

Autistic Spectrum Disorder: Behaviour Therapy, Relationship Therapy and Play: A Combined Future?

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Abstract

This review aims to look at the research undertaken in each of the two branches of Autistic Spectrum Disorder therapy, comparing and evaluating their individual successes and looking for an integrated way forward including the role of play and playfulness in therapy and the difficulty of play for children with ASD. The definition of play is discussed as well as the relationship between play and Autistic Spectrum Disorder. Future directions are suggested including looking at a definition of what constitutes play and a playful situation for a child with Autistic Spectrum Disorder, an integrated therapeutic approach in an everyday environment.

Introduction

Autistic Spectrum Disorder is a large and complex disorder, there are many elements to it and children with a diagnosis of ASD can display very different behaviours and difficulties. A number of varying diagnosis fall under the ASD umbrella including Attention Deficit Hyperactivity Disorder and Asperger's . This research paper focuses on a diagnosis of ASD specifically including high and low functioning.

Autistic Spectrum Disorder was first identified by Kanner in 1943 as children who exhibit serious failure to develop relationships, problems with language development and 'insistence on sameness'. Autistic spectrum disorder has been further defined through research and the current DSM-IV as

Diagnostic and Statistical Manual of Mental Disorders: DSM IV

(I) a total of six (or more) items from (A), (B), and (C), with at least two from (A), and one each from (B) and (C)

(A) Qualitative impairment in social interaction, as manifested by at least two of the following:

- 1. Marked impairments in the use of multiple nonverbal behaviours such as eye-to-eye gaze, facial expression, body posture, and gestures to regulate social interaction*
- 2. Failure to develop peer relationships appropriate to developmental level*
- 3. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people, (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people)*

4. lack of social or emotional reciprocity (note: in the description, it gives the following as examples: not actively participating in simple social play or games, preferring solitary activities, or involving others in activities only as tools or "mechanical" aids)

(B) Qualitative impairments in communication as manifested by at least one of the following:

- 1. Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)*
- 2. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others*
- 3. Stereotyped and repetitive use of language or idiosyncratic language*
- 4. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level*

(C) Restricted repetitive and stereotyped patterns of behaviour, interests and activities, as manifested by at least two of the following:

- 1. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus*
- 2. Apparently inflexible adherence to specific, non-functional routines or rituals*
- 3. Stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole-body movements)*
- 4. Persistent preoccupation with parts of objects*

(II) Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years:

(A) Social interaction

(B) language as used in social communication

(C) symbolic or imaginative play

The Autistic Spectrum disorder (ASD) is large and varied and the degree of each child's difficulties and presentations of the disorder vary greatly. One of the central difficulties for all children with Autistic Spectrum disorder are the social communication difficulties including language delays; often causing great difficulty for the individual to function within society, through daily life and routines, including building relationships. The therapeutic interventions and improvement of these within all aspects of the Autistic Spectrum Disorder is a primary goal for therapists and researchers alike to find a way of to allow these children to lead a full productive life within society, for example attending mainstream school, developing friendships, and working through obsessive behaviours to prevent them impacting on their daily lives. The symptoms of ASD are more commonly divided into a triad of impairments defined

by Wing and Gould in 1979 based on Kanner's original definition. The three elements of the triad are described as firstly severe social impairment, secondly severe communication difficulties and thirdly a split element including absence of imagination and/or repetitive behaviour.

An agreed element of autistic spectrum disorder for all types of therapeutic intervention is the difficulty children with ASD have with play. An impairment of play skills is recognised by the very definition of ASD and the development of these skills is utilised within the therapeutic interventions discussed here.

There are two polarised camps on the theories of therapeutic interventions of ASD disorders, a medical/behavioural branch and a social/ relationship branch. The behaviour branch primarily focuses on cognitive and language development including managing behaviours. The behaviour therapies are generally more structured and take place in a more controlled environment. There is a large amount of empirical research on behavioural or ABA (Applied Behaviour Analysis) therapies and a strong results base for their impact on cognitive and language development, as well as the management of behaviours. The second branch is that of social or relationship based theories and interventions. This branch of therapy tends to be based in a more naturalistic setting, and focuses more on the social communication aspects of ASD, focusing on joint attention, early non-verbal interaction. Relationship based therapies are more child-led than the ABA approach, allowing the child more control over their environment and activities. The more 'play' based therapeutic interventions such as non-directive play therapy, fall into this branch and parents are more often given the tools to use the principles of the interventions to support their child's development.

The possible causes of Autistic Spectrum Disorders have been a subject of great debate and no real and definitive conclusion has been made by either camp although a number of studies have investigated suspected links.

A causal link theory was discussed by Sahey & Panksepp (1987); (this theory was also referred in Wakefield 1991 discussed later) they looked at the effect of hypersensitisation of neurohormone systems in the brain (brain opioids). The paper looked at the possibility that a disturbance in the brain in early childhood would induce a blockade or disruption of an opioid modulated social brain system. Some neurological researches have studied the belief that the brain contains systems specifically designed

to induce socially motivating behaviours for development and survival of the species. Indeed a study on the effect of early neo-natal exposure to high levels of endorphins lead to overall developmental delays in rats, cognitive and physical impairments in particular (Sandman & Kastin 1981). The impact of opioids was further discussed by Shattock et al (1991) where the amount of brain opioids present was linked to an abnormality of the gut involving the excessive absorption of peptides. However as medical research and knowledge develops in these areas there are no direct studies relating to this theory on children with ASD, the implementation of therapeutic drugs to combat these affects has been somewhat successful in animals (Panksepp 1981), no real link has been proven with regard to children with ASD and numerous long term clinical trials would be needed before drug therapy based on this theory would be an option.

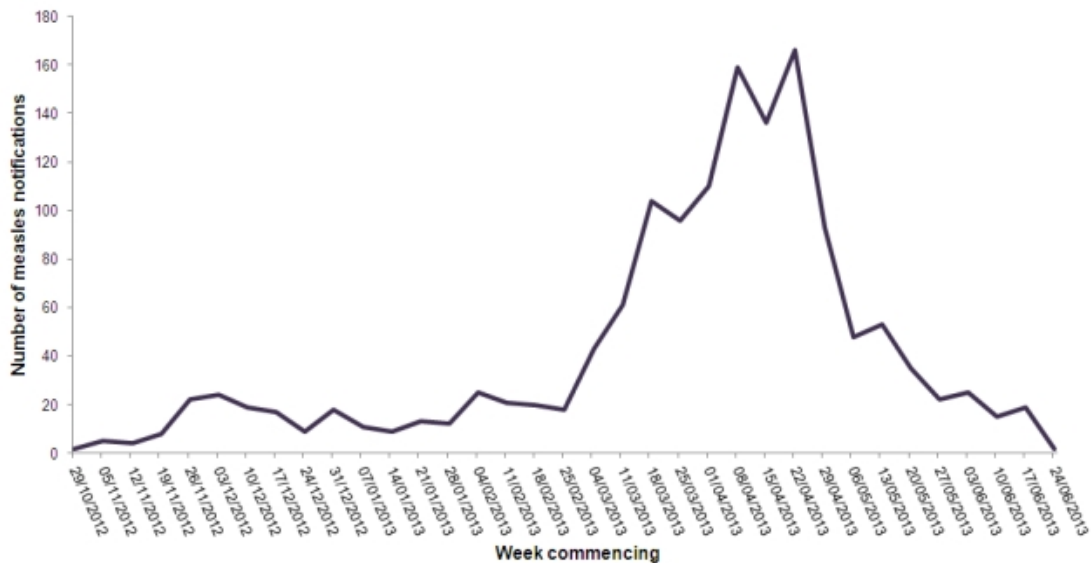
Many studies have suggested a cause and have then been disproved or discredited Researchers also need to take care when suggesting a cause due to the potential impact of their findings for example Wakefield's (1995) research paper linking the Measles, Mumps and Rubella vaccine with autism spectrum disorder. Wakefield's study looked at only twelve children with 'pervasive development' and disorders of the bowels. The main focus of the study was to determine a link between bowel disorders and that of 'pervasive' development, linking with some of the previously mentioned studies on brain opioids. However, eight of the twelve children involved in the study showed a regression in development which coincided with the MMR vaccine. A single paragraph of Wakefield's study stated that

'In eight children, the onset of behavioural problems had been linked, either by the parents or by the child's physician, with measles, mumps, and rubella vaccination. Five had had an early adverse reaction to immunisation (rash, fever, delirium; and, in three cases, convulsions). In these eight children the average interval from exposure to first behavioural symptoms was 6.3 days (range 1–14).'

Wakefield goes on later to state that no definitive link is proven by his study between the MMR vaccine and ASD; however what was stated has been enough to have worldwide implications. Wakefield's study has had long term implications on the uptake of the MMR vaccine even though the research has been discredited, this has led to outbreaks of measles in the UK; a potentially fatal and serious disease stemming from the drop in MMR uptake. In Wales alone a recent outbreak was monitored for the

period from November 2012-July 2013 when the epidemic was declared over, the following graph depicts the instances of reported cases over a weekly period, the low uptake of the MMR vaccine being blamed for its quick and sharp rise of cases.

Chart of number of notifications by week during the outbreak period: Week 44 2012 (week commencing 29/10/2012) - week 26 2013* (week commencing 24/06/2013)



* Data until end of week 26 2013 (17/06/13 - 30/06/13). Data for week 26 is provisional and may increase due to late notifications being received.

Source: *CoSurv Notifications, Public Health Wales*

Indeed a study in 2012 by Brown et al found that although other factors now influenced parents decisions on the MMR uptake (such as immune overload); Wakefield’s study was still an influencing factor in many of the cases.

It is unfortunate in a sense that the MMR link set out in Wakefield’s study has caused the work to be discredited, as the main focus of the study was the bowel disorders and their possible implications for ASD onset and diagnosis.

Whatever the actual cause of ASD it remains that children with ASD and their families face long term and often lifelong difficulties. Many of the traits and developmental delays associated with autism leave simple daily tasks a complete nightmare and scary prospect for many children with ASD; the social and communication difficulties they face can leave them isolated and unable to form relationships with even their parents. With the absence of a ‘cure’ it falls to therapeutic

intervention to close the developmental gaps faced by children with ASD and find ways for them to function within society, build relationships and live a productive and meaningful life.

With an unidentified cause therapeutic intervention has been the main focus of research, as previously discussed there are two main branches of therapy that most therapeutic programs fall into, behaviour based therapies such as Applied Behaviour Analysis (ABA), Picture Exchange Programme (PECS), Pivotal Response Treatment (PRT) and the second branch covering relationship based therapies such as floor time and non-directive play therapy. A few recent studies have looked at combining elements of both therapies and the importance of the 'play' and 'child led' elements of learning such as the Early Start Denver Model.

This review aims to look at the research undertaken in each of the two branches of therapy, comparing and evaluating their individual successes and looking for an integrated way forward including the role of play and 'playfulness' in therapy.

The Behaviour Therapy Route (Applied Behaviour Analysis (ABA))

Most behaviour therapies find their basis in Social Learning Theory (Bandura) and form a practical basis from Applied Behaviour Analysis or ABA. ABA is based mainly on the concept of rewards as a motivator for learning or changing behaviour. Behaviour therapies focus on the changing of unwanted or undesirable behaviours for something more socially acceptable and appropriate for communicating the needs of the child.

Lovaas, O.I., (1987) looked at the impact of Behavioural therapy on the educational and intellectual functioning of children with ASD. Lovaas has found that behavioural therapies can have a positive effect on children with autism, reducing aggression and unwanted behaviour, reducing self-stimulatory behaviour and improving language development. Although Lovaas acknowledges the limitations of improvements via behaviour therapy to the environment in which they are learned. Lovaas 1987 longitudinal study monitored three groups of children with ASD. The first group received more than forty hours a week of intensive one to one therapy from based on reinforcement therapy from trained therapists and took place in the child's home, school

and community. The second group (control group one) received ten hours or less of one to one treatment. Both groups received treatment for two years or more. The third group (control group 2) did not receive therapy from the team. Pre study testing showed no significant differences between the three groups. The final test results showed a significant improvement for the first group compared with both control groups, with the first group obtaining an average of thirty IQ points higher than those in the control group ($p < 0.01$). There were also significant results in the children's educational achievement with 47% of the first group successfully passing through first grade, with only 2% of the control group; significantly higher than the control groups where $p < 0.001$.

Lovaas also touches on the play skills of children with autism, including toy play in the pre-test for all subjects, however in the discussion Lovaas comments on the difficulty to differentiate low level toy play against the repetitive behaviours displayed by children with ASD. Since this study there have been a number of significant studies defining 'play' which may have been beneficial in accurately assessing the play skills of the children in the pre-test and also in the follow up where play skills are not detailed. The lack of 'conventional' play skills, in particular role play and abstract thinking are a key complication of ASD and it would be interesting to see the impact of behaviour therapy and relationship therapy on the play skills of ASD children as discussed later on.

The impact of ABA therapy and behaviour therapy on academic abilities is discussed in a more recent study by Troyb, E., Orinstein, A., et al 2014. This study focussed on children who were diagnosed with ASD but no longer met the diagnostic criteria for ASD, these individuals are referred to as having achieved optimal outcomes. These individuals received early intervention treatment consisting of intensive behavioural interventions, similar to Lovaas 1987 study.

The group achieving optimal outcomes (32 in total) were compared with a group of high functioning autistic spectrum disorder individuals (41) and a group of typically developing peers (34). Although individuals with a previous diagnosis of ASD who reach optimal outcomes no longer meet the requirements for a diagnosis of autism, there may still be residual difficulties present within social communication and pragmatic use of language and reasoning (Kelley et al, 2010). The outcome of Troyb's study indicated

that the academic abilities of the optimal outcomes group were similar to that of the peer group, the optimal outcomes group also scored higher on average than the high functioning autism group, whose scores fell in the reading comprehension testing (although still meeting national averages). The High Functioning Autism group also scored lowest in the story construction, tying in with the lack of imagination and impaired ability for abstract thought (Attwood, 1998), this also goes some way to explaining the low scores for the high functioning ASD group on the problem solving mathematical tests. This study although highlighting the long term results of intensive behavioural therapy for children who go on to become optimal outcomes does not go into detail on the exact nature of the therapy undertaken by the children, and in essence cannot determine the specific type of therapy nor rule out any mitigating factors in the child's environment or upbringing. A future direction from this study could be a longitudinal version where a controlled therapeutic intervention (as in Lovaas 1987) combined with a look at diagnosis and outcomes including academic ability in the future could be studied; therefore providing a controlled sample of therapy and a monitored progression through the academic and therapeutic services.

The difficulty to generalise, inflexibility of routines and rituals and the impaired ability for abstract thought can become a barrier to ABA therapy and general overall development. The difficulties with generalisation and the regulation of thought hampers the use of skills and advancements, gained through therapy, to be used outside of therapy.

Adrien, Martineau and Barthelemy (1995) studied the regulation of cognitive activity of children with autism compared with globally delayed children. The study compared fifteen children with autism against fifteen mentally retarded children (study definition) (using the DSM-III-R diagnosis criteria 1987). Each group had a split of 12 boys and 3 girls, part of the selection criteria included choosing mentally retarded children with a verbal age lower than their non-verbal age adhering to a developmental characteristic of children with ASD. Although the developmental ages were comparatively similar the mean age gap between the two groups showed a difference of fourteen months and four days, a significant gap.

All of the children were tested using object permanence tasks corresponding to Piaget's stages of sensori-motor development IV- VI. Overall the tests indicated that the

higher the sensorimotor stage the test was the more difficulty the children with ASD had with abstract thinking and regulation of thought. There was little difference between the two groups at the earlier stage tests of sensorimotor development (stages IV-V), the typical error sequences (preservative behaviour responses) were insignificant at lower stage tasks and did not differentiate between the ASD sample and the mentally retarded sample greatly until reaching the more complex stage VI task. Overall the findings of the research were of low significance, although the study highlighted a significant difference between the performance of the group of children with ASD at stage V and stage VI, suggesting the difficulties of regulation of thought and generalisation of children with autism, perhaps a further study with a larger sample size and a third group of children within 'normal' developmental range for their age would produce more significant results, and even further to compare lower functioning children with ASD against children with higher functioning ASD.

Another difficulty ABA therapist's face when dealing with children with ASD is their responses are often limited to only a certain number of environmental cues, named 'stimulus overselectivity' by Lovaas & Schreibman 1971); for example a child may not recognise a familiar adult if they tie their hair back or change their hair colour. Lovaas et al (1971) found that when behaviour was learned with a number of different cues present, the child with ASD linked the behaviour only to one of the cues and would not initiate the learned response when the other cues were presented.

This was supported by the findings of a study testing the observational learning of children with ASD versus typically developing children (Varni, J., Lovaas, O., et al (1979). The study consisted of two groups of fifteen children, the first was a group of children with ASD with a mean chronological age of 10 years, all of the children in this group had minimal receptive and expressive speech; the second group of 'normal' children with a chronological age of three years. The test itself consisted of an adult model and a teacher sat opposite the child at a table with various stimuli in visual range of the child. ABA principles of social reinforcement were used to encourage the children to remain seated in the chairs and prevent self-stimulatory behaviour. The adult model then undertook the behavioural sequence under instruction from the teacher and the behaviour reinforced by reward and praise, following a set number of observations of each task the children were then tested to see if they had made any gains from observational learning. The results of the study illustrated two main points, firstly that

the typically developing group showed gains through observational learning with a relationship between age and acquisition in comparison the group of children with ASD showed no relationship between age and acquisition with all ages achieving acquisitions similar to those of the younger children, Varni interestingly notes that the three oldest children with ASD had the poorest performance; this brings to mind the importance of early intervention therapies although no description is given in the study of any previous intervention (early or otherwise) having been undertaken by any of the children with ASD. The second point illustrated by the results of the study is that children with ASD do not learn through observation (modelling of behaviours) without further therapeutic intervention, this could be linked to the findings of Lovaas relating to stimulus overselectivity and the suggestion that a symptom of ASD is the inability to relate behaviours to multiple cues, the children with ASD in Varni's study may have attributed the behaviour to the specific adult model rather than the teacher making it difficult to then make the correct response to the teacher alone in the post-test phase.

This response to only limited cues can also hinder the generalisation of skills learned through therapy. Koegel, Schreibman et al, discuss the concept of stimulus overselectivity further in their 1979 study and looked at the impact of different forms of schedule reinforcement incorporating the importance of antecedent stimuli in ASD behaviours. Koegel et al in this study looked at changing the schedules of reinforcement during training sessions and the effect on overselectivity. The subjects consisted of twelve children (eight boys, four girls) a small sample but all with a diagnosis of ASD and had all been tested for sensory impairment due to their variable responses to stimuli. All children were tested following both conditions in a randomised order; the first condition was correct response reinforcement throughout, with 100 overtraining trials provided where on average every third correct response was reinforced. During the second condition every correct response was reinforced during both the training and overtraining. The results indicated a reduction in overselectivity following the first condition both overall as a group and individually for each child. The difference between condition one and condition two mean results indicating a significant difference (where $t=1.97$, $p<.038$). These results suggest a useful progression for behaviour and reinforcement therapy where using a partial reinforcement schedule during training can support children with ASD to generalise the behaviours and responses learnt to outside the classroom and reduce the child's overselectivity. The

results of this study begin to hint at the benefit of using a holistic therapeutic intervention combining the successful elements of each type of program.

A well-known form of behavioural therapy, the Picture Exchange Communication System (PECS) is now widely used by speech and language therapists with children with ASD as well as for children with other disorders or delays as a form of building communication. PECS (run by Pyramid) requires a trained PECS therapist to encourage communication with a child using highly motivating items teaching the child to exchange a picture or symbol representing the item with the therapist in return for the motivating item. Success at the PECS program can lead in the long term to increase in vocabulary and sentence building, this type of therapy is effective in established environments with individuals familiar with the PECS system, but can be difficult to generalise to everyday life situations in an unfamiliar environment. For example symbols are not available in every aspect of life, a PECS user may go into a shop with their PECS book, offer pictures as communication to the sales assistant and be met with a puzzled and incorrect response from an individual unfamiliar with the PECS system. On the flip side a PECS user in controlled environments (schools, day centres, home) would be able to communicate and function productively, being able to communicate choices and decisions for their own wants and needs.

A picture exchange system similar to the PECS program was used by Mancil et al (2009). Mancil, Conroy & Haydon (2009) studied the potential outcome of combining two forms of behavioural therapy, namely Functional Communication Training (FCT) and Milieu Therapy with the aim of combining the benefits of both. Behavioural Therapies can be effective in avoiding aberrant behaviour common in children with a diagnosis of ASD. Often in many diagnoses where there are communication difficulties, aberrant behaviours can present themselves as a substitute for a lack of communication skills (Sigafoos 2000). The contrast between these two forms of behavioural therapy is the setting in which the therapy takes place. FCT therapy includes assessing the purpose of the aberrant behaviour and replacing it with a more acceptable form of behaviour/ request, FCT generally takes place within a structured setting. In comparison milieu therapy focusses in replacing the aberrant behaviour with new communication skills within a more natural environment with a less structured approach. Both forms of therapy have had successes in their own right, FCT is criticised as having difficulty generalising the changed behaviour to a natural

environment and towards different people other than the therapist. The Milieu therapy uses natural change agents (teachers/parents) to promote the generalisation of the learned communication skill or behaviour and modelling of the correct or desirable behaviour, research on the effect of milieu therapy on improving aberrant behaviours is sparse, Mancil et al's study looks to expand on that research.

Mancil's study looked at using both FCT and Milieu strategies to replace the aberrant behaviour with functional communication skills using natural change agents within a natural environment. The study was based on only three participants diagnosed with ASD with a large age range for the small sample of 4 years one month to seven years eleven months. The levels of social initiation and communication (2-3 word utterances) were similar for the three children, however the educational, socio-economic and experience of each of the natural agents (parents and teachers) varied greatly. One of the children had also undertaken ABA therapy at a previous time. The study took place within the children's homes and schools, with parents being trained as the change agents. The therapy involved teaching children to exchange pictures for the items they wanted, this was initially done with prompts, and following successes the prompts were gradually removed. The system was also placed within the school to monitor generalisation of the therapy. Children were observed at school to establish the effect of the modified Milieu therapy on generalisation of the learned behaviours, implementation of the therapy took place at the homes of the children.

The results of the study indicated a decrease in the aberrant behaviour as the percentage of communication responses rose, the communication responses increased both at home and at school indicating a generalisation of the communication skills learned. Even as the use of prompts decreased the Percentage Communication Response remained high indicating positive results for the therapy. As previously discussed the small sample size affects the validity of this study, and repetition of the therapy with more participants is needed to cement the results. The parents involved in the study also noted that they did not use the intervention therapy outside of the sessions; this has implications for the results whereby there may have been a marked difference in the children's generalisation had the parents continued use of the intervention in other areas of the home. The study could also go further into assessing the improved communication skills of the children using tools such as the CCC (Children's Communication Checklist) as discussed further on in Mohammadzaheri, F., et al's study

in 2014 and also look at any improvement in the child's play skills as a result of the intervention.

The Relationship Based (DIR) Route

Forms of play therapy

Music therapy

Musical Interaction Therapists seek to establish a relationship with the children through the shared process of making music. Musical Therapy is a form of interaction and play based around parent-child interactions leading to social and communication development with in children (Christie et al, 1992). Within music therapy songs provide tempo, pauses, rhythm, routine, volume and are a gateway to interaction, as a song becomes familiar the child knows what to expect, and is encouraged to use good communication skills (eye contact, gestures and sounds) when they notice the therapist has stopped for example. Singing with action songs or using instruments allows a child to join in and have a shared experience without the pressure of a verbal response. Musical interaction therapy allows children with ASD to relate to others; develop self-awareness and allows them to respond more easily in social interactions (Robarts, 1998).

A case study over two years was undertaken following a child with ASD and the effect of musical interaction therapy. The child was three and a half at the beginning of the case study, non-verbal and did not use gestural communication. The sessions involved various repetitive games such as patting, tickling, stroking, and singing and action rhymes, the therapy followed the child's lead and the mum and therapist often imitated the child promoting turn taking. Alongside these games the musician played music reflecting the mood of the games and the timing of the actions and interactions of the mother and child. Prior to therapy the child failed to acknowledge the presence of the mother (six minutes minimum if the mother was acknowledged), post treatment the child always acknowledges the mother within a minute. The child's eye contact rose from almost non-existent pre-therapy to six times per minute post-therapy, the child's

level of interaction initiation rose from 20% to 75% following the musical therapy intervention. Some of the joint interactions from within the musical interaction therapy were generalised by the child outside of the sessions. For example a previous behaviour where the child would pick fluff from the bed as a repetitive behaviour became part of a game during therapy; the child would then look for the game during this behaviour outside of the sessions, often just pretending to initiate the behaviour in order to instigate the game (Wimpory et al 1995).

The more commonly used form of music intervention therapy is improvisational music therapy, a more child-led form of musical intervention therapy. Improvisational music therapy according to Gold et al (2006) addresses levels of spontaneous self-expression, social and emotional communication for children with a range of developmental disorders including ASD.

An empirical research study by Kim, Wigram and Gold (2009) looked at the effect of improvisational music therapy on children with ASD. The study looked at ten children with diagnosed ASD aged between three and five with no previous undertaking of any form of play therapy. The children were assessed using the Childhood Autism Rating Scale (CARS) at pre and post-test. Each child undertook two different sessions of thirty minutes each for a total of twelve weeks. One toy session and one music session, the materials and environment were consistent for all children. The study also divided the sessions into two parts; a directed element and an undirected element, musical interventions were avoided in the toy play sessions. The child's emotional and motivational responsiveness was measured along with the child's responsiveness towards the interaction initiated by the therapist.

The results of the study firstly showed the impact of the music therapy opposed to the toy therapy on the various elements of the child's responsiveness. The results showed a higher level of responsiveness and a significant difference for the music therapy over toy therapy for joy ($F(1,135) = 24.26, p < 0.001$); emotional synchronicity ($F(1, 135) = 31.26, p < 0.001$) and with initiation of engagement ($F(1, 135) = 54.95, p < 0.001$). The study also found more compliant behaviours were shown by the children in the music therapy rather than the toy therapy. The level of no response to the therapist's interaction initiation during the toy play was double the level of no response in the music therapy. The study also showed an overall higher amount of responsiveness

in the undirected elements of the therapy sessions indicating the benefits of a more 'child-led' approach to play; even for children with ASD predisposed as having fundamental difficulties with play itself.

The results of this study provide a supportive base for improvisational music therapy as a form of effective therapeutic intervention for children with ASD; however the sample size was relatively small and omitted to include a control group for comparison. An interesting contrast would have been between a group of children receiving music therapy alone and a group receiving the toy play therapy. A factor on the result would also have been the mix of directed and non-directed time within the sessions; a future study could separate and clarify the results further by providing for a music therapy directed group and a music therapy non-directed group.

Son-Rise Program

The Son-Rise program (Hogan & Hogan 2004) is a relationship based responsive interaction program focussing on previous difficulties raised within the ABA therapies of stimulus oversensitivity (Lovaas 1971); and repetitive behaviours. The difference between the Son-Rise program and the ABA therapies is the view on the repetitive behaviours; whereas the behavioural thinking looks to eliminate the repetitive and often unwanted behaviours the Son-Rise program believes the behaviours to be essential relaxation behaviour for the child with ASD allowing them to regulate their autonomic system; essentially shutting out the stimulus overload of the world around them (Nijhof et al, 1998). Within the Son-Rise Program the facilitator (predominantly the child's parents) even goes so far as to join in with the repetitive behaviour as a 'way in' with the child and to show acceptance. The Son-Rise program is very much focussed on a child led approach to improving social interaction and then improved development and learning as a result, as many of the relationship based interventions are. However another important factor for the Son-Rise Program is the use of a specifically designed room within the child's own home.

Going back to the fundamentals of the Son-Rise Program, the aim is to create an '*Optimal Physical Learning Environment*' (Hogan & Hogan 2004); thus eliminating as much as possible an overload of stimuli from the environment. The environment

according to the Son-Rise program should contain only neutral colours and natural lighting, toys and equipment to be stored off the floor to provide a ‘distraction-free floor area for play’. The sessions in the room must only be between one adult and one child to avoid the child having to filter out the distraction and stimulus caused by the presence of another child. The Son-Rise program is a popular therapeutic intervention boasting positive results; the program has been in use since 1983 however there has been no published empirical research on the program and its effectiveness.

Within the Son-Rise program the use of ‘play’ as a vehicle for learning is again central to its implementation, the process of ‘playing’ with the child and following the ‘child’s lead’. But the ‘play’ has not been defined nor whether the ‘play’ has been deemed such by the therapists or the child. Surely a move towards a ‘child-led’ approach gives more scope for the activities undertaken to be chosen by the child, falling more in line with the research undertaken by Thomas et al and McInnes et al. An interesting study would be to see how the learning environment criteria for the Son-Rise Program falls in McInnes et al’s play perception test.

Floor time

The floor time intervention therapy is a well-respected and popular Developmental, Individual-difference, relationship (DIR) therapeutic approach to ASD. Floor time was derived by Greenspan, S.I., & Weider, S., (1997). DIR more commonly known as ‘floor time’ incorporates the developmental capabilities of each individual child, together with sensory-processing and regulation levels of the child; and the environments and relationships through which the therapeutic intervention will take place. This approach contrasts sharply with the structured and uniformed approach of ABA therapy. According to Greenspan ‘floor time’ is the element of therapy where ‘the caregiver follows the child’s lead and promotes the continuous flow of interactions utilizing affect cues that, entice, challenge, sooth and encourage the child further’. The purpose to interact continuously with the child on a level they are capable of extending these skills to a point where the child can become capable of higher functions. Floor time encourages social skills, spontaneous communication and language use and relationships (Pajareya 2011).

Floor time moves through six stages beginning with shared attention and self-regulation including enjoyable interactions and harnessing the senses. Once mastered floor time then moves on through stages of engagement and relating, two-way intentional communication, purposeful problem solving communication, then leading to elaborating and creating symbols (including pretend play extended by the adult) and finally a stage where the child is challenged through pretend play to connect ideas together beginning to separate reality and fantasy, self-modulation of impulses and emotions.

Wieder and Greenspan (2003) undertook a case study of a child with ASD's progress through the 'floor time' intervention. The child in the case study 'J' began 'floor time' intervention at two years and six months for a period of four years. The intensity of 'floor time' was high with six sessions per day. Over the four years 'J' also received semi-structured activities (reminiscent of the directed sessions in Blanc's dysregulation study discussed earlier 2005); intensive speech and language and occupational therapies; a number of weekly play dates, attendance at pre-school and various extra-curricular activities (music, sports etc.). 'J's main facilitator was the father, many of the types of games and interactions between dad and 'J' are details within the case study focussing on encouraging 'J' to engage just that little bit more each time, developing the scope of the activity and interaction just slightly further on than the last (resonating with Vygotsky's 'scaffolding' theory of learning).

Eighteen months into the 'floor time' therapy more family members had now become involved showing a marked improvement on shared attention, 'J' had also developed some verbal language and showed a marked increase in symbolic play, following four years of 'floor time' therapy 'J' was now able to problem solve and could relate some of the concepts he had learned to everyday life, 'J' was able to discuss feelings and motivations with dad and was beginning to explore abstract thought and empathy.

The findings of the case study are indeed supportive of the 'floor time' intervention, however it is difficult to generalise the results of a single case study to an entire therapeutic intervention. There may also be some bias from this study as it was undertaken by the designer of the therapeutic intervention discussed. It is also difficult to attribute 'j's developmental progression to 'floor time' alone due to the number of

other therapeutic interventions undertaken by 'j' during the study period. This case study could also be put forward again as an illustration of the effect of a combination of therapies on the outcomes of a child diagnosed with ASD and the combined benefits of a number of interventions simultaneously.

In 2007 a group study was undertaken of sixty eight children with ASD aged 1.5-6 years old using the PLAY project home consultation (PPHC) program (Weider & Greenspan). The PPHC project aims to train parents to undertake the DIR/ floor time model within their own homes at an intensity of around fifteen hours per week for 8-12 months; children were excluded if they were taking part in any other form of intensive intervention aiming to produce results showing the benefit of the PPHC program alone. The fifteen hours per week could take the form of structured sessions (resonating against the findings of McInnes and Howard on 'play' 2009); or during incidental daily activities. The parents are taught 'play based intervention' based on Greenspan's theoretical framework; again the definition of what constitutes 'play' being an issue of debate with specific factors influencing the 'child's' approach to a situation as playful rather than an adult's perception of a playful situation.

The children in the study were tested pre and post-test using the Functional Emotional Assessment Scale (FEAS Greenspan et al 2001) to measure changes in the children's development and behaviours. According to the FEAS the higher the child's score the higher their development and the more functional their behaviour. All of the children were enrolled in another form of intervention; some preschool programs, some early interventions; although none of the interventions were described as intensive intervention therapy. The results found that the children's FEAS scores increased over the twelve month duration of the program ($p < 0.0001$) with 45.5 percent of the children making good to very good functional developmental progress. A two tailed reliability t-test on the scores indicated a high reliability of the results where $p < 0.05$. The children were also tested using clinical methods (the functional development level (FDL)). The comparison of the pre and post-test results for the FDL also indicated high gains for the children following the PPHC program of intervention ($p < 0.0001$). Despite the promising results the study presents some limitations, first and most importantly the absence of a control group, making it impossible to conclusively attribute the results to the implementation of the PPHC program. A further study on the DIR/ Floor time intervention program was conducted including a control group.

An independent randomised controlled trial of 'floor time' was undertaken in 2011 (Pajareya, K., & Nopmaneejumrulers, K.). This study addressed the singular case study issue and the control group limitations of the previous two studies on DIRI? Floortime intervention by using a group of thirty two children with diagnosed ASD. The children were split into a control group using ABA intervention and a test group using DIR/ Floor Time supplemented treatment groups. The children were categorised into stratum based on the severity of their autism determined via the Childhood Autism Rating Scale (Schopler et al, 1986). The implementation of the study was done via parental training, the parents received training on the Floor Time technique and received modelling and observation support from the investigators. The children were assessed pre and post-test using the Functional Emotional Assessment Scale (FEAS, Greenspan et al 2001), the children were also assessed again post-test using CARS to determine any impact on the degree of autistic symptoms.

The results comparison with regard to the FEAS test showed an increase for the control group of 1.9 (SD=6.1) and an increase of 7.0 (SD=6.3) for the intervention group, with the difference showing as statistically significant in the t test ($p=.031$). A significant difference was also shown in the CARS results ($p=.002$). The results of the pilot study indicate a positive outcome of the implementation of Floor Time in comparison to a control group giving more viable results, although the effects of the additional therapies undertaken by the children on the results cannot be separated.

In both studies regarding Floor Time additional therapeutic interventions ran alongside it, such as speech therapy, occupational therapy, picture exchange programs and other ABA based interventions. If the gains are more significant with a combination of therapies including a mix of behavioural and relationship based approaches, further research focussing on the most effective combination of therapies would be a positive move towards a holistic therapeutic intervention.

Non directive interaction therapy

Non-directive play therapy aims to create through a one-to-one relationship a safe and trusting environment where through free play children are enabled to explore their feelings and express themselves. Non-directive therapy has been a form of therapeutic intervention for a long time; non-directive play therapy was introduced through child therapy initially by Axline, V. in 1947. Axline described the process of

therapy as a vehicle to allow children to express themselves freely through play experiences resolving their own difficulties by utilising the non-directive therapy philosophy of an innate drive in all human beings for self-realisation. Axline also devised a set of eight principles of practice for non-directive play therapy; these are set out as follows

1. Developing a warm, friendly relationship with the child.
2. The therapist must accept the child as they are.
3. Allow the child a freedom to express their feelings completely.
4. Recognise and reflect the feelings of the child to gain insights into their behaviour.
5. Maintain a respect for the child's problem solving ability.
6. Make no attempt to direct the sessions, follow the child's lead.
7. Do not hurry the sessions; recognise therapy as a gradual process.
8. Establish only limitations that are necessary to make the child aware of their own responsibilities.

Axline's work is well referenced within current research. Non-directive play therapy is commonly used as a tool for children with emotional difficulties who have often experienced trauma; the non-directive therapies provide an emotional outlet and an opportunity to work through their difficulties within a safe environment.

Josefi and Ryan (2004) undertook a case study of the impact of non-directive play therapy on a child with severe Autistic Spectrum Disorder. This case study looked at the impact of sixteen non-directive play therapy sessions with a boy of six years old with a diagnosis of severe ASD. Prior to the sixteen play therapy sessions the therapist spent one hour a week for eight weeks observing the child using the Tavistock method of observing without active engagement and being child-led observations similar to that of non-directive therapy. (Miller et al, 1989). Josefi et al notes that at the end of these eight weeks the child has begun to initiate interactions with the therapist. The non-directive play therapy sessions were set out with a range of materials to allow opportunity for expression, imagination, and interaction. The same materials and layout were used for each session to allow the child to gain familiarity with the room. The sessions were videotaped for later analysis.

The results were analysed both qualitatively by the therapist and quantitatively by both the therapist and an independent observer of the videos. The qualitative analysis was taken via detailed notes written directly after each session, the subjective qualitative analysis four predominant themes were identified; attachments, autonomy, symbolic play development and nurture. The quantitative analysis was measured and addressed in line with the themes of the qualitative analysis.

The attachment level for the child was deemed to be indicated by his body positioning in relation to the therapist, the way a particular object was handled and the quality of social interaction. Throughout the progress of the sixteen sessions, the child displayed increased eye contact and proximity to the therapist and more of the interaction was initiated by the child. The child was also initiating physical contact with the therapist towards the end of the sessions, including climbing on to her lap and requesting piggy back rides, the number of gestures and words used to communicate with the therapist also increased as the sessions progressed. The child was said to show separation anxiety similar to that of a mother and child bond when the treatment came to an end.

In line with the attachment theme, the objective quantitative analysis measured the amount of physical contact and child-initiated interaction during the sessions. The physical contact increased over the course of the sessions, (with a few anomalies such as 0 time in sessions 7 and 8) the time of physical contact rose from 0.12 in session 2 up to 6.42 in session 13.

The second theme identified through the qualitative analysis was autonomy, the child progressed from needing the therapists help with minor tasks, to testing the boundaries of the room and the sessions, through to the child appearing to regulate its own wilfulness. The quantitative analysis measured the number of child initiated activities through the hour long sessions, these progressed from 5.8 minutes in the first session to 28.25 minutes in session 16; these results support the subjective view of an increase in the autonomy of the child through the non-directive play sessions.

The final and most relevant theme to this discussion is that of play, qualitatively this was measured by the child's choice of activities and the level of engagement and the interaction with the therapists. The qualitative analysis identified that the child's play remained the same for the first nine sessions but became more symbolic for the

remainder with the child using the toys appropriately. The quantitative analysis also supports this finding showing that the child predominantly chose activities including sand play dough, finger paints and musical instruments. From around session nine the child began spending more and more time on the pretend play toys; the food, phone, doll and doctors set. The increase in the use of the pretend play activities coincided with an increase in interaction time with the therapist, for example in session twelve the child spent a total of 16.36 minutes interacting with the therapist and a total of 10.67 minutes on the pretend play activities. During the more mutual play activities the therapist noted that the child displayed more positive social interactions such as laughing and smiling.

With regard to the ritualistic behaviours often displayed by children with ASD, typical ABA and behavioural type interventions aim to reduce these types of behaviours and encourage socially acceptable responses in their place. For relationship based therapies this is not the main aim, some even maintaining that the behaviours are a relaxation outlet for the child; although many of the studies find a reduction in these behaviours occur with the improvements in other areas of development throughout the therapeutic intervention. The results of this study show no real impact on the incidence of ritualistic behaviours for this particular child. On a session by session basis there is a significant drop in incidence between the first and the last session (15.25 minutes and 6.17 minutes respectively), however when an average is gained between the incidence of repetitive behaviours in the first eight sessions compared with the last eight sessions there is a less significant difference with a decrease of 23% in the last eight sessions.

A report from the parent of the child indicated that the child was able to generalise the skills and social interactions gained in the non-directive therapy to outside of the therapy room. The parent described the child as more emotionally responsive, more accepting of change and more able to follow rules and boundaries. The child was also more responsive to the needs of others around him.

All of these reported results indicate a benefit to the child from undertaking the non-directive play therapy, the results of this study are difficult to generalise due to the nature of a case study and the absence of a control subject/group within the study. Despite this the results indicate that non-directive play therapy can have a positive impact on children with ASD allowing them an environment where they can be emotionally secure and relaxed, and able to instigate therapeutic change for themselves

in an optimal environment. It also indicates that children with ASD are able to develop their pretend play skills in the right environment and with the right therapeutic intervention for the child.

‘Play’ within play therapy is used as a vehicle for development within a number of interventions, both behavioural and relationship based. As previously discussed a number of studies and pedagogy’s recognise the importance of play as a vehicle for learning and advancement within the development of children (Piaget, Vygotsky).

Behavioural or Relationship based? An evidence based comparison

So although there are empirically evidenced benefits to both forms of therapy, there are limitations to both routes derived from the very nature of autistic spectrum disorder itself, many of these therapies support children with ASD to function within their familiar routines and structured environments what about the real world? A world that is constantly changing and unpredictable?

There is a large wealth of research on the effectiveness of behavioural therapies on play skills of children with ASD, other researchers argue against this, suggesting that behavioural techniques teach children to ‘pretend’ to play and are really just going through the motions instead of the genuine act of play. (Lockett et al 2007). A common critique of behavioural therapy is the generalisation of any learned behaviour to outside of the intervention room.

A study that compared the use of behavioural therapy within a structured and a natural setting was one by Mohammadzaheri, F., et al in 2014. Mohammadzaheri looked at two different types of behavioural therapy for children with ASD and conducted a randomised clinical trial to compare the two. The first was a structured Applied Behaviour Analysis (ABA) consisting of controlled antecedent-behaviour-consequence therapy, correct responses are rewarded and stimuli are tightly controlled. The second is Pivotal Response Treatment (PRT), the basis of PRT is derived from the ABA approach of behaviour therapy but with added allowances to improve response; Child choice being one of the key elements of this. The sample consisted of thirty six to eleven year olds with diagnosed ASD (DSM-IV-TR 2000), children selected had been referred for intervention, had at least two words Mean Length of Utterance (MLU)., had no visual or auditory impairment or psychiatric disorder and had an IQ of at least 50.

Both the ABA and the PRT groups had a split of 60/40 boys and girls and were all Iranian. None of the children in the study received any other form of intervention during the study. The children were randomly assigned to either the ABA or the PRT group.

The focuses of the interventions were to expand on the child's Mean Length of Utterance (MLU). For the ABA group the child's favourite food, toys etc. were provided as a reward and teacher chosen materials, for the PRT group items chosen by the child were used for rewards and activities, each child received two one hour sessions per week for three months. Within the ABA group the therapists remained on the structured tasks compared to the PRT group where previously mastered tasks were also included, the rewards given in the PRT group were also related to the requests made by the child in comparison to the favourite items given in the ABA group. The PRT group were rewarded for every attempt made rather than only correct attempts in the ABA group.

The children in both groups were assessed using the Children's Communication Checklist (CCC), the number of utterances from the children throughout the interventions was also noted and an overall MLU determined. The Mean Length of utterances improved significantly in the PRT intervention rising from 2.76 pre-test to 3.20 post-test with the ABA intervention showing only a slight rise from 2.77 pre-test to 2.79 post-test, the post-test results between both groups showing a significant difference of $p=0.01$, indicating greater improvement in Mean Length of Utterances (MLU) in the PRT group over the ABA group following three months of intervention. The PRT children also showed gains in pragmatic language skills such as context, rapport and coherence through the CCC test and a suggestion of increased generalisation of skills learnt. There are a number of suggested reasons for the increased effectiveness of PRT as opposed to ABA, including the use of real objects as opposed to picture cards or abstract concepts. However the most effective difference appears to be the use of objects highly motivating to the child, in essence the child's choice of rewards and activities. But why is this so? And does this relate to the concepts of play as a high motivator for learning even for children with difficulty developing play skills? Research into the benefits of play and learning give an insight into this.

The effect of Pivotal Response Training with regard to 'teaching' pretend play skills to children with ASD was looked at in comparison to a Video Modelling program

(Lydon et al 2011). It has been suggested that children with ASD lack the motivation to play, rather than an inability to play, through repeated attempts and failures (Stahmer, 1999). This suggests a viable reason why elements of play are not undertaken by children with ASD within a free play session, they are not motivated to do so. Lydon suggests that PRT is an effective tool for motivating children with ASD to play and to generalise those skills to other situations.

The significance of child choice and child led play within learning have been shown through studies on play to have a significant impact on the motivation and learning of a child. The way a child approaches a task can significantly affect the outcome. McInnes, Howard, Miles and Crowley (2009) used the child's definition of play and looked at the importance of this in defining play, they also looked at the behavioural implications on children when in playful compared to non-playful situations. The study showed a significant difference in the outcomes for children in play versus non play conditions where children in the play condition performed significantly better than those in the non-play condition; and also a significant difference in the behaviours displayed by the children in each condition.

Thomas, Howard and Miles (2006) suggest that play should be looked at as the child's approach to learning rather than a categorized definition or criteria for play. Their study on the impact of play on task outcomes was based on previous research of children's perceptions of what constitutes a playful situation (King 1979; Ceglowski 1997; Karrby 1989 all cited in Thomas, Howard and Miles 2006). Thomas et al found that results are better for children who approach a task as playful against children who approach a task as non-playful. This resonates with the results of Mohammadzaheri's study with the improved outcomes for Pivotal Response intervention compared with a structured Applied Behaviour Analysis intervention, where the PRI is more likely to have taken place in a setting with better play conditions than structured ABA intervention.

ABA and behavioural approaches have their place in improving the behaviours of children with ASD and empirical research supports this. As discussed within this paper some lines of thought question the need for reducing the repetitive behaviours suggesting they are an outlet for a build-up of overstimulation. An interesting study by

Land and O'Reilly (2009) looked into the impact of the presence or absence of repetitive behaviour or 'stereotypy' on therapeutic play interventions.

The study involved the case study of an eight year old girl diagnosed with ASD. The intervention was undertaken in two different conditions, the first was with a period of time where the child could freely engage in stereotypy (abolishing operation component, AOC) before the play therapy session, the second condition was the play therapy session without an AOC beforehand. The play therapy itself consisted of modelling, prompting with reinforcers and child-led naturalistic instruction. This discussion paper raises issues with conditions of the 'play' within the play therapy session itself; however the results of the case study have interesting implications for the reasoning behind the stereotypy in children with ASD and the implications it may have. The case study measured the amount of functional play, levels of stereotypy and problem behaviour.

The child showed progressive improvements of the level of functional play in both conditions over the course of the interventions supporting the impact of play therapy in general on functional play skills of children with ASD. However the specific aim of this study was to uncover the impact of free stereotypy engagement before therapy. Even though improvements in functional play levels were shown in both conditions the amount of functional play in the first condition (AOC beforehand) was higher than that of the second condition (without AOC), the results being 56% and 39% respectively. The incidence of stereotypy within the play therapy sessions was lower with the AOC beforehand than in the play sessions without the AOC; 28% in condition one and 44% in condition two.

The study shows that the reduction of stereotypy through allowing free and uninterrupted time for it has a positive impact on functional play skills and a reduction in problem behaviours. These results provide some support for the aims of behavioural therapy in eliminating the repetitive and problem behaviours.

A study by Eisele and Howard (2012) looked further into the repetitive behaviours associated with children with ASD to see if the behaviours demonstrated any 'playful' qualities using the criteria for play set out in 'Handbook for Child Psychology' (Rubin et al 1983) and the Leuven Involvement Scale.

The study looked at the repetitive behaviours of nine children with a diagnosis of ASD and an age range of 5-12 years. Observations took place during dedicated break times during the course of a typical school day. All of the episodes observed were determined to be freely chosen, intrinsically motivated and personally chosen in line with Rubin's criteria for play. Further analysis of the observations using the assessment of Ludic Behaviour measure (Ferland 1987) showed a rate of 0.94 for pleasure and spontaneity during the repetitive behaviour.

An analysis of the behaviours observed using the Leuven scale indicated, many of the characteristics indicative of play were present in the analysis, with satisfaction, persistence, concentration, energy and facial expression showing a proportion of over 0.89 indicating the repetitive behaviours have a number of play elements within them. A few of the play criteria's held a low proportion in particular language (0.03), creativity (0.14) and reaction time (0), these characteristics are typically a difficulty in general for children with ASD. Overall there are indications that the repetitive behaviours displayed by some children with ASD can be defined as atypical play, for eight out of the nine children the proportion of displayed indicators for involvement in the activities as play were over 0.53 with a range of 0.53-0.69. This opens a discussion into the area of play and Autistic Spectrum Disorder.

The difficulty of using 'play' with children who don't know how to play

The word play is defined as to 'engage in activity for enjoyment and recreation rather than a serious or practical purpose' (Google online dictionary 2012). This official definition of play is inaccurate in terms of child development and child psychology; it fails to acknowledge the importance of play as a factor in children's development or make reference to the educational programs currently in place supporting the importance of learning through play. The importance of play in child development has been agreed on by a number of pedagogy's including Piaget and Froebel. The foundation phase framework in Wales (2008 pp. 6) states that children will 'learn through first hand experiential activities with the serious business of 'play' providing the vehicle'; this implementation of play clearly does not fall under the same definition as the first. The difficulty of defining play also has implications on the study of play.

But what about play and autism? Many of the studies, definitions and diagnostic criteria highlight lack of play skills (predominantly symbolic and imaginative) as a sign and symptom of ASD, but few studies have explored this deficit in depth in relation to its impact on therapeutic intervention.

Within the studies undertaken on play and autism, the definition of play often depends on the theoretical perspective of the researcher (Sutton-Smith, 1997).

The results of some studies into children with ASD highlight impairment in imagination, specifically an inability to imagine 'unreal' objects even after 'scaffolded' (Vygotsky) guidance from adult interaction partners (Scott, F.J., Baron-Cohen, S., 1996). Pretend play is highlighted as a particular difficulty for children with ASD, the reasons for which remains a subject of debate

Craig and Baron-Cohen (1999) went further into the analysis of imagination in children with ASD. They looked at three different test situations using the Torrance Creativity test throughout, the aim was to find whether the cause of the impairment was through executive dysfunction or the imagination impairment suggested by Scott et al. Four groups of children were compared a group of children with, a group of children with ASD with no language or cognitive delay, a group of children with moderate learning difficulties and a group of typically developing children. The results indicated that children with ASD found imagination creativity significantly more difficult than reality-based creativity particularly between the ASD group and the moderate learning difficulties group ($X^2=15$, $p<0.005$) and between the ASD group and the typically developing group ($X^2=15$, $p<0.005$). The results however could not determine what the cause of the impairment might be, showing supporting results for both executive dysfunction and imagination impairment.

The difficulties in imagination, pretend play and abstract thought for children with ASD can impact on their development in a number of areas, in particular the ability for children with ASD to relate to their peers and with general social interaction. Bacon et al (1998) looked at the responses of children with ASD to the distress of others. Bacon compared the behaviour of children with low functioning Autism with four other groups of children; namely high functioning ASD, developmental language disordered, mentally retarded and typically developing children. The groups of children were subject to two types of situation during a semi-structured play session. During the

first situation the experimenter simulated distress by hurting themselves on an object or wall and crying out. The second situation was where the experimenter made out they had lost their favourite pen and was distressed whilst looking for it around the room. The children's responses to the situations were categorised into behaviour types and compared for each group.

The results for the first group indicated that 43% of the children with low functioning ASD did not respond to the simulated distress and was shown to be significant following a post hoc Tukey test ($F=9.37$, $p<0.0001$), test results also found that only 55% of the children with low functioning ASD looked towards the adult in distress ($F=9.18$, $p<0.0001$). The results for the 'lost pen' situation were comparatively similar to the results for the first, the group of children with low functioning ASD had the highest percentage of no response (45%) and only 29% of the children with low functioning ASD looked towards the experimenter.

It remains for studies to be undertaken to explore the deficit of play skills in children with ASD in the context of its implications for a more child led and play based form of therapy to support the learning of children with ASD. As the McInnes and Thomas studies have identified, a play perception of a task by a child motivates the child to complete and work at it, and it has been shown that a child who is highly motivated is more likely to learn at a faster rate within behavioural therapeutic interventions for ASD (Vismara et al 2010), a future avenue for study should surely be a method that incorporates all of the successful 'play' criteria to motivate a child with ASD including proven elements of therapeutic interventions such as the Early Start Denver Model.

Although a conclusive definition of play has not been reached by researchers, many theorists have come to agree upon a attributes and features present in play; and 'play' itself is in fact defined by the attitude and perception of the 'player' (McInnes, 2009). A commonly agreed feature of play in research is that play is intrinsically motivated. (Luckett, 2007). These elements of play are in contrast with the controlled training methods of some behaviour based interventions. Luckett's review of the literature surrounding behaviour therapies and play with children with ASD argues that instead of a focus on the type of play (functional, social or symbolic) research should instead focus on whether the child's approach to the activities constitutes play or not. Many of the studies undertaken with a focus on functional play of children with ASD

list functional play as use of an object ‘as intended’ and ‘typical’ , disregarding the perception or attitude of the child (Libby et al 1998); but then what of the suggestion of play for a child with ASD being described as atypical play. Luckett also questions the terminology of many of the behaviour based studies, in particular the use of the term ‘free choice’ period during a controlled intervention session. Indeed in reference to the perceptions of play studied by McInnes et al is there even such a thing as ‘free choice’ during a controlled therapy session.

The difficulty with play and ASD is the very nature of the disorder itself, the DSM IV as previously mentioned defines elements of ASD as ‘ a lack of spontaneous seeking to share enjoyments, interests or achievements with other people’, ‘a lack of social or emotional reciprocity’ and delays in ‘symbolic or imaginative play’. All of these elements raise an opposition to the very nature of relationship based forms of therapy and indeed behaviour based ones, difficulties in finding objects and situations to motivate children with ASD within therapeutic interventions would be hampered by these traits.

Some researchers argue that children with ASD are capable of play, just an atypical form of play. Libby et al (1998) looked at the patterns of play in early spontaneous play of children with ASD compared with children with downs syndrome and typically developing children. Twenty seven children took part in the study separated into the afore mentioned types in groups of nine, the three groups were comparable with no significant difference identified using the ANOVA analysis between language comprehension and expression ($f(2,26)=0.56$, $p=0.58$ and $f(2,24)=0.16$, $p=0.85$). The children with ASD produced significantly more sensori-motor type play compared to the other two groups ($H=10.77$, $p<0.01$). There was no significant difference between the functional play of the three groups or in the amount of non-play behaviour. The level of symbolic play across the three groups were comparatively similar, the difference in symbolic play for children with ASD was shown in the amount of symbolic play involving an absent object relating to the difficulties with abstract thought associated with ASD. Interestingly following a Pearson’s test sensorimotor play was negatively correlated with symbolic play in the children with ASD.

The results of this study would be more robust if undertaken over a much longer period with a larger sample size. The background of the study does not include any interventions the children may have been subject to. The children in the study identified

as the children with ASD are not stated as having an official diagnosis of ASD which may impact on the results.

The results indicated that children with ASD are able to engage in symbolic play, in this instance primarily object substitution. Libby et al suggest that the predominance for sensorimotor play indicated by the results could prevent the individual with ASD from displaying their true capacity for symbolic play.

The difficulties with abstract thought and generalisation (Attwood, 1998; Adrein et al 1995) facing children with ASD have an impact on the effectiveness of therapeutic intervention within naturalistic settings; these attributes are also an essential component of symbolic play. An interesting research paper highlights the difficulties faced by children with ASD and play regulation, suggesting during directed play sessions the actions of children with ASD corresponded to a higher level of development (Blanc et al 2005). The 2005 study consisted of three groups of children, the first a group of 21 children with diagnosed ASD (mean age 82 months), the second a group of 14 children with global cognitive impairment (mean age 70 months) and the third a group of typically developing children (mean age 40 months). Although displaying a mean age difference between the groups a Kruskal-Wallis pre-test indicated no statistical difference between the groups of children for developmental age ($\chi^2=1.19$ where $p=0.0033$). During the test the children were scored using the Regulation Disorders Evaluation Grid (Adrien et al 2001), the Pretend Play Scale (Blanc 2001). The children had two play situations; the first consisted of a free play session, the second a more directed play session where an adult provides a build-up of prompts from subtle to direct modelling of action. The results of the study indicated that the group of ASD children had the greatest difficulty with the regulation of play (where $X^2=38.24$, $p<0.0001$). The results for the RDEG were correlated with the developmental age for functional play and showed a strong and negative correlation where the dysregulation of play was higher with more delayed functional activity ($r=-0.71$, $p<0.0001$).

These results illustrate previous findings and diagnostic criteria highlighting the difficulty children with ASD have with symbolic play.

The study also brought to the fore the difference between the impact of free and directed play on the symbolic play levels of children with ASD. The results from the Pretend Play Scale between the free play and the directed play sessions showed that the

group of children with ASD demonstrated a very small percentage of symbolic play in the free play portion of the test, however in the directed play session the percentage of symbolic play rose by 21.8 for ASD children. Blanc et al call for the development of therapeutic interventions based on symbolic play, suggesting that difficulties in symbolic play lie within the disordered performance; this was based on results where children displayed improved performance and the reaching of higher developmental levels when supported by an adult. This type of situation is suggestive of Lev Vygotsky's 'scaffolding' theory of progressing children's development and learning by extending their current skills to the next level with the support of an adult.

A number of researchers have suggested a relationship between the difficulties with joint attention faced by children with ASD and the level of impairment of symbolic play. Nineteen children with ASD aged between twenty seven and seventy five months were compared with fourteen children with developmental delays were compared to determine the relationship between joint attention and symbolic play (Crowson 2006). Children with ASD were tested pre and post study using the Early Social Communication Scales (ESCS), with a twelve month period between each test; the children with developmental delays were only tested pre-study to determine a base comparison (control group). The pre-test highlighted some interesting findings regarding younger children with ASD, for example the symbolic play acts were not significantly different to the control group ($F=11.24$, $p=0.77$), however the children with ASD group showed significantly fewer functional play acts than the control group ($F=11.24$, $p=0.002$) indicating that there may be a higher deficit in functional play skills for younger children with ASD (mean age of 47 months) than symbolic play skills.

During the follow up test neither the incidence of functional play nor the symbolic play of the children with ASD increased. The study then correlated these results against higher and lower level joint attention behaviours, the study found that the number of functional behaviour acts were a predictor of the number of joint attention behaviours in the follow up test where $r=0.58$, $p<0.05$. With regard to symbolic play a significant correlation was found between the frequency of higher level joint attention acts (pointing, showing) at both the first and second tests and the frequency of symbolic play acts at the second assessment ($r=0.53$, $p<0.05$ (first test) and $r=0.68$, $p<0.01$ (second test)). Interestingly the results of this study indicate a deficit in functional play as well

as symbolic play for children with ASD, further study could investigate the impact of delayed functional play skills on the development of symbolic play skills; and also the effect therapeutic intervention has on the development of both sets of skills in younger children with ASD correlated with the development of joint attention.

Functional and symbolic play and their relationship with expressive and receptive language ability were investigated in a group of forty typically developing children aged 1-6 years old, results were obtained using the Test of Pretend Play (Lewis & Boucher 1997), the Lowe and Costello Symbolic play test, and the Leiter scale (Lewis et al 2000). The study found that symbolic play had a significant correlation with the development of both expressive and receptive language, but not with the development of functional play or non-verbal skills. Although this study relates to typically developing skills, a similar study found that children with ASD also supported a relationship between play and language development where a significant correlation was found between the levels of symbolic play and the development of expressive and receptive language (Mundy et al 1987).

However if the implications on what constitutes play in McInnes, Howard et al's study (2009) are to be accounted for it may be difficult to reconcile a playful approach with an adult directed situation. A future line of study may be to discover the effect of McInnes et al's play study on children with ASD compared with a control group of typically developing children to establish an ASD child's perception of play. It would also be plausible to research further regarding play skills and ASD using the play principles set out by Thomas, Howard and Miles (2006).

- **Fostering peer interaction and integrated play groups**

An integrated way forward

Support for children with ASD can also be given through peer interaction and integrated groups. Integrated play groups were introduced by Wolfberg et al (1993). The integrated play group approach promotes a non-directive peer support system for developing play skills in children with ASD. The criteria for integrated play group intervention incorporate the findings of many of the studies mentioned in this review, incorporating the successful elements of previous studies within the setup of the intervention.

Environment is an important element of the integrated play group intervention; the setting must include well-designed play spaces to promote optimal opportunities for play and social interaction. The available play materials are carefully selected, determined by their interactive potential, complexity, diversity, structure and their ability to appeal to children with different stages of development.

Specifically to benefit children with ASD who have been shown to respond well to routine through the results of the more directed behavioural studies such as Lovaas (1987); a consistent schedule and routine are established allowing children with ASD high levels of predictability and consistency (Rutter 1978).

Another important element of the integrated play group therapy is the forming of a balanced play group, children of different ages and developmental stages are included to provide opportunities for variable play experiences and interactions. Scaffolded interventions are used to support spontaneous play within the sessions to allow development following Vygotsky's *zone of proximal development* theory. The adult participation within the sessions is described as guided participation again in-line with Vygotsky's scaffolding theory of development. Essentially the adults present are there to support and develop the children's spontaneous play and peer interaction without initiating and directing it.

The most important element of the integrated play group intervention is that of the child with ASD being fully immersed in the play. Even if the immersion is the initial learning to play with minimal participation they take on which ever role they are capable of at that particular developmental stage within the play. Wolfberg gives the example of

'...a child who has a particular inclination to manipulate objects through ritualistic banging may incorporate this into a larger play theme of constructing a building with blocks. With the assistance of more capable peers, the child may take the role of a construction worker and hammer the blocks with a play tool.'

Wolfberg et al used qualitative and quantitative methods to evaluate any progress made by the children during the intervention. Three play groups were established using the criteria set out by Wolfberg, each group included two children with ASD and three typically developing peers with an age range of 6.11 to 8.5 years. A

primary research target was identified out of the two children with ASD in each group. The play groups took place twice a week for thirty minute sessions in a play area set out according to Wolfberg's criteria.

A baseline was established by undertaking play sessions without the support of an adult, schedule or routine. , following an initial intervention of one month, the children were again monitored (probe 1) to see if the effects generalised to situations without the specific interventions. The interventions then began again for a two month period before a follow up observation period took place (probe 2). All sessions were video recorded and random five minute samples were analysed from the thirty minute time frame for each session.

The results for play groups were divided into the percentage of time spent on three different areas:

1. Time spent in cognitive play with objects (no interaction, functional, manipulation, symbolic).
2. Time spent in social play (isolate, orientation, parallel, common focus).
3. Time spent in dimensions of both cognitive and social play (common focus and functional object use).

The results for social validation and generalisation were collected via a semi-structured interview with the parent and teacher of each target child, and via symbolic play assessments by the principle researcher both prior to the intervention and at the end of the study.

The results overall indicate a decrease in the incidence of object play and an increase in social play between the baseline and probe 1 and; more significantly probe 2. The difference in the type of object play also changed from pre to post test the levels of manipulation play fell where functional play increased in all three target children, for example the manipulation percentage for one of the target children fell from 64% to 0% while the functional play percentage rose from 25% to 88%. For the same child the percentage of their social play as isolated fell from 48 % to 0% while their common focus social play rose from 10% to 93%. The results from all three target children are

comparative with each other and all three indicate a progression in the development of their level of play both cognitive and social; and incidentally in their social interaction level.

The symbolic play test results displayed notable increases in the diversity of play, and the number of symbolic play acts. There were also decreases evident in the amount of manipulative and stereotyped play in line with the findings of the video analysis. Two thirds of the target children showed increases in number of words spoken and mean length of utterances. The incidental language development following the integrated play group intervention was significant for one of the target children where the number of words spoken rose from 1 pre-test to 41 post-test. This reflects the findings of Mohammadzheri's study with the improvements of communication skills.

The results of the parent and teacher interviews indicated significant individual results in the behaviours and play skills of all the target children in varying degrees, supporting the quantitative results gained and indicating a generalisation of the skills acquired to the home and classroom environments.

The initial findings of the first study into the integrated play group intervention are encouraging, in particular towards the potential benefits of a holistic approach to intervention for children with ASD. However the results of this study do pose some limitations; the sample size is small, only the effects on three children were studied even though six children with ASD took part in the group sessions. One of the three children studied remained at zero for the number of words spoken and mean length of utterance, the same child also showed a smaller increase in the percentage of functional play acts than the other children rising from 0-19, the child also showed a significant rise in the percentage of functional play skills moving from 10-81 where the other children had shown a decrease. This anomaly could be explained through the lower developmental and play skill level of the child on entry to the program; so that on an individual basis the child in question has shown improvement in play skills just not to the extent of the other two children.

A further case study by Wolfberg (1999) looked at the impact of the development of imaginative play and spontaneous language through peer interaction within the integrated play group intervention. . The child in the case study was a seven year old boy with ASD and severe language delay. The intervention was set up in line

with the criteria set out by Wolfberg et al and took place twice a week for thirty minute sessions. Results from this case study support the previous studies by Wolfberg et al, indicating gains in diversity of play, peer interaction and language acquisition and implementation.

A Combined approach? Including the importance of play in therapy

Having discussed both types of therapy could there be a way forward? Very recent published empirical research has highlighted the Early Start Denver Model (ESDM) as a possible move forward combining the two strands of therapy. ESDM aims to 'enhance the social attention and communicative abilities of young children with ASD, with particular focus on the critical skills of social attention, affection sharing, imitation, and joint attention' (Fulton et al 2014); encompassing many of the focusses of relationship therapy, however the ESDM is delivered via intensive sessions of fifteen to twenty hours a week following ABA principles of implementation. ESDM focuses on early intervention and is designed for children with ASD between 12-60 months. Functional behaviour assessment is incorporated for unwanted behaviours with a focus then placed on replacing aberrant behaviours with acceptable behaviour. The importance of learning through play is recognised and implemented into the program including elements of the Denver model. A randomized trial of ESDM was conducted by Dawson et al (2010) where ESDM was delivered in a controlled setting of an intensity of twenty hours a week of one to one intervention again following intensity

and control principles of ABA therapy, these children displayed improvement in language skills, IQ and a reduction in aberrant behaviours.

The thirty eight children in Fulton's study received both intensive 1:1 therapy and group therapy following the ESDM program of therapy. Children's skills were tested before, during and after the intervention over a time lapse of an average of 11.8 months. The results of the study were promising, a significant reduction in behaviours were noted (following the ESDM behaviour rating) where $t(37) = -16.6$ ($p < 0.001$), the size of the effect was also measured using the Cohen's test where $d = -3.7$ indicating a large effect. It could be argued that the ESDM behaviour rating is too closely linked with the model itself; however the children were also tested using Mullen Scales of Early Learning (MSEL) (Mullen, E. M., 1995). The MSEL results indicated a significant increase to the children's overall learning where $t(17) = -5.0$ ($p < 0.001$), although the significance was only small following Cohen's test where $d = -0.41$. The behaviour scores of the children also indicated positive results for the study where by the end of the intervention thirty of the thirty eight children scored 5 or 6 for behaviour (compliant or above average behaviour). All of these results support the aims of both relationship based and behavioural based forms of therapy; they are also consistent with the results of Dawson et al's study. An interesting addition to Fulton's study would have been a control group, allowing for a comparison against the test group for progression without intervention.

A further difficulty found with the results of Fulton's study was the improvement of behaviours did not generalise to the home environment, this could be due to the nature of ASD to latch on to only a limited number of environmental cues for learned behaviour or stimulus over selectivity as suggested by Koegel and Schreidman (1979). The lack of generalisation conflicts with the findings of Mohammadzaheri with regard to Pivotal Response Treatment where a child's choice of objects and activities appeared to contribute towards more positive results, the choices were combined with more frequent instances of praise and natural rewards as opposed to a more structured ABA approach, however the findings were significant. This then suggests that a further amalgamating of the various therapies and their implementation is needed to draw all of the successful elements together and produce a holistic approach to the treatment of ASD and aberrant behaviours.

The implementation of the therapies needs to be considered, for reasons as suggested by Mohammadzaheri; better generalisation of skills was reported when natural implementers were used (for example parents, school teachers). But with all studies on the impact of therapy it is important that the therapies are implemented correctly by all of those involved. In the study by Mancil (2008) on the effect of a modified milieu therapy on communication behaviours; a mitigating factor in the results was the difference in training and educational achievement of the parents and teachers involved.

A further study testing the effectiveness of the Early Start Denver Model eliminated some of the mitigating factors mentioned above in Fulton's study. The study by Vivanti (2014) looked at the effect of ESDM within a group based community care setting; Vivanti's study contained a control group of 30 children to compare against a test group of 27 children. The control group were receiving a non-specific form of therapy including elements of ABA, visual support, PECS, PRT, speech and language therapy and occupational therapy. The conductors of the study ensured consistency throughout the twelve month implementation of the ESDM therapy by training all involved staff in ESDM including assessment prior to commencing intervention and at a six month interval to ensure reliability. The results were also promising and comparable to the results in Fulton's study; this study however was able to compare the findings with that of the control group thus able to more accurately determine the implementation of the ESDM as the reason for the results.

The participants in the study were subject to a pre-test and post-test using the MSEL, both groups displayed gains in all areas with the ESDM group showing higher gains of 14 DQ points versus 8 DQ points for the control group. The results also showed a higher gain in the area of receptive language for the ESDM group over the control group. However there was no significance found for the group element of the study indicating that the implementation of. This study unintentionally displays the successes of both integrated programs with the control group children also showing gains within the MSEL test. The positive results from this study and Fulton's study indicate that an integrated therapeutic intervention such as the ESDM (and the mixed therapeutic input of the control group in a group setting) are beneficial both on a 1:1 basis and in a group community based basis.

The improvement seen in the ESDM group supports the idea that childcare setting and community based staff can be successfully trained to implement therapeutic interventions for children with ASD providing more widespread opportunities for families to access support and intervention.

Conclusion