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Quantifying Instructional Interventions in Pediatric Physical Therapy with the Motor Teaching Strategies Coding Instrument (MTSCI-1): A Pilot Study

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Abstract
Purpose: This paper presents the development and preliminary psychomotor testing of a new instrument, the Motor Teaching Strategies Coding Instrument (MTSCI-1), designed to quantitatively assess motor-teaching strategies used by physical therapists during therapeutic interventions with children. Method: The MTSCI-1 was developed to evaluate the use of strategies grounded in motor learning theories and concepts. The items were generated from a review of the literature. To evaluate reliability, two physical therapists used the MTSCI-1 to code videotaped treatment sessions of pediatric physical therapists. Kappa was calculated. Validation was examined by comparing scores of physical therapists with different years of experience. Results: The resulting instrument had two main sections: (a) task/movement characteristics, and (b) before-, during- and after-task strategies. Each activity trial was analyzed and frequency of strategies used was determined. Percentage of agreement and preliminary inter- and intra-rater reliability (κ=.66-.94) as well as content and construct validation were established. The instrument differentiated the use of some strategies among groups of physical therapists with varied years of experience. Conclusions: The MTSCI-1 may be considered in research studies to document the motor-teaching strategies of physical therapists. The MTSCI-1 may also facilitate the learning and training of therapists from various fields in the application of motor learning to maximize clients' outcomes from their motor-teaching activities.

Introduction

Instructing children to learn and relearn motor activities is an essential and fundamental part of physical therapy interventions. To select appropriate instructional strategies and achieve desired outcomes, pediatric physical therapists are expected to be knowledgeable in many diverse domains including the area of motor learning.[1] Over the past three decades, scientific knowledge about motor learning strategies and related theoretical foundations has emerged and challenged the traditional framework of therapeutic intervention.[2-4] In 1999, in a survey conducted to determine the extent of knowledge about recent theories, pediatric physical therapists indicated their awareness of recent theories, but expressed their need for additional information to apply the theories.[5] In 2005, a group of American pediatric physical therapists who participated in focus groups indicated that they were using motor learning strategies, among other strategies, in their direct intervention with children with spastic diplegia. However, the author noted that the discussions "did not highlight specific details of what occurs during physical therapy intervention sessions."[6] In the Netherlands, Berendsen and collaborators mentioned that rehabilitation professionals hardly used the concept of motor learning in their interventions.[7] Established motor learning theories and strategies relate to: i) context, ii) prior knowledge, iii) selective attention, iv) purposeful tasks, v) physical practice, vi) feedback, and vii) repetition.[4,8-11] Physical therapists continue to be strongly encouraged, or required, to systematically reflect on their own teaching style and to gain further awareness of their instructional motor learning strategies in a comprehensive and practical manner.[12,13]

Models/frameworks have been proposed to physical therapists to guide the application of the theories, but a practical instrument has not yet been available to assist physical therapists to reflect on the motor learning strategies used during their direct interventions.[14-16]

In the literature, motor learning strategies have been addressed from the contextual, physical, and verbal perspectives. They have evolved from various theories -- the behavioral, cognitive, motor behavior and environmental theories among others.[4,14] Initially, some authors have suggested that insufficient use of motor learning strategies, particularly with individuals with neuromotor dysfunctions, leads to less effective therapeutic interventions. Some of the inadequate strategies mentioned included limited amount of practice in natural environments (i.e., out-of-context or solitary), minimal duration and intensity of motor activities and inadequate use of type and time of feedback.[2,17-19] More recently, in some specific populations of children with disability, researchers have found that the selective use of a particular motor learning strategy, such as natural context, repetition/fatigue, purposeful tasks, sufficient learning time, guidance, or feedback, can have an impact on the treatment outcomes.[20-26] Physical therapists' use of motor learning strategies may therefore promote or impair motor learning and motor performance of children.

Investigations of pediatric physical therapists' behaviors are scarce. Carter studied the interactive behaviors between physical therapists and children with cerebral palsy during videotaped treatment sessions, using a real-time, multiple entry data coding system based on a system by Repp and collaborators.[27,28] Embrey and Hilton explored, through retrospective think-aloud procedures while viewing videotapes of treatment sessions, the process of physical therapists' intervention with children with diplegia, and described cognitive schemata called movement scripts.[29] The tools used by these authors provided an open exploration of therapists' behaviors but did not focus on the particular framework of motor learning. To date, a comprehensive tool based on motor-learning concepts has yet to be developed to yield a systematic analysis of the use of instructional motor learning strategies.

In the current busy clinical environment, clinicians would benefit from a concrete means to support and guide their 'reflection-on-action' (thinking back and discussing their treatment sessions – in whole or in part), from a motor learning perspective, an essential means towards becoming a reflective practitioner according to Schön.[30] Educators who need to incorporate the motor learning framework in their curriculum in a systematic and continuous manner would also find useful a tool to evaluate students' progress in this domain in a comprehensive manner. Finally, in studies of therapists' use of motor learning strategies, researchers require a valid and exhaustive tool. Hence, there is a need for the development of a standardized method for documenting therapists' instructional behaviors.

The purpose of this paper is to describe the development and initial psychomotor testing of a new instrument, the Motor Teaching Strategies Coding Instrument (MTSCI-1), to identify and investigate motor-learning strategies used by pediatric physical therapists.

Method

The methodology used to develop the MTSCI-1 was adapted from Guyatt and collaborators and included identification of the pediatric physical therapists as population of interest, item generation and reduction, and determination of reliability and validation.[31]

Item Generation and Reduction

The item generation for the motor teaching strategies included in the MTSCI-1 were gathered in six main steps. The first step included a review of the literature on proposed motor-teaching models, particularly those of Gentile and Schmidt , and recommendations made by different bodies of literature addressing motor learning and motor control such as Lister, Shumway-Cook and Wollacott, and Schmidt.[4,32-35] The second step was a review of previous tools used to investigate therapists and physical educators' behaviors.[29,36,37] The third step comprised a compilation of all items gathered from the previous steps and elimination of repetitive items. In the fourth step, operational definitions were developed for each of the general descriptors and motor-teaching strategies based on the key concepts identified in the literature. The final two steps related to the format and organisation of the items (a) to correspond to the logical order and progressive continuum of activities and strategies that may be used in therapy; (b) to facilitate the administration and coding of the instrument; and (c) to allow a micro-analysis of therapists' verbal and non-verbal behaviors. On a single page, each trial of activity was assigned a separate line (number) on the instrument allowing individual trial analysis. In a series of columns, task/movement characteristics followed by strategies were grouped under three distinct time periods: Before-task, During-Task, and After-Task. Finally, some strategies were assigned under different groups if they were likely to be used, whether appropriate or not.

After the original draft of the MTSCI-1 was developed, as described above, two expert researchers/educators in the field of motor learning, with over 20 years of experience, provided feedback and recommendations. In their revision, they primarily addressed three areas: clarification of definition and choice of terminology for the items, location and grouping of the items on the form, and units of coding

for the items. In addition an experienced neuro-physical therapist provided suggestions with regard to clinical applicability. The terminology and format of the tool were further refined. These expert consultations provided the initial content validation of the MTSCI-1.

The final version of the MTSCI-1 contains 9 columns describing the task/movement characteristics (including the environment) and 30 columns of dichotomous strategies in most instances. Appendix A provides a sample. Examples of operational definitions of the MTSCI-1 items are provided in Appendix B.

The type of task/movement characteristics is important to determine physical therapists' selection of strategies. Therefore, the task/movement characteristics are documented first on the instrument. Passive manoeuvres unrelated to tasks are also noted but are not analyzed. Each active movement-trial is assigned a number (1-8 for stability and 9-16 for transport) based on Gentile's taxonomy of tasks[32] (Table 1). The physical therapist's goal for each task performed or break-period is recorded. And the number, sequencing and duration of repetition of the task during the session are noted.

Table 1. Taxonomy of Tasks & Assigned Numbers (3rd and 4th column of the MTSCI-1)

	Body Stability		***Body Transport***	
Environmental Context	***No Manipulation***	***Manipulation***	***No Manipulation***	***Manipulation***
Stationary **No intertrial variability**	1. Closed Body stability	2. Closed Body stability Plus Manipulation	9. Closed Body transport	10. Closed Body transport Plus Manipulation
Stationary **Intertrial variability**	3. Variable Motionless Body stability	4. Variable Motionless Body stability Plus Manipulation	11. Variable Motionless Body transport	12. Variable Motionless Body transport Plus Manipulation
Motion **No intertrial variability**	5. Consistent Motion Body stability	6. Consistent Motion Body stability Plus Manipulation	13. Consistent Motion Body transport	14. Consistent Motion Body transport Plus Manipulation
Motion **Intertrial variability**	7. Open Body stability	8. Open Body stability Plus Manipulation	15. Open Body transport	16. Open Body transport Plus Manipulation

Adapted from Gentile, p.115. [32]

A contextual environment that facilitates motor learning should accomplish three effects on the learner: (a) to stimulate, (b) to assist in planning and (c) to promote the execution of the task at hand.[4] The MTSCI-1 was designed to code and measure the environment therapists provide to the children, on each trial of activity, on a scale of 0 to 3 where each of the three effects counts for one point.

The use or non-use of each motor-teaching strategy is coded, i.e., present (X) or absent. The motor teaching strategies of the 'Before-Task' execution include: mental practice, action and/or movement goal setting, verbal and non-verbal cues, demonstration/observational learning, and a waiting period with or without interference. 'During-Task' execution, the instrument allows the documentation of independent, self- or externally-initiated tasks through guidance/facilitation, or passive-related-to-a-task. Finally, for the 'After-Task' execution, the type of feedback is noted: qualitative versus quantitative or knowledge of result versus knowledge of performance. The potential outcome/goal of each trial of movement and the need for repetition, explanation, or encouragement (the 'IF' section of the instrument) can then be evaluated according to Gentile's proposition on decision processes: yes/no answers to two questions – Did the child accomplish the goal? Did the child move as planned? – leading to four possible results.[32]

Quantitatively, the information gathered on the MTSCI-1 during a therapy session (part or whole) includes (1) the type, number of repetitions, and duration of activities; (2) the frequency that environmental conditions were promoted; and (3) the type and frequency of therapists' use of strategies.

Preliminary Reliability Testing

To test the inter- and intra-rater reliability of the MTSCI-1, two physical therapists used the tool to evaluate videotapes of pediatric physical therapists treating children. Both therapists, the investigator, and the research assistant had more than twenty years experience as neuro-therapists. The investigator videotaped two clinicians with

different levels of experience during their entire treatment sessions of pre-school children with moderate spastic diplegia. Immediately after the treatment sessions, the investigator carried out stimulated recall interviews in order to minimize the possibility of incorrect interpretation of the intent of the therapeutic intervention. While viewing the videotape of their treatment session, therapists were asked to identify and describe the activities (passive and active) and their goal(s), and to provide comments on the tasks, repetitions, breaks, and goals. These interviews followed a protocol based on the recommendations of Marland and usually lasted between 1 and 1 ½ hours.[38] The sessions were recorded on audiocassettes, transcribed by a typist, and supplemented by handwritten notes. The investigator used the information from the transcripts of these interviews to document the activities and goals on the MTSCI-1 form. Then the investigator and research assistant independently reviewed the videotapes and evaluated/ coded each trial of activity, as previously described.

During a series of training sessions, the evaluators independently practiced coding the motor-teaching strategies by watching sections of the videotaped treatment sessions. After each training session, they discussed and clarified the content and operational definitions of the items on the MTSCI-1 and the discrepancies and problems in interpreting or recording the activities. Four coding-practice sessions of two hours each were required before an acceptable level of agreement was reached for each item on the MTSCI-1. To establish preliminary inter-rater reliability, four videotapes were coded and the level of inter-rater agreement, percentage agreement, was calculated for each item of the MTSCI-1. The percentage of inter-rater agreement was computed dividing the number of agreements by the sum of agreements and disagreements and multiplying by 100. An inter-rater percent agreement at 84% or greater was reached for each item on the MTSCI-1. To correct for chance and obtain an improved percentage of agreement between raters, Cohen's Kappa (κ) values are summarized in Table 2. Values were generally good to excellent based on Fleiss who characterized Kappas of .40 to .60 as fair, .60 to .75 as good, and over .75 as excellent.[39] For the purpose of establishing preliminary, intra-rater agreement, four different videotapes were each coded twice by the two physical therapists, one week apart. An intra-rater agreement of 88% or greater for each item or component of the MTSCI-1 was obtained.

Table 2. Cohen's Kappa Values for Inter-rater Agreement of Item Scoring

MTSCI-1 Items	Values
Non-verbal goal setting	.66
Action goal setting	.69
Movement goal setting	.70
Demonstration	.86
Whole description	.89
Part description	.80
Wait	.70
Independent	.83
Self-initiation	.70
External initiation	.73
Passive-related	.94
Positive feedback	.84
Negative feedback	.68
Quantitative feedback	1.00 (not observed)

Validation

There are no gold standards to measure concurrent validity of the MTSCI-1. Initial content and construct validity came from the theories of motor learning and expert consultations. The instrument is based on the literature's account of motor-teaching models derived from examination of motor-learning theories (a combination of information processing and ecological theories) and provided the underlying foundation that defines the construct of *motor teaching*. In the MTSCI-1, motor teaching is linked to a network of *operationalyzed definitions* that support validity of the construct. The main categories encompass taxonomy, environment, mental practice, goal setting, formulation, execution, and evaluation/ feedback.

A 'known group' method was used to test the construct validity. The MTSCI-1 was expected to differentiate between groups of pediatric physical therapists with differing levels of experience -- therapists with fewer years of neuro-experience would likely use more motor teaching strategies than therapists with more years of neuro-

experience, as the former group had recently learned about motor learning in their professional educational programs. The investigator solicited pediatric physical therapists practicing in twenty treatment centres that were members of a regional association of treatment centres. The therapists met the selected criteria, i.e., actively treating a pre-school child with spastic diplegia who has an interest in pulling-to-stand at furniture and having a 'friendly' relationship. Twenty-one of the 22 eligible therapists from 11 centres agreed to participate. They were divided into four groups according to their years of experience with individuals with neurological impairments: 6 months to 4 years; 5 to 9 years; 10 to 12 years; and 13 years plus. The number of therapists in each group were 6, 4, 5, and 6, respectively. The rationale for this division was based on (a) the period of time since the introduction of motor learning as an integral part of the national core curriculum; (b) Jensen, Shepard, and Hack's use of '13 years or more experience as experienced clinician'; and (c) the interval years of experience of the physical therapists divided into halves with the 9 year mark.[40]

Following the coding of the therapy sessions with the MTSCI-1, an analysis of variance among the four groups of physical therapists (based on their experience level) was performed to determine whether a significant difference in the frequency of use of motor-teaching strategies among the groups was present for some items. Results indicated that pediatric physical therapists used, consciously or not, and at various degrees, motor-teaching strategies based on motor-learning concepts. The instrument was able to detect a significant difference among groups. Therapists with fewer years of experience used significantly more appropriate and effective environmental conditions ($F=5.45$, $p=0.008$), non-verbal behaviors ($F=2.87$, $p=0.067$), assisted movements ($F=5.49$, $p=0.008$), and self-initiated movements ($F=2.33$, $p=0.111$) compared to therapists with more years of experience. The alpha level (α) of .05 was used; the value for self-initiated movements is reported as it indicated a trend. Therapists with fewer years of experience emphasized more play and environmental interaction while therapists with more years of experience tended to increase the child's selective attention to specific tasks through more structured sessions with reduced use of equipment and distractive surroundings. Findings of differences on the extent of use of the motor-teaching strategies among groups of neuro-pediatric physical therapists provided preliminary data to support the construct validity of the MTSCI-1.

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Discussion

The purpose of the current study was to describe the development and initial psychometric testing of the Motor Teaching Strategies Coding Instrument. The MTSCI-1 aimed to capture, operationalize, explore and quantify, in a comprehensive manner, different parameters of motor-teaching based on motor learning, cognitive, behavioral, and environmental theories. Motor teaching strategies refer to environmental, task selection, goal-oriented, physical and cognitive motor learning strategies. The instrument fills a gap in physical therapy. Prior to this study, no instrument was yet available to record and reflect practice patterns of pediatric physical therapists.[17] Previous investigators used tools that addressed only selective aspects of instruction, feedback, or interactive behaviors.[26,27,29,36,37] The initial testing on the reliability and validation of the MTSCI-1 offers support for the instrument as a research tool. The instrument detected a significant difference among the groups of pediatric therapists with varied periods of neuro-experience as regards to their use of some motor-teaching strategies.

The format of the MTSCI-1 is easy and practical; a single page format makes it possible for the observer/coder to use the instrument regardless of the setting where video-recording facility is accessible, e.g., center, home. The language of the instrument is generally clear and self-explanatory, although some terms may be more familiar to the researcher than the therapist. Yet, it is imperative to establish a common language between the practitioners and researchers in order to promote greater diffusion, integration, and utilization of innovations in the motor-learning theories and concepts that continue to challenge the working knowledge of practitioners.[12,13] The MTSCI-1 may act as a translation 'bridge' and provide a platform for an interactive discourse.

The instrument was originally designed as a research tool to investigate entire therapy sessions, and the coding required considerable amount of time. However, practitioners may consider using it as a tool to reflect on their practice – in whole or in part, individually or in groups, with or without videotaped sessions. The instrument may provide them with the information they need to guide themselves in the application of the recent theories and strategies in their direct interventions.[6,7,14,15] Their actions may lead to increased benefits in the children's outcomes.[15,22,25,26] Viewed as an educational instrument, the MTSCI-1 may facilitate the application of motor-teaching strategies in the practical and clinical sessions of professional education and continuing education programs, in a systematic and continuous manner.

The results of this initial study in the development of the MTSCI-1 need to be interpreted with caution. The coding of one treatment session per therapist was assumed to be representative of their pattern of practice. Although this assumption may be challenged, physical therapists indicated it was the case. Further studies with larger and varied samples and with repeated videotaped therapy sessions per therapist need to be carried out. The measurement of percentage agreement with Cohen's

Kappa values obtained within and between two evaluators offers preliminary information on the reliability of coding the MTSCI-1; further studies are needed to provide rigorous data. Furthermore, the ANOVA was based on a small number of subjects in each group of physical therapists with different years of experience. While the MTSCI-1 measures the extent of use of motor-teaching strategies, the instrument does not provide information on the appropriateness of the use or non-use of the strategies by physical therapists. One cannot infer the conscious and purposeful intent of the practitioner. Future studies will be required to investigate these issues.

The MTSCI-1 may discriminate patterns of motor-teaching practice but does not necessarily imply knowledge of related theory. Practitioners' theory-in-use (applied knowledge during a practical session – what one does) has been found to be somewhat different from verbal, espoused-theory (what one says).[30] The instrument represents, nevertheless, behaviors of therapists related to the motor-learning framework. Further support will be needed to validate the theoretical constructs underlying the MTSCI-1. Future hypotheses might relate to the reproducibility of differences among therapists in other settings, with or without a training period in motor teaching/learning, with more or less expertise, or with other client populations. Nevertheless, although not formally asked, physical therapists who participated in the study commented on the positive value of the process of reflecting on their practice.

Conclusion

The need for an instrument to record and quantify physical therapists' strategies related to motor learning theories was addressed. The Motor Teaching Strategies Coding Instrument (MTSCI-1) was introduced as a valid, comprehensive means to measure practitioners' motor-teaching behaviors objectively and to analyze and compare behaviors on an individual basis or among groups of practitioners. The instrument may potentially be used in research, education, and practice.

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APPENDIX A
MOTOR TEACHING STRATEGIES CODING INSTRUMENT (MTSCI-1)

THERAPIST: E. O DATE: Nov.2006 CHILD/AGE: B.K./ 4Y. TIME OF Rx: 49:20 min SHEET #: 2/3

		TASK/MOVEMENT CHARACTERISTICS									BEFORE TASK															DURING TASK							AFTER TASK								IF			
			TAXON-OMY OF TASKS						ENVIRONMENT			VERBAL INSTRUCT. IN MENTAL PRACTICE		GOAL SETTING			FORMULATION										EXECUTION							EVALUATION/DECISION-MAKING										
																											FEEDBACK							FEEDBACK										
																											TACT/PROPRIO. PHYSICAL GUIDANCE			OTHER				VERBAL										
															VERBAL		SELECTIVE ATTENTION						INTERNAL								VERBAL												
																		VERBAL CUES					INTER-											QUALITATIVE		QUANTITATIVE								
																		DESCRIP.		GEN. REINF.			FERENCE			ASSISTED																		
LINE #	PASSIVE UNRELATED TO TASK		STABILITY / HOLD	TRANSPORT / TRANSITION	THERAPIST'S GOAL	THERAPIST ACTIVITY OR BREAK	TIME m:s	# REPETITION OR DURATION m:s	STIMULATING	PLANNING	EXECUTION	STATE	MOVEMENT	NON VERBAL	ACTION GOAL	MOVEMENT GOAL	DEMO WITH VERBAL CUES	WHOLE	PART	POSITIVE	NEGATIVE	WAIT	ACTION	VERBAL	INDEPENDENT	SELF INITIATED	EXT INITIATED	PASSIVE RELATED	QUALITATIVE	QUANTITAIVE	NON VERBAL	POSITIVE	NEGATIVE	GENENVIR GOAL	DIRECTION	DISTANCE/MAGNITUDE	NON VERBAL	SUCCESS	NO GOAL	SURPRISE GOAL	NO SUCCESS
	X		1-8	9-16		DESCRIP.			1-3			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
1			2		Stand, not lean	Standing	19:40	(1:10)	X	X	X					X			X			X			X								X									
2				9	Dissociate L.E.	Down 1/2 kn	20:50	7	X	X	X				X	X			X			X			X								X									
3			-	-	Break	Sit on floor	21:20	(:10)		-																																	
4				9	Dissociate L.E.	Stand up 1/2 kn	21:30	6	x		x					X			X			X					X							X									
5				10	Tolerance	Stand & reach	21:50	2	x	x	x			X	X	X			X			X		X		X						X									
6			2		Stand, not lean	Standing	22:10	(:40)	x	x						X										X						X									
7				10	Balance	Stand &reach	22:50	3	x	x	x			X	X	X		X				X				X						X			X						
8			2		Stand, not lean	Standing	23:15	(:35)	x	x	x			X					X			X		X		X														
9				9	Dissociate L.E.	Down 1/2 kn	23:50	8	x	x	x			X	X	X			X			X				X						X									
10			-	-	Break	Sitting	24:15	(:35)		-																																	
11				9	Dissociate L.E.	Stand up 1/2 kn	24:50	7	x		x			X		X			X			X						X						X									
12			1		Stand, not lean	Standing	25:15	(:25)	x	x	x			X												X																
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Scale: 0-3 The x indicates strategies used

APPENDIX B

Examples of Operational Definitions Used in the MTSCI-1

Taxonomy of Tasks.

Stability/ Hold: Tasks that require stabilizing the body with or without manipulation (number 1 to 8).

Transport/ Transition: Tasks that require transporting the body in space with or without manipulation (number 9 to 16).

Repetition. Number of identified trials for a similar activity throughout the entire session, as identified by therapist.

Environment. Before, during, and after a motor activity (task), three aspects of the therapist' behavior-in-context are examined based on the child's response. Is the therapist (a) stimulating the child's interest for the task; (b) promoting the child's planning of the task; and (c) fostering the child's execution of the task. Factors considered in scoring the environment included the therapist's use of the room, equipment, and toys to enhance these behaviors.

Verbal Goal Setting.

Action Goal: Verbal presentation of a functional, environmentally interactive, purposeful, and relevant goal to the child, e.g., "Let's go shut the door," "Let's go pick up the doll."

Movement Goal: Verbal presentation of a movement-oriented (or part of a movement) goal which may or may not be related to a functional context, e.g., "Stretch your elbow all the way…," "Stand up."

Verbal Cues. Verbal information presented to the child about the whole movement or part of the movement necessary for the task, e.g., "Let's walk up tall," "Lift up your foot," "Keep your back straight."

Wait. Period of time (of varied duration) following verbal or non-verbal instructions when the therapist 'obviously' waits for the child's action or reaction.

Self-Initiated Task. A movement, initiated by the child, which may or may not require assistance in the execution and/or the termination of the movement.

Passive, Related-to-Movement Task. A movement performed solely by the therapist for the child but which produce the movement (in part or whole) necessary for the child learning of the task at-hand.

Qualitative Feedback.

Positive reinforcement: Affirmative or approving comments intended to reinforce the child's general behavior, e.g., "Good girl," "Great!"

Negative Reinforcement: Disapproving or critical comments intended to modify the child's general behavior, e.g., "No, no, not like that," "Oh, you can do better than that!"

Quantitative Feedback.

General Feedback: Non-specific comments relating to the environmental goal or task completed (referred to as Knowledge of Result – KR), e.g., "You pushed the toy in the box," "You are sitting up."

Direction or Distance/ Magnitude Feedback: Specific comments pertaining to the orientation or magnitude of the child's movement that is related to the task at-hand or completed (referred to as Knowledge of Performance – KP), e.g., "Two more steps sideways," "Three more fingers to touch," "Nice straight back."