CHAPTER 5

Phase Four: Pilot Study Three

5.1 INTRODUCTION

Using the measurement model developed in the previous pilot studies, the following research sub-questions directed the investigations in this fourth phase of the research:

i) "What is the change in children's functional performance in targeted daily living tasks immediately following NDT and at a follow-up period"?

ii) "What were the parent and therapist perceptions of goal outcomes and related NDT intervention?"

The first aim of Pilot Study Three was to incorporate and further refine the previously piloted outcome measures and filming protocol to investigate changes in occupational performance of 12 children with cerebral palsy (CP), immediately following intensive Neuro-Developmental Treatment (NDT), and at a follow up period. The pilot study utilized data that were collected during intensive periods of NDT, administered to the children during the treatment practicums of a Neuro-Developmental Treatment Association (NDTA$^{TM)}$ certificate course held at Deakin University, Geelong. The second aim was to investigate how the parents, children and therapists perceived their experiences during the NDT intervention.

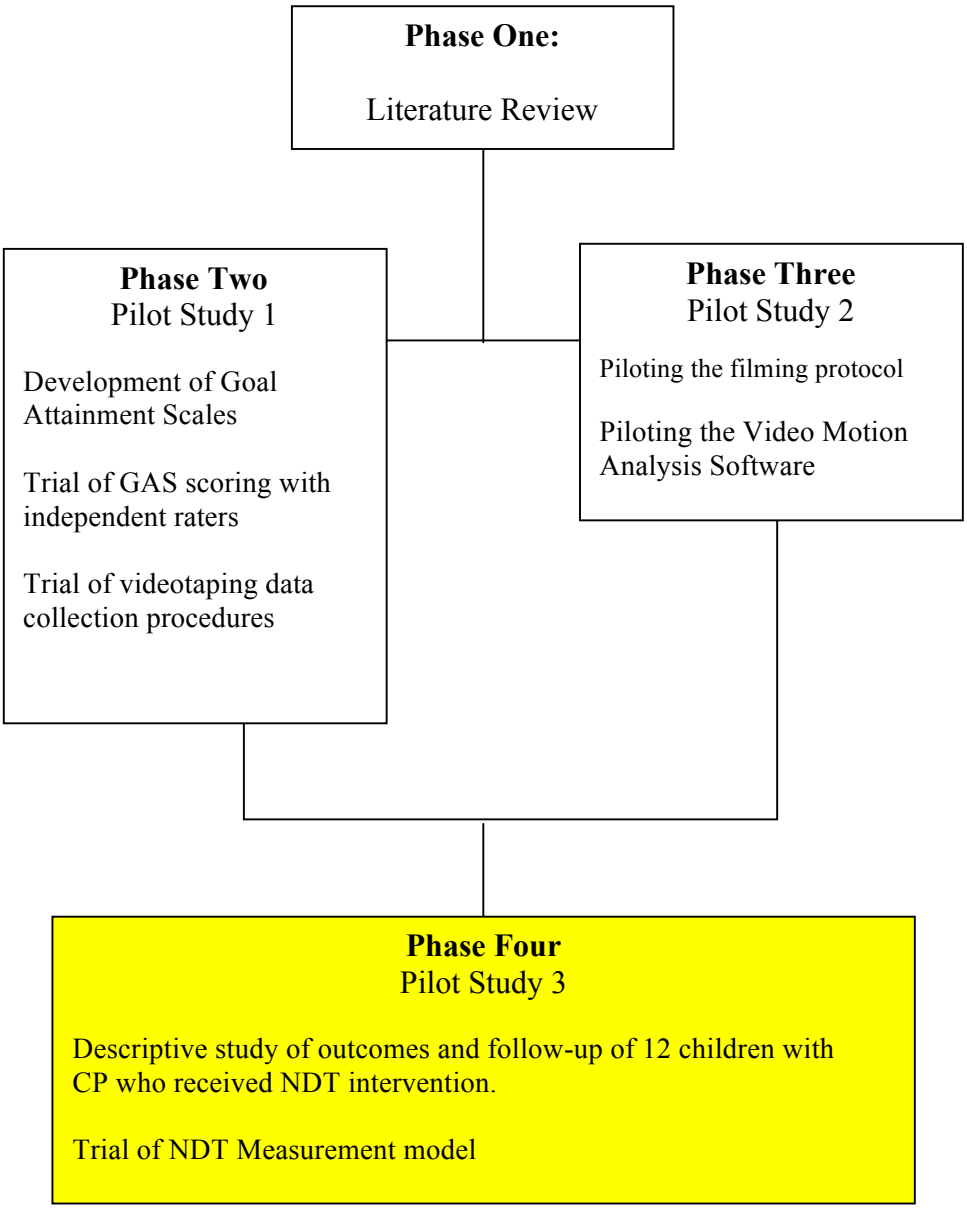


Figure 5.1: Visual representation of the four phases of the study, with Phase Four highlighted.

5.2 METHODOLOGY

5.2.1 Design

5.2.1.1 "The best laid plans of mice and men…." (Burns, 1785, cited in Noble & Hogg, 2003).

Two research designs were originally planned for Pilot Study Three, both based on blinded evaluators, randomised and/or controlled trial methodologies. The aim was to collect 'high level' evidence to investigate changes in occupational performance of the children following intensive NDT. Both designs were abandoned due to practical and ethical issues, as described below.

First, a randomized controlled crossover design was planned, where children with cerebral palsy (CP) who would be receiving NDT intervention during an eight week NDT Course were to be randomly assigned to one of two groups. Group 1 was to receive NDT intervention in the first four weeks, and regular therapy in the second four weeks. Group 2 was to receive regular therapy in the first four weeks, and NDT intervention in the second four weeks. A 'wash-out' period of one month of no intervention was scheduled between the first and second four week block. This preferred design was chosen for the following reasons: subjects serve as their own controls resulting in reduction in error variance, and thus sample size needed; all subjects would receive treatment (at least some of the time); statistical tests assuming randomisation could be used; and finally, blinding could be maintained. This plan was discarded when the planned NDT course was cancelled due to too few registrants.

Second, a randomized controlled study was planned to investigate outcomes of a cohort of children with CP who were to receive NDT as part of a subsequent NDT course to be held at San Francisco State University, California. This design was conceptualised as an experimental comparison study in which therapy outcomes of a small cohort of children with CP (Group 1) who were randomly assigned to receiving an intensive course of NDT were to be compared with a control group of children with CP (Group 2) who were receiving regular therapy. All children were recruited through a major service delivery system in the state of California, and had volunteered to be participants in the NDT Course practicums. Children and families who were assigned to the control Group 2 were to receive a course of intensive NDT at the conclusion of the study to overcome concerns by parents regarding withholding desired intervention. Although consent to participate was obtained from all children, parents and therapists involved, institutional permission was withdrawn in the initial stages of data collection. The study was therefore discontinued.

5.2.1.2 Design of the current study

The research design that was finally implemented in this stage of the research utilized quantitative and qualitative methods. First, to measure functional outcomes of a course of NDT intervention, a quasi-experimental pre- and post-test outcome study with blinded rating of immediate and follow-up outcomes was employed. In this design, baseline performance (**O**) is followed by intervention (**X**). Immediate outcome performance is subsequently measured at the conclusion of intervention (**O**). Another measure of performance was obtained after a period of withdrawal from intervention (**O**). (See Figure 5.2).

Figure 5.2: Pre- and post-test design with follow-up.

The basic pre-post test design (**O X O**) utilized in this study is sometimes referred to as 'non-experimental', as there is no control or comparison group against which to measure the impact of the target intervention. It has been described as the weakest form of experimental design, because the extent to which causation can be implied is limited (Berg & Latin, 2008). Quasi-experimental designs are used when randomisation (Wikipedia, n.d., e) is impossible or impractical and, as found in this study, they are typically easier to set up than true experimental designs, which require random assignment of participants. Since quasi-experiments are usually carried out in natural environments (Wikipedia, n.d. d), some authors suggest that this design may minimize threats to external validity (Wikipedia, n.d, a), because the problems of artificiality that often arise with well-controlled RCT designs are reduced. This experimentation method is thought to be efficient in initial longitudinal research (Wikipedia, n.d., c) that involves measuring performance over longer time periods, and which can be followed up in different environments, such as found in this study.

While the lack of random assignment in the quasi-experimental design method may allow studies to be more feasible, it also poses many challenges for interpreting the outcome of the research. Notably, the absence of randomisation introduces threats to internal validity (Wikipedia, n.d., b). When randomisation is

absent, some knowledge about the data can be approximated, but conclusions of causal relationships are difficult to determine due to a variety of extraneous and confounding variables that exist in any social environment (Shadish, Cook & Campbell, 2002).

Several design strategies are suggested to address the threat to internal validity. First, the design can be expanded across time by adding baseline measurements either before or after the intervention (Shadish, Cook & Campbell, 2002). Additional post-intervention measures are thought to be useful for determining whether an immediate intervention effect decays over time. If a change in performance occurs between the pre-test performance and first post-test performance, several hypotheses might be suggested regarding the cause for change, including intervention, maturation, or other environmental and personal variables. However, if no subsequent change occurs between the first and second post-test when intervention is withdrawn, one might be more confident in assuming that maturation or other variables are not likely alternative explanations for the hypothesized cause-effect relationship between intervention and outcome. In this study, an additional post-test was added to the pre-test/post-test design after a period of no intervention to strengthen internal validity (See Figure 5.2).

Second, sound research strategies of any type are thought to reflect the theories which are being investigated. Where specific theoretical expectations can be hypothesised, these are incorporated into the design. For example, where theory predicts a specific treatment effect across measures, inclusion of all relevant measures in the design improves the capacity to interpret results (Trochim, 2000).

As reported in Chapter Two, the propositions underlying this study were based on a contemporary and emerging theory of Neuro-Developmental Treatment (NDT) (Howle, 2002), and a theory of occupational performance (Chapparo & Ranka, 1997). The functional outcomes that were measured, the way they were measured, and the way the intervention was administered in the design of this study were guided by assumptions and evidence contained in publications related to these theories.

Third, quasi-experimental research designs often reflect the settings of the investigation. In this study, data were collected in the natural environment and under therapy conditions that best reflected the usual way NDT intervention occurs. The particular functional needs of each individual child and family were addressed in the design strategy through the use of Goal Attainment Scaling (GAS), allowing common measurement across different and individual goals for each child and family participant.

Fourth, quasi-experimental research should utilize intervention processes that are faithful to the intervention they purport to investigate; the sequence and timing of event carefully thought out, and potential difficulties with measurement, intervention fidelity, and construction of a database anticipated. In this study, a measurement model utilizing GAS, filming techniques that suited a clinical situation, and child-friendly data collection strategies, were all piloted before the commencement of data collection. A theory-driven approach to quasi-experimentation is thought to be futile unless it can be demonstrated that the program was in fact carried out or implemented as the theory intended. In this

study, the fidelity of NDT intervention was constantly monitored throughout through supervision of NDT instructors who were independent of the study.

Fifth, quasi-experimental research designs are often used because they have some flexibility built into them, and strike a balance between redundancy and the tendency to over-design. Where it is reasonable, other, less costly, strategies for ruling out potential threats to validity are utilized.

In summary, quasi-experimental research design is based on multiple and varied sources of evidence, and should be multiplistic in realisation. It must attend to process as well as to outcome, and is enhanced when it is theory driven, and utilizes multiple analyses that attempt to bracket the intervention effect within some reasonable range.

Some contemporary authors suggest traditional thinking on quasi-experiments as a collection of specific designs and threats to validity have changed toward a more integrated, synthetic view of quasi-experimentation as part of a general logical and epistemological framework for research. The current study positions itself at the beginning of a line of research that adopts an integrated, multiple method approach to the study of the impact of NDT on functional performance of children. Its aim is to generate findings that can contribute to the design of experimental research in the future.

5.2.1.3 Ethical approval

Ethical approval to conduct this research was obtained from the University of Sydney Human Research Ethics Committee Protocol No. 13028 (Appendix XII). Copies of the approved information and consent forms are presented in the appendices:

Participant consent form – Parents (Appendix XIII)
Participant information statement – Parents (Appendix XIV)
Participant consent form – raters (Appendix XV)
Participant information statement – raters (Appendix XVI)

5.2.2 Participants

Three groups of participants contributed to this phase of the research.

The first group of participants comprised *12 children with CP* aged between two and fifteen years *and their families*, who met the following inclusion criteria: a) they had volunteered to participate in NDT course treatment practicums; b) the children had a diagnosis of cerebral palsy and associated co-morbidities; and c) family consent to participate in the study (Appendices XIII, XIV and XVII – XXII). Demographics of the 12 children are included in Table 5.1 with their classification of cerebral palsy. This population of children represents the total cohort of children who participated in the NDT practicums.

Table 5.1: The 12 children with classification of cerebral palsy and age.

DIAGNOSIS	AGE
1. CP - dystonia	13y 8m
2. CP - quadriplegia	4y 2m
3. CP - quadriplegia	6y 8m
4. Hypotonia and Global developmental delay	4y 4m
5. CP - diplegia	15y 1m
6. CP - diplegia	2y 7m
7. CP - diplegia	6y 11m
8. CP -hemiplegia	10y 6m
9. CP - diplegia	3y 7m
10. CP - hemiplegia	3y 1m
11. CP - hemiplegia	4y 8m
12. CP - dystonia	4y 5m

Further description of the 'type' and level of severity of CP for each of the 12 children are recorded in Table 5.2, using the Gross Motor Function Classification System - Expanded and Revised (GMFCS – E & R; Palisano, Rosenbaum, Bartlett, & Livingston, 2007a) and the Manual Ability Classification (MAC; Arner et al., 2005). GMFCS – E & R Levels from I – V describe the ability of children with cerebral palsy (from less than two years of age and up to 18 years), to initiate movement associated with daily life, such as mobility, sitting and transitional movements as well as their need for assistive devices. For example, Level 1 describes a child who can walk independently, through to Level V, for a child who needs to be transported in a manual wheelchair (Palisano, Rosenbaum, Bartlett, & Livingston, 2007b).

Table 5.2: Classification Gross Motor Function Classification System and the Manual Ability Classification (Palisano, Rosenbaum, Bartlett, & Livingston, 2007a; Arner et al., 2005). *Represents pre-NDT, post-NDT & follow-up codes that were assigned to each of the children as described below.

GMFCS – E & R and MACS Classification			**GMFCS LEVEL**	**MACS LEVEL**
CHILD*	DIAGNOSIS	AGE		
(1) J53, J51, J52	CP - dystonia	13y 8m	V	V
(2) J93, J91, J92	CP - quadriplegia	4y 2m	V	V
(3) J73, J71, J72	CP - quadriplegia	6y 8m	V	1V
(4) K83, K81, K82	Hypotonia – global developmental delay	4y 4m	1V	1V
(5) J103, J101, J102	CP - diplegia	15y 1m	1V	1
(6) K63, K61, K62	CP - diplegia	2y 7m	1	1
(7) J13, J11, J12	CP - diplegia	6y 11m	11	11
(8) K33, K31, K32	CP -hemiplegia	10y 6m	1	1
(9) J43, J41, J42	CP - diplegia	3y 7m	1	1
(10) J123, J121,J122	CP - hemiplegia	3y 1m	1	11
(11) K23, K21. K22	CP - hemiplegia	4y 8m	1	II
(12) J113, J111, J112	CP - dystonia	4y 5m	111	11

The Manual Ability Classification (MAC) Levels describe how children with cerebral palsy (four to eighteen years) usually handle objects in daily activities – either with one or both hands. Easy and successful handling of objects is described as Level I ability whilst a child who is extremely limited even for simple actions and requires full assistance in handling objects, would be described as having a 'Level V ability' (MACS - Manual Ability Classification System, 2010).

The second group of participants comprised *seven NDT Coordinator Instructors (CI's*), who met the following criteria: a) they were members of the international NDTA ™ Instructors' Group (NDTA, 2006) and had participated in the first and

second pilot study; b) they demonstrated the highest level of agreement with the researcher's GAS ratings in the previous pilot studies; and c) they gave consent to participate (Appendices XV – XVI)

The third group of participants comprised *12 therapists* who were graduate student therapist participants in the NDT Course. Nine members of the group were physiotherapists, one was an occupational therapist and two were speech pathologists, and they came from Australia, Hong Kong, Singapore, Canada and India. The therapists met the following inclusion criteria: a) they were all paediatric therapists who were experienced in treating children with CP (a pre-requisite for participation in the NDT course); b) they were trained to apply NDT strategies that were administered in twice-weekly treatment practicums of a six week NDT course; and c) they consented to participate in the study (Appendices XXIIIi – XXIV).

5.2.2.1 Recruitment procedures

Children and families were recruited from children and families who had volunteered to participate in practicums in an NDT Course, which was held at Deakin University. Fliers about the study were sent to potentially interested families, and they were invited to participate. Families were given initial information about the course treatment practicums and the study. They were invited to participate in the practicums and then in the related study (Appendices XIII, XIV and XVII – XXII).

All but three families who were contacted chose to participate in the course and study. Detailed information was then sent to families about the course and the study, together with the consent forms. Three families were unable to attend due to the following reasons: away on holidays during the period; a new baby due; and one parent only had one free day each week.

The choice of children who were recruited to participate in the course was based on NDTA™ criteria for children participating in NDT certification courses treatment practicums. The goal was to afford therapist participants in the course a wide variety of learning experiences in implementing NDT. Inclusion criteria for participation in the course were: representation of a variety of classifications of cerebral palsy; a range of severity; a range of ages; parental commitment to attend treatment appointments; and parental 'consent to participate'. Children who were excluded from participation in the course demonstrated one or more of the following exclusion criteria: parental reports of the child having substantial difficulty being with new therapists or in new environments; children who had health issues such that consistent attendance to practicums was not predicted; and children of families who lived a great distance from the course venue. The 12 children available to participate fully in the course practicums, became the 12 participants in the study.

The choice of therapists who were recruited to participate in the course was based on NDTA™ criteria as described. The therapists were introduced to Pilot Study Three through a course presentation and following this, 'Consent to participate' forms were distributed. A clear message accompanied these, that there was no

imperative attached to signing these forms (Appendix XXIIIi). However, all therapists did consent to both participate in the study and to allow access to their data, including assignments, 'parent notes' and qualitative survey data (Appendices XXIII - XXIV).

The seven NDTA ™ Coordinator Instructors (CIs) who had participated in each of the pilot studies and had the highest level of agreement with the researcher's GAS ratings in the previous pilot study, were again recruited through contact by email. They were given information about Pilot Study Three and in reply email, all consented to participate (Appendices XV – XVI)

5.2.3 Instruments

To address the first research sub-question posed in Pilot Study Three, *"What is the change in children's functional performance in targeted daily living tasks immediately following NDT and at a follow up period?"*, the instruments used were the same as those developed in the first two pilot studies, with incorporation of a number of refinements relating to film equipment, the filming set, and video analysis software. These instruments are described below and represent the "NDT Measurement Model" that was developed during Pilot Studies One and Two, and was trialed in this study.

5.2.3.1 Goal Attainment Scales

Through discussion with parents, a specific everyday task that was particular to each child was nominated as a functional outcome of the NDT practicums. Further biomechanical analysis of each child's performance of the task yielded

particular motor performance skills that were desired as motor performance outcomes of the NDT practicums. Table 5.3 lists the goal areas nominated by the parents and children. This information was used to develop Goal Attainment Scales with incremental steps ranging from -2 to +2, using the procedures described in Pilot Study One (Section 3.4.2) and Pilot Study Two (Section 4.3.11).

Table 5.3: The 12 children participants and their functional goals.

Child	Functional limitation / Goal area
1.	Movement forwards for assisted transfers from wheelchair.
2.	Eating with a fork.
3.	Finger feeding.
4.	GOAL A Reaching to grasp toys 'beyond her reach', at the side.
4.	GOAL B Reaching to grasp toys 'beyond her reach' across midline.
5.	Communicating using a Dynavox.
6.	Standing to use a bat.
7.	Executing 'Ronde de Jambe' ballet move (for ballet class).
8.	Undoing screw top lids
9.	Walking to throw a ball through a hoop. GOAL A
9.	Vocalising with clarity GOAL B
10.	Climbing a step to reach a toy
11.	Donning socks
12.	Standing at a table to use hands

5.2.3.2 Filming instruments

Cameras

Three Canon video cameras (Canon MD160) were utilized in Pilot Study Three, as they were smaller than those used previously and offered ease in packing, portability and superior control devices, which included remote control devices for initiating and ending filming (Plate 5.1A).

Support of the overhead camera

For flexibility and ease of the filming 'set up', a number of modifications to the overhead mesh support were instituted. A housing system for the overhead camera was constructed, which allowed quick and easy changing of tapes from a small stepladder (Plate 5.1A).

A portable and flexible boom arm mount was created for the overhead camera. This mounting system was created from a 'typical', aluminium camera tripod, with maximum telescopic extensibility. Two long, extra aluminium rods were added. The first tube connected via a screw over the upright portion of the tripod. The second rod, which included the camera housing, was then added horizontally to the top of the tripod and slowly raised from the ground (Plate 5.1B).

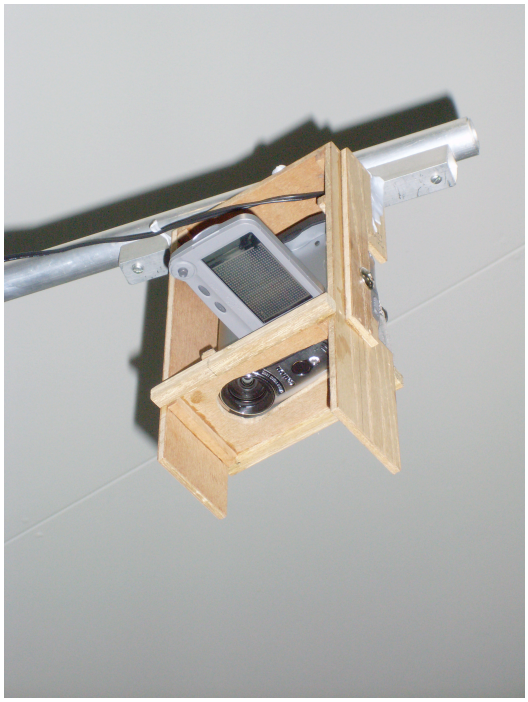
This tripod, with added weights attached centrally below to a hook for stability, was positioned beside the grid. With counterbalancing weights attached to the long horizontal boom arm, the camera could be safely extended to a position centered 2500mm above the centre dot of the filming grid. This was accurately located with a plumb line (Appendix XXVi and ii). A light stepladder was used to

change the tapes in the overhead camera. Together with the 'collapsible tripod', the ladder could be easily transported to the film set (Plate 5.1B).

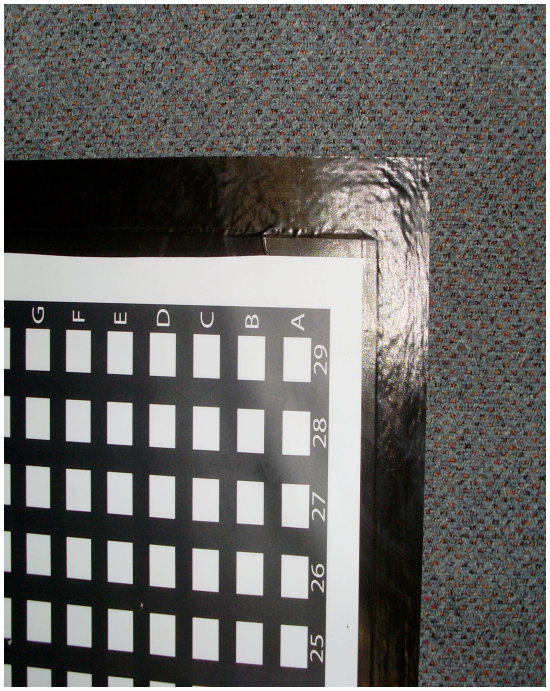
The floor grid

A 1.5 metre long floor grid was pre-prepared from durable materials. This saved considerable time during set preparation, as construction of a taped grid (as used in Pilot Study Two) was no longer required. The grid was easily transportable in a cardboard tube to the film venue. It was placed so that the longer (1.5 metre) side faced the front camera. This allowed for the filming of 'projected action sequences', such as walking from either side camera. For example, a *few* steps along the longer axis of the grid could be captured.

The floor grid was commercially printed with a HP8000s Eco Solvent large format printer onto a substrate consisting of a thick non-curling satin polypropylene film. This was then laminated using floor graphics laminate of heavy duty 'supermarket floor quality' for durability, and secured to the floor with cloth tape. It enabled replicable positioning of the child, equipment and toys from one film period to another, as well as the reference points for x/y coordinates for video analysis (Plate 5.1C).



A



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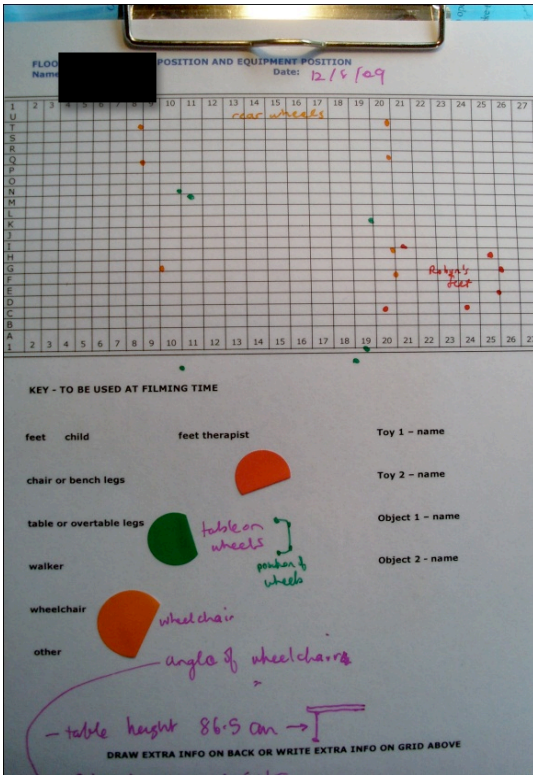


D

Plate 5.1: Aspects of filming set-up. A) Overhead camera in housing rotated to capture video footage from any part of the grid below; B) Tripod with boom arm and overhead camera; C) Corner of the floor grid; D) Example of laminated chart.

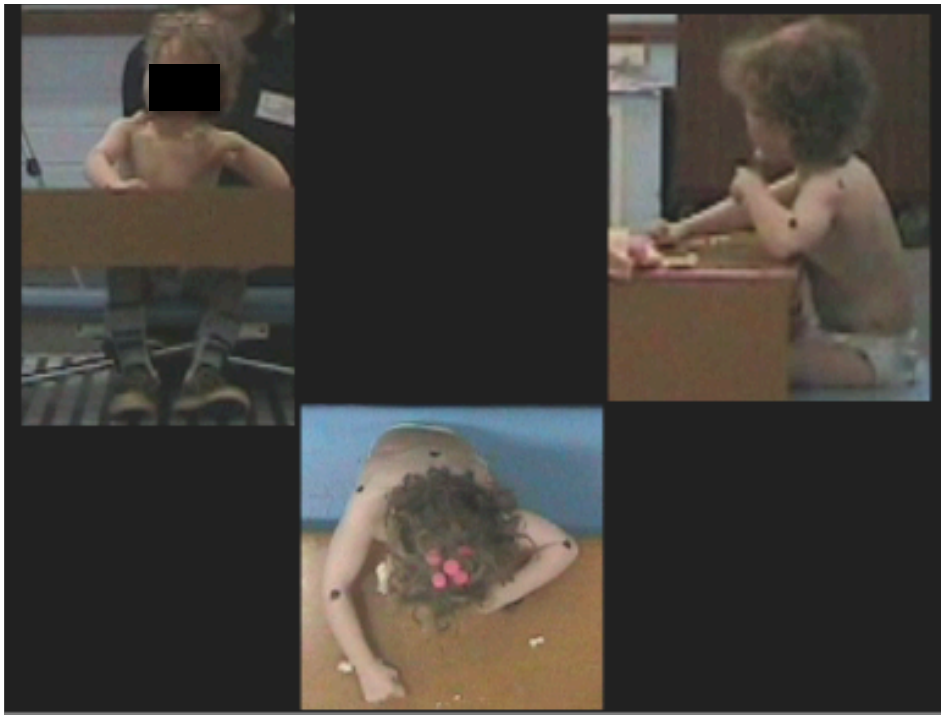
Colour coded laminated sheets

Several processes were used to ensure that exact film set conditions were replicated from one film period to the next. This involved replicating the exact position of the child, equipment and toys on the floor grid using the procedures developed in Pilot Study Two, and as described below in Section 5.3.6.7.

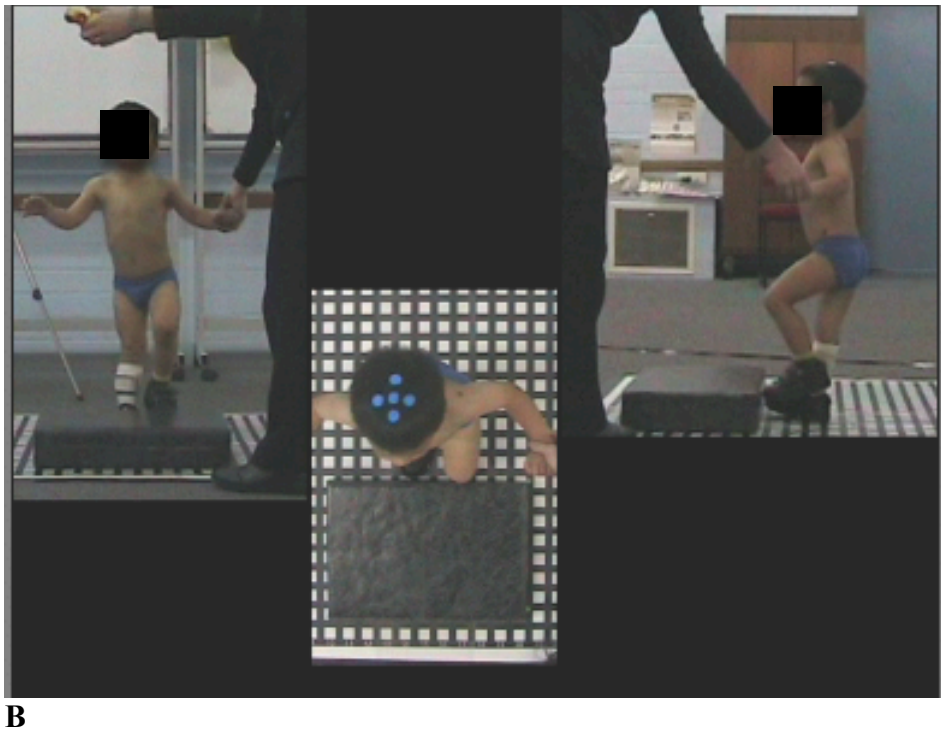
Prior to filming, research assistant two replicated the position of markers on the floor grid (colour coded sticky dots) by drawing matching coloured dots with texta pen onto the appropriate grid points on each child's laminated 'grid sheet' (which was attached to a clipboard). This information thus represented colour coded marked positions on the floor grid. The choice of 'camera side' was also recorded on the child's laminated chart (Plate 5.1D).

Video tapes

Each child was filmed for three trials at each filming (pre- to post- and follow-up). This enabled choice of the 'best' pre-test and 'best' post-test views of performance, and sufficient video footage for accurate editing of the video to 'three views' per DVD. Consequently, to be sure of sufficient footage (and allowing for incorrect 'takes' such as filming from the incorrect side), three, one hour mini digital video (DV) tapes were used for each child (three 'views'). This was repeated for each of the pre-, post- and follow-up filming and enabled the first correctly administered trial of three to be selected each time, for editing as part of 'three DVD views' (Plates 5.2 a-f).

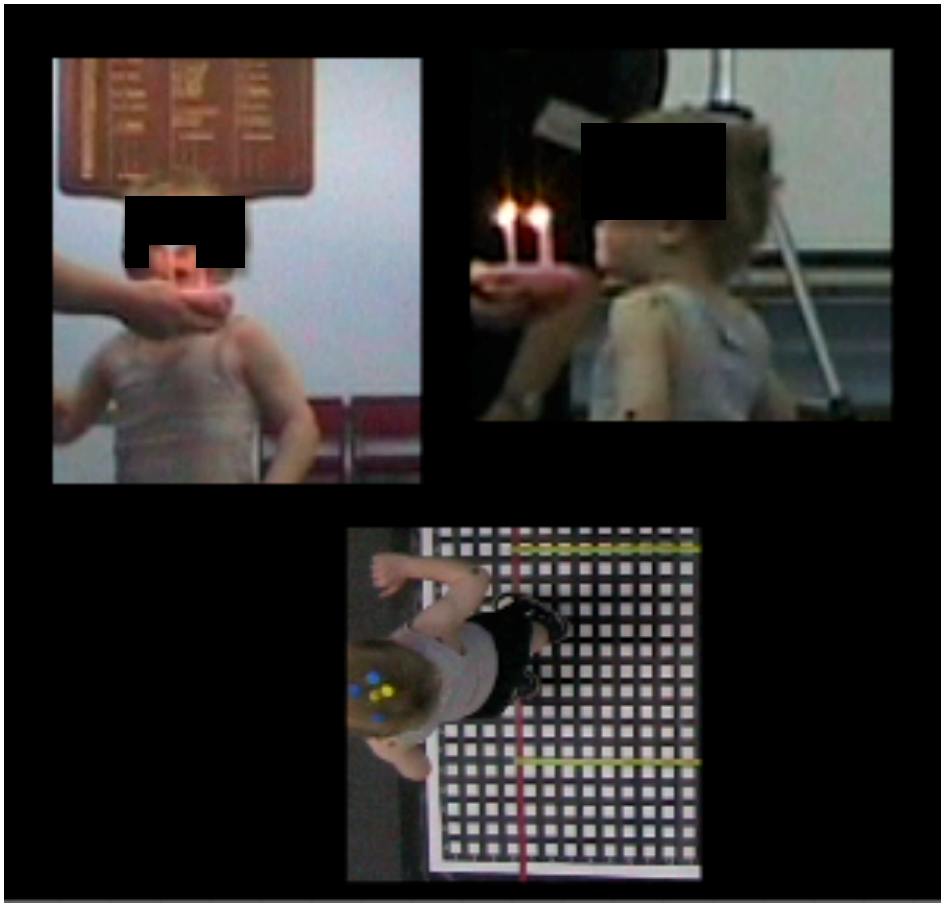


A



B

Plate 5.2: Examples of three views per frame. **A)** Eating with a fork (screenshot); **B)** Climbing a step (screenshot).



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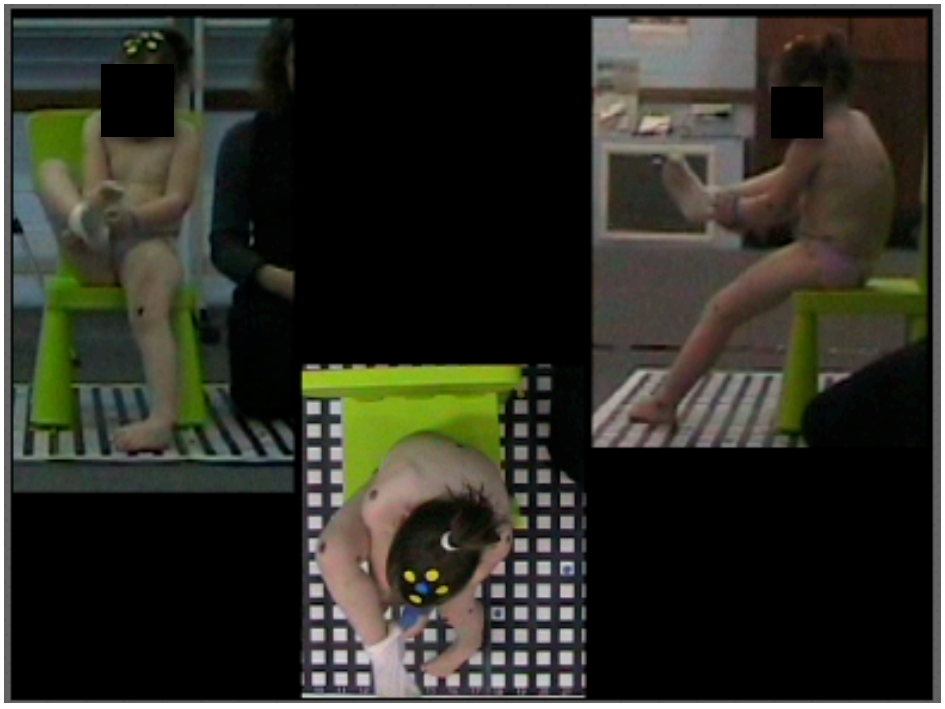
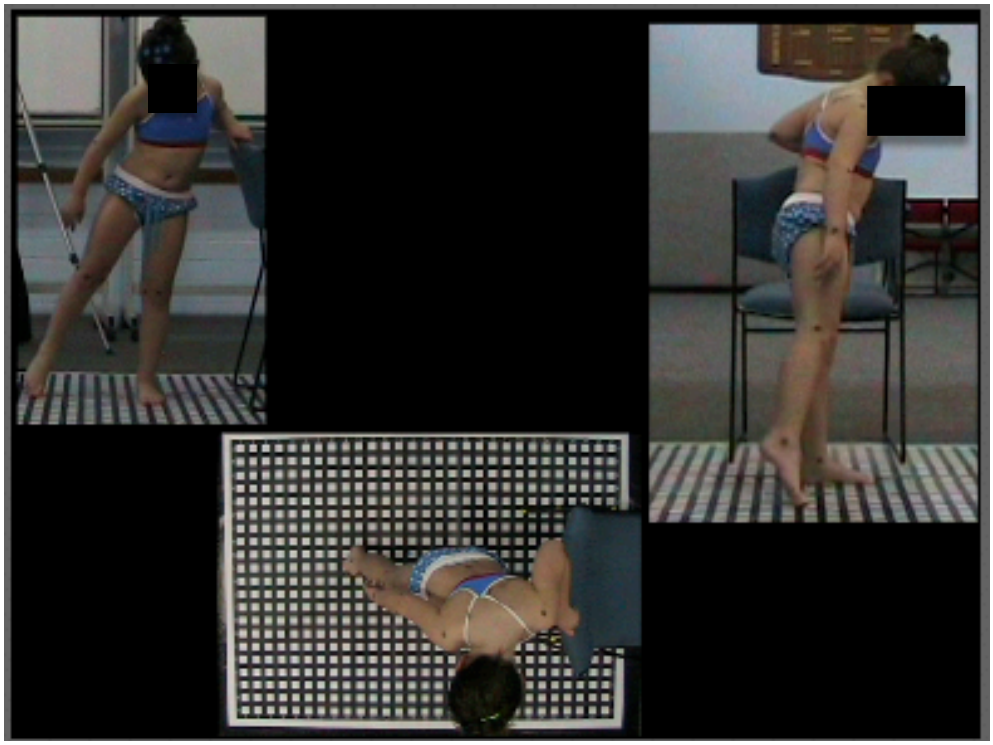
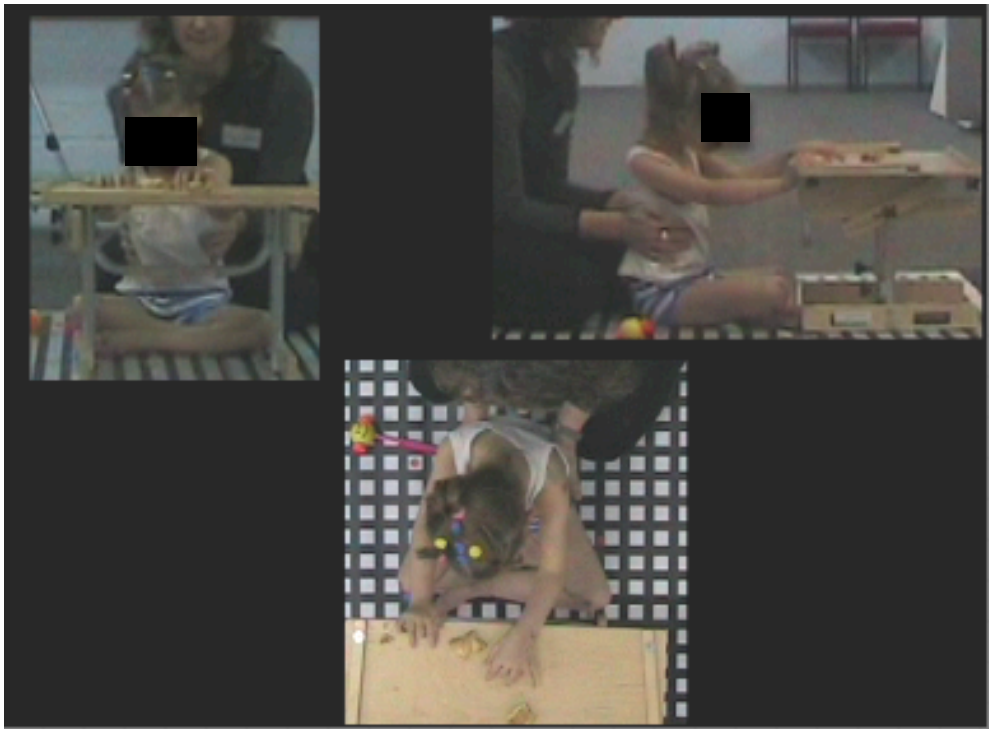


D

Plate 5.2 (cont.) Three Views**. C)** Blowing out candles (screenshot); **D)** Donning a sock (screenshot).



E



F

Plate 5.2 (cont.) Three views**: E)** Ballet step (screenshot); **F)** 'finger food' (screenshot).

Photographic record

An SLR camera was used to record the exact film set positions for each child.

Portable film kit

An easily portable filming kit was constructed as all filming for the research was separate from the NDT Course, and conducted at a different venue. All equipment required for filming fit into a suitcase, with the exception of the tripods, the cardboard tube containing the floor grid and the stepladder (Plate 5.3A), and proved to be easily transportable to the filming location, as well as inexpensive.

The list of equipment taken to each filming period is included in Appendix XXVI. It incorporated the film equipment (Plate 5.3B), a 'tool kit' (Plate 5.3C), decorations for the 'magic room' waiting area together with stamp pad and 'dots', each child's laminated sheet to assist film set replication from pre-test to follow-up, and the floor grid. The procedures for these items are described below.

A

B

C

Plate 5.3: Film equipment. A) The 'child friendly' NDT filming kit; B) Film equipment; C) 'Tool kit'.

5.2.3.3 Video movement analysis software

Three software packages were utilized during the film editing and data analysis processes. 'Final Cut Pro' 5.0 software (Final Cut Pro, 2007) was used as in Pilot Study Two, in editing of the footage to three simultaneous views via a cable link to an Apple MacBook laptop. This footage was then burned to three DVDs per child (pre-, post- and follow-up tests) to be viewed by the blinded expert raters.

Logger Pro 3 for Mac (Vernier, 2010) and Excel were used together to collect and analyse data (such as time and position data), from the Quicktime movies created through Final Cut Pro. After trialing VideoPoint™ software (Videopoint™, 2005) and Logger Pro 3 for Mac (Vernier, 2010) in Pilot Study Two, Logger Pro was considered to be easier to use and more versatile. Both software packages produce graphs during data collection, and many of the other features of VideoPoint™ are currently included in Logger Pro 3. The latter software was used with one example of a pre-to-post change in goal performance by each of the 12 children. The 'Quantitative Outcome Measure' chart was developed and used by the researcher to enable an objective record of changes in specific motor behaviours during the children's task performance (Table 5.4). These behaviours represent observable, measurable, system based components of functional goals as described by Howle (2002, p. 246 – 247). Maloney, P. et al., (1978, p. 508) similarly describe functional components of tasks, which they described as used in GAS charts. Examples included environmental manipulations, such as removing a garment, and using hands together. Examples of visual and numerical data generated by the Logger Pro/Excel format used are illustrated in Figure 5.3 and 5.4).

Upright head

Measurement

The reference point is set on the left corner of the headrest of the wheel chair. Dots then set on top of the child's head, and tracked. Distance from the reference point to the centre dot was then measured for each frame of the video. Total time head remains in contact with the headrest was determined from the measurement readings.

Results

Pre-test video (106 seconds duration):
Total time head remains partially in contact with headrest for 64 seconds.

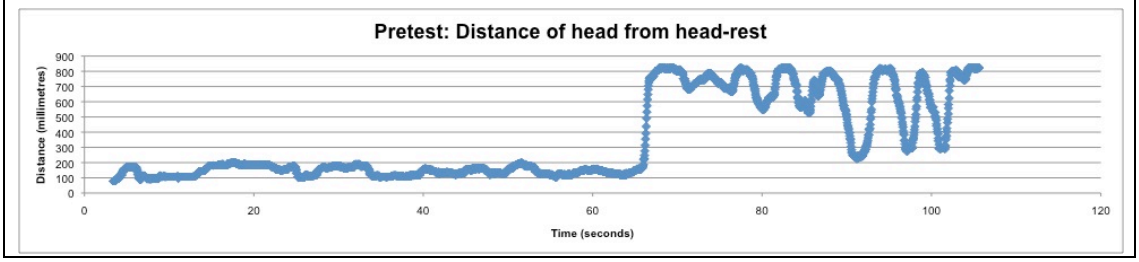


Figure 5.3: An example of Logger Pro/Excel output for time of movement - in this case head movement with respect to the headrest (x-axis time, y-axis distance) .

Lean Forward

Measurement

Pre-test video

The reference point is set on the dot on the lower left trunk of the child. The dot on the left shoulder was tracked over time, and the angle between the vertical and this dot was calculated.

Figure 5.4: An example of Logger Pro/Excel output for measuring range of movement.

Table 5.4: Potential quantitative 'onscreen' outcome measurements (Davis & Bain, 2006).

Quantitative Outcome Measures
1. Time taken to perform task
2. Goniometric range of movement changes in task component/s (Hough & Hughes, 2006)
3. Assistance given: • More distal or proximal on body part • More or less time hands on (same body part)
4. Task component performance measures e.g. number of steps taken, number of grasps / re-grasp in task within a certain time frame
5. Number of trials in a given number, performed successfully
6. Number of environmental manipulations – examples: • Shirt held whilst donning • Verbal encouragement
7. Presence or absence of certain task related movements (refer to written functional outcome conditions) Examples: • Vision directed to task • 1 limb moves independent of other • Rotation from midline • 2 hands used • Intra or inter limb coordination (e.g. requirement for humeral flexion and elbow extension) • Mirroring • Involuntary movement
8. Area of hand surface used to assist child's movement e.g. grasp versus fingertip assist.

5.2.3.4 Parent and therapist questionnaires

Three instruments were utilized to address the second research sub-question in this phase of the research: *"How did parents, children and therapists perceive their experiences during the NDT intervention*?". First, a modified version of the Measures of Processes of Care (MPOC) questionnaire (King, Rosenbaum, & King, 1995) was completed by parents at the end of the course. The MPOC is . . . "a well-validated and reliable self-report measure of parents' perceptions of the extent to which the health services they and their child(ren) receive are family-

centred (McMaster University (2011)." In this study, it was utilized as one way to describe the perception of NDT by families and children.

Second, parents and therapists filled out open-ended questionnaires, which sought qualitative information about their perceptions of goal outcomes (Davis, 2008 a & b). These open-ended questionnaires have been developed for use in NDT courses to obtain information about parent and therapist perceptions of goal attainment through the NDT processes (see Appendix XVIII for the parent questionnaire and Appendix XXIIIii for the therapist questionnaire).

Third, parents filled out 'outside therapies' forms prior to both the post-test and the follow-up filming (Appendices XXVIIi). These forms provided information about treatments that children may have received at the same time as NDT, and which may have affected both the outcomes of intervention, and the interpretation of them. 'Outside therapies' included changes in spasticity medication, or orthoses, or other therapy approaches such as Constraint Induced Movement Therapy (Appendix XXVIIii).

5.2.4 Composition of the filming set

The results from Pilot Study Two indicated that a large area was required to allow for filming at either side. Considerable forward space was also required to view and film the whole child and projected action sequences such as walking across the grid. All filming of the children in the pre-test, post-test and follow up was done at a different location from the NDT Course. As identified in Chapter Two, Section 2.9, there were some indications in studies to suggest that the location of

intensive NDT intervention influenced children's attendance and parent's perceptions of the extent to which intervention interrupted daily life (Bower, Michell, Burnett, Campbell, & McLellan, 2001; Chapman, 2004; Trahan & Malouin, 2002). A St. John's Ambulance training hall was located close to the course venue, and easily incorporated the positioning of all the filming equipment listed below. It was easily located, spacious parking at no cost was available, and it was comfortable and accessible for families.

5.2.4.1 Description of the waiting area

The venue comprised a waiting area and a film set. A large corridor enabled provision of a 'private' waiting area for families, and was set up by placing display screens in the wide corridor adjacent to the doorway to the film room. The screens were decorated to promote a child friendly atmosphere, and included a 'Welcome to the Magic Room' sign (Plate 5.4a). Inside were further decorations including soft toys, chairs for parents and children, the requirements for placement of dots on anatomical landmarks and a chart of the latter (Plate 5.4b; Appendix XXVIII). This area was created with decorated display screens. There was a clear view from the waiting area to the film set (Plate 5.4c & d). Children and family members were able to see each other during all stages of the filming process. The configuration of the filming area is described below.

A

B

C

D

E

Plate 5.4: Aspects of filming. A) Entry to the Magic Room; B) Corridor 'waiting room'; C) View to the film set from the waiting area; D) View from the film set to the waiting area; E) Lining the camera base up with front of grid.

5.2.4.2 Description of the filming area

Camera positions

The front and side cameras were positioned 4250 mm between the central dot on the floor grid and the middle base of tripods. The side camera was positioned at either side as required by the task. As in the procedures for Pilot Study Two, each camera was set at the lowest tripod level with zero horizontal rotation of the camera. The vertical position of each camera was set by lining up the closest border of the grid with the base of each camera's mobile screen (Plate 5.4e). The camera window was centred on the child's performance on the grid for the start of filming. This process was reliably replicated in repeated filming of the same task and child (Plate 5.5A). Any zoom function required for analysis could be operated *later* during editing. The film set dimensions are illustrated in Figures 5.5, and Plates 5.5 and 5.6a.

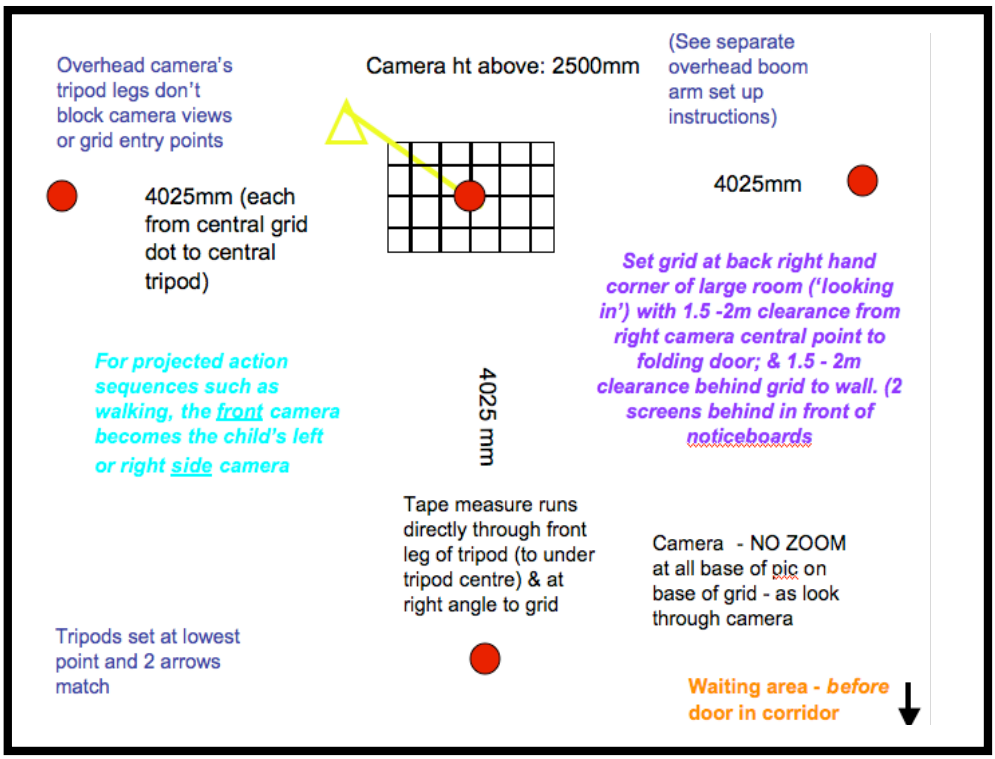
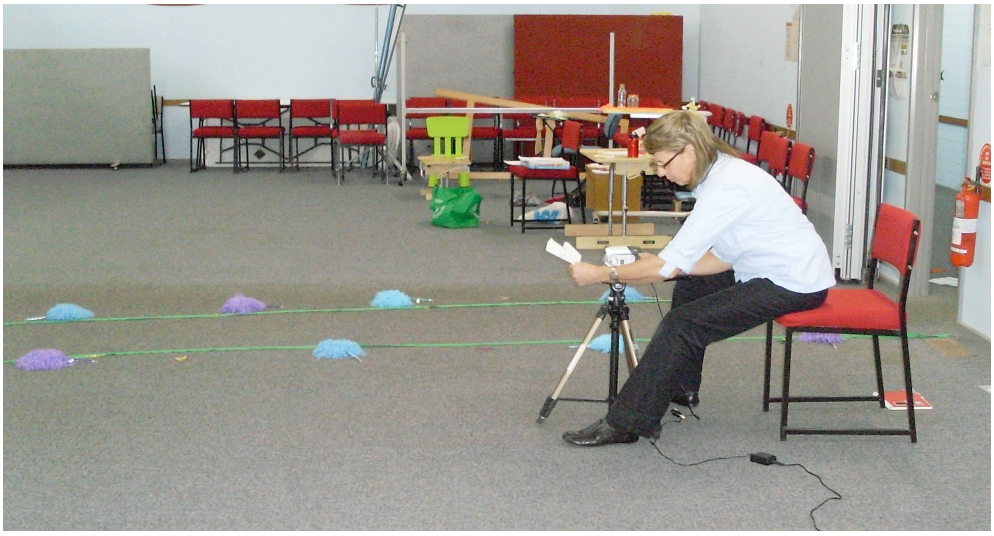


Figure 5.5: Diagram of camera set up in the film venue. The red dots represent camera positions.

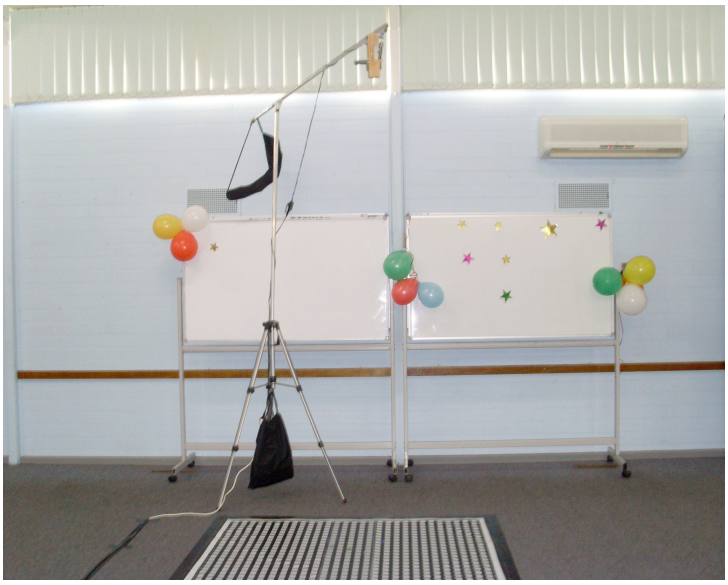
A

B



C

D



E

Plate 5.5: The film set and aspects of set up. A) Replicating the camera set up for clinical portability; B) View of film set from right side camera (bottom right of picture); C) Front camera - filming the code; D) View from grid towards left camera E) View from front camera.

A

B

Plate 5.6: More film set: A) Looking across set to right side camera;
B) Storage area of 'props'

Storage area of 'props'

A storage area of 'props', that is, equipment and toys required by each child, was created in one corner of the room (Plate 5.6b). The exact procedure for replication for each child's film set requirements will be further discussed under the procedure section of this chapter.