory feedback during the movement in order to change the motor plan; these movements are usually fast, and once they are triggered, they proceed to completion. An example is the calypso leap in jazz dance (See Figure 1). Incoming information about the environment is still necessary in order to achieve the task, such as observing a physical obstacle in the way. Schmidt proposed that when people explore new actions, they learn generalized rules for groups of movements.

These rules can be used in a wide variety of situations. A similar theory exists in language. Consider a child seeing a dog for the first time and being taught the word "dog". At first the child thinks "dog" is the name of that one animal. However, after seeing several varieties of dogs, the child forms a general idea of dogs and can then identify a dog even if it is a breed that the child has never seen. In dance, a similar example might be turns on one leg that remain in place. Dancers might first learn this movement with the lifted leg at the ankle of

the supporting leg, then try it with the lifted leg at the knee. Next, they might be asked to try various arm positions. In more advanced classes, they might learn how to change arm and lifted-leg positions while doing multiple turns, or even try turns with the torso off-center. Each of these possibilities is a variation of the generalized rule for turns on one leg.

With Schmidt's theory, many movements fall under one general rule, and the memory storage can handle the models for various classes of movements. The central theme of this theory is the concept of schema. The notion of a schema states that one can store in memory an abstract classification of an object; in other words, it can store a set of rules that is representational. Schmidt claimed that each time a movement is made, these four elements are stored: Conditions at the start of the movement (such as weight or position of the body), parameters that can be varied (such as force and tempo), sensory information (how the movement felt and appeared), and knowledge of results (the outcome). Schmidt's theory also suggests that a movement never before attempted can be done effectively if it is based on a previously developed rule. In the example of dancers learning turns, once they have practiced a sufficient variety of turns on one leg, they can achieve a new leg or arm configuration in a turn at a high level of skill.

A central idea in Schmidt's theory is the generalized motor program (GMP), a program that facilitates the motor system in executing an entire class of similar actions. It is stored in the memory, and it requires that various parameters be added preceding execution. Parameters are aspects such as speed, force, and body parts that can vary from one execution of the GMP to another. Invariant features are called the signature of the GMP. They are the aspects that do not change from one movement within the same class as another. An example is having children write their name with different body parts. Although the size and accuracy might vary, the shape and letters remain the same, whether they are using their hand, foot, or elbow!

### *Ecological Theory*

Newer theories of motor learning began to emerge in the late 1970s. These theories emerged from ideas based in what is known as ecological theory or ecological perspective. This view examines the interactions between the individual, the environment, and the task. In this theory, actions need information from the environment (perceptual information) that is specific to the desired motor action. Karl Newell is a well-known ecological motor theorist, writing his ground-breaking work in 1991. Newell's theory relies on ideas from the dynamic systems theory and the ecological perspective. The dynamic systems theory views the body as a mechanical system; behavior emerges from the interaction of the physical/nervous system and the environment. Newell's theory combines dynamic systems with the idea that perceptual information is necessary to learn movement skills. According to Newell, learning is done through search strategies, and one must search through what is called the perceptual-motor workspace to solve a new movement problem.

The perceptual-motor workspace is part of the brain's processes that consider both relevant sensory cues and the best possible motor strategies to achieve the goal. This theory supports exploration and active problem solving to develop new movement skills. Through this process, the person develops optimal abilities. Newell suggests three ways that teachers can assist students in motor learning: Help the learner understand the perceptual-motor workspace, support the instinctual search strategies used by people learning movement, and provide additional information to enable

the exploration. Teaching falls to the floor is one example that illustrates these three methods. In this scenario, the teacher can encourage the dancers to sense the floor and how its surface and resilience will affect the falling technique. They might also explore what motor strategy, such as counterbalancing the weight, might make descent smoother. Second, the teacher can encourage dancers to experiment with timing and use of arms and legs to achieve safe technique. Third, the teacher can provide feedback about ways the dancers can improve these strategies to enhance falling capabilities. In addition, teachers can encourage exploration and active problem solving by posing questions rather than offering solutions.

Ecological theory addresses the limitations of previous theories in dealing with the learning of novel movements and new coordination. Because movement is learned through exploration and problem-solving, it is not necessary to have a model or schema of the movement in order to attempt it.

In this paper, both schema theory and ecological theory are presented as useful teaching approaches in motor learning. Dancers can rely on representational models of movement (or schema) to organize groups of movements and make learning and accomplishing new variations of skills easier. Schema theory allows dancers to be increasingly versatile at learning dance skills as the demands on dancers continue to become more complex. In addition, exploration of the environment (ecological theory) also has importance for motor learning. Dancers who explore the environment and are active problem solvers are more effective learners. As choreographers incorporate improvisation and various techniques into their artistry, dancers are required to rely on relevant sensory cues and the best possible motor strategies. Teachers and choreographers should aim to acknowledge and integrate all of the methods that the various motor learning theories provide.

## Learning Styles

Most dancers have preferred ways that they learn. Learning styles can be defined simply as the way people approach learning something new. Some dancers prefer to see the material in order to learn it. Other dancers need to break down the material and think about it. Some dancers cannot learn movement unless the rhythmic structure is clear. And still other dancers learn best if the teacher or another student uses physical touch. The following describes two models of learning strategies.

### *Gardner's Theory of Multiple Intelligences*

In the 1980s, developmental psychologist Howard Gardner created his theory of multiple intelligences, which defined eight "intelligences" that can support learning:

1. Linguistic: the use of words, written or spoken
2. Logical/mathematical: ability to reason, consider abstractions, use numerical skills
3. Spatial: awareness of space and how the body and objects occupy space
4. Musical: a sense of rhythm, pitch, and musical composition
5. Bodily/ kinesthetic: a sense of the body and movement ability
6. Interpersonal: interactions with others
7. Intrapersonal: awareness of self and personal goals and standards
8. Naturalistic: relating to the laws of nature and the natural surroundings



There are two criticisms of this theory. First, people who learn well in one area often do well in others, which is not what Gardner suggested. Second, no empirical evidence or research outcomes support this theory. At this time, it is only supported by subjective observations. Therefore, for the purposes of this paper, the theory is considered only as a model for examining various learning styles.

#### *McCarthy and Kolb: Combining Two Theories*

Educator and author Bernice McCarthy described four learning styles in her educational system. David Kolb, another educational theorist, focused his work on experiential learning, and he described a cycle of learning. Authors Debra Rose and Robert Christina merged these two constructs into a single model for learning preferences, shown in Figure 2.

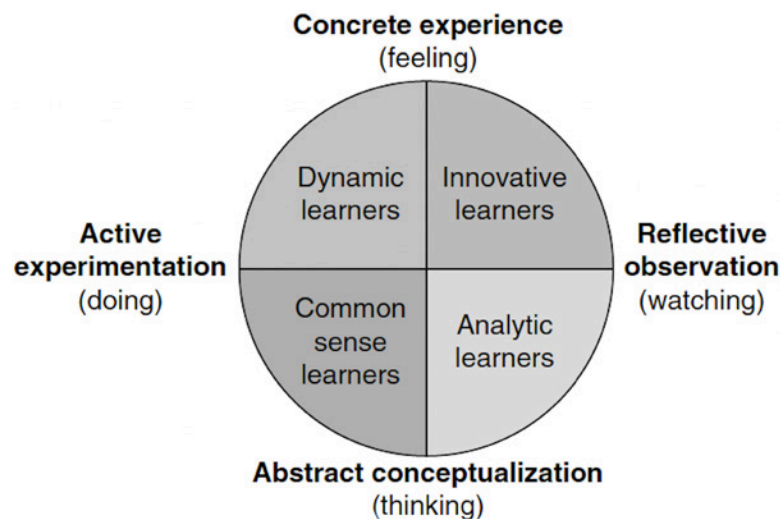
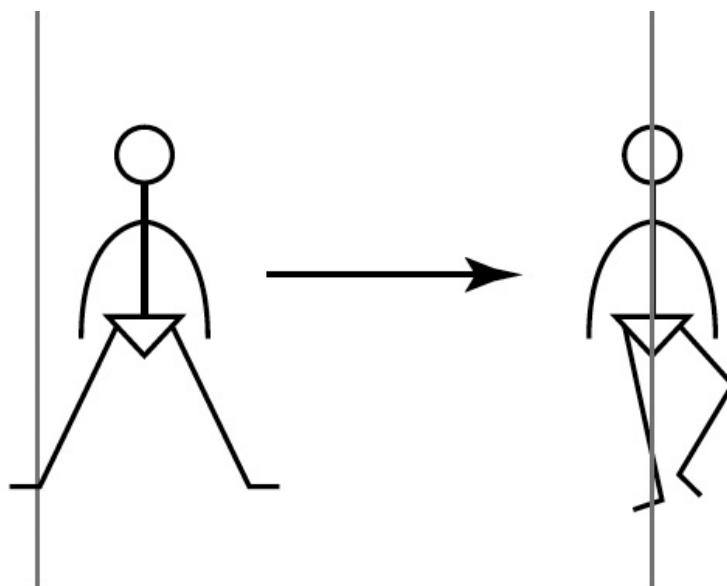


Figure 2. Rose, D. J.; & Christina, R. W., *A Multilevel Approach to the Study of Motor Control and Learning*, 2nd Edition, 2006, p. 188. Reprinted by permission of Pearson Education, Inc., Upper Saddle River, NJ

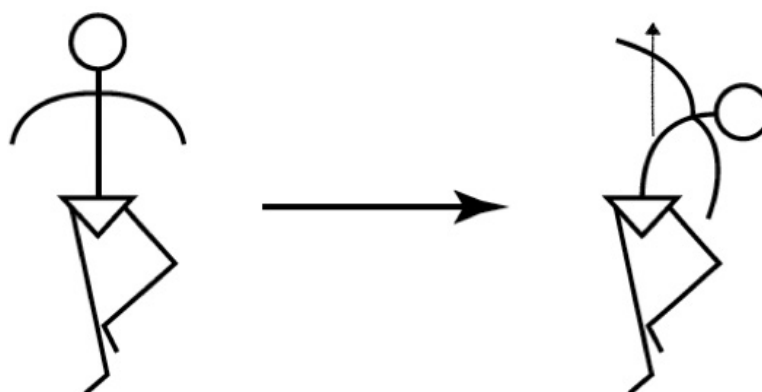
Both dynamic and common-sense learners use active experimentation, but dynamic learners choose concrete experiences, whereas common sense learners prefer abstract thinking. Both innovative and analytic learners use reflective observation, but innovative learners choose concrete experiences, whereas analytic learners prefer abstract thinking. The common thread linking these theories is that each student is unique and has various preferences in the learning process.

One area of learning not specifically addressed in the theories discussed in this section relates to the topic of postural control. Consider both proactive mechanisms (muscular responses that come before a disturbance) and reactive mechanisms (muscular responses that occur after a disturbance) when teaching balance control for a given skill. Often what is practiced in dance class is proactive control, that is, dancers know ahead of time that they are going to be shifting their weight to find a balance. Emphasizing the anticipation of the shift of weight before lifting the gesture leg assists in developing proactive control. Research suggests that dancers demonstrate different anticipatory (proactive) mechanisms for one-legged balances than nondancers because of dance training. Images can assist in developing these proactive responses. For example, dancers can imagine seeing a vertical line from the foot that will be the supporting leg and moving the torso in one unit onto that line (See Figure 3).



**Figure 3.** The dancer can imagine the vertical line (plumb line) to facilitate good trunk alignment during weight shift. Created by Donna Krasnow

However, dancers also need to understand that unexpected events can cause disturbances to balance, such as another dancer running by and accidentally bumping into them. These situations call for reactive balance control. Dance teachers can use interesting improvisational games to explore ways to enhance reactive control. One example is having dancers work in pairs. One dancer stands with eyes closed while the other lightly disturbs that dancer's balance with small, unforeseen pushes in various directions. Finally, at the most complex level, balance must be developed for movements where the upper torso is taken off the vertical while the lower base maintains the same support (See Figure 4).



**Figure 4.** Balance becomes more complicated as the torso is taken off the vertical alignment. The dancer can imagine that the plumb line comes out of the side of the body instead of the top of the head. Created by Donna Krasnow

Throughout all of these procedures, teachers and dancers can address the wide variety of learning styles using demonstration, analytic description, exploration, and social interactions, to name a few. It is clear looking at the dance example of a passé balance that each motor learning theory can contribute to

augmenting the learning situation. Teachers must remember that each dancer can be at different levels in different dance forms. A highly skilled modern dancer might be one of the beginners at the Argentine tango club, and an expert ballroom dancer might feel very unskilled at hip-hop. Each new challenge calls upon the dancer to experiment with a variety of methods to make the greatest gains in skill acquisition.

## Part 2: Instructional Strategies

Instructional strategies are methods of relaying information about correct execution of a skill, and are among the main components in teaching dance. In order for teachers to be effective, they need to understand what type of instruction is best for varying skills, how often to apply these strategies, and how much information should be communicated. The focus of this section is on these two areas of instructional strategies: demonstration and verbal instructions.

### Demonstration and Verbal Instructions

Before learners even attempt a new skill, they can receive information in two ways, which can serve functions. One way is to watch a physical demonstration of the skill, and the other is to receive verbal instructions about how to do the skill. For example, dancers can see the shapes and the timing of a dance phrase by observing the teacher; they can learn about how to maintain their core support by listening to the teacher describe this aspect of the skill. Because vision is such an important means of motor learning, demonstration is a primary tool in the dance class.

#### *Defining Demonstration*

Demonstration is also known as modeling, sometimes called observational learning. A common myth in dance is that demonstration is always effective in teaching a skill. Educators must determine whether demonstration would be effective in a given circumstance or for a particular aspect of a skill. Note that young children (ages 4-7) do not use demonstration in the same way as older dancers. First, they do not identify what they are seeing in a way that they can easily recall later when they are executing the movement. Second, they do not mentally rehearse the demonstration while they are watching. Therefore, the teacher should encourage young dancers to mark along with them.

It is imperative for teachers to understand what learners visually perceive when they are observing a demonstration. Learners observe the relationships between joints and body parts in a given action. For example, whether a *développé* (leg extension) is done at 45° or at hip level, or whether it is done quickly or slowly, the coordination pattern of the hip, knee, and foot remains constant. Similarly, dancers can recognize a *développé* regardless of the height, sex, age, or weight of the person executing it. However, those relative motions of the joints change if the leg does a straight-legged brush (*grand battement*), even if it is to the same height or timing. Experienced dancers can often pick up many aspects of a movement phrase, even without being aware of seeing or learning these components, which is one reason they can absorb large quantities of material at one time. In studies looking at the usefulness of demonstration for learning, researchers have sought to clarify which movement characteristics are essential to the learning process. Probably the most important aspect that determines whether demonstration will be useful is whether the learner needs to develop a new pattern of coordination in order to achieve the skill.

Beginners develop different abilities when they observe advanced and beginner demonstrations. Observing an expert execute a skill gives beginners a high-quality example to use as their model. They can absorb accurate information about the coordination patterns from this demonstration. On the other hand, when observing their less-advanced peers, learners develop problem-solving abilities; they can compare what they are seeing with the expert demonstration, and they can determine the discrepancy between the two examples. In this way, the observers develop methods of error detection and correction as well as analytic skills.

One excellent strategy that can be implemented in the dance class is to have students work in pairs. Each pair has an active dancer and an observer. When the dancers are beginners, the teacher should be specific about what the observer is to critique and how. For example, the teacher might suggest that the observer determine what the most important elements are to describe, and to limit critiques to two or three main points. After the first group does the phrase, the observers give comments to their partners. Then the pairs switch roles. This process has three benefits for the dancers. First, they develop problem-solving and analytical skills as they observe. Second, their understanding of the sequence, timing, and positioning of the phrase is reinforced. Third, they develop communication skills, which will be important in later roles as teachers and choreographers.

### *Timing and Frequency of Demonstration*

One common strategy that teachers use when presenting new material is to begin with a detailed and lengthy explanation of the purpose of the new exercise and how the students should approach it. However, this strategy might not be effective, because the dancers do not have a clear image or context for using this information. Dancers should see a demonstration of the new material or phrase before attempting it. Too much verbal instruction at this stage can overload their attention. They need to see the material and attempt it; more information can be added later. This strategy is particularly appropriate for beginners. A second issue concerning demonstration is frequency. Research supports the general rule that more is better. The teacher should be willing to demonstrate, or ask a student to demonstrate, as often as the dancers need to see the material. Further, demonstrations should be interspersed with practice attempts, not simply done several times at the beginning. The concern that students will become dependent on demonstration is not supported by research, and as dancers develop their visual perceptual skills, they will need fewer demonstrations to learn new material. It may seem that these recommendations present unique challenges for teachers who are not able to demonstrate often or full-out, perhaps because of injury or age. In these situations, it is even more important to have students demonstrate for each other, either in pairs or for the entire class. These demonstrations can act as models of the material, or they can be vehicles for encouraging problem-solving discussions.

### *Using Sound as a Learning Tool*

Because dance is so inherently connected to music, dancers can use sound as a form of demonstration. Timing, rhythm, phrasing, and emphasis can be addressed with certain instructional techniques. If a movement sequence is complex, it can be helpful to the dancers to leave the physical movement phrase temporarily and focus on learning the timing through auditory means, which might include clapping, foot stepping, or singing the rhythm. After the dancers feel secure in the timing of the phrase, they can return to the physical execution and focus on other aspects of the material.



## Verbal Instructions and Cues

Verbal instructions are as popular as demonstrations in dance instruction and are explanations of how a skill is accomplished. They can educate the learner about characteristics of the skill that cannot be observed through demonstration. Instructions are usually general; that is, they do not give feedback about a particular performance, and they do not necessarily give corrections concerning what the teacher has observed. In effect, they lay down a general blueprint for the skill. Various factors influence what constitutes good verbal instruction.

Attention and memory are major factors that affect verbal instructions. People have a limited capacity for attention and this limitation places restrictions on both the quantity and content of verbal instructions. Dancers, especially beginners, can easily be inundated with too much information. Generally, one or two main ideas are sufficient, because the dancers are already focusing on the material they saw in the demonstration. If the teacher offers too many additional points, the dancers will be unable to attend to everything involved. Further, they will not be able to retain all of the information during movement execution. It is tempting to tell dancers everything at once that they will need to know to achieve a new skill or dance phrase. It is more effective to distribute the information over time. In order to avoid information overload, initial instructions should be limited, concise, and straightforward. Figure 5 shows what occurs if a dancer is overloaded.



**Figure 5. The teacher is overloading the dancer with information while she is trying to learn a new movement.**  
Photo by Jake Pett

Instructions should also be age appropriate, that is, relate to the life experience and language that is common to that age group. Additionally, dancers should be encouraged to use external focus (thinking about movement tasks and outcomes) rather than internal focus of attention (thinking about specific muscles) when learning new skills. This strategy of using external focus can be accomplished in these two ways: creating a discovery learning situation and using metaphoric imagery. Discovery learning theory is a constructivist educational philosophy that encourages students to construct their own knowledge through exploration, problem-solving, and play. Metaphoric imagery is the representation of the desired movement with a figure or likeness. With metaphoric imagery, the dancer concentrates on the

image or idea of the movement, and the movements and muscles are determined on a nonconscious level. For example, to encourage keeping the torso forward in low runs, dancers can imagine that they are the figurehead on the front of a Viking ship leading the way through the water. Using verbal analogies is another form of verbal instruction. Verbal analogies are used to explain how two actions are similar in some way. When dancers relate something new with a skill that they have previously experienced, it assists them in understanding the new activity. For example, metaphors commonly used to teach jumps and leaps to children are to imagine that they are playing a game, jumping to reach a ball, as in Figure 6, or leaping over a log in the forest. In addition to these images being delightful metaphors, they also give them a context for new movements (a dance jump or leap) with something they have previously encountered in their children's games. Verbal analogies encourage implicit learning, that is, learning without conscious effort or awareness of what is being learned. Verbal instructions can also draw attention to the environmental conditions that are necessary in achieving the task. For example, a teacher can describe the angle of the head by directing the line of focus and the face to a particular point or object in the space. An additional advantage to giving instructions that relate to the larger space is that it can prepare dancers for choreography that deals with set pieces as well as for touring that involves changing environments.

Verbal cues are brief phrases that act as prompts for the main ideas of the movement or direct the attention to vital environmental situations. For example, the teacher might say, "Look for the wing" to direct attention to movement components or to the space. Teachers can provide verbal cues during demonstration, during instructions, or while dancers are in motion. In each case, they offer a short reminder of

essential elements of the task. Verbal cues are as useful for advanced dancers as for beginners. In both cases, as dancers use cues, they form an association between the cue and the prompted action, allowing the dancer to focus on fewer movement elements and direct attention to other aspects of the work, such as the music. In addition, teachers can consider the use of the voice in giving verbal cues. They can sing counts in musical phrasing, which can give dancers important information about the phrasing, accents, and effort in the movement. Words can be accented with various dynamics; teachers may use long, lingering sounds for lyrical movement, and use sharp, abrupt sounds for percussive movement. The sound of cues can be as critical for the learning process as the actual words being spoken.

**Figure 6. Children imagining that they are jumping for a ball**  
Photo by Jake Pett



### Augmented Feedback

Feedback, sometimes called correction, is a response to a movement that gives information about the result, to be used for improvement. Augmented feedback comes from a source external to the performer, such as a teacher,

choreographer, or video. For example, a teacher might say, “You need to lift your focus at the top of the leap.” This feedback can also describe the causes of errors and why the changes are being suggested. Two types of augmented feedback are knowledge of results (KR) and knowledge of performance (KP). KR gives information about the outcome of a movement task or about whether or not the goal was accomplished. An example is “During the traveling turns, you got ahead of the music”. KP gives information about the movement features that determine the outcome. In the previous example, the teacher might say, “Make sure you are listening clearly to the music and stepping on the beats.” Other examples can be seen in Table 1.

**Table 1 Examples of KR and KP - Created by Donna Krasnow and Virginia Wilmerding**

| Action                                | Knowledge of results  | Knowledge of performance   |
|---------------------------------------|---|--|
| Pirouette turn                        | "You did not complete your triple turn."                                    | "When you initiate the triple turn, bring the arms in faster."                                     |
| Body roll in standing second position | "You lost your balance during the arch."                                    | "When you arch during the body roll, increase your core support."                                  |
| Jazz layout                           | "You fell backward at the final shape."                                     | "Keep your body weight forward as the body arches back."   |
| Ballroom salsa                        | "You lost contact with your partner on the turning step."                   | As you initiate the turning section, make your steps smaller."                                     |
| Partner Lift                          | "You did not get your partner all the way to the intended top of the lift." | "Use more plié at the onset of the lift, and keep your partner closer to your body on the way up." |

Augmented feedback has two primary roles in teaching motor skills. The first is to help the learner acquire the necessary skills to execute the movement accurately. The second role is to motivate the learner to continue practicing. Research suggests that positive reinforcement is more successful than negative reinforcement and punishment in getting results. The research also strongly indicates that information about errors (KP) is better for the acquisition of skills. Without information about errors, learners cannot alter or correct movement aspects that are inhibiting high-level skills. Additionally, feedback about what has been done correctly encourages the learner to continue engaging in the practice, and it is highly important for motivation.

Content of augmented feedback can be quantitative, qualitative, or both. Quantitative augmented feedback has a numerical value relating to the measure of the skill, such as the number of turns or the height of a jump. Qualitative augmented feedback is about the quality, such as stating that the turn has good fluidity, or the jump has explosive power.

When should the teacher withhold feedback? Dance teachers make intuitive decisions about how much error to allow when dancers are learning new movement. In sports, teachers and coaches use a concept called performance bandwidth, which provides a range of tolerable error. Feedback is only given when

the learner's performance falls outside this range. With beginners, teachers can be generous with the acceptable range. Even with movements such as positioning of arms and legs, teachers should allow a bit more leeway while dancers explore and experiment in the learning process.

Another concern for educators is the timing of feedback, and whether it should be given during or after movement execution. While teachers often use concurrent augmented feedback (during the movement), it can have a negative effect on learning. The learner might direct attention away from what they are exploring, and toward the augmented feedback, which diminishes the importance or usefulness of their personal experience.

For motor skills, constant feedback is not useful. However, there is no absolute way to determine the optimal frequency of feedback, depending on the skill. Because so little research has been done with dancers, it is difficult at this time to recommend specifics regarding frequency of feedback. What can be stated is that it is important to give dancers opportunities to repeat material without receiving feedback so that they can develop their own problem-solving strategies. If feedback is given 100% of the time, dancers might become dependent on receiving feedback and may not do well in terms of retaining information.

## Part 3: Motivation

Motivation can be examined from different points in time. Initially, dancers must be motivated to start a new activity. Then, motivation must be why they persist in the activity. Finally, motivation engages dancers so that they are willing to spend time and energy in order to improve. Several factors determine a dancer's motivation, including attitudes, goals, context, and self-image. Highly motivated dancers exert more effort, are more focused and determined while training, and are willing to practice for extended amounts of time. Being motivated is a psychological state, triggered by the dancer's personal desires and interests. Part of this psychology is the need for self-satisfaction, and the desire to do an activity that enhances self-esteem and self-efficacy. Self-esteem is a dancer's feelings of worth or value, and is specific to the type of activity being performed. For example, a dancer can have high self-esteem in dance classes but low self-esteem in history classes. Self-efficacy is a dancer's belief that a specific task can be performed well, and is one of the best predictors of success, as noted in the research.

Motivation can come from within or can be stimulated by an outside source. Intrinsic motivation arises from internal factors, such as a person's curiosity. For example, dancers who arrive before class or stay after to ask questions because they have a desire to learn and improve demonstrate intrinsic motivation. Extrinsic motivation comes from factors that lie outside, such as praise and criticism. In the case of the dancers arriving early or staying late, if their reason is fear of receiving a poor grade, it demonstrates extrinsic motivation. Research suggests that younger children are more motivated by external reasons, such as family, friends, and teachers, while teenagers and adults are more motivated by internal reasons, such as feelings of success and enjoyment.

Factors that encourage dancers to persist in dance activity include:

- The appeal of involvement in performances with an audience
- The need to be a part of a social community
- The desire for pleasure and enjoyment

- The wish to be in good physical condition
- The drive to be artistic, and to be a part of something larger than the self
- The need to please family, friends, and teachers
- The desire to attain states of flow, which involve immersion in the activity, loss of one's sense of time, and a feeling of effortlessness

## **Motivational Methods**

Motivational methods are strategies developed by the teacher or the dancer to approach a task with energy and enthusiasm. When dancers practice skills with no motivation, chances for improvement or progress are poor. Motivating ideas can be added right before and during practice. For example, while students are doing a traveling combination, a teacher might say, "That's it! Move a little farther and get across the floor by the end of the phrase!" Factors that affect motivation include setting goals, praise and criticism, success and failure, cooperation and competition, and feedback.

### *Setting Goals*

Goal setting is the process of determining challenging yet attainable goals before practice begins. Below are some principles of goal setting:

- Direct or precise goals are better than vague goals.
- Goals that present challenges are better motivators than easy goals, assuming the task is not too far beyond the abilities of the learners.
- Short-term goals can lead to the accomplishment of long-term goals; the best strategy is a combination of short-term and long-term goals.
- In order for goals to be effective, learners need feedback about progress.
- Learners must accept the goals. Otherwise, they will not commit themselves to achieving them and will not accomplish them.
- In order to achieve goals, a plan of action must be in place.
- Competition can be used, but it should not be encouraged to such an extent that it creates a hostile learning environment.
- Goals alter performance by influencing effort, persistence, and attention.

Finally, achieving goals can improve self-confidence. One part of this approach is to allow dancers to see in small steps that they are indeed improving. Another aspect is to focus on the goal, which might lessen tension, nervousness, or self-critical thoughts. In this way, goals can provide a kind of mental training that works to enhance both self-confidence and skill acquisition.

### *Praise and Criticism*

Feedback can be used as a form of motivation to help dancers learn a new skill. It is not clear from the research whether praise helps with skill acquisition, but it is known that it functions as a motivational tool. Criticism (relating errors to the learner) is useful for improving skills, and, psychologically it can be better for motivation than no commentary at all. Constructive criticism is given in a supportive, positive tone with the intention of being helpful. Destructive criticism involves insults that are often in a tone of annoyance or frustration. Constructive criticism is highly effective in giving dancers feedback that they can use to improve performance, while destructive criticism tends to lower self-esteem and impede learning.



## *Success and Failure*

Success and failure in learning motor skills has a powerful effect on the psychology of learners. Successful dancers feel competent and self-assured, while learners who deal regularly with failure tend to be anxious, less self-assured, and have difficulty setting appropriate goals. Recurring failure also diminishes motivation. Teachers can offer a combination of opportunities for success and failure for students who are highly motivated, but it is best for dancers who have low motivation to focus primarily on opportunities for success. This difference can be achieved through differing feedback and demands, and by giving praise to those learners with low motivation to boost their self-confidence. The exercises or combinations can be adapted in class for dancers at different levels of experience and training. Finally, dancers should be made aware that errors do not imply failure; errors are necessary in order for learning to occur.

## *Cooperation and Competition*

Cooperation is working together or acting in harmony. Usually when people think of dancers working cooperatively, it is in rehearsing or performing choreography. However, dancers should learn cooperation in the training setting as well. Competition is a challenge between two or more dancers, and it can occur for a variety of goals, such as being the best at a skill, prestige, recognition by the teacher or audience, awards, and placement in a company or choreography. It is seen as the opposite of cooperation. Note that cooperation and competition are not necessarily mutually exclusive. With young dancers, class should be more focused on cooperation. Figure 7 shows two young dancers cooperating in creating shapes.

**Figure 7. Young dancers working together in dance class.**  
Photo by Jake Pett



## *Special Considerations for Children*

Children who take dance classes because they have chosen to do so are intrinsically motivated. They tend to be the children who continue in the activity. Children who are placed in classes by their parents need additional encouragement. In the early years, excessive repetition should be avoided, and there should be an emphasis on creative play. Also, if possible, boys should be placed in classes with other boys, to assist them in feeling more comfortable in class. In teacher-centered learning, the teacher decides on activities and when the students are ready to advance to the next level. In student-centered learning, students can make decisions about the content and timing of learning. Studies involving motor skills have demonstrated that student-centered learning can be highly successful.

## **Part 4: Conditions of Practice**

All dancers understand that improving at dance requires practice. In both myth and reality, many ideas revolve around practice. Some sayings include the following:

- Practice makes perfect.
- Practice is everything.
- Practice does not make perfect; only perfect practice makes perfect.
- If practice makes perfect, and no one's perfect, then why practice?
- They say that nobody is perfect. Then they tell you practice makes perfect. I wish they'd make up their minds.
- They say that practice makes perfect. Of course, it doesn't. For the vast majority of athletes, it merely consolidates imperfection.
- Practice makes permanent.
- Nobody likes practice, but what's worse—practicing, or sucking at something?
- Excellence is a habit, not an act. It takes practice and perseverance.
- Expertise in any field is the result of intense practice for a minimum of 10 years. It takes about 10,000 hours or 10 years of dedicated practice to truly master a skill, be it playing the violin, computer programming, skateboarding, or dancing.

Most teachers and dancers realize that dance skills do not improve with just any practice. Activities carefully constructed with the intention of improving skills are called deliberate practice. Some aspects of practice that aid in determining how to design one's classes include: constancy versus variety, amount of practice, and part or whole practice. The first question to be considered is how to assess learning.

Two ways researchers measure learning are transfer of training and retention. Transfer of training is the ability to use skills acquired in one circumstance on the skill acquisition and problem-solving ability in another circumstance. Retention is the ability to recall what has been learned. Transfer tests have the dancers changing to different tasks or conditions, using the same skill, such as a stationary turn placed in a traveling combination. Retention tests occur after a period of time but usually test the dancer on the same task or conditions.

### **Constant versus Variable Practice**

Constant practice refers to keeping the movement and environmental elements the same each time the skill is practiced. Variable practice includes varying both the movement and the environment that the dancer experiences during practice. For example, dancers can practice a skill at different speeds or to different music, or in various studios with different floor surfaces. Research suggests that variable practice is generally superior in both transfer and retention tests. Variable practice increases the generalizability of a skill, which is learning a specific skill and applying it broadly to many skill variations. Although variable practice might initially encourage more error, these errors can lead to better transfer of the learned skill to new contexts or skill variations, especially during the early stages of learning.

To determine how to create variability in practice, two aspects of the skill need to be described: the physical environment and the skill characteristics. The physical environment for dancers that directly affect movement are: floor surfacing, the size of the performance space, mirrors, music tempo, costumes, and props. Skill characteristics depend on whether the skill is open or closed. Closed skills are skills that are done the same way each time; they follow the same general motor plan. Open skills are skills that need to be done in many variations of timing, gestures, spacing, multi-limb coordination, spatial patterns, organization of body parts, and differing ways to share weight with a partner. In ballet, many

skills are repeated in the same way, with some slight timing variations. Practice with little variation could benefit learning of these skills. An example would be the large circling leaping sequence seen in many choreographed dances. At the other extreme, contact improvisation involves open skills with unexpected changes occurring for the dancers. While contact improvisation classes do include some repetition of certain lifting skills, the classes and performances in this form are always changing.

Another aspect of variability is whether practice is random or blocked. Random practice is practice that involves practicing many variations of a skill mixed together with other skills. The structure of most dance classes encourages random practice. Dancers move from one skill to the next throughout the class, and they mix skills within the same combinations. Blocked practice involves practicing a skill the same way with many repetitions within a given practice session. An example of blocked practice would be doing an exercise of the same skill repeatedly, such as practicing step, ball-change across the floor in jazz class over and over with no variation in arms or timing. An observation about dancers who participate in blocked practice is that they do not judge their progress accurately, and tend to overestimate what they have learned. It is suggested that teachers find ways to incorporate random practice in their dance classes, even when teaching a set syllabus. Finally, elite performers can handle more variation in practice than beginners.

### **Amount and Distribution of Practice**

Few guidelines exist in dance literature about how much practice is necessary or how to plan practice over time. Often choreographers dramatically increase hours of rehearsal right before performances, or teachers increase practice right before exams. Researchers suggest that this tactic is not the best approach to help dancers learn material; the prevailing wisdom is to taper practice in order to increase readiness, and to avoid potential fatigue and injury.

Dancers usually continue practicing a skill after it has been learned, which is known as overlearning. This is sometimes called post-mastery learning. This term should not be confused with overtraining, practicing to the point of fatigue and burnout. Research supports overlearning as an appropriate tool in training. However, the concept of diminishing returns suggests that overlearning only has benefits up to a certain point. After that, extra practice will probably not have any additional benefit. In some situations, teachers may even see an actual decrease in ability from excessive overlearning due to physical fatigue, boredom, reduced attention, and a drop in motivation from seeing no improvement.

Distribution of practice can be divided into massed or distributed practice. Massed practice involves little rest between sessions. Distributed practice involves relatively longer rest between practice sessions; the rest periods are as long as or longer than the active practice. In general, shorter sessions for practice show better improvement in retention than longer sessions. Often learners prefer longer sessions, but they have better results with shorter, more frequent practice sessions. Further, learners who participate in less frequent, shorter sessions are better at predicting their retention than those who participate in frequent, longer sessions.

Including rest as part of the training process has several benefits. First, including periods of rest helps to consolidate memory (See Figure 8). Memory consolidation refers to stabilizing changes in the nervous system after learning a new skill. Second, rest improves the recall of skills. Dancers may learn phrases in

class or rehearsal but have a difficult time remembering the material the next day if they have had little rest. Sleep, particularly dream sleep, is especially important in memory consolidation. Finally, rest and sleep improve performance of motor skills. When dancers lack sleep, performance of known skills can suffer. Research has also demonstrated that sleep can enhance certain aspects of motor skills beyond what rest can provide. A night of sleep can improve speed without loss of accuracy by 20% beyond what rest can provide.



**Figure 8. Dancer in constructive rest pose from somatic practice.**  
Photo by Jake Pett

The value of rest and sleep in motor learning has not been sufficiently explored in dance training. While dance teachers are beginning to appreciate the issue of physical fatigue and its relationship to injury, the connection of rest to motor learning in dance is less understood. Traditional dance training is built on the idea of rigorous, persistent physical activity, and holds that rest suggests a lack of commitment and seriousness, but these assumptions are being questioned.

## **Whole and Part Practice**

Whole practice is practicing a skill or dance phrase in its entirety. Part practice is practicing one section, one component, or one body part of a skill or phrase before practicing the entire skill. This technique has been used in dance for decades, and dancers recognize its value in motor learning. Teachers need to determine when to use whole or part practice, which depends on the complexity and organization of the skill.

Complexity of a skill depends on two factors: the number of sections, parts, or components of the skill, and how much attention the skill requires. Complexity does not indicate the level of difficulty. Balancing on one foot without support is difficult but not complex. Organization of a skill is about the parts of the skill and how they relate to each other in time and space. When the parts are interdependent, the skill is considered to have a high level of organization. For example, a dance turn is dependent on the preparation prior to the turn, the use of limbs and balance during the turn, and the recovery at the end.

It is better to practice a skill in its entirety (whole practice) when the skill is low in complexity but high in organization, which refers to simple skills with parts that interrelate. Doing a leap or a head spin are examples of skills that can use whole practice. Part practice is effective when the reverse is true—the skill is high in complexity and low in organization. Développé into grand rond de jambe in ballet or

modern dance, is an example of a skill that can benefit from the use of part practice. If part practice does not result in transfer to the whole skill, it is not useful, even if the dancers improve at each part.

Three types of part practice are regularly used in dance: fractionization, segmentation, and simplification. Fractionization is a method used for a skill with asymmetric leg and arm coordination, and it involves practice of individual limbs before trying the whole skill. This method is commonly used in practicing musical instruments, such as the piano or drum, that involve asymmetric multi-limb coordination. Segmentation involves skills that have a series or sequence of components. The dancer begins by practicing the first part, then practicing the second part, then adding it to the first part, and so on, until the entire sequence is learned. This method looks like the following sequence:

- Practice A
- Practice B
- Practice A + B
- Practice C
- Practice A + B + C
- Practice D
- Practice A + B + C + D, or the whole skill

Simplification involves lowering the difficulty level of either various portions of the skill or different characteristics of the skill. Simplification can be applied in a variety of ways, including limiting the demands of attention, diminishing speed, using auditory cues, or sequencing the order of the skills. For example, a modern or jazz turn that uses complicated arm and torso movement can be taught by first practicing the legs with the turn, then adding the arms, then adding the torso. Diminishing speed is probably one of the most common simplification methods used in dance classes. Slower speeds allow learners to concentrate on more aspects of the skill, and to allow for accuracy to develop. Reducing difficulty in work with props and sets can also benefit from simplification. In dance, if a prop is very heavy or difficult to hold, dancers might start by using a substitute prop that is easier to handle. If the movement using the prop is complicated, the movement can be practiced first without the prop, adding the prop later.

Using auditory cues is useful with skills that have a rhythmic or musical component. Teachers can clap, speak in rhythm, sing, and even play a variety of small musical instruments to accentuate the rhythm of a skill. Another method is to call out a verbal cue on an important moment within a skill. For example, teachers might call out "Spot!" at a certain count in a turn combination. Be aware that using too many cues can overload the dancers and draw attention away from other important elements of the skill. As stated above, some skills should be practiced as whole skills because they are low in complexity but high in organization. However, in these instances, attention can be used as a way to achieve a form of part practice by directing the dancers' attention to a specific feature of the skill. For example, dancers might be learning a complex leap, which involves legs and arms changing positions while in the air. The teacher might tell the dancers to focus their attention on the leg transitions only, even though they are doing the whole skill. Next, the teacher can suggest that the dancers attend to a different aspect of the leap. Through this process, the dancers are focusing on parts of the skill even though they are performing the entire skill.



## Dance-Specific Conditions of Practice

### *Improvisation*

Improvisation offers a way for dancers to explore variability of practice, and is often used as part of the creative process. Dance improvisation involves creating movement in a spontaneous and experimental manner. To date, little has been done to explore the potential for motor learning through improvisation as a complement to traditional dance training. First, improvisation can allow dancers to self-select the various components of the movement while maintaining a primary focus on a single concept. For example, a teacher may wish to focus on the use of weight in a combination going to the floor and returning to stance. Encouraging the dancers to determine their own timing, type of descent, and body shapes enables them to concentrate on the concept of release of weight without multiple elements to accomplish. Second, it is important that dancers experience unplanned disturbances to balance in order to prepare for new experiences and possible mistakes on stage. Improvisation provides unexpected, surprising challenges to balance (See Figure 9).



**Figure 9. Dancers improvising body shapes to challenge balance.**  
Photo by Jake Pett.

Third, use of focus in the traditional dance class can be limited, often involving the head remaining upright and the focus straight ahead; it is usually determined by the form or the teacher. Improvisation provides an opportunity to explore other uses of focus, which can enhance proprioception. It also requires the use of peripheral vision to develop an awareness of the other dancers in the surrounding space.

Fourth, improvisation can assist in the process of changing poor alignment habits. Most teachers would agree that how the body organizes is essential to success in dance. In known or previously experienced movement phrases or skills, each person has nonconscious patterns that support alignment. Improvisation can disrupt the habitual use of muscle recruitment supporting alignment by introducing unplanned movements, potentially allowing new recruitment patterns to develop. This process can provide an ideal opportunity to use imagery and exploration to find new ways of organizing the body.

Fifth, improvisation can influence the way dancers interact with each other. Dance is a communal art form. In the traditional technique class, few opportunities exist for dancers to interact with each other in novel movement sequences and settings. Improvisation offers an environment for unplanned interactions to occur with other dancers, including spatial conflicts, movement dialogues, copying and mirroring. Sixth, improvisation shifts control from the teacher to the dancer, enhancing self-confidence and

encouraging cooperation. Improvisation can also improve motivation by adding the elements of pleasure and play.

Several dance forms incorporate improvisation directly into the training process, such as Argentine tango, Flamenco, African dance, Middle Eastern dance, break dance, and tap dance. It is recommended that all dance classes for young children include improvisation.

### *Mirrors*

Mirrors have been a part of some forms of dance training for so long that teachers and dancers do not question their value. Two factors in motor learning affected by mirrors are skill acquisition and self-esteem. In terms of learning, the research is mixed. In some cases, dancers using mirrors had better retention, but in other cases the dancers without mirrors had better retention and execution. It may depend on the type of skill and the level of the dancer. For slow skills, the mirror may just be a distraction. Advanced dancers may have sufficient kinesthetic awareness and not need as much visual input from the mirror to learn new skills. Sometimes the information provided by the mirror is not useful because of the view provided. For example, dancers working to improve lumbar hyperextension or swayback may think they are well aligned if seeing their body organization from the front, as in Figure 10.



**Figure 10. Dancer using a front-on view to correct her alignment.  
Photo by Jake Pett**

Even though some research suggests benefits from using the mirror, it is recommended that mirror use be limited in order to develop kinesthetic awareness and reduce dependency.

Regarding self-esteem and the mirror, research suggests that dancers of higher skill feel better about themselves and have better body image when not using mirrors, whereas recreational dancers have the opposite effect. This odd contradiction may relate to how self-critical advanced dancers are about their bodies, and the demands of the dance culture. Once again, it may be best to limit mirror use, and teachers can also help by giving concrete suggestions on areas of focus, such as the line of the movement.

## Part 5: Memory and Types of Learning

Memory can be defined as the ability that allows people to benefit from past experiences. Two important aspects of memory for motor skills are storage and retrieval of information. Memory has both a working memory component and a long-term memory component. The working memory is a system that temporarily stores recently learned information, its traditional name being short-term memory. The working memory is an interactive workspace that combines new information with material recalled from long-term memory in order to solve problems and encourage decision-making about future actions. The duration of retaining information in the working memory is only 20 to 30 seconds! If movements are not rehearsed or mentally processed in some way past 20 to 30 seconds, they will be lost. When dancers are learning a new skill, they can learn the skill more successfully and remember it more easily if they can relate it to a skill that they already know or with a meaningful image.

The long-term memory is where information is permanently accumulated or stored. Specifically, it stores: information about how to do activities including motor skills, personal past events, and general knowledge. Long-term memory includes three systems: procedural, semantic, and episodic. Procedural memory assists in the understanding of how to do an action but not what is needed to do the action. For example, when putting on dance shoes or driving a car, people can execute the skill (the how) but cannot describe it (the what). Procedural skills need enough practice to reach the habitual stage. Semantic memory is the system that stores general information about the world, that is, understanding ideas or facts even if they are not present at that moment. Examples include the names of all the planets that circle the sun, when the Hindenburg exploded, the names of the famous Alvin Ailey dancers who have danced Revelations, concepts such as intelligence and love, or the generic representation of objects such as cat and building. Episodic memory is the system storing personal events and the time period in which they occurred. It is the only memory system that allows people to consciously re-experience their past. Examples include remembering one's first day of school, the first dance performance, getting engaged, and auditioning for an important dance company. Knowledge can be described as either declarative or procedural. Declarative knowledge can be described or stated verbally (the "what"), and is the kind of knowledge stored in the episodic and semantic memory systems. Procedural knowledge cannot be stated verbally but rather aids in the performance of the skill (the "how"), and is the type of knowledge in the procedural memory system.

The two critical spatial features in remembering movement are location and distance. The endpoint location is easier to remember than distance; for example, with children, it is common to teach the arm placement of fifth position by suggesting that the hands are placed above the forehead (location), rather than suggesting that the arms move 160 degrees (distance), as in Figure 11. Kinesthetically-learned locations are not the same as visually learned locations, and dancers need to develop the kinesthetic. In dance, it is common practice to execute movement on both sides, and traditionally, learning is initiated on the right side. Recent discussions have centered around whether this is the best practice for learning and memory. Bilateral transfer is the transfer of learning from one limb to the same limb on the other side of the body. It is generally acknowledged that bilateral transfer does occur, and it is agreed that bilateral transfer is asymmetric, that is, transfer is not the same in both directions. A controversial point is which direction has better transfer. The common recommendation, and what is supported by sports research, is that it is best to start practice with the preferred limb, because transfer is better from

preferred to non-preferred limb. It may be that starting on the right side is not problematic except that it often results in excessive practice of the material on that side. Teachers should make sure to balance the amount of practice on both sides.



**Figure 11. Children learning 5th position arms.**  
Photo by Jake Pett

One important issue that can be discussed in terms of memory and learning is use of the barre. In addition to ballet teachers, more contemporary dance teachers are using barre work at the start of classes. The question arises as to what skills are actually learned at the barre, and whether or not they transfer to center and traveling work. Because barre exercises are complex, probably some elements transfer and others do not. For example, research shows that strategies that dancers use to shift their weight from two feet to one foot and back to two feet do not transfer from barre to other conditions. Dancers shift the weight toward the standing leg less at the barre than is necessary when working without a barre. Dance teachers and dancers often claim that elite dancers do not rely on the barre as much as beginners do, but studies demonstrate that advanced dancers and beginners rely equally on the support of the barre. Further, muscle use varies between barre, center, and traveling work. The supporting leg muscles are not as active at the barre as they are in the other two conditions. Positive elements of transfer include training for strength and endurance of the supporting leg and alignment of the foot and ankle. Teachers may need to reconsider what they think the benefits are when using barre techniques in training and avoid assumptions about other aspects that do not transfer.

## Part 6: Mental Practice and Imagery

### Mental Practice

Mental practice is rehearsing a skill or sequence of movements using thought without physical execution. It can occur with no visual activity, such as dancers lying with their eyes closed, or it can occur while watching other dancers or a video of the dance. It can be used to learn a new skill, or to prepare for performing a skill that has already been learned, such as thinking through the steps of a known



combination just before executing it or reviewing choreography before going onstage. Skill acquisition is not only about learning new skills; it can refer to relearning a skill in various circumstances, such as during injury recovery or movement reeducation, which is the process of changing habits and forming new ways of working. The change might be an alignment issue, or it may be a poor habit that could lead to a sudden injury, such as poor use of the feet in jump landings.

Mental practice has been researched in relation to physical practice. Studies show that physical practice is superior to mental practice, but mental practice is superior to no practice at all. Further, when physical practice is mixed with mental practice, the two combined are almost as useful as physical practice alone. The benefits are that it can be used to avoid physical overuse and fatigue, and some of the work can be done in a small space. One additional problem for injured dancers is the psychological impact of being injured, and mental practice provides a positive opportunity during this stressful period.

## Imagery

Mental imagery is a psychological activity that brings to mind the physical characteristics of an absent object or event. External imagery suggests that the dancer is like an outside third person and sees the movement as if viewing a self-video. Internal imagery suggests that the dancer uses the perspective of being inside the body and experiences the sensations as if doing the movement. Three aspects that make images useful are: how vivid the image is, how easy it is for the person to use the image, and how precise or accurate the image is. There are several ways to categorize images. First, they can be defined by the sensory mode used to experience the image, visual or kinesthetic. Visual imagery is a representation of concrete objects, events, or movements as experienced through vision. Kinesthetic imagery is a representation of concrete objects, events, or movements as experienced through tactile sensation. A second category relates to direct and indirect imagery. Direct imagery is a nonverbal expression of the actual movement. Indirect imagery, also called metaphoric imagery, is a representation of the movement that is not literal, instead using a figure or likeness, as in Figure 12. Third, images can be defined based on their spatial orientation. Lines-of-movement imagery uses a specific direction required in the relative positions of body parts. Global imagery involves images that create an overall state or feeling sense. Finally, anatomical imagery uses specific anatomical terms, but it is presented as a metaphor.

Imagery is not useful if the dancers have never actually performed the skill, unless it is combined

**Figure 12. Dancer using an image of waves to support balance.**  
Photo by Jake Pett





with observation. In other words, dancers can use imagery if they are watching the teacher or another student demonstrate the material, and they can use imagery for a skill with which they are already familiar. However, it is not useful to ask dancers to use imagery with an untried skill that they are not observing at the moment of imaging.

Imagery has been used in dance for centuries, and it has been documented since the early 1900s. Its traditional role has been to improve the quality of movement and to enhance artistry and expressiveness. The use of imagery in dance from a motor learning perspective is relatively new, and began for dancers in the somatic practices, such as the work of Irmgard Bartenieff, Mabel Todd, Lulu Sweigard, Moshe Feldenkrais, and Frederick Matthias Alexander. It has become increasingly common for dance teachers to use various types of images in dance classes, including visual, kinesthetic, direct, and indirect imagery, and often gleaned from the somatic practices. This use of imagery is thought to have multiple benefits, which include: enhancing learning skills, improving memory of dance sequences and choreography, adding creative inspirational sources, clarifying movement intention, and integrating the body and the mind. Teachers claim that imagery is beneficial in teaching good alignment to dancers. They state that the use of imagery works at a nonconscious level to enable muscular changes, which enhances alignment through movement re-education.

## Conclusion

Motor learning is a major component of every human's life. In dance, motor learning describes how dancers learn both basic and complex skills. It involves acquiring skills so that they are executed with smoothness, expressivity, coordination, and accuracy, and so that they are retained in the dancer's memory.

This paper began with an examination of the various theories of motor learning, and looked at diverse learning styles. It then analyzed instructional strategies, including demonstration, verbal instructions, augmented feedback, and conditions of practice. Next, the paper explored motivation and motivational methods, followed by memory and types of learning. It concluded with a discussion of mental practice and imagery. By understanding motor learning, teachers and dancers can develop better strategies to create effective dance practice.

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