The conquered giant: the use of the computer in play therapy

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The computer plays an important role in every day life. It could represent a powerful tool in play therapy, but play therapists still lag behind in their use of computers in general. Children handle the computer with much more ease than adults. Boys are more attracted to computers than girls. They are especially fascinated by aggressive computer games. The learning potential of the computer is seemingly endless but there exists some risks as addictive power and the moral adult world of internet that is not adapted to the young child. The pace of the computer fits the modern child well. In play therapy the computer can be very useful in the treatment of problems like anxiety, aggression management, ADHD, but also as a general tool. It can further 'automatic writing' and help the child express its inner turmoil.

The digibeth world

We can no longer conceive a world without the computer. At the end of the century, the millennium problem was not a psychological fin-de-siècle feeling, but a practical one: how to program the computer to enable it to compute data beyond 1999. The millennium problem shows that the importance of the computer has reached far beyond the comprehension of the long line of its inventors, beginning with the sixteen-year-old French Blaise Pascal inventing a calculating machine for his father in the seventeenth century. Now, all over the world, we are being 'processed' by computers and daily life has become truly digitalized. Still, there are many areas where the computer is not used and could represent a powerful instrument, as it could in play therapy (Delfos, 1992). Play therapists, however, do not belong to the generation that grew up with the computer, and they often see it at best as a useful instrument for writing up reports on play therapy. That is one of the reasons why there is seldom a computer to be found in the play therapy room. There has been some experimental work on systematic use of the computer in social work with children (The Bridge, 1996). But there is still much resistance. Matsuda (1999) views opponents to small children playing on computers as 'emotional opponents' who are opposed because of their own preconceptions. Many of them have never touched a computer.

To the children, however, the computer is an instrument for learning while playing, and playing while learning; it is the '*éducation permanente*' par excellence.

The computer plays an important role in childrens daily life, at school, at home and at their friends' homes. Roberts (2000) notes that American youth devotes most of its waking activity to media, especially television. About one-half of the youngsters aged 8 through 18 years uses a computer daily at home. Much of the time spent on the computer is while playing computer games. Boys are much more attracted to computer games than girls, and producers of computer games are assiduously looking for games that will attract girls. Girls, however, have a totally different nature from boys, and these differences are encountered in play therapy as

everywhere else.

Before considering for which mental problems the computer could be useful and how, I want to examine certain aspects concerning the use of the computer: the differences between adults and children, those between boys and girls and some of the advantages and dangers of computer use.

Differences between adults and children

For the adult, the computer is mainly an instrument for performing several tasks. Its main significance lies in its capacity to organize the world in a digital way. After having been made literate in the nineteenth century, man is becoming 'digitalized' during the twentieth century. As in so many other learning fields, children prove to be superior to adults in mastering the new instrument (Delfos, 2000a). Whereas adults possess more knowledge, children seem to have a more lively intelligence. Give the child one language and it will learn it in a way linguists all over the world are still trying to comprehend. Listening carefully to the speakers around him, the infant will discover grammatical rules for himself and make mistakes because it assumes a perfect system, which grammar itself is not. He will say 'I runned' in what could be seen as a too perfect conjugation. Nobody taught the child to say this. When corrected, it readily understands the exception to the rule, applies it and then generalizes its discovery to the conjugation of the whole verb and other verbs if necessary. Linguists all over the world are still trying to discover the universal grammar underlying that of different languages, and they are still failing. Today the computer is yet one more example that shows us the enormous capacity of children to learn. Children are very intelligent information processors. When you put an adult at a computer, especially with a new program, and you compare his learning speed to that of a child under the same conditions, the difference is staggering. The child finds its way easily, is not hampered by fear and enjoys discovering the new medium. Its eye-hand coordination is clearly superior to that of the adult, which we see when we look at the way adults and children handle the 'mouse'. The child finds its way through trial and error and learns quickly. Most of the time children enjoy the medium and are not easily frustrated by set backs. So the computer could represent an important tool in therapy with children. Still there are differences between boys and girls.

Gender differences in computer use

Gender plays a basic constitutional influence in the development of the child. We are reluctant to emphasize the differences because they can give rise to a battle of the sexes, as the concepts 'differences' and 'inequality' tend to get confused. Whether it should be attributed to genetics or socialization, girls and boys differ significantly in how they express problems (Delfos, 2000b). Boys show more externalizing behavior (externally oriented, aggressive behavior) while girls show more internalizing behavior (inwardly directed, anxiety behavior) (Achenbach and Edelbrock, 1978; Verhulst, 1985; American Psychiatric Association, DSM-IV, 1994). As a result, boys in general show more aggressive problems, girls more anxiety problems. It can be said that boys in trouble are generally more annoying to those around them, and that girls with problems are more annoying to themselves. As the environment of a child is more disturbed by externalizing behavior than by internalizing behavior, more boys are registered for help than girls. Boys, moreover, show more disorders than girls (Gomez, 1991; Delfos, 1996). So, clients for play therapy are more often boys than girls.

Here the idea of the computer becomes even more interesting, because, as I said above, boys are more attracted to computer games than girls. Kubey and Larson (1990) found that 80% of

children between 9 and 15 years who do computer games are boys. Funk, Germann and Buchman (1997) observed that boys tend to spend three times as much time at the computer than girls. In her chapter on children's likes and dislikes in entertainment programs Valkenburg and Cantor (1999) summarize research on gender differences in the attraction of computer games. Girls are less interested object-oriented, they are less interested in winning or killing the enemy, they like a story-line, real-life situations, and they are interested in the development of relationships between characters. They value comprehensibility.
The difference in attraction to computer games is reflected in the character of the games, because most of the games are action games of an aggressive nature, and aggression generally attracts boys more than girls. This effect can be observed in all kinds of play material, not only computer games. Berenbaum and Hines (1992) discovered that preference for male playthings is associated with the postnatal level of the male hormone testosterone, just as Meyer-Bahlburg and others (1988) found that a decrease in playing with rough playthings is associated with an increase in the level of the female hormone progesterone.
In line with this research, during the fifteen years I have had a computer in the play room, boys have used it much more often than girls.

Dangers and advantages of computer games

The computer is a controversial instrument. It has important advantages, but there are also dangers. One of the important advantages of the computer is that it offers the child a seemingly endless universe of knowledge. The encyclopedia in book form has its counterpart in the computer encyclopedia (for instance *Encarta*, 1997-2000) here the child cannot only read about Martin Luther King and see his picture, but can also view original video material, hear him pronounce his famous visionary speech and download material for its school project. At the other hand, *internet* can be explored by children without any restraint, while anyone can place on it virtually everything with no concern about moral standards or censorship of any kind. Some favor censor solutions as a 'child lock' on internet but these are still solutions within an adult virtual world. There should be a 'childnet' where opportunities are available for the child without the dangers that the adult world of internet presents.

The range of opportunities in the field of computer and video games (computer games that are played through television) seems unlimited: educational games, creative games, adventure games, but also old-fashioned party games. The learning potential reaches far beyond those of the school. As early as 1984 Greenfield showed that the complexity of a 'simple' Pacman game easily exceeds those of any ordinary party game. It demands a good eye-hand coordination, a sharp discrimination, quick reaction and a flexibility for changes. The graphic quality of computer and video games are improving day by day, so that their realism is continually approaching that of television. Moreover, computer play and learning material is very attractive and the speed better fits the acceleration that this generation has undergone in the move from television (Coupland, 1991) to computer. If you watch video clips on television, you can see the speed at which young people live, and understand how they are able to process many more images every minute than the past generation can. So the computer fits the standards of youngsters better than much of the orthodox play material.

The computer has become an important educational tool. In the Netherlands nearly every classroom has its computer nowadays. There exists an overwhelming quantity of educational programs. From elementary school through university. One of the great advantages is the way learning material can be adapted to suit the level of a specific child.
Moreover, the computer, just like the television, is a very attractive medium. Nihei, Shirakawa, Isshiki, Hirose, Iwata and Kobayashi (1999) report the first systematic use of virtual technology

in Japan to improve the quality of life and amenity of in-patients in a children's hospital. The quality of life of the children who suffered from psychological and physiological stress greatly improved.
Children love to spend time on computers, not only to play games. De Leeuw and colleagues (De Leeuw and Otter, 1995; De Leeuw, Hox, Kef and Hattum, 1997; Borgers; De Leeuw and Hox, 1999) used the computer as a means to carry out overall research with children and adolescents by using computer questionnaires. The precision of children when filling these in increased enormously and they enjoyed the task very much. The response quality and quantity in children was significantly better with computer questionnaires than with written questionnaires.

As children like so much to spend time at the computer, there lies one of the dangers of the computer: the risk of addiction. However, that risk seems to be limited. At first most children are fascinated by the computer, but after a time their interest diminishes to a level like that for all other activities. There is a short revival with a new game. However, for a small group of children the computer can become addictive. Probably those who are also prone to gambling. In addition there are the children who have problems playing with their peer group, especially children suffering from an autistic disorder. Many children with Asperger's syndrome prefer the computer to playing with peers (Wing, 1996). The computer offers them a world where problems with peers do not arise. As a consequence their experience of being with other children lags more and more behind and forming relations with their peers becomes even more difficult.

There are several addictive factors inherent in computer games. There is the principle of variable reinforcement (that is that sometimes behavior is reinforced through reward and sometimes not). A variable scheme of reinforcement can be very powerful in strengthening behavior (Bandura, 1986). This is an important element in *action games* where the child has to 'shoot' an adversary, or in *platform games* where it has to perform activities in order to get to a higher level of the game.
There are several aspects that make computer games very attractive and fascinating for children (Greenfield, 1984; Kubey, 1996). The games have very attractive graphics and sound effects that follow youth trends. The child's curiosity is continuously being aroused, and certainly a good game is constructed so as to offer continuous challenges. Moreover the child can actively control the medium. Mastering a problem is a very rewarding experience. There are 'help desks' and 'walk-through's' to overcome phases that are too frustrating during the game, so that motivation for continuing it remains intact.
The computer is a truly interactive instrument and offers opportunities for active control and continuous feedback. Playing on a computer can be a very rewarding experience; the player is a hero in the game and at the end is rewarded by having his name being entered in the 'hall of fame' or becoming a 'supreme warrior' or such like.

Another danger of computer games is that of aggression. Worldwide research (by 1966 already close to two thousand studies since the invention of the television, Federman, 1966) shows that aggression on television tends to stimulate aggression in children, especially boys with an aggressive nature. Bandura (1965) was the first to show the influence on the later behavior of children of watching aggression. He demonstrated that if children are not always in a position to re-inact the aggressive behavior they have seen, they internalize it and display it at some later time. This new behavior becomes part of what might be called a passive aggressive behavior repertoire. International Unesco-research by Groebel (1998) showed again that aggression in the media encourages aggression. Huesmann and colleagues (Huesmann, Eron, Lefkowitz & Walder, 1984; Huesmann and Eron, 1986) found that aggressive behavior in adults was connected with having watched aggressive television programs during childhood. The same results are being found now that computer games are being studied (Silvern and Williamson,

1987; Provenzo, 1991). With the more realistic computer and video games the effect tends to be even more important. Aggressive games further aggressive behavior (Sherry, 1997).

Finally it is important to point out the danger of computer games for the moral development of young children. By means of the computer the child is confronted with moral material it cannot always understand. Young children, take the world very literally, and run the risk of taking moral judgments in the games too literally. As the scenes are very realistic, children sometimes try to apply the game to the real world, as it seems so rewarding to do so in the virtual world. There are examples of children behaving like serial killers who were addicted to the computer game *Doom* (2000), a very aggressive game where you have to shoot your adversaries in order to reach a higher level. The generalization of its effect is demonstrated by the fact that this game (adapted version) is used by the American army to numb the feeling of soldiers towards killing. We have no idea how much young children are already exposed to aggression before they have developed a moral sense that enables them to situate that behavior within a specific context. The moral learning of the child mainly takes place through watching the behavior of others (Bandura, 1986). The model does not necessarily need to be an adult from the child's immediate surroundings. Learning can also take place through symbolic model behavior, a figure from a fairy tale or a television hero. Research on the influence of television programs has demonstrated that television heroes have a model function. This holds also for the symbolic figures of the computer game. The influence of computer games may be even larger, because in computer games the child plays an active role, producing events on the screen. The interactive opportunities of the computer to 'communicate' with the child facilitates identification with the figures in the game.

Kohlberg (1987) refined a model of the moral development created by Piaget (1964). The phases of moral development during the primary school age and the beginning of the secondary school are: orientation towards obedience and punishment (phase 1), orientation towards personal whims (phase 2), and orientation towards approval by others (phase 3). A young child presumes that authority must be obeyed. It forms its judgment on the basis of the consequences that behavior has: punishment or reward. And this is exactly what is essential in the computer game. Consequently the child is highly susceptible to the standards and values that are offered through the game. With aggressive games the standard is that aggressive behavior (beat, shoot and kill) are rewarded with points and non-aggressive behavior is punished by being 'killed', called 'losing a life'. The 'shoot and kill' rewards are on a variable schedule and thus reinforces the behavior of the player. As well as this aspect, the computer game also relates to the world of phantasy of the child. Because of it's magical way of thinking, the young child has difficulty in discriminating between reality and phantasy (Fraiberg, 1968) and is not able to estimate the degree of reality of the game. From the perspective of the child, the computer is mighty, a giant, and therefore games should be developed by adults aware of their responsibility towards children. Responsibility, however, doesn't sell, irresponsible behavior does. So most of the computer games are more harmful than not.
The young child (until approximately eight years) can take computer games too literally. As it grows older its orientation towards being good is the most important motivation for moral growth. Computer games that offer a spectrum of bad guys and bad behavior being rewarded could influence the moral judgement the child is developing during this period.
The moral development of boys and girls is different. Boys are more oriented towards competition and girls more towards cooperation (Damon, 1988). Because computer games with their accent on competition match the moral orientation of boys, they are a threat to moral development, especially of boys (Delfos, 1994). It is important to realize these effects when using the computer in play therapy.

Various computer applications

The computer can be used in various ways in play therapy. It can be used to stimulate the child to express itself through writing or drawing. As early as 1984, Johnson mentions the use of the computer in play therapy in making drawings. There are countless numbers of games, and every day the number grows. Many games of these are dexterity games and aggression games. They need not always be bought as children exchange them among themselves. Moreover computer games are easy to copy, so that there is a quick distribution.

Different games can be arranged into some distinct categories.

Platform games are those in which the player has to carry out various tasks, and when he succeeds he moves to a higher and more complex level. One of the first, and still very successful computer games, *Mario*, is a good example of a platform game.

Role Playing Games (RPG) are games in which the player (or players) takes on a specific role and the computer takes on those that remain. The outcome depends on the role taken and the moves made.

Adventure games are those in which the principal personage walks through a virtual world, striving to attain a certain goal, such as rescuing a princess. He is constantly being confronted by problems that he has to solve before he can go any further.

Arcade games cover a wide spectrum, in which there is a lot of action, often very aggressive. These games are also called 'beat'em ups' and 'shoot'em ups'.

Simulation games simulate activities like car racing of flying.

Mental mind games include the famous *Tetris* in which descending geometric forms have to be arranged so that they fit together.

Games sometimes fall more than one category. In many games, dexterity plays an important role, as it does in a mental mind game like *Tetris*.

The computer as an therapeutic instrument

Because the computer fits in with the world of the contemporary child, it can play an important role in the treatment of several disorders, and be used as a general instrument in play therapy. As well as being a general tool for establishing a good relation with the child, it can be used in the play room in two other ways: to stimulate expression through writing and drawing and for the use of computer games to treat specific problems.
In my experience girls use the computer more often as an instrument for expressing themselves, whereas boys prefer computer games. Research on play therapy is very rare. Sometimes a case study has been presented where the computer was used in play therapy, but not in any systematic way. Therefore, what follows is mainly my own experience with the use of a computer in the play room.

Possible applications of the computer in play therapy are countless. It is an excellent instrument for associative and creative expression, for the treatment of anxiety, for the management of aggression, for moral development and for concentration. Computer games enhance the eye-hand coordination (Greenfield, Brannon and Lohr, 1994; Smit, 1992). A computer game like *Tetris* can enhance concentration (Haier, Siegel, MacLachlan, Soderling, Lottenberg and Buchsbaum, 1992; Trimmel and Huber, 1998) and develops spatial orientation (Okagaki and Frensch, 1994). Attention-Deficit-Hyperactivity-Disorder (ADHD) can be made comprehensible to a child by using a break-out game, training left-right coordination can be done with a computer and it can be useful in the treatment of addiction.

A computer game can be adjusted to fit a particular child's needs, much more than is possible with ordinary play material. Using examples, the therapist can observe, participate, interpret and explain the problems the child is dealing with. That does not mean that the computer can replace the play material; it is nothing more than an extra tool. In play therapy, it is especially children between eight and fourteen who use the computer during certain periods.

Creative expression

The great advantage of computer writing in play therapy is that it stimulates the child to write without worrying about spelling and grammar. It can always be easily corrected afterwards. As the play therapy is not the place to teach grammar, the speller offers the opportunity to write without mistakes - and children want that - without having to know all the rules. This means that 'automatic writing' is made possible. Young children often have difficulties with the motor function of writing, as this function is not fully automatized, and this is certainly often true of children with disorders that are genetic in nature. They feel restrained in the writing they otherwise like to do. On the computer every single letter is readable and the speller corrects the errors.
The child can confide its inner turmoil without any concern to the computer. Girls in particular like to express themselves in this way. The therapist and the child can write together, alternately for example. In this way the therapist can make his therapeutic interventions and the child can respond. This writing is quite another way of ordering thoughts than talking is. It is a powerful tool in treating trauma (Anonymous, Bowen, 1972; Lange, Schrieken, Van de Ven, Bredeweg, Emmelkamp, Van der Kolk, Lydsdottir, Massaro and Reuvers, 2000a).
Writing can change cognitions about inner turmoil, grief and trauma and even influences physical reactions in a positive way (Lange et al, 2000a). As a result of his research in the field Lange (2000b) developed a writing therapy on the Internet, *Interapy*.
The fact that therapist and child are sitting side by side writing at the computer can prove to be very helpful in some instances. Children often confide more easily in situations where there is no direct eye contact, for example during a ride in a car or while washing the dishes (Delfos, 2000a).
Therapist and child can write a story about a painful subject in the child's life. Afterwards it can be printed and at a next session it can be extended. Very often children use the printed text to comfort themselves and to explain their problems to others. For example, a seven year old child wanted to explain to her mother how afraid she was that her mother, an alcoholist, would die. Also she wanted her mother to know that, even though her foster parents were very good to her, she still missed her mother and wanted to live with her. The story was read to the mother by the child and the therapist, and the metaphoric language enabled the mother to take a step back and really listen to the child (Delfos, 1997).

Especially young children enjoy the 'perfect' production the computer can give. Moreover it is very simple to erase something and rewrite it. Children, no less than adults, want to perform well. It annoys them that they are not able to write or draw perfectly. When drawing, children often greatly enjoy the chance to erase parts of the drawing by clicking on the 'mouse' and having an 'eraser' under the cursor. Some children enjoy this latter so much that they do nothing else. Children love to draw, but they often see that their drawing is not right. Felt-tips and color crayons cannot be erased. With the computer this is possible and the child can control its own drawing. Very often it wants to draw a perfectly straight line and the computer enables this to come within his reach. Computer drawing does not replace real drawing, but it offers other opportunities. Children alternate the material they choose to fit in with their needs. Moreover the computer offers an inexhaustible number of ready made illustrations. A scanner makes it possible to insert any image the child wants.

Treatment of anxiety

Most of the children in play therapy suffer from anxieties. The origin of a particular anxiety can be treated, but this does not mean it generalizes to all subject areas that have become associated to the original fear subject. One of the problems of anxiety is that the coping mechanisms can be ruled out. The anxiety 'freezes' the person into inactivity. And it is this inactivity and the avoidance that increase the anxiety. Computer games can be extremely helpful in the treatment of anxiety. They offer a virtual exposure and stimulate coping mechanisms. Guided by the therapist the child can overcome difficult situations and the effect seems to generalize to daily situations. As a ten-year-old boy said: 'I was not at all afraid at home after I beat that spider in the game.' At first I worked with the computer game *Castle*, using very simple graphics. In the game the player had to overcome several obstacles, one of them killing a little spider. The graphics were nothing more than symbols. They did not even resemble the real thing, but the effect was sometimes greater than using the realistic graphics computer games now available. The identification with the cursor was no problem, the adversity to be defeated was filled with the anxieties the child had. Children are absorbed in the game they play and the difference between reality and phantasy temporarily vanishes. This same game with its simple graphics made the child who was afraid of spiders cry out while playing: 'It can't bite me, can it?', taking his fingers off the keyboard in terror. It was his absorption in the game and the anxiety being laid bare that made this intelligent boy feel that way.

Treatment of aggression

The psychological and physiological aspects of aggression can be made comprehensible while playing computer games. All over the world, children like to play aggressive games (Groebel, 1998). Aggression is accompanied by an increase of an aggressive feeling, and has its physical counterpart in the production of adrenergic hormones like adrenaline. This production increases during thrilling computer games and can lead to aggression afterwards. In case the amount of hormones in the body is already high, it is hard to change the course of events. However, at the beginning of the game before the hormone level rises too much, it is possible to stop the aggression to rise.
A therapist can show the child how an aggressive feeling increases when playing a computer game and how this can be controlled. The child learns to recognize that his feeling of joy changes into one of frustration and anger when there is adversity in the game. The child is often amazed to feel how an innocent situation can turn into a very unpleasant one so easily. The great advantage is that this is being made comprehensible in the innocent situation of a computer game, where the child's self-image is not being affected. The child's motivation to discover the mechanism is greater than when it is in conflict with its surroundings, and the opportunities for learning to change the expression of aggression increase.
The platform games are especially suitable for helping the child overcome frustration and increase its frustration tolerance.

Treatment of Attention Deficit Hyperactivity Disorder

Children with ADHD have problems with impulsiveness, hyperactivity and concentration. They switch from one stimulus to the next. It is important for them to understand themselves and learn to optimize the control they can practice on themselves. A computer game like the 'break out' games helps them understand the effects on their surroundings. In this game the player has to

direct a ball towards bricks in a wall in order to break them and pull the wall down. In the meantime there are objects falling down from the bricks that are opened and these objects can be helpful or make it more difficult for the player who has to decide quickly whether to catch the object or avoid it. The ball jumps to every side and its behavior is rather unexpected if the player moves too fast. Problems arise if the ball is moved too fast or too slow. That is exactly what a child with ADHD experiences, so it identifies with the ball. This game, like *Tetris*, trains the left-right coordination, one of the problems that comes with ADHD. Impulsiveness is a big problem when playing a computer game, and children with ADHD see how this works out in a game. Concentration and dexterity games have an enormous advantage for children with ADHD. *Tetris*, for example, enhances concentration so much that after playing *Tetris* (Trimmel and Huber, 1998) it is sustained for some time.

Treatment of gamble compulsion

The computer can be used to treat gamble compulsion and make the addiction statistically visible and felt. There are lots of computer games simulating a gambling machine, for example a fruit machine. While playing this game the physical reaction can be made clear, just as in the case of aggression. The addiction to gambling games is also a physical one. The reinforcement scheme and its reaction can be made visible in graphics without the risk the player runs in real life.

General aspects

Moral development can be registered and stimulated with the help of computer games. Lots of games stimulate bad moral behavior. Children, especially boys, love to play these games, and cannot be stopped from doing so. The benefit of the play therapy is that it can stimulate moral development while playing the game. There is, for example, a game where you shoot 'smurfs' to kill them, *Smurf hunt*. The more smurfs the player kills, the more he is awarded in a high score and even more if the smurf is female. This is contrary to the idea that you should not kill good people and that you should protect the weak ones. In discussion, the therapist can stimulate moral development.

Children's problems, can be treated with play material, and the wide range of computer games offers new opportunities. For example, a girl living in a children's home was wondering if her mother was still thinking about her, and if she was actively trying to get her child home again. For some time this girl loved playing the adventure *King's Quest 7* (Williams, 2000), because the principal figure is a queen searching desperately for her daughter.

There are many more areas in play therapy where the computer can be used, and further research on possible applications in play therapy is needed.

Literature

Achenbach, T.M. & Edelbrock, C.S. (1978). The classification of child psychopathology: A review and analysis of empirical efforts. *Psychological Bulletin*, 85, 1275-1301.

American Psychiatric Association. (1994) *DSM-IV. Diagnostic and Statistical Manual of Mental Disorders*. Washington DC: American Psychiatric Association.

Anonymous, Bowen. (1972). Toward the differentiaton of the self in one's own family. In J.L. Framo (Ed.). *Family interactions*. New York: Springer.

Bandura, A. (1965). Influence of Model's reinforcement contingencies on the acuisition of imitative responses. *Journal of Personality and Social Psychology*, I, 589-595.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, N.J: Prentice Hall.

Berenbaum, S.A. & Hines, M. (1992). Early androgens are related to childhood sex-typed toy preferences. *Psychological Science*, 3, 203-206.

Borgers, N.; Leeuw, E. de. & Hox, J. (1999). Surveying Children. Cognitive Development and Response Quality in Questionnaire Research. *Methodological Issues in Official Statistics*. Stockholm, Sweden: SCB.

Bridge, The. (1996). *My life in words and pictures*. London: The Bridge, Child care consultancy Service London.

Coupland, D. (1991). *Generation X. Tales for an accelarated culture*. New York: St Martin's Press.

Damon, W. (1988). *The moral child. Nurturing children's natural moral growth*. New York/London: The Free Press.

De Leeuw, E.D. & Otter, M.E. (1995). The Reliability of Children's Responses to Questionnaire Items. Question Effects in Children's Questionnaire Data. In J.J. Hox; B.F. van der Meulen; J.M.A.M. Janssens; J.J.F. ter Laak & L.W.C. Tavecchio (Eds.), *Advances in Family Research*. Amsterdam: Thesis Publishers.

De Leeuw, E.D.; Hox, J.; Kef, S. & Hattum, M. van (1997). Overcoming The Problems of Special Interviews on Sensitive Topics: Computer Assisted Self-Interviewing Tailored For Young Children and Adolescents. In *Sawtooth Software Conference Proceedings*. Sequem, WA: Sawtooth Software Inc.

Delfos, M.F. (1992). De computer als hulpmiddel in de spelkamer. *Nederlands Tijdschrift voor Opvoeding, Vorming en Onderwijs. NTOVO*, 8, 6, 388-394.

Delfos, M.F. (1994). Jij bent dood, daar krijg ik mooi 150 punten voor! *TJJ, Tijdschrift voor Jeugdhulpverlening en Jeugdwerk*, 6, 9, 9-13.

Delfos, M.F. (1996). Jongens, de zorgenkindjes van de toekomst. *Psychologie*, 15, 6, 16-17.

Delfos, M. (1997) *Oline, het olifantje. Over opgroeien bij verslaafde ouders*. Bussum: Trude van Waarden Produkties. Series therapeutic children's books.

Delfos, M.F. (2000a, in preparation). *Are you listening to me? Conversing with children from four to twelve years old.* This is a translation of: Delfos, M.F. (2000a). *Luister je wel naar mij? Gespreksvoering met kinderen tussen vier en twaalf jaar.* Amsterdam: SWP.

Delfos, M.F. (2000b, in preparation). *Children and behaviour problems. Anxiety, aggression, depression and ADHD. A biopsychological model with guidelines for diagnostics and treatment*.

This is a translation of: Delfos, M.F. (2000b) *Kinderen en gedragsproblemen. Angst, agressie, depressie en ADHD. Een biopsychologisch model met richtlijnen voor diagnostiek en behandleing*. Lisse: Swets & Zeitlinger.

Doom (2000). http://hotfiles.lycos.com/cgi-bin/texis/swlib/lycos/info.html?fcode-000048

Encarta. (1997-2000). Microsoft Corporation: http://encarta.msn.com.

Federman, J. (1966). *Media Ratings: Design, use and consequences.* Studio City, CA: Mediascope.

Fraiberg, S. (1968). *The magic years: understanding and handling the problems of early childhood*. London.

Funk, J.B; Germann, J.N. & Buchman, D.D. (1997). Children and electronic games in the United States. *Trends in Communication*, I (2), 111-126.

Gomez, J. (1991). *Psychological & Psychiatric problems in men*. London/New York: Routledge.

Greenfield, P. (1984). *Mind and media: The effects of television, video games and computers*. Cambridge, Mass: Harvard University Press

Greenfield, P.M.; Brannon, C. & Lohr, D. (1994). Two-dimensional representation of movement through three-dimensional space: The role of video game expertise. *Journal of Applied Developmental Psychology*, 15, 87-103.

Groebel, J. (1998). Summary of the Unesco Global study on media violence. Paris: Unesco.

Haier, R.J.; Siegel, B.V.Jr.; MacLachlan, A.; Soderling, E.; Lottenberg, S. & Buchsbaum, M.S. (1992). Regional glucose metabolic changes after learning a complex visuospatial/motor task: a positron emission tomographic study. *Brain Research*, 20, 570 (1-2), 134-143.

Huesmann, L.R. & Eron, L.D. (Eds.). (1986). *Television and the aggressive child: A cross-national comparison.* Hillsdale, NJ: Erlbaum.

Huesmann, L.R.; Eron, L.D.; Lefkowitz, M.M. & Walder, L.O. (1984). Stability of aggression over time and generations. *Developmental Psychology*, 20, 1120-1134.

Johnson, R.G. (1984). High Tech Play Therapy. *Techniques*, 1 (2), 128-133.

Kohlberg, L. (1987). *Child psychology and childhood education*. New York: Longman.

Kubey, R.W. (1996). Television dependence, diagnosis, and prevention. In: T. MacBeth (Ed.). *Tuning into young viewers*. Thousand Oaks, CA: Sage.

Kubey, R.L. & Larson, R. (1990). The use and experience of the new video media among children and young adolescents. *Communication Research*, 17, 107-130.

Lange, A. (2000b). *Internet*: Interapy: http:// 145.18.113.242/interapy2/nl/public/splash.html.

Lange, A.; Schrieken, B.; Ven, J-P. van de; Bredeweg, B.; Emmelkamp, P.M.G., Kolk, J. van der; Lydsdottir, L.; Massaro, M. & Reuvers, A. (2000a). Interapy: The effects of a short

protocolled treatment of post-traumatic stress and pathological groef through the Internet. *Behavioural and Cognitive Psychotherapy*, 28 (2), 103-120.

Matsuda, S. (1999). Digital of the Heisei era: experiment at Toyonaka Bunka Kindergarten. *Turk. Journal of Pediatrics*, 41 (suppl.), 91-97.

Meyer-Bahlburg, H.F.L., Feldman, J.F., Cohen, P., & Ehrhardt, A.A. (1988). Perinatal factors in the development of gender-related play behavior: Sex hormones versus pregnancy complications. *Psychiatry*, 51, 260-271.

Nihei, K.; Shirakawa, K; Isshiki, N.; Hirose, M.; Iwata, H. & Kobayashi, N. (1999). Virtual reality in a children's hospital. *Turk. Journal of Pediatrics*, 41, suppl: 73-82.

Okagaki, L. & Frensch, P.A. (1994). Effects of video game playing on measures of spatial performance: Gender effects in late adolescents. *Journal of Applied Deveopmental Psychology*, 15, 33-58.

Piaget, J. (1964). *The moral judgment of the child*. New York: Free Press.

Provenzo, E.F. (1991). *Video-kids: making sense of Nintendo*. Cambridge: Harvard University Press.

Roberts, D.F. (2000). Media and youth: access, exposure, and privatization. *Journal of adolescent health*, 27 (2, supp.), 8-14.

Sherry, J. (1997). *Do Violent video games cause aggressin? A meta-analytic review.* Paper presented at the International Communication Association, Montreal, Canada.

Silvern, S.B. & Williamson, P.A. (1987). The Effects of Video Game Play on Young Children's Aggression, Fantasy, and Prosocial Behavior. *Journal of Applied Developmental Psychology*, 8, 453-462.

Smit, B.D. (1992). Is your child overdosing on video games? *Contemporary Pediatrics*, 105-107.

Trimmel, M & Huber, R. (1998). After-effects of human-computer interaction indicated by P300 of the event-related brain potential. *Ergonomics*, 41 (5), 649-655.

Valkenburg, P.M. & Cantor, J. (1999). Children's Likes and Dislikes in Entertainment Programs. In: D. Zillmann & P. Voderer (Eds.), *Media Entertainment: The Psychology of its Appeal*. Hillsdale, NJ: Erlbaum.

Verhulst, F.C. (1985). Mental health in Dutch children (I): a cross-cultural comparison. *Acta Psychiatrica Scandinavia*, Suppl. 323, 72.

Williams, R. (2000). *King's Quest 7*, http://www.sierra.com.

Wing, L. (1996). *The Autistic Spectrum. A Guide for Parents ans Professionals*. London: Constable & Company Limited.

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