Attention in preschool children with and without signs of ADHD.
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Chapter 6. Discussion

6.1 Introduction

The problems of ADHD children are diverse and difficult to diagnose (Goldstein & Goldstein, 1990; American Psychiatric Association, 1994; World Health Organization, 1992). Various diagnostic manuals like DSM-III-R (American Psychiatric Association, 1987), DSM-IV (American Psychiatric Association, 1994) or ICD-10 (WHO, 1992) state that the problems of ADHD children frequently arise early in development (usually in the first years of life). They claim that, in order to make the diagnosis of ADHD (American Psychiatric Association, 1987, 1994) or hyperkinetic disorder (World Health Organization, 1992), the characteristic behavior problems should be of early onset (before age 6) and long duration. However, most authors also agree that the diagnosis is very difficult to make before age 6 (Campbell, 1985; World Health Organization, 1992; Goldstein & Goldstein, 1990). Although one can easily imagine that the early diagnosis of the disorder would be of great importance for curing the problem, or as Goldstein and Goldstein (1990) state, for managing it, surprisingly little attention has been given to the early diagnosis of ADHD. This discrepancy was in fact the main rationale behind the study presented here. We started the study with the idea of making a contribution to the development of objective instruments for the early diagnosis of ADHD and other attentional problems. But because very few studies concerning attention, the development of attention, and ADHD, have been undertaken in children of 2 to 6 years of age, our preliminary goals had to be revised. We were faced with the problem that there was no specific theory on the normal and deviant development of attention in this age range.

Various questions have to be answered before one can start developing an instrument like the one we intended: how do attentional processes develop during preschool years, and how can we distinguish the normal development of these processes from a deviant course? Are children with attentional problems delayed in their development or do they suffer from a structural (neurological?) defect with a unique developmental pattern? Which theories are appropriate to study the attentional processes in these young children? In chapter 2 we argued in favour of two theoretical starting points, one derived
from information processing models, and the other of a more ethological nature. We also showed that the underlying study is in fact divided in four parts: the first part studying the normal development of attention from an information processing point of view; the second part dealing with the comparison of preschool ADHD children with their control peers from the same information processing point of view; the third part studying developmental patterns of attention as observed in a free play situation; and the last part comparing preschool ADHD children with their control peers in the same free play situation. In this chapter, we will discuss all four parts separately. We will also discuss several additional topics. To start with, we discuss the 'selection problem'. It goes without saying that, in order to obtain a better understanding of the problems of preschool ADHD children, those children must first be selected. But because, as we showed, young ADHD children are difficult to diagnose, it is very difficult to select a proper ADHD group. In the next part of this chapter we will discuss the method we chose to select our ADHD groups, and the implication of this method for the interpretation of the results of our study. Because, in spite of all efforts, we could only select two small groups of ADHD children, we were not able to compare ADHD children of different age groups with each other. This fact has clear implications for our study, because we are not able to draw valid conclusions concerning the deviant development of attentional processes in preschool children. In the last paragraphs we will return to the starting questions of our research: did we gain more insight into the normal and deviant attentional processes and what is the value of this study? Can our research contribute to the future development of an objective diagnostic tool for early ADHD? What are the shortcomings of this study and are there any recommendations for future research on the topic?

6.2 Selecting Preschool ADHD Children

Few children are diagnosed ADHD at preschool age. This does not mean that preschool children do not suffer from the disorder. As we showed in previous chapters, the diagnostic criteria are simply not suited for recognizing the problem at this early age. Because of this problem, we had to develop our own criteria for selecting ADHD children for our study. Two different groups of children with signs of ADHD participated: one group selected from a 'high'-risk population: children from Medical Day Care Centers; and the second group selected from normal schools. We called the first group the 'clinically referred ADHD-group' and the second the 'non-referred ADHD-
group’. Most of the children from the clinical group were not primarily referred with ADHD problems, but with developmental problems due to physical, mental, or environmental factors. Although we tried to make a very accurate selection, we recognize that these children may have suffered from other than ADHD-problems, which probably influenced the findings in our study. In order to overcome this problem at least partially, we selected a second group, the non-referred ADHD children. Although we may assume that these children did not suffer from other than the ADHD problems, none of these children were ever referred with ADHD problems. They were children from normal schools, and were selected for our ‘non-referred ADHD’ group only because their sum-scores on the GBO, teacher version, GBO, parent version, or GBO, laboratory version were above the 90th percentile (see Appendices A, B and C). With these two groups, a high-risk group and a low-risk group, we hoped to get more insight into the specific problems of preschool ADHD children. The selection of the ADHD children with the aid of the GBO, teacher version must be seen as a rough method for screening ADHD, because this observation scale is only standardized for children 6-13 years old. There were two reasons for choosing this observation scale. Firstly, no standardized instrument exists for screening Dutch preschool children on ADHD. Secondly, the GBO, which consists of only fifteen items that cover behavior typical for ADHD children, like activity, attention, impulsivity, rapidly changing task orientation, and talkativeness, is very easy to administer and very suitable for children in a preschool situation.

The advantages and disadvantages of the chosen method may be clear. The main advantage is that two ADHD-groups, a 'high-risk' and a 'low-risk' group

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1 A sum-score above the 90th percentile on the the teacher version of the Groningen Behavior Observation Scale GBO (Vaessen & Van der Meere, 1990), IQ-score of 80 or higher, no medical treatment with stimulant drugs, behavior that met DSM-IV classification for ADHD and no other disorder, no neurological impairments or severe developmental abilities (e.g. mental retardation, autism) as established by medical history and child observation.

2 From chapter 3 and chapter 4 it may be clear that the selection method for the non referred ADHD group slightly differed in the two studies. In the RT study we used the GBO, teacher version as a screening instrument, in the ethological study sum-scores on both the GBO, parent version as well as the GBO, laboratory version had to be above the 90th percentile.
group, may provide a better understanding of the various levels of ADHD. But the main problem of the selection method remains of course the question of generalizability. Are our 'ADHD'-groups representative for the real 'ADHD-population'? In our opinion, this question can not be answered, because a 'preschool ADHD-population' as such does not exist. Our children are ADHD-children only insofar they meet the requirements set by a reasonably well validated observation scale (the GBO). We realize that the findings of our study must be handled with caution. Although the analyses presented in chapter 5 showed that the characteristics of our clinically referred ADHD group were in line with the criteria of DSM-IV (American Psychiatric Association, 1994) and ICD-10 (World Health Organization, 1992), the analyses also showed that a small subgroup of children could definitely not be characterized as an ADHD group. It should be noted, however, that this particular 'false positives' error is common to most diagnostic procedures. It should not be seen as a weakness of our study in particular. Some aspects of the selection method can of course be improved. In the first place, the different versions of the GBO should be standardized for the use with younger age groups. Another important improvement can be made by selecting only those children who are referred with signs of ADHD and have no other problems. But, as we showed earlier, selecting a well-defined ADHD-group will remain one of the most problematic parts of any study.

A major consequence of the difficulty with selecting preschool ADHD children was that we were able to select only 26 clinically referred ADHD children and 19 non referred ADHD children in the RT study, and 30 clinically referred ADHD children and 31 non referred ADHD children in the free-play study. Although we planned to study the normal as well as the deviant development of attention, we were not able to compare different age groups of ADHD children with each other, because the groups would have been too small to draw reliable conclusions. The only thing we could do was to match children from the ADHD groups on age and gender with children from the control groups. The next step to be taken is to select preschool ADHD children in different age groups and compare these age groups with each other and with control children from the same age groups. But the quality of this exercise still depends on the number of preschool ADHD children one can select according to a carefully chosen selection procedure.

Did the selected, non referred ADHD groups provide us with additional information? As mentioned before, the selection method for the non referred ADHD groups differed for the two studies. It is striking to see that the scores
of the non referred ADHD group in the RT study (which was selected with the GBO, teacher version only) always fall in between those of the clinically referred ADHD group and the control group, whereas the scores of the non referred ADHD group in the ethological study (which was selected on basis of the scores on both the GBO, parent version and the GBO, laboratory version) generally overlap with the scores of the clinically referred ADHD group. This discrepancy stresses the importance of carefully selecting specific groups. Furthermore, it shows that the combination of two observation lists for school- and family situations can contribute to the selection of preschool ADHD children. But, as we already argued in chapter 4, we have to be cautious, because there are age differences between the clinical and non-clinical ADHD groups in the ethological study. Before we can draw any final conclusions, we need a developmental study of preschool ADHD children. In any case, the development of a standardized method for the screening of preschool ADHD children can make an important contribution to the early diagnosis of ADHD. Standardizing the different versions of the GBO for the initial screening of preschool ADHD children seems a good starting point.

6.3 The Development of Attention from an Information Processing Point of View

In chapter 2 and chapter 3 we expected to find developmental differences in the so-called output related processes, response preparation and response inhibition. Because the method employed was derived from studies with older children, we first had to find out whether the Reaction Time (RT) task could be used with preschool children. The findings presented in chapter three show that we found task-effects in every manipulation at each age, which is an indication that the tasks were suitable for the study of attentional processes in preschool children. Weissberg, Ruff and Lawson (1990) and Harper and Ottinger (1992) have already shown that reaction time tasks can, under certain conditions, be used to study preschool children with and without signs of ADHD. Our study supports these findings.

Unfortunately, we were not able to find the expected developmental differences in response preparation. We found differences in task orientation only between the youngest age group and the older children: the 4-year-old children tended to look away from the task more often than the older children in both the response preparation task and the response inhibition task. The
Wickens showed that the reaction times of younger children are significantly longer than those of older children when response preparation is less optimal.

The youngest group had more problems with inhibiting false responses than the older children. This finding can be seen as partial support for the hypothesis concerning the developmental differences in response inhibition. What are the consequences of these findings? One important conclusion is that behavioral observations during reaction time tasks can provide us with important additional information. In a RT study with preschool children this additional information is essential for correctly interpreting the data from RT data. But in our view RT studies with older children should also make more use of additional behavioral data for interpreting the results. What conclusion can be drawn from the inability to find developmental differences in response preparation? Does this mean that the suggestions of Wickens (1974) must be rejected? We think not. Because we had to deal with very young children, we were not able to vary also the intertrial intervals between blocks of trials. We chose for varying the intertrial interval within a block of trials. The addition of three more blocks of trials appeared to be too much for those young children to handle. Before a valid conclusion can be drawn concerning the development of response preparation, this variant of the experiment has to be administered. The finding that 4-year-old children have problems with response inhibition is unequivocal. Young children do have more problems with response inhibition than older children. It is surprising that all differences we found, concerning task orientation (on both tasks) as well as response inhibition, were only significant between 4-year-old children and 5-year-old children and not between the older age groups. It seems as if there is a developmental shift between the age of four and five years. Before the shift the children are very easily distracted, and have problems with inhibiting an already started, but false response. Although these abilities continue to develop after age 5 years, (5-year-old children are slower responders than 6-year-old children, they make more errors, look away from the task more often), the differences we found between the 5-year-old children and the 6-year-old children were not significant. We must realize that the total age range of three years is very small. If we eventually broaden the age range to for example three to seven years, probably more developmental shifts will be discovered. Many influential theories of cognitive development support the idea of developmental shifts during these early ages, for example Piaget (1962, 1965), Flavell (1985).

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3 Wickens showed that the reaction times of younger children are significantly longer than those of older children when response preparation is less optimal.
The main conclusions that can be drawn from this part of the study are that the information processing theories can be extrapolated, with specific restrictions, to preschool children. We found developmental differences concerning task orientation and output related processes with our tasks, but more specific attention has to be paid towards certain aspects of the experiment and the range of age-groups, before final conclusions concerning the development of output related processes can be drawn.

An important issue here concerns the question whether the developmental differences lie in the output-related processes or whether children in various age groups simply use different strategies to solve the problem. One can imagine, for example, that 4-year-old children do not have the cognitive capacity to focus on both possible locations and thus capitalize on the left response only, whereas the older age groups can wait for the stimulus to come, before they decide to give the proper response. Because we did not find an age x task interaction between reaction times in the 50/50 condition as compared to the 67/33 condition (the 4-year-olds should profit more in the 67/33 condition than the older children because they capitalize on left-hand responses), an explanation in terms of strategies does not seem correct. We were not able to verify whether other strategies play a role here. More insight into the strategies the children use would probably be given by production system models as used by Klahr (1980) and Siegler (1983).

6.4 Attentional Processes in Preschool ADHD Children from an Information Processing Point of View

In chapter three we showed that it is not the manipulated output-related processes, but task orientation during the RT tasks which acts as the main discriminator between the clinically referred ADHD children, the non referred ADHD children, and their respective control groups. Does this mean that the RT tasks are not appropriate for preschool ADHD children? The answer to this question is more complicated than a simple 'yes' or 'no'. Why did we fail to find differences between control children and children with signs of ADHD on these tasks? As we argued in section 6.3, we tried to manipulate response preparation by varying the interstimulus intervals within the blocks of trials. There are strong indicators that varying the interstimulus intervals between blocks of trials affects response preparation more than the method that we chose (Wickens, 1974; Van der Meere, Vreeling, & Sergeant, 1992). But
again, due to practical reasons, we were not able to perform this manipulation. We strongly suggest that future research tries to manipulate response inhibition with varying interstimulus intervals (and thus preparation times) between blocks of trials (for example blocks of 24 trials with interstimulus intervals of 2 seconds, blocks with intervals of 4 seconds, etcetera) before deciding on whether or not the task is able to identify response preparation in preschool ADHD children. But, and this is especially the case with ADHD children, the researcher should focus on this manipulation only, and not try to manipulate other aspects as well in one single session, because the RT tasks are very demanding for preschool ADHD children. In our opinion the failure to find significant differences in the response inhibition task has two main causes: the small number of children in this study and the small number of trials in the high- (16) and low- (8) probability condition. In order to draw valid conclusions, either the number of children, or the number of trials, or both should be increased. As we already mentioned before, the first possibility - increasing the number of children in the study - is highly dependent on the number of available preschool ADHD children one is able to select. To increase the number of trials in such a study is of course possible. But again, this can only be done when the researcher decides to focus only on the manipulation of response inhibition, because otherwise the results will be strongly influenced by unwanted effects from factors like boredom, fatigue, etcetera.

What did we learn from this part of the study? Firstly, that when using RT tasks to study attentional processes in preschool ADHD children additional information from behavioral observations (task orientation) is necessary for the correct interpretation of the RT data. Secondly, although a first glance at the results may lead to a different conclusion, we strongly emphasize that RT tasks constitute a profitable method in the study of attentional processes in preschool ADHD children. In this study we investigated the possibility of using RT tasks with preschool ADHD children. Therefore we capitalized on more than one aspect within the information processing paradigm.

In this study, we focused primarily on the output-related processes. As already mentioned in previous chapters, another possibility is to focus on the energetic mechanisms in the model of Sanders (1983). Many authors claim that ADHD children have problems in sustaining their attention for a specific task for a prolonged period of time (Seidel & Joschko, 1990; Van der Meere, Wekking, & Sergeant, 1991). Sustained attention, or vigilance, can be measured with a special RT task: the Continuous Performance Task (CPT) (Klee & Garfinkel, 1983). Harper and Ottinger (1992) developed a special version
of the CPT: the Preschool Vigilance Task (PVT). With the PVT these authors were able to measure vigilance in preschool ADHD and control children from 4-6 years. Although no hard conclusions could be drawn from their study, the results were promising for further developing this instrument for the study of attention and inattention in preschool children. Patandin, Veenstra, and Weisglas-Kuperus (in preparation) adapted a vigilance task from the study of Jacobson, Jacobson, Padgett, Brumitt, and Billings (1992) to study the effects of prenatal PCB (polychlorinated biphenyls) exposure on sustained attention in children 3 years old. The latter study shows that RT tasks can be used to study attentional processes in children even younger than 4 years of age! We think that, in addition to the tasks we used in the present study, a vigilance task can provide relevant information about task orientation, attention, and inattention in preschool ADHD children, because this task also takes into account variables like time on task and task orientation.

6.5 The Development of Task Orientation as Measured During Free Play

The RT tasks were only applied to children in a small age range, because in our pilot studies we found that the tasks could not reliably be used with children younger than 4 years of age. The advantage of the method of free play is that it can be applied with children as young as two years of age. In chapter 2 and chapter 4 we hypothesized that task orientation would develop from orientation to the physical characteristics of toys (exploration) in young children towards open ended activities and imaginary (high level) play in older children. The hypotheses could partly be confirmed: We found no differences in the quality and duration of exploration between the children of different age groups, but we did find clear developmental differences in high level play (older children showing more high level play, and less low level play, when compared with the younger age groups). The findings thus only partially support the suggestions of Ruff and Lawson (1990), who also assumed also developmental differences in exploratory behavior (orientation towards the physical characteristics of the toys). What is the reason for this discrepancy? We think that the term 'orientation to physical characteristics' must be redefined. The function of exploration is to obtain information about what the object does (see also Berlyne, 1960, and Hutt, 1970). This is done by exploring the physical aspects of the toy. But the information obtained by exploration is essential for what follows: play, or 'What can I do with this
object. This information about the functionality of the toys is gained in the same way by children of all observed age groups. The differences between children of different ages lies mainly in the periods after the exploration phases: then we see that young children mainly focus on the physical characteristics of the toys. In our study this particular form of focusing was operationalized by low level play, whereas the older children engaged in open ended activities and imaginary play, operationalized by high level play. Another important finding from this part of our study was that the main differences on most variables lie between two and three years, and that the older age groups did not differ significantly from one another on most variables. In line with Ruff and Lawson (1990) we can state that children of three years (and older) are capable of using more sophisticated cognitive capacities in their play, as contrasted with children of two years (and younger), who persist in repetitive manipulation of the toys. One reason for not finding clear differences between the older age groups on high- and low level play may lie in the nature of the toys. Although we tried to use age-appropriate toys, it is possible that the toys are more appropriate for the younger than for the older age groups. But we do not think this is a valid objection, because in that case the older children would have shown more signs of boredom, expressed by less time on task, less high level play, more low level play, which was definitely not the case. One way of reducing the chance of measuring the so-called 'bottom'- and 'ceiling'-effects (finding no differences because the task is either too simple or too difficult) to a minimum may consist of using different kinds of toys for different age groups, although it may then be problematic to compare the results between the groups.

The method of measuring task orientation by means of free play observation can provide a better understanding of the attentional processes in preschool children. It should be noted, however, that although the task is easy to administer, the scoring of the behavioral categories is very time-consuming and difficult, which makes this method less useful for studying significantly more children than we did. In summary, this study generally confirms the suggestions made by Ruff and Lawson (1990) and has provided a good, qualitative understanding of the processes under focus.

6.6 Task Orientation in Preschool ADHD Children as Measured During Free Play
As we argued in chapter 4, the method of observing the behaviors of preschool ADHD children during free play appears to be an excellent method for obtaining more insight into processes like task orientation, attention and inattention. We found clear differences between ADHD children and control children on attentional variables, duration of high level play and low level play, shifts of attention, and number of nonplay activities. Most findings support the suggestions of authors concerning older ADHD children (Alessandri, 1992) or preschool ADHD children (Kalverboer, 1971, 1975; Campbell, Breaux, Ewing, & Szumowski, 1984). One important hypothesis had to be rejected. Following Touwen and Kalverboer (1973) we hypothesized that ADHD children would show less exploration than control children. Our analyses demonstrated that the exploration profile of the ADHD children was exactly the same as that of the control children. One reason for this finding could be that the total exploration time of the ADHD children consisted of a number of very short episodes of exploration, whereas the control children explored the toys for more prolonged periods of time. We did not analyze this possible explanation, but do not consider the idea as very plausible: we divided the total play period in three parts of five minutes, and found no differences between the groups in any five minute-episode. Furthermore, during the observations we did not notice any differences in exploration between ADHD or control children. A more plausible argument lies in the definition of exploration. We divided task orientation in three categories, namely exploration, low level play, and high level play. The distinction between these three categories is very hard to make, but after many pilot trials, substantial discussions, and extensive training of observers, we succeeded in making sufficiently sharp distinctions between these three categories, that could eventually be scored with high inter-observer reliability. If one is not able to make a sharp distinction between these three categories, the inclusion of for example parts of high level play in the definition of exploration may eventually lead to totally different conclusions. Still another argument for not finding differences in exploratory behavior between children with and without signs of ADHD may lie directly in the group studied by Touwen and Kalverboer (1973). Their study focused on children with 'signs of minor neurological dysfunction'. Furthermore, these authors speak of visual exploration, while in our study visual exploration is necessary, but is mostly

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4 These authors suggested that a typical behavioral pattern of MBD children in a free play situation is to start to manipulate the available toys without first visually exploring them.
accompanied by manual exploration/manipulation. This may imply that Touwen and Kalverboer (1973), refer to another behavioral category, more remote from the toys, than the exploratory behavior we defined. The disadvantage of the method of free play observation may already be clear. The scoring of the different behavioral categories is very time-consuming and requires thorough training of observers. The method cannot be used by untrained observers, and is unsuitable for a quick screening of great numbers of children. On the other hand, the advantage of the method is that the children can be observed in a semi-natural environment, with no pressure from an experimenter or a strenuous task. Some elements of the task need further refinement; in order to study the developmental aspects of task orientation, attention and inattention in preschool ADHD children, more children of different ages need to be included in the study.

6.7 Implications of this Study: Some Critical Remarks

The main rationale for the study was to contribute to our understanding of the normal and deviant development of attentional processes in preschool children. The study had an exploratory character, because, until now few studies have considered attention in preschool children. As may be clear from the foregoing sections, our opinion is that this study may serve as a starting point for further investigation of the topic. Consequently, we have no clear-cut answer to the question whether or not this study provided more insight into the normal and deviant development of attention. The tasks we used require further adaptations and refinements before any valid conclusions concerning the measures can be drawn. It should be stated that in practice it is very hard to obtain sufficient numbers of young ADHD children. Given the problems with early ADHD diagnosis, only large-scale studies will provide the researcher with groups big enough to perform the statistical tests required for more valid conclusions. Furthermore, only a combination of cross-sectional and longitudinal studies can provide us with a good impression of development. The so-called time-sequential design (Appelbaum & McCall, 1983), is in fact the classic cross-sectional design, replicated over time. This method provides information on age differences (if independent groups) or age changes (if longitudinal) and some information on time of measurement. The design incorporates the strong aspects of both the cross-sectional as well as the longitudinal design, without the latter's disadvantage of considerable and long lasting research investments. However, the disadvantage of the design is that it requires many subjects in each age group. In this study we have chosen
to focus on two research lines. We tried to extrapolate the information processing theory to younger age groups because this method has provided a very influential body of knowledge about attentional processes in 'older' children with and without ADHD. Furthermore, we followed the suggestion of Kalverboer (1988) that the approach of systematic observation may complement the experimental approach, based on the information processing paradigm. The choice for adopting two lines of theorizing implied that we had to make a number of concessions. Due to the limited available time and workload of the children we could not carry out certain investigations and adaptations of specific manipulations. These restrictions have lead to a more or less shallow overview of the processes under focus. Therefore we should confine ourselves to giving recommendations for further research. The advantage of the method chosen is that we were able to obtain a broader insight in the specific problems of preschool children with and without ADHD. But it may be clear that more research is needed to draw valid conclusions concerning this topic.

In chapter 5 we critically reviewed our selection method and tried to look at the composition of the clinically referred ADHD group. We concluded that the group consisted of various subgroups, and that the characteristics of these subgroups could be compared with the criteria as put forward in DSM-IV and ICD-10. Of course, this conclusion is only preliminary, and we need a more reliable instrument to select preschool ADHD children. In our opinion, the best way to develop this instrument is to develop a standardized observation scale (for example the different versions of the GBO) for preschool age. The instrument could then serve as an external criterion for selecting preschool ADHD children whose behavioral and attentional profiles (obtained by the measures suggested in the underlying study) could be compared with the criteria of DSM-IV and ICD-10.

6.8 Recommendations for Further Research and Final Remarks

We will end this study with an overview of the recommendations already made in previous sections of this chapter and some concluding remarks about the value of this research.

The main conclusions that can be drawn from our findings are:
- The combination of the methods derived from information processing theory and ethology, together with observation scales provides a better
understanding of the different aspects of the normal and deviant development of attentional processes than either method used separately.

- The method derived from information processing theory is appropriate for the study in preschool children, but further research on specific aspects of the tasks is needed.
- The method of free play observation provides an important contribution to the investigation of attentional processes in preschool children.
- In order to obtain more insight into the deviant development of attentional processes, more children in different age groups need to be tested. One should be aware that the recruitment of children with signs of ADHD in these young age groups remains difficult.
- A reliable instrument is needed for the initial screening for ADHD at preschool age (for example the extrapolation of the different versions of the GBO to younger age groups).

Until now, ADHD has been recognized as a serious problem. Although the disorder is generally identified when the child is 7 years or older, most authors agree that the problems start at a much earlier age. However, this study has demonstrated, among others, that the diagnosis of ADHD in preschool children is a problematic issue. Our study may contribute to increased insight into behavioral and attentional aspects of preschool children. If the recommendations made in this chapter are used in future research on the topic, it may be possible to develop methods that can help us to diagnose ADHD at preschool age in the future. Early detection implies managing the problems of ADHD children at a much earlier age, which may help to prevent them from running into serious problems at home or at school.

References


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