

Floor Time Play with a child with autism: A single-subject study

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Abstract

Background. Children with autism exhibit difficulties with social interaction and communication skills, and they present with restricted interests and stereotyped patterns of behaviour that affect their daily lives. Floor time play (FTP) is an intervention approach that addresses these issues; however, there are few published studies on its effectiveness. **Purpose.** This study determines the effectiveness of FTP intervention with a child diagnosed with autism. **Methods.** A single subject AB design was used with circles of communication as the behaviour indicator for improvement. Visual and statistical analyses were completed. The child's mother kept a daily journal describing FTP intervention sessions at home. **Findings.** Despite variability in the data, statistical analyses indicate a significant difference between the numbers of circles of communication during the intervention phase as compared with the observation phase. **Implications.** This study provides preliminary evidence for the use of the FTP approach with a child with autism.

Abrégé

Description. Les enfants atteints d'un trouble autistique ont de la difficulté sur le plan des interactions sociales et de la communication et ils ont des intérêts limités et des schèmes de comportement stéréotypés ayant des répercussions sur leur vie quotidienne. La méthode Floor time play (FTP) est une méthode d'intervention qui aborde ces problèmes; toutefois, peu d'études ont été publiées sur l'efficacité de cette méthode. **But.** Cette étude a pour but de déterminer l'efficacité d'une intervention FTP auprès d'un enfant ayant un diagnostic d'autisme. **Méthodologie.** Un plan expérimental à sujet unique de type AB a été utilisé avec les cercles de communication, à titre d'indicateur du comportement à améliorer. Des analyses visuelles et statistiques ont été effectuées. La mère de l'enfant a tenu un journal quotidien décrivant les séances d'intervention FTP à la maison. **Résultats.** Malgré la variabilité des données, les analyses statistiques indiquent une différence significative entre le nombre de cercles de communication pendant l'étape de l'intervention. **Conséquences.** Cette étude fournit des données probantes préliminaires relatives à l'utilisation de la méthode FTP auprès d'un enfant atteint d'autisme.

Children with autism are characterised by severe and persistent impairments in social interaction and communication skills, and they present with restricted interests and/or repetitive patterns of behaviours (American Psychiatric Association [APA], 2000). These difficulties interfere with these children's ability to participate in daily occupations such as play, school, leisure, and personal care activities (National Research Council, 2001). According to the National Institute of Mental Health (2008), 3.4 per 1,000 children aged 3–10 years are affected by this disorder. They constitute a heterogeneous group in which each child has a unique profile of cognitive, sensory, affective, and social challenges and strengths (Greenspan, DeGangi, & Wieder, 2001). Therefore, intervention with these children should include “a therapeutic approach based on the child's uniqueness rather than follow a standard program designed for all children with the same diagnosis” (Greenspan & Wieder, 1998, p. 2).

Intervention for children with autism

There is consensus amongst authors that early intervention with these children is beneficial (Howlin, 1998; Jacobson, Malick, & Green, 1998; National Research Council, 2001). A variety of therapy approaches are available for children with autism; however, the effectiveness of one treatment approach over another has yet to be shown through larger scale research (Autism Society Canada, 2005). Treatment programs based on the behavioural model today constitute the predominant therapeutic approach chosen to intervene with these children (Autism Society Canada, 2005; Schreibman, 2005). The goal of behavioural-based approaches is to encourage appropriate behaviours through their reinforcement and ignore behaviours that can limit the functional independence of the child. Applied behavioural analysis (ABA) is one such approach in which basic and complex skills are taught using discrete trial teaching. Skills are broken down into small steps and each step is taught, using prompting and positive reinforcement, until it is mastered before going on to the next step of the skill (Harris & Delmolino, 2002). Occupational therapists may select principles of behavioural approaches to teach a variety of specific skills such as feeding, playing, or improving problem behaviours (Case-Smith & Arbesman, 2008). According to McEachin, Smith, and Lovaas (1993) and Lovaas (1987, 1993), children with autism receiving intensive ABA-based treatment made significant gains in their cognitive abilities and their functional independence. Siegel (1999) states that the advantage of behavioural treatment approaches are that the child's motivation is based on cues other than social ones. The social interaction challenges of the child with autism are thus bypassed, allowing new learning to take place. However, the ecological validity of these behavioural approaches has been called into question due to difficulties in generalizing skills learned in the discrete trials to more natural, "real world" settings (Solomon, Nechels, Ferch, & Bruckman, 2007). Critics claim that within behavioural approaches, communication and interaction occur in a structured artificial environment; instead, the child should be interacting and communicating in a logical, intentional, and creative manner in a more natural environment (Greenspan et al., 2001; Greenspan & Wieder, 1998).

Several authors (Case-Smith & Arbesman, 2008; Harris, 1986; Howlin & Rutter, 1987) advocate that the involvement of families in the therapy program is necessary for the generalisation of learned skills. Hence, intervention programs have begun to center on the parent-child relationship and assist parents in developing communicative interactions with their children (Domingue, Cutler, & McTarnaghan, 2001; Greenspan et al., 2001; Gutstein, Burgess, & Montfort, 2007).

The Developmental Individual Difference Relationship-based Model (DIR)

The DIR model assists clinicians and parents in assessing and providing an intervention program for children with developmental challenges. It takes into account the child's unique **D**evelopment of functional emotional capacities, **I**ndividual processing differences, and the parent or caregiver-child **R**elationship, which is crucial for fostering new learning (Greenspan

et al., 2001; Greenspan & Wieder, 2006). The model proposes six developmental milestones that each child must master to allow for intellectual and emotional growth (see Table 1). A fundamental concept in DIR is circles of communication (CoC). A CoC refers to a reciprocal communication with two participants responding to each other verbally or nonverbally. For example, the child manipulates an object then looks at the mother and smiles (opening CoC). The mother smiles back (continuing the CoC). The child in turn responds by giving his toy to the mother, smiling or even turning away (closing CoC) (Greenspan et al., 2001).

Closing CoC ensures the continuity of the communication (Greenspan & Wieder, 1998). When a CoC remains open, it means the intended message didn't come across and communication has broken down. Since communication is an essential element of the six developmental milestones, the increasing length and complexity of the CoC is an indicator of more advanced milestones (see Table 1) involving emotion and intent with purposeful behaviour (Greenspan & Wieder).

The Floor Time Play Approach

Floor time play (FTP) is an intervention technique and the cornerstone of the therapeutic process described in the DIR model. FTP aims at moving the child with special needs through the six developmental milestones by following the child's lead during play and building on what the child does to encourage more reciprocal interactions. For 20- to 30-minute periods, the parent or caregiver "go down on the floor" and play with their child, encouraging him or her to interact by opening and closing as many CoC as possible (Greenspan & Wieder, 1998). Greenspan and Wieder recommend setting aside six to ten 20-minute FTP sessions a day. The principles of this intensive intervention approach can be incorporated during activities of daily living (ADL) (such as mealtime, dressing, and bathing) and delivered by family members, caregivers, and therapists.

The FTP approach is of particular interest to occupational therapists as it takes place in the participant's environment, centering on the child's occupations, such as play or ADL. The FTP approach views the child holistically and as a unique individual, values espoused by the occupational therapy profession (Townsend & Polatajko, 2007). Within the behavioural model, there is little or no consideration of a child's internal mental states; while in FTP, CoC are encouraged during purposeful activities so that the child links his or her behaviour to intention rather than learning by rote and reinforcement (Greenspan & Wieder, 1998). For example, a child can learn to play with a ball, such as throwing and catching, by interacting (i.e., opening and closing CoC) with the caregiver, thereby attaching a positive emotion with the caregiver and the activity rather than being externally reinforced whenever the task is performed.

Studies Exploring The FTP Approach

Studies exploring FTP intervention are sparse (Alcaraz, Augustovki & Pichon Riviere, 2007). The authors of the FTP approach (Greenspan & Wieder, 1997) completed a chart review of 200 children, aged 22 to 48 months, diagnosed with one of the two subgroups of autism spectrum disorder (ASD): autism

Table 1
Six Developmental Levels of Emotional Functioning

Developmental milestone or level	Chronological age	Characteristics of each level
Level 1: Self-regulation and interest in the world	0–3 months	Internal regulation and homeostasis. Uses sight, smell, sound, touch, and taste to self-regulate. Balances growing awareness of sensations with the ability to remain calm.
Level 2: Attachment and Engagement in relationships	2–7 months	Forming a special relationship. Deep bond or “falling in love with a parent or caregiver.” Builds a foundation for future relationships.
Level 3: Two-way purposeful communication	3–10 months	Purposeful communication using gestures, vocalisations, facial expressions to open and close circles of communication (CoC) (3 circles or more).
Level 4: Behaviour organisation, problem solving, and internalization	9–18 months	Complex sense of self. Engages in a continuous flow of interactions, closing at least 10, 20 or more CoC through negotiation, problem solving. Experiences various emotions: closeness, pleasure, assertive curiosity, fear, and anger (3 circles or more).
Level 5: Representational capabilities	18–30 months	Internal representation (imagery). Learns that things and feelings can be named and mentally represented. Development of symbolic or pretend play. Closing and opening of CoC during symbolic play (10 circles or more). Speech is increasingly used to open/close CoC.
Level 6: Representational differentiation	30–48 months	Logical bridges between ideas and feelings. Connects pretend sequences together logically. Development of abstract thinking (what, when, how, and why questions).

Adapted from: Greenspan, S. I., DeGangi, G., & Wieder, S. (2001). *The Functional Emotional Assessment Scale for Infancy and Childhood, FEAS*. Bethesda, MD: Interdisciplinary Council on Developmental and Learning Disorders. Greenspan, S. I., & Wieder, S. (1998). *The child with special needs: Encouraging intellectual and emotional growth*. Reading, MA: Perseus.

or pervasive developmental disorder not otherwise specified (PDD-NOS). These children received intensive FTP intervention for two or more years. FTP intervention was provided by family or professionals two to five hours a day. Intervention outcome was obtained with parental and clinical reports as well as scores on the Functional Emotional Assessment Scale (FEAS), a preliminary version of a nonstandardized observation tool (Greenspan & Wieder) that assesses the emotional functioning of the participants based on the six DIR developmental milestones. The results of this chart review indicated that after at least two years of FTP intervention, (a) 58% of children had “good to outstanding” outcomes (i.e., 50 CoC of spontaneous verbal communication, reached milestone 6, created and participated in pretend play); (b) 25% had “medium outcomes” (i.e., 30 CoC, reached milestone 4, challenges with symbolic capacities); (c) and 17% had “ongoing difficulties” (i.e., difficulties mastering milestones 1–3, vacillation between gaining and losing capacities). The findings of this chart review indicated a better outcome for children receiving FTP intervention than a comparison group of children receiving traditional interventions (e.g., special educational approaches or behavioural therapy). A major criticism of this study (National Research Council, 2001) was that parental dissatisfaction with traditional interventions may have been a confounding factor in the selection of the comparison group. Furthermore, no controls and few details of the specific intervention protocols used were identified in the study (Solomon et al., 2007).

A follow-up study was conducted (Greenspan & Wieder, 2005) with 16 of the children who had obtained “good to outstanding” outcomes in the chart review. The purpose of the study was to determine if a subgroup of children diagnosed with ASD could surpass expectations for high-functioning

ASD children. Ten to fifteen years after the initiation of FTP intervention, a comprehensive picture of the adolescents’ emotional, social, and sensory-processing abilities as well as cognitive and academic outcome were obtained. Data were collected using parent/child interviews; school reports; the Functional Emotional Developmental Questionnaire (Greenspan & Greenspan, 2002), a nonstandardised questionnaire that rates the level of mastery of the functional emotional developmental milestones; and the Child Behaviour Checklist (CBCL), a standardised measure that evaluates maladaptive behaviours and emotional problems (Achenbach & Ruffle, 1991). The results of this follow-up study reveal that this subgroup of children diagnosed with ASD in early childhood had become empathetic and creative and possessed adequate peer relationships and academic abilities. The authors further suggest that with a family-oriented approach that focuses on the building blocks of relating, communicating, and thinking, “some children with ASD can master the core deficits and reach levels of development formerly thought unattainable” (Greenspan & Wieder, p. 59). Greenspan specifies that it is uncertain how representative the small sample used in the follow-up study is of children with ASD. Nonetheless, these results suggest that implications of intensive FTP intervention can continue to be observed into adolescence (Greenspan & Wieder).

Solomon et al. (2007) completed a pilot study with 68 children diagnosed with ASD, aged 18 months to six years. The purpose of the study was to describe and assess the effectiveness of a parent training program for young children with autism: The PLAY Project Home Consultation program. During this program, parents were encouraged to interact one-on-one with their children for 15 hours per week. Parents were trained to use FTP with their children for developing social interac-

tion and play skills. A standardised version (Greenspan et al., 2001) of the FEAS was completed pre- and post-treatment. Of the 68 children, 45% made good to very good progress in their functional development as measured by the FEAS, and 90% of the parents were satisfied with the PLAY program. The authors suggest that further studies are required that include a control group to determine whether the changes in post-FEAS scores are due to this home-based program and not to other extraneous factors (most participants were enrolled in early educational programs).

Despite its growing popularity as an intervention approach for children with autism, studies on the effectiveness of FTP intervention remain limited (Greenspan, 2008; National Research Council, 2001). The purpose of this study was to determine the effectiveness of FTP intervention with a child with autism.

Method

Study Design

A single-subject design was used in this study. According to Ottenbacher (1986), this research design allows for the documentation of therapeutic effectiveness of a continuous treatment with a specific client while taking into account economical considerations. The design included a baseline observation phase (A) and an intervention phase (B).

Participant

The participant was a boy aged 3 years 6 months, diagnosed with autism at the age of 2 years 5 months, and recruited through an advertisement for the study with the Autism Society. He had no comorbidities or previous participation in intensive treatment programs, such as ABA or FTP. Ethical approval was obtained from the local university's research ethics board. An information session on the study was held with the mother and informed consent obtained. At the time of the study, the participant was enrolled in a community day-care program with educator support and monthly day-care consultation by an occupational therapist and a speech and language pathologist.

According to medical records, the participant attained motor milestones such as locomotion (crawling and walking), feeding, and toilet training within normal limits; however, language and play skills were delayed. The child was nonverbal, using only few spoken words to communicate. He used the picture exchange communication system (PECS) to make requests with pictograms during snack time or meals. He was occasionally able to point or take an adult by the hand to express his needs. Little interaction took place during play and appropriate use of toys was limited.

Instrumentation

To obtain a pre-intervention functioning level of the child, the following measures were administered by the occupational therapist during phase A.

The Childhood Autism Rating Scale (CARS) (Schopler, Reichler, & Rothen Renner, 1988): A brief standardized 15-item behaviour rating scale that differentiates autism from developmentally delayed children and distinguishes mild-to-moderate from severe autism.

The Sensory Profile (Dunn, 1999): A standardised questionnaire for 3- to 11-year-old children that determines the ability to process and modulate sensory information. It was completed during an in-person interview with the participant's mother. Scores, corresponding to either a typical performance or a probable or definite difference when compared to neurotypical children, were calculated to arrive at a profile of the child's sensory responses.

The Functional Emotional Assessment Scale (FEAS): A standardised, criterion-referenced rating scale, designed for determining the child's emotional capacities in the context of relationships with his family (Greenspan et al., 2001). The child and his mother were observed during play situations and each rated as "deficient, at risk, or normal" with respect to Greenspan's six developmental milestones of emotional functioning.

In addition to obtaining information on the pre-intervention functional level of the child, an objective behavioural measure was needed to capture changes resulting from the FTP intervention. CoC are the focus of FTP intervention and their increasing length and complexity is representative of progress through the developmental milestones. CoC were selected as the objective measure of behaviour change for this study as they meet the criteria for dependent variables considered important in a single-subject design study as discussed by Horner, Carr, Halle, McGee, Odom, & Wolery (2005): directly observable, can be summarized (number of CoC per session), can be collected throughout the experiment, and allow assessment of progress as defined by the framework guiding the intervention. All sessions were videotaped and CoC determined from the viewing of the videos.

During the intervention phase, the mother was asked to keep a daily journal so as to obtain a description of the FTP intervention at home, including activities completed and her impressions of her child's progress during each session. This allowed the therapist to keep track of the child's evolution at home and discuss the FTP strategies that the mother used. There was no recording in the journal during the observation phase as the FTP intervention had not yet begun.

Procedures

The child was seen four times a week for 45 minutes at a private clinic. The parent participated with her child during the sessions. The first 30 minutes of each session were dedicated to (a) observation during the observation (A) phase and (b) intervention during the intervention (B) phase. The last 15 minutes of each session during both phases consisted of discussion time with the child's mother. During phase A, this time was used to complete data gathering, such as completing the Sensory Profile. During phase B, the time was used to coach the mother with respect to the FTP intervention techniques.

Intervention

Phase A: Observation.

Phase A occurred over eight sessions (2 weeks). During this phase, semi-structured activities such as fine motor tasks and free play situations took place. No FTP intervention was initiated. The participant's play skills and interactions with his

mother were observed using the FEAS. Age appropriate play material was provided including sensory, cause and effect, and early symbolic play materials such as baby dolls, toy cars and a garage, and stuffed animals.

Phase B: Intervention.

Phase B took place over 28 sessions (7 weeks) during which the FTP intervention was done. An intervention phase three times the length of the baseline was used to minimize the effects of variability. The length of the baseline phase was not increased due to ethical considerations, and the length of the intervention phase was limited by the mother's lack of availability for continued intensive intervention. The occupational therapist conducting the intervention was an experienced clinician who had received training with the FTP approach approved by the Interdisciplinary Council on Developmental Learning Disorders. During these sessions, the occupational therapist taught FTP intervention techniques to the participant's mother. Several teaching methods were used: (1) demonstrating an adult-child interaction pattern, such as extending CoC by being playfully obstructive (e.g., the therapist might give the child a different toy than that requested); (2) encouraging parent to interact with the child by including both adults and child in a play scenario, such as pretending to sleep under a blanket; and (3) guiding the parent by providing verbal suggestions while she played with her child. The parent was encouraged to practice strategies to maintain interaction with the child and watch for cues of disengagement or sensory overload.

Data Analysis

All video-recorded sessions were edited to 20 minutes. The first and last five minutes of each session were removed as FTP did not always start right at the beginning of the session and the mother-therapist discussions sometimes began before the end of the 30 minutes. The last two sessions of phase B were removed due to technical difficulties during filming; thus, data consisted of eight observation and 26 intervention sessions. To increase objectivity during rating, sessions were placed in random order and the number of CoC during each session was coded by two occupational therapy students who were blind to the sessions. They obtained excellent inter-rater reliability ($\kappa = 0.81$) as defined by Fleiss (1981).

Both visual and statistical analysis of the graphed data was completed. Although the use of statistical techniques with single-subject designs has been criticized, there is growing recognition that statistical analysis is warranted, particularly when visual analysis of the data shows a large degree of intra-subject variability, making it difficult to detect significant treatment changes (Ottenbacher, 1986). Two statistical procedures were applied: the celeration line approach and the two standard deviation band method (Ottenbacher).

The celeration line allows for the analysis of a trend across phases (Nourbakhsh & Ottenbacher, 1994). A line is drawn in the observation phase and extended into the intervention phase to determine whether the behaviour measured in the observation phase is increasing, stationary, or decreasing. The two standard deviation band method is advantageous when there is (1) a small number of data points in the baseline phase

and (2) a high degree of variability in the baseline data (Ottenbacher, 1986). The standard deviation for the observation data is computed and two bands are plotted across the observation and intervention phases, representing two standard deviations above and below the mean for the observation phase.

The data collected in a single-subject design are often composed of repeated measurements and observed changes may be predicted due to a serial dependency. As such, the serial dependency of the data from phases A and B were independently appraised by calculating the autocorrelation coefficient for each data series. Both autocorrelation coefficients were found to be not significant: $r=0.04 < 0.76$ for phase A and $r=0.36 < 0.40$ for phase B. According to Ottenbacher (1986), a greater tendency toward dependency of data during the intervention phase is typical because of the influence of the intervention on the data points. Visual inspection and statistical procedures were applied directly as no dependency was found in the data.

Findings

Child Descriptors

Results from the assessments done in the observation phase confirmed that the participant exhibited mild to moderate behaviours associated with autism per the CARS. The child was essentially nonverbal, and demonstrated inappropriate interest in, or use of, toys and objects. He frequently threw toys or would focus on some insignificant part of the toy. Scores on the Sensory Profile showed a definite difference in vestibular and multisensory processing. The child was reported to (a) frequently seek movement activities such as running and spinning that interfered with the participation of daily routines, (b) become easily distractible in an environment rich in sensory stimulations, and (c) displayed variable response to tactile stimulations, enjoying touching people and objects, but disliking grooming activities. Finally, FEAS scores for the child were "deficient" in the six developmental milestones, with lower scores obtained during symbolic play than during sensory play. The child's abilities to self-regulate were limited. He often wandered around the room, was active, and had difficulty calming himself when upset. He settled into play for short periods of time. He showed some emotional interest towards his mother, seeking proprioceptive input (hugs) by pressing against her back while playing with her hair (soothing). He rarely interacted during play and would sporadically respond to his mother's cues to play. Representational capacities were limited to repetitive actions during symbolic play, such as pushing a car down a ramp, and did not involve interaction. The child's mother obtained a "normal" score for her ability to interact in a calm and sensitive manner. However, facilitating two-way communication and promoting more complex behaviours were scored "deficient." During play, the mother used too much verbal language and had difficulty keeping her child engaged.

Visual Analysis

The plotted graph (see Figure 1) displays the number of CoC that was coded during phases A and B. A considerable increase in CoC at session 6 of phase A was observed. Closer analysis of

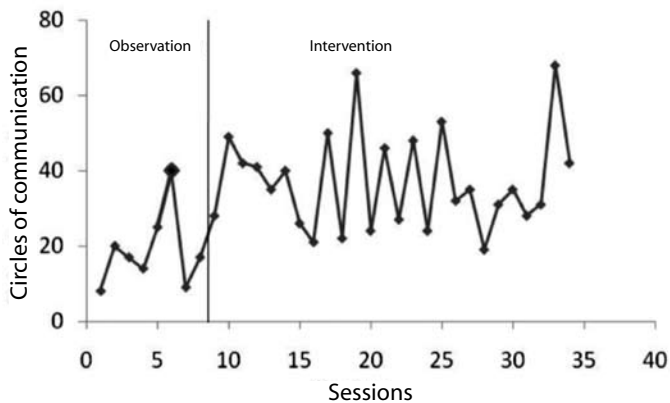


Figure 1. Number of circles of communication by therapy session (N= 34).

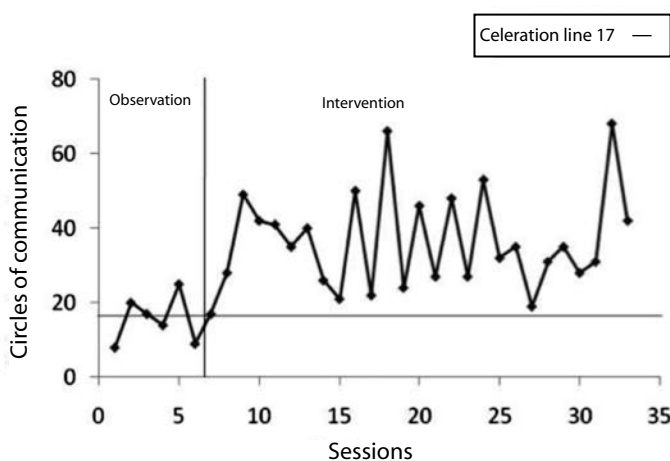


Figure 2. Number of circles of communication by therapy session. The sixth session has been removed for analysis purposes. The celeration line was generated by split-middle procedure (N= 33).

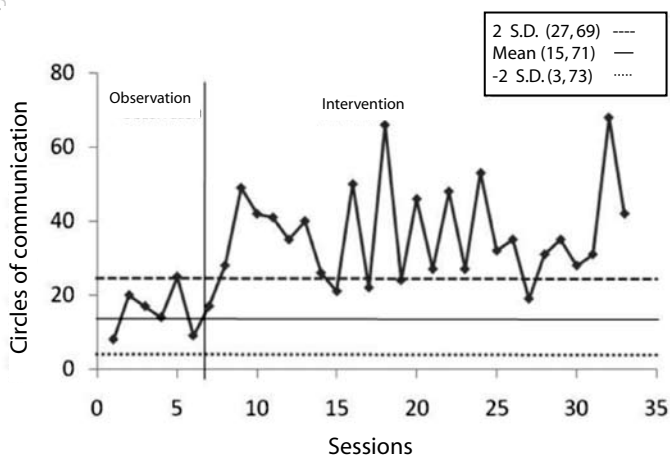


Figure 3. Number of circles of communication by therapy session. Standard deviation bands were generated by two standard deviation band method (N= 34).

the videotape showed that the therapist used FTP intervention principles toward the end of this session, which led to this spurious increase in CoC. Session 6 was therefore omitted from analysis (see Figure 2).

Visual analysis of the data showed great intra-subject variability in both phases A and B. A definite trend was difficult to determine by visual inspection.

Statistical Analysis

Celeration line.

Figure 2 shows that, despite the variability, all of the data points in the intervention phase fall above the extended celeration line. This is deemed to be statistically significant as a measure of change, as noted by the probability table adapted from Bloom (1975) in Ottenbacher (1986).

Two standard deviation band.

In Figure 3, sessions 8 to 13, 24 to 26, and 28 to 33 are all above the two standard deviation band. At least two successive data points in the intervention phase must fall outside of the two standard deviation bands for the differences observed in the intervention phase to be statistically significant. Given these results, we can say that there is a significant difference between the numbers of CoC in phase B as compared with the number of CoC in phase A.

Mother's Journal

The mother documented an average of three sessions per day in the journal. Weekday sessions were typically shorter (10 minutes each) and took place around the child's routine, such as meals or bath time. Weekend sessions were longer (45 minutes each) and frequently involved games that could be elaborated, with potentially more CoC, such as playing on the play structure. The child's preferred games revolved around the themes of pursuit, which had been practiced during therapy sessions. For example, a daily bath time hide-and-go-seek game with the child's mother expanded into hiding in other rooms of the house or hiding objects on self. As weeks progressed, the child accepted playing this game with new partners and in new contexts. The mother also commented on her child's initiating play by seeking her or by inventing a new game (taking turns on the trampoline). Pretend play remained minimal; however, object use was more appropriate (e.g., feeding a doll with a bottle).

The mother's personal impressions of her child's progress during the home sessions were shared in the journal. Communication between her and her child was more spontaneous with more rapid exchange of CoC, even if nonverbal. She was thrilled to see her child attend to childhood activities without distress. "At bedtime, when his dad is reading a story, he [child] is attentive and follows the story by pointing at the pictures. Prior to intervention, he would rip the book out of our hands!" She commented on the shared pleasure during activities with her son, seeing him engaged and wanting to repeat enjoyed activities. "It warms the heart to see my child with glee in his eye."

Discussion

The purpose of this AB, single-subject study was to determine the effectiveness of FTP with a child diagnosed with autism. Both visual and statistical analyses were completed to determine the change in the CoC. Trends in CoC, using visual analysis, were difficult to determine due to data variability.

This variability was further examined and can be explained by the increasing problem-solving demands placed on the child as therapist worked to augment the number of consecutive CoC, guiding the child to progress to higher milestones. During some sessions, the child responded very well to the increasing demands (e.g., sessions 18 and 24); however, some days the demands led to shorter exchanges, variable interests in activities (e.g., sessions 27–31), or difficulties with sensory regulation (e.g., sessions 15, 17, and 19), making it difficult for him to engage in a continuous flow of CoC. Despite the variability in the data, both the celeration line and two standard deviation approaches demonstrated a significant difference between the numbers of CoC in phase B as compared with phase A.

This study provides a preliminary level of evidence for the use of FTP with a child with autism and supports the findings of previous studies on FTP intervention with autistic children (Greenspan & Wieder, 1997; Solomon et al., 2007). This study's results are promising, given that the intervention period was significantly shorter (7 weeks) and less intense (average of 3 to 4 daily 20-minute sessions of FTP instead of the recommended 6 to 10) than those reported in the literature (one year or more of FTP) (Case-Smith & Arbesman, 2008; Greenspan & Wieder, 1998; Solomon et al., 2007). The results of this study can be of interest to clinicians whose frequency of intervention is often constrained by time and financial resources.

The mother's journal presented her impressions of her child's progress during FTP home sessions, commenting on the pleasure she gained by interacting with her child in more typical play situations. FTP intervention falls within the occupational therapy realm as play is regarded as the child's main occupation and an important vehicle when treating children with autism (Ziviani, Boyle, & Rodger, 2001).

Limitations to this study have been identified in both the design and methodology. A single-subject design study does not allow generalising to other individuals. Further research would be necessary to replicate these results to a broader sample of children diagnosed with autism. The time frame of the study was too short to allow consolidation of the skills necessary to master each developmental level. The resulting transitional state of the skills contributed to data variability during the intervention phase.

This study's strength is the provision of a detailed explanation of the data variability, allowing for a more comprehensive understanding of the visual and statistical analysis. This is useful for occupational therapists intervening with FTP, as children's abilities to open and close CoC may vary as they progress through the developmental milestones.

It would be of interest to replicate this study on a larger sample of children with autism and be able to generalize findings to children with various degrees of severity of autism. A

more comprehensive study of the use of FTP intervention at home by parents would also be important. The mother's journal provided an interesting insight into her perception of her child's progress when using FTP at home. The mother recorded an average of three sessions per day. Given that Greenspan and Wieder (1998) recommend six to ten 20-minute FTP sessions a day, further research of the feasibility of its application in the home environment would be useful.

Conclusion

Children diagnosed with autism benefit from early, intensive intervention programs (Greenspan, 2008; National Research Council, 2001). FTP is an intervention approach that is becoming popular with this population. Although FTP is used by an increasing number of clinicians and parents, few independent studies on its effectiveness have been completed (Case-Smith & Arbesman, 2008; National Research Council). This single-subject design study was conducted to provide further insight on the effectiveness of the FTP approach with a child diagnosed with autism. The statistical analysis of the data demonstrated a significant increase in the numbers of CoC in the intervention phase as compared with the number of CoC in the observation phase. The mother's journal provided a parent's perspective of the implementation of FTP at home. In view of these encouraging results, continued research studies of the FTP approach are warranted.

Key Messages

- The child in this study demonstrated a significant increase in CoC during the intervention phase as compared to the observation phase, indicating that he benefited from the FTP intervention.
- This study provides a preliminary level of evidence for the use of FTP with a child with autism.

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