List of references and abstracts from which today’s articles were ultimately chosen:

CINAHL - Cumulative Index to Nursing & Allied Health Literature

#1.

ABSTRACT:
This article presents a model to guide activity-focused physical therapy and occupational therapy interventions for children with neurological conditions. Activity-focused interventions involve structured practice and repetition of functional actions and are directed toward the learning of motor tasks that will increase independence and participation in daily routines. According to this model, the pediatric therapist: (1) develops activity-related goals in collaboration with the child and the family; (2) plans activity focused interventions by adapting knowledge of motor learning to the child’s individual learning strengths and needs; and (3) integrates impairment focused intervention with activity-focused intervention.

#2.

ABSTRACT:
PURPOSE:: Current technology allows the recording of movement for both motion analysis and providing observational feedback. The most effective type of observational feedback is under debate. We compared a child’s reach-and-point performance after viewing a videotaped playback of a model’s performance and after viewing a split-screen comparison of the model’s and child’s performances while simultaneously receiving verbal cues.
METHODS:: A PTVision system provided observational feedback and recorded spatial trajectory, target accuracy, movement time, and joint angles while a 13 year-old boy with cerebral palsy reached for three targets.
RESULTS:: The split-screen comparison had the largest effect on reach performance, including slower-yet-more-accurate movements and a more extended wrist, curved spatial trajectories, and an ulnar-deviated wrist.
CONCLUSIONS:: Feedback using split-screen comparison between a model’s and the child’s performance with verbal cues appears to promote motor learning. When using technology to augment therapy, the intervention should be designed considering current motor learning principles.

#3.

ABSTRACT:
The purpose of this experiment was to assess whether learning an action through observation is enhanced by the intention to reproduce the observed behaviour. Two groups of participants observed a model practise a timing task and performed a 24-hour delayed retention test. Participants in the first group of observers were explicitly instructed that they would be required to execute the timing task that they had observed as accurately as possible during the delayed retention test. Observers in the second group were instructed that they would be required to describe as accurately as possible the behaviour that they had observed. A control group of participants, who did not observe the model, was also administered the delayed retention test. The results of the retention test indicated that absolute timing (parameterization) was learned by the observers to the same extent with or without
intention to reproduce the task. Indeed, on the retention test absolute timing for the two groups of observers was as effective as that for the models. However, observing with an intention to reproduce the task was beneficial for learning the movement’s relative timing structure. Results are discussed with respect to a potential mechanism by which intention enhances observation.

#4.

ABSTRACT:
Purpose: The purpose of this research was to examine the effects of presenting augmented information to children with cerebral palsy during practice of a novel motor skill.
Methods: Single-subject designs with nonconcurrent baselines were used to study improvements in performance. Thirteen children with cerebral palsy were randomly assigned to one of three practice protocols and performed 36 ten-second trials to learn to move a Pedalo, a therapeutic exercise vehicle, backward. Each protocol involved a variable mix of practice under the following conditions: no augmented information, knowledge of performance, and knowledge of performance enhanced by a cognitive strategy. Performance was measured by changes in backward displacement (cm) of the Pedal across trials.
Results: All 13 subjects demonstrated improvement in performance across phases. However, only eight subjects (62%) demonstrated a significant improvement in performance when the baseline and retention phases were compared. Of these eight subjects, one demonstrated significant improvement in performance with practice alone, two when provided with knowledge of performance, and five when provided with knowledge of performance and a cognitive strategy.
Conclusions: This study suggests that children with cerebral palsy benefit greatly from practice of motor tasks and that some of these children may benefit from the use of cognitive strategies to enhance the role of knowledge of performance during practice of motor skills. However, sufficient time is required to successfully integrate the feedback into performance.

#5.

#6.

ABSTRACT:
A motor-learning framework is relevant to the planning of therapy sessions with children with movement disorders. Theoretical and practical consideration needs to be given to the child’s learning stage and priority goal: learning or performance. Following a motor-teaching model, instructional factors related to the therapeutic intervention include: context, motivation and prior knowledge, instructions, modelling, taxonomy and sequencing of tasks, anticipation skills, mental and physical practice, repetition, facilitation-guidance and feedback. Further reflection on motor learning concepts in the selection of appropriate motor-teaching strategies may promote more effective physiotherapy interventions. Therapists are encouraged to document systematically their instructional strategies and the outcome on the children’s motor learning.

ABSTRACT:
Coincident timing by children was measured under conditions of knowledge of results (KR) on every trial KR (n = 17), random KR (n = 17), and fading KR (n = 17). Following acquisition trials, groups performed retention trials one week later with no KR. Absolute constant error and variable error were analyzed by a multivariate repeated-measures analyses of variance. Although no statistically significant differences were found in learning across groups, the use of fading KR and random KR may more clearly approximate true learning conditions. Since there was no significant decrease in performance with subjects in the Random KR group and a slight improvement in performance with the subjects in the Fading KR group from late performance to retention, these techniques may be more advantageous for teachers, coaches, and therapists to use in indigenous teaching or clinical settings.


ABSTRACT:
The role of upper extremity kinesthetic stimulation in motor learning and performance of a gross motor task was investigated. Twenty-seven children with and twenty-seven children without sensory integration (SI) problems (aged 5 to 7 years old) were required to learn a gross motor task. The children were randomly assigned to one of two training groups, the upper extremity (UE) weight bearing and the lower extremity (LE) weight bearing groups. Results indicated that during the acquisition and retention phases the UE group performed the task better than the LE group. The difference between the children with and those without SI problems was also significant. These results seem to reinforce the use and importance of kinesthetic stimulation for the acquisition of motor skills by children with SI problems.


ABSTRACT:
Visual demonstrations have long been regarded as a critical instructional method for children’s motor skill and social-emotional development. Despite their widespread importance, skill demonstrations have often been characterized by a failure to consider age related differences in children’s cognitive and physical abilities. Similarly, the potential psychological effects of modeling on children’s behaviors in the psychosocial domain have rarely been discussed. Thus the purpose of this paper is to review theoretical and research perspectives from the motor behavior and psychology literatures about developmental and psychological factors associated with children’s modeling of motor skills. Specifically, this paper will emphasize (a) how children perceive characteristics of a visual demonstration, (b) how they translate perceptions to actions that attempt to match the skill demonstration, and (c) how observational learning can be used to enhance self-confidence and motivation in youth. Practical implications for maximizing motor skill and psychosocial development in children are addressed in each section of the paper.

ABSTRACT:
The nature of repetition and its contribution to the acquisition of motor skills in neurologically healthy subjects are examined in this article. We argue that cognitive processing is a key component of practice, which is undermined by repetitive performances. The effects on motor learning of contextual interference, knowledge-of-results delivery schedules, and observation of models are examined, with particular reference to the nature of practice. The role of repetition in learning with respect to physical therapy is also discussed.


ABSTRACT:
Relevant to this special series on movement science, a brief overview of research in the field of motor learning is provided. A distinction between learning and performance is emphasized with respect to experimental design and the evaluation of laboratory and clinical intervention techniques. Intrinsic and extrinsic feedback are defined. Basic principles of motor learning pertaining to the use of augmented feedback or knowledge of results (KR) are reviewed. Particular emphasis is placed on recent research regarding the effects of selected KR variations (KR relative frequency, bandwidth KR, and KR delay) on motor performance and learning in healthy young adults. Results are discussed in terms of short-lasting temporary performance effects and relatively long-lasting learning effects. Theoretical and practical implications from this research are discussed. It is suggested that it is appropriate to use the principles obtained through laboratory experimentation as guidelines rather than as exact recommendations when applying basic research findings to clinical practice.


ABSTRACT:
The purpose of this article is to provide a framework for understanding motor skill and the process by which it is acquired. A selective historical overview is presented to demonstrate how the study of movement is a necessary preliminary to the study of motor skill learning. The phenomenon of skill is explored as an inherent feature of goal-directed organisms whose effective functioning depends on achieving a degree of competence in solving problems that are encountered in the everyday world. The relationship between problems and solutions is discussed. Movement is examined as a problem-solving tool and as the means by which the individual expresses skill. Factors that influence the individual’s level of skill are fully explored, along with the implications for functional behavior. The creative use of resources in problem solving is thoroughly examined, and tasks are discussed in terms of the demands imposed on the individual.
ABSTRACT:
In this article we discuss the results of a motor intervention study that we conducted with young children with Down syndrome and other disabilities (Mahoney, Robinson & Fewell, 2001). Results from this study indicated that neither of the two major treatment models that are commonly used with young children with motor impairments was effective at enhancing children’s rate of motor development or quality of movement. These findings add to an increasing body of literature indicating that early motor intervention procedures are not adequately meeting the goals envisioned for this endeavour. We argue that there are at least two interrelated reasons why this may be occurring. The first is that parents, who are the people with the greatest opportunities to promote children’s motor learning, are not being asked to become active participants in their children’s motor intervention. The second is that contemporary models of motor intervention have been focusing on motor learning activities that are incompatible with contemporary theories and research on early motor learning.

ABSTRACT:
The purpose of this study was to investigate the effect of high versus low frequency knowledge of results (KR) in a group of 16 individuals with developmental delay and in gender and age-matched average individuals learning a motor skill on a laptop computer. Participants were randomly assigned to either a 100% KR or a 50% KR group. KR was provided during the acquisition phase according to group assignment as participants learned the motor skill, whereas no KR was provided during the retention phase. Results indicated both populations who received 50% KR in the acquisition phase demonstrated better performance in the retention phase than those who received 100% KR. The results of this study suggest that, as has been found in the average population, feedback that is too frequent can interfere with learning and retention of tasks for individuals with developmental disabilities (DD). Limitations involved the small sample size along with the task potentially being artificial in nature. Future research is needed to study further the effects of frequency of KR on skill acquisition, particularly in instrumental activities of daily living in this population.

ABSTRACT:
The effectiveness of learning strategies, e.g., the Five-step Approach, has been examined extensively under well-controlled laboratory conditions in the motor learning and physical education literature. This study examined the application of the Five-step Approach as an instructional technique in field settings. Two experiments were conducted in which a similar strategy was used in school settings. In Exp. 1, 40 third-grade children were randomly assigned to two groups, one to whom the Five-step’ Approach was explained (readying, imaging, focusing-attention, executing and evaluating), and a Control (Nonstrategy). Both then performed an activity similar to bowling. In Exp. 2, 33 seventh-grade children were assigned to the same learning conditions but performed a team-handball throwing task. Accuracy of performance was measured as a dependent variable in both experiments. Analysis of variance with repeated measures on the second factor indicated high values of accuracy for the Five-step Approach group in Exps. 1 and 2 compared with the Nonstrategy group. It was
concluded that the Five-step Approach can enhance performance on motor tasks not only in laboratory settings but also in real world environments such as physical education classes. Physical educators might consider the use of task-pertinent learning strategies during their practical work.

**PSYCHinfo**

#18.  

**ABSTRACT:**  
Determined whether the effectiveness of variable practice within a class of movements is influenced by the structure of the variable practice session. 88 children (mean age 11.3 yrs) were tested on a throwing task. Three groups of Ss practiced under variable conditions that differed with regard to contextual interference and sequential organization of task variations; another group received constant throwing practice. Following practice trials with knowledge of results, the 4 groups and a control group without prior practice were required to produce and evaluate a novel response without vision and knowledge of results. Compared with constant practice, variable practice, in general, enhanced performance of a novel movement variation; this corroborates the variability-of-practice hypothesis of R. A. Schmidt’s (see record 1975-26710-001) schema theory of motor learning. (PsycINFO Database Record (c) 2007 APA, all rights reserved)

#19.  

**ABSTRACT:**  
This study examined whether children with hemiplegic cerebral palsy (CP) have anticipatory control of fingertip forces during lifts of familiar objects, and what type of practice (blocked or random) best enhances the retention of anticipatory control during lifts of novel objects. Eighteechildren with hemiplegic CP (7 females, 11 males; 7 to 14 years of age, mean age 10 years, SD 1.8) and 18 age-matched typically developing children (8 males, 10 females; mean age 10.4 years, SD 1.7) participated in the study. In the first experiment the children lifted familiar objects of various weights and sizes five times each, while the vertical lifting (load) force was measured. Most participants demonstrated higher rates of load force increase for heavier (and larger) objects already during the first lift, indicating anticipatory control. Furthermore, the load force rates generally were similar across the five lifts for each object, suggesting that they had stable representations of the objects’ properties. In the second experiment children lifted three novel objects varying in weight (but identical in volume) 27 times each, in either a blocked or a random order, followed by nineimmediate and nine delayed (24 hours) retention trials. Blocked practice resulted in greater differentiation of the force rates between objects during acquisition than did random practice. Both practice schedules resulted in similar retention. These findings suggest that children with hemiplegic CP have a priori internal representations used for anticipatory force scaling with familiar objects. Furthermore, the results indicate that these children can form and retain internal representations of novel objects for anticipatory control, irrespective of the type of practice schedule employed. Thus, clinically based practice sessions that incorporate lifts with novel objects may enhance anticipatory force scaling and related prehensile function in children with hemiplegic CP.
ABSTRACT:
In this study, the motor teaching principles taxonomy (MTPT) was developed to investigate which teaching principles physiotherapists use to treat children with developmental coordination disorder during Neuromotor Task Training (NTT). In NTT, special attention is paid to the best ways to instruct and provide feedback. Based on motor learning theory and video observations of NTT treatments, teaching principles aimed at improving motor learning were categorised into three categories: giving instruction, providing or asking feedback, and sharing knowledge. The MTPT’s reliability and validity were satisfactory. Therapists gave instructions very frequently. In addition, the principle frequency showed hardly any correlation with the children’s initial motor performance level, indicating that the principles used are not related to the child’s entry level.

ABSTRACT:
Examined active and passive verbalization methods of learning gymnastic floor exercises and routines in 3 groups of 5-7 yr old kindergarten students in physical education class in Budapest. 20 children learned gymnastic exercises and floor routines by the active verbalization method, 20 children learned with the passive verbalization method, and 40 control children learned with the regular method of physical exercise. The passive verbalization method involved listening to a song along with the routines; the active verbalization method involved learning a song, then chanting the lyrics during the exercises. Learning was practiced 1 hr a week for 2 mo. Results show that the active verbalization group had significantly better success in motor exercise learning than the passive verbalization and control groups. The level of motor abilities did not affect the quality of learning gymnastic routines.

ABSTRACT:
Investigated the effectiveness of parental involvement on the acquisition of object-control skills of preschool children who are at risk for 15; aged = developmental delay or academic failure. The experimental group (n 41-50 mo) participated in an 8-wk motor skill intervention program consisting of 2 45-min lessons per week delivered by the children’s parents. The control group (n participated in the regular motor skill program, which consisted of movement songs delivered by the parents. All children were pretested and posttested on the object-control subscale of the Test of Gross Motor Development. Both groups performed in the lower 20th percentile on the pretest. Data indicate that the experimental group improved significantly in
the object-control subscale score from pretest to posttest, whereas the control group did not change. Results provide support for including parents in the instructional process of children who are at risk for developmental delay or academic failure.

#25.

ABSTRACT:
Two studies examined the level of development of the over arm’ throw in children of selected primary schools. The 1st study examined (S. O’Keeffe (see record) investigated the level of development of the ’over-arm’ throw among 145 4-6 and 11-13 yr olds. Lack of development of the throw was assessed in 5 components, with each component having its own rate of development and each with an identifiable number of developmental stages. Exp 2 (P. J Smythe et al, in preparation) was conducted with 28 6-yr-olds. In 1 condition, Ss received demonstrations, teaching and feedback as in the 1st study reported. In the 2nd condition, Ss (after receiving initial demonstrations) were free to practice the throwing action with the same equipment available to them as the taught group but without any teaching or feedback. Results show that these studies of throwing development are consistent with the view that children in Irish primary schools are deficient in fundamental motor skills. Findings also show how development can be enhanced by appropriate teaching and practice. The importance of including retention tests in such studies is also highlighted.

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#26.

#27.

ABSTRACT:
This study examined whether children with hemiplegic cerebral palsy (CP) have anticipatory control of fingertip forces during lifts of familiar objects, and what type of practice (blocked or random) best enhances the retention of anticipatory control during lifts of novel objects. Eighteen children with hemiplegic CP (7 females, 11 males; 7 to 14 years of age, mean age 10 years, SD 1.8) and 18 age-matched typically developing children (8 males, 10 females; mean age 10.4 years, SD 1.7) participated in the study. In the first experiment the children lifted familiar objects of various weights and sizes five times each, while the vertical lifting (load) force was measured. Most participants demonstrated higher rates of load force increase for heavier (and larger) objects already during the first lift, indicating anticipatory control. Furthermore, the load force rates generally were similar across the five lifts for each object, suggesting that they had stable representations of the objects’ properties. In the second experiment children lifted three novel objects varying in weight (but identical in volume) 27 times each, in either a blocked or a random order, followed by nine immediate and nine delayed (24 hours) retention trials. Blocked practice resulted in greater differentiation of the force rates between objects during acquisition than did random practice. Both practice schedules resulted in similar retention. These findings suggest that children with hemiplegic CP have a priori internal representations used for anticipatory force scaling with familiar objects. Furthermore, the results indicate that these children can form and retain internal representations of novel objects for anticipatory control, irrespective of the type of practice schedule employed. Thus, clinically based practice
sessions that incorporate lifts with novel objects may enhance anticipatory force scaling and related prehensile function in children with hemiplegic CP.

#28.

ABSTRACT
The purpose of this study was to examine the effect of a summary knowledge of results (KR) feedback schedule (KR after every fifth trial) versus every-trial KR on the acquisition and retention of a golf putting task for individuals with intellectual disabilities. Thirty-two individuals with mild intellectual disabilities were randomly assigned to either a summary or every-trial KR group. Participants performed 50 acquisition trials, 25 one-day retention trials, and 25 one-week retention trials. Participants in the every-trial KR group scored significantly better during acquisition, while the summary KR group performed significantly better for both retention intervals. Because of the absence of an acquisition block effect, results relative to learning must be viewed with caution. Findings partially support the guidance hypothesis.

#30.

ABSTRACT:
The purpose of this study was to examine the effects of different preparatory activities on the improvement of fundamental motor skills of elementary-aged children with learning disabilities and attention deficit disorders. Preparatory activity conditions were used within a true experimental design: No Warm-up (NW), Task Specific Warm-up (TSW), and Mental Preparation (MP). Participants were randomly assigned to experimental and control groups. Selected items from a norm-referenced assessment instrument were scored during videotaped posttest sessions. Test items consisted of functional locomotion and object control skills. Findings indicated that children labeled learning disabled with attention deficits, who participated in NW, TSW, and MP did not differ in catching and running performances. However, participants in the MP group were significantly superior in throwing accuracy as opposed to those in either the TSW or NW groups. The findings support the use of mental preparation as a preparatory activity involving throwing accuracy for children who are learning disabled with attention deficits. Number of References 43.

#31.

ABSTRACT:
The effects of contextual interference on motor skill acquisition and retention were examined in 24 subjects (mean age 13.9 years) with mild mental retardation and 24 chronologically age-matched subjects (mean age 13.11 years) with no disabilities. Subjects from each group were assigned randomly to either a blocked or a random practice schedule. All subjects performed 15 practice trials for each of three different beanbag throwing tasks, 45 trials total. Following a 10-min filled retention interval, 2 trials of each throw (6 total) were performed in a random order by all subjects. Accuracy scores were measured as absolute error from the target. The data revealed a significant interaction between ability groups and practice schedule. Post hoc analyses revealed that the retention scores of the mildly mentally handicapped subjects practicing under blocked conditions were significantly less accurate than scores of any of the other three acquisition groups. Significant effects in variable
error retention scores indicated that subjects in the random practice condition performed more consistently than subjects in the blocked condition.

#32.

ABSTRACT:
The purpose of this study was to determine the effect of modeling strategies on the acquisition, retention, and transfer of a novel motor task. Forty males and 40 females, divided equally between two age groups (9.0 to 10.6 and 18.0 to 45.0 years), were randomly assigned within each age group to visual model (control), visual model plus cues, visual model plus verbal rehearsal, or visual model, verbal rehearsal plus cues conditions. The task consisted of juggling three nylon scarves during acquisition and retention and three bean bags during transfer. A 4 x 2 (Model Type x Age) MANOVA revealed a significant age by model type interaction. For acquisition, children in the visual model plus verbal rehearsal condition and visual model, verbal rehearsal plus cues condition performed significantly better than children in the visual model only or visual model plus cues groups. Adults performed equally well during acquisition under any of the model type conditions. The retention data indicated that the adults’ performance in the visual model plus cues condition was superior to all other model types; for children there were no differences between the four model type conditions. Results for transfer performance revealed only a main effect for age, with adults performing better at transfer than children. These results support previous research that suggests that effective modeling conditions are related to the cognitive-developmental level of the learner.

#33.

ABSTRACT:
This investigation examined the effects of eight sessions of intensive teaching of motor tasks on children with poor coordination. The 24 children, aged 5 to 9 years, were grouped by age and assigned to 1 of 10 teachers. These teachers were then randomly assigned to either Task Treatment Group 1 (TTG1) to teach both the overarm throw and hopping to their allocated children or Task Treatment Group 2 (TTG2) to teach target kicking and the volleyball bounce and catch. Each group acted as the other group’s control. Repeated measures ANOVA of pretest-posttest scores showed that intensive teaching of the overarm throw, target kicking, and the bounce-and-catch task resulted in significant gains for the respective groups.

#34.
Sanz, M. T. and Menendez, F. J. (1992). Early Motor Training in Down’s Syndrome Babies: Results of an Intervention Program.

ABSTRACT:
This study examined whether infants with Down syndrome (N=32) undergoing early motor training would benefit from their parents observing a clinician implement an intervention program with their child. Parents of half the children remained in the room while the clinician implemented motor stimulation techniques, while parents of the other half were given detailed explicit instructions on carrying out the training objectives at home. Results of infant motor evaluations at ages 6, 12, 18, and 24 months found significant differences in favor of those whose parents underwent training by modelling rather than by direct instruction. A secondary finding was that subjects who began motor training earlier attained higher motor developmental quotients.
**ABSTRACT:**
This study examined the effects of model type and verbal rehearsal strategy in relation to motor sequencing of boys with learning disabilities (LD). Eighty boys, ages 7 and 8 years, were exposed to four experimental conditions in a 2 x 2 (Model x Verbal Rehearsal Strategy) design. Subjects were randomly assigned to one of four groups: (a) visual-silent model/verbal rehearsal, (b) visual-verbal model/verbal rehearsal, (c) visual-silent model/no verbal rehearsal, and (d) visual-verbal model/no verbal rehearsal. The four groups were statistically equal on measures of age, IQ, behavior, learner modality preference, and motor proficiency. Data collected for experimental analysis were generated by the Motor Sequencing Test which measured the ability to model seven locomotor tasks in the correct order. Results revealed that the boys with LD performed significantly better on the motor sequencing test when trained in verbal rehearsal strategy. However, results indicated no significant difference in motor sequencing under visual-silent and visual-verbal model conditions.

**ABSTRACT:**
This study reinvestigated and extended the findings of Landers and Landers (1973), which examined the influence of skilled and unskilled teacher and peer models on motor performance. Sixth grade females (N = 100) were randomly assigned to groups in a 2 x 2 (Model Type x Model Skill) factorial design or to a no-model group. In the treatment groups, subjects observed one of four unfamiliar models—(a) a skilled teacher, (b) an unskilled teacher, (c) a skilled peer, or (d) an unskilled peer—perform on the Bachman ladder task. Subjects performed 30 trials of the task and also completed self-efficacy questionnaires on three occasions. Results showed that subjects who watched a skilled model performed better than subjects who watched an unskilled model. Unlike the Landers and Landers study, no model type by model skill interaction was found. In addition, the skilled model group reported higher efficacy beliefs than the control group after performing and were more efficacious than the unskilled model subjects both after watching the model and after performing. These results suggest when students view unfamiliar models, the skill rather than the status of the model may be more salient.