Cognitive studies in children with mild mental retardation with externalizing behavioural disorders
van der Meer, Dirk

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2000

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):

Copyright
Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): http://www.rug.nl/research/portal. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.
CHAPTER 6

GENERAL DISCUSSION

The aim of this thesis was to explore a number of attentional abilities as well as impulse control in children with mild mental retardation (MMR) and externalizing disorders (ADHD and CD). It was assumed that attentional abilities would be impaired in children with MMR and externalizing disorders because of their low IQ. However, with one exception (the visual-scanning task) this was not the case, as chapter 2 clearly demonstrated. In general, the MMR group with externalizing disorders performed equally well as the normal control-group or even outperformed children with IQs in the normal range. Given the large control-group, this is a powerful conclusion.

More specifically the results are the following:

1) With respect to the Posner experiment, it appeared that valid cues produced faster and more accurate responses than invalid cues. The children with MMR and externalizing disorders outperformed the control group in the valid condition, and did not make more errors compared to the control-group. Consequently, it has been concluded that covert attentional shifting is intact (as far as engagement and disengagement are concerned) in children of our target-group.

2) The results of the Divided Attention task demonstrated that children of the target-group are capable of dividing their attention. Therefore, the capacity to process two sources of information simultaneously is not impaired. The question may arise whether the tasks were measuring a ceiling effect. In this respect Kunert, Derichs, & Irle (1996) demonstrated, that in the same age group, strong developmental trends took place in all these tasks. Younger children in their study performed less well compared to older children. Given this finding and the lower mental age of the target-group, it was expected that the target-group in our study would also perform less well. This was not the case. In some experimental variables the target-group outperformed the norm-group.

In conclusion, attentional ability is intact in our target-group.
3) Differences in task efficiency between the target- and the normal control-group were found during the so-called visual-scanning task. That is to say: when the children of the target-group had to execute the task while externally-paced they performed like the control-group. However, in the self-paced condition the children in the target-group demonstrated poor test performance. It is obvious that this finding deserves replication. Having said this, the finding suggests that the children in our target-group have problems in monitoring their behaviour, which in turn could be explained by a lack of impulse control. Lack of impulse control was the main topic of chapter 3 and 4.

4) With respect to impulsiveness the following finding was made: children of the target-group demonstrated impulsive behaviour on two impulsiveness indexes: the CPT commission errors, and the suppression of immediate arousal, as demonstrated in chapter 3. Chapter 4 suggests that impulsiveness in the target-group is independent of two important state indexes: manipulation of time-on-task and presentation rate of stimuli.

The main conclusion of the research findings is that attentional abilities are intact, but children have problems with response inhibition, which seems to be pervasive in nature.

An important question that emerges is the extent to which the current findings are compatible with the handful of studies executed in the field of MMR co-morbidity. It must be underlined that the findings do not agree with the studies reported in the introduction, concerning MMR and co-morbid disorders [Handen, McAuliffe, Janosky, Feldman, and Breaux (1998); Pearson, Yaffee, Loveland and Lewis (1996); and Melnyk and Das (1992)]. There are three factors involved that may explain the difference between our study and the previously mentioned studies: 1) the IQ level of the subjects in our experiment was about 20 points higher than in the samples studied by Pearson et al. and Handen et al., 2) different types of tests were used in the studies. We mainly used computer-paced tests, whereas the previously mentioned studies only used self-paced tests, 3) the target-group in our study seems qualitatively different compared to the groups described in their experiments.
Limitations of the studies

It must be underlined that it was impossible to control for all the factors which are involved in such a severely handicapped group of children as was the case in our target-group. Admittedly the thesis may be criticized because of the lack of the necessary control groups.

A second drawback of the thesis is the fact that half of the target-group was on medication. Although true, it must be emphasized that three statistical analyses were carried out in order to estimate the extent in which medication could have confounded our results. These analyses justified the conclusion that our target-group is highly impulsive. Another point is that the children who were receiving medication could be more impulsive than without medication. This however would just have strengthened the idea that the target-group is impulsive.

A third comment may be the small groups in the study with consequently: less statistical power and the absence of statistical differences. First, it is common practice in experimental psychology to work with this amount of children (n=30). Second (and this is uncommon in experimental psychology), the target-group was compared with a (large) norm-group. The finding that the target-group performed equal to the norm-group, or the absence of a statistical significant difference was not the result of a small target-group. The findings are consistent: no differences in attentional performance (in some cases the target-group even outperformed the norm-group) and significant differences on impulsiveness indexes.

Recommendations for future research

1) The main conclusion of this thesis is that the target-group is highly impulsive. MMR children without ADHD and CD are not impulsive; therefore impulsiveness recorded in the target-group cannot be a result of their mental handicap. It is a separate handicapping condition, which they are unable to control. Impulsiveness was defined here in terms of poor response inhibition. However, we have to keep in mind that there is no universally accepted definition of impulsiveness or response inhibition. For example: impulsiveness within the ADHD syndrome is, according to DSM – III - R, represented by: giving an answer before the question has been finished; being unable to wait one’s turn; frequently interfering in the activities of others. Another way in which impulsiveness can be defined is the inability to abruptly stop behaviour once it has been initiated. On a practical level (although somewhat
limiting) response inhibition is defined as the ability to withhold a motivated and goal-directed response in order to enhance adaptive functioning.

Given the differences in interpretation and definition, it is not surprising that there is no indubitable definition of the concept of impulsiveness. It is not clear whether the construct of impulsiveness is truly multidimensional or whether this is an artefact due to a heterogeneity of tests measuring it. So there is an urgent need for a practical way of defining a measurement for response inhibition. With this in mind, to get more grip on the mechanisms behind impulsiveness in this group more research is needed along the lines of other operationalizations of impulsiveness including observational approaches (Kalverboer, 1974, 1990) than only response inhibition, as was the case in the present thesis.

2) There is a growing body of research concerning neurological substrates of impulsiveness (for a review, see Tannock 1998). Neurological studies (fMRI, MRI, PET, etc.) and neurophysiological studies (E.E.G., E.R.P., V.E.P. etc.) combined with neuropsychological studies of this target-group should be considered in order to gain more insight into the neurological substrates in the complex symptomatology involved here.

3) It is a remarkable finding that in our target-group attentional abilities were not impaired together with their pervasive poor impulse control. This imbalance in main developmental trends merits further investigation. One factor that maybe contributed to the explanation of this imbalance is abuse or exposure to stress during development. As stated in the description of the target-group, one of the problems was the stressful situations in which the children have been raised. In view of this complication an interesting and promising line of research has been developed over recent years. For about ten years now, Post Traumatic Stress Disorder (PTSD) research has concentrated particularly on developmental biology, the assumption being that traumatic experiences in childhood can impair the neurobiological maturing process and thus lead to lasting cognitive and emotional disorders. This approach places special emphasis on the temporal and spatial character of cerebral development (e.g., decreased synapse density and myelinasation of nerve fibres) (Feinberg, 1988, Innocenti, 1981; Yakovlev, & Lecours 1967) and subsequently links it with ensuing PTSD symptoms and other disorders (e.g., impulsiveness, development of a hyperkinetic syndrome). Thus, different brain regions could be affected, depending on the developmental stage as well as the
extent and duration of the biological stress reaction. The following regions would then show an increased vulnerability and involvement in various PTSD symptoms: the hippocampus, the amygdala, the prefrontal cortex, the corpus callosum and lymbic structures (Pynoos, Steinberg, Ornitz, & Goenjian, 1997; Teicher, Ito, Glod, Andersen, Dumont, & Ackerman 1997). Most of these structures play a role in impulsive behaviour. This would be a promising line of further research on impulsiveness.

One other interesting question with regard to future research is: do specific brain regions mature faster as a result of disturbances in the normal course of neurobiological development? It is thought that in children with developmental disorders, certain brain regions mature faster compared to those in children with normal development, as a result of compensation (Sapolsky, 1990; Sapolsky, 1996). The following hypothesis has been suggested regarding abused children: Abuse raises the cortisol level. Cortisol has a neurotoxic effect; especially in the lymbic regions. Lymbic regions play an important role in impulsive behaviour. The density of cortisol receptors in the lymbic regions are very high and, in turn, interact with the dopaminergic system and can accelerate the biological development of specific brain regions, especially the frontal cortex (Southwick, Krystal, Johnson, & Charney, 1992). This hypothesis raises an interesting question: do children exposed to abuse have less frontal lobe dysfunction in general or only during specific stages in development? This would also be an interesting line of research for the future with respect to such children’s cognitive abilities.

**Recommendations for clinical practice**

1) This study underlines the necessity of a specialized and broad diagnostic approach. An IQ test alone does not reveal the specific deficits and assets of our target-group children. The assessment procedure must encompass several aspects of (neuro)psychological functioning as well as the concept of self-monitoring. These children should not just be viewed as unfortunates who are mildly mentally retarded with a few additional problems; they can provide us with a better understanding of the mechanisms of complex behavioural disorders. I hope that this study will also make a contribution to a better understanding of this specific target-group and the nuances at play in it.
2) The findings of this study suggest that if these children are provided with the proper conditions, they are able to perform in many respects on the same level as normal children. The children in this study have problems monitoring their own behaviour. Therefore if the environment in which they function helps them to structure their behaviour they are able to perform better.

3) I agree with Barkley (1994) to consider impulsiveness as a handicapping condition for which at present there is no cure. This means that the treatment the children are receiving at the moment (a lot of effort and energy is invested in the treatment of impulsiveness) must be reconsidered. Treating impulsiveness in this target-group would not be productive. The caretakers as well as the children will become frustrated. Accepting impulsiveness as a handicap on both sides (children and caretakers) and learning to cope and to deal with it, will be much more effective.

4) The effects of the medication that the children are receiving in this study should be evaluated carefully. Pre- and post-evaluation should become a standard procedure. Following on from this, medication policy in general should be reconsidered: are we giving the right medication to the children and for the right reasons?
REFERENCES


