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Patterns of inattention in children: Findings from the inattention checklist for teachers

Małgorzata Święcicka
Faculty of Psychology, Warsaw University

Andrzej Matuszewski
Institute of Computer Science, Polish Academy of Sciences

Małgorzata Woźniak
Faculty of Psychology, Warsaw University

Correspondence to:
Małgorzata Święcicka
Faculty of Psychology
Warsaw University
ul. Stawki 5/7
00-183 Warsaw, Poland
(48 22) 554 97 57
swiecicka@post.pl

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Abstract

Background: This study concerns construction of a checklist for teachers designed to find out types of attention disorders in children. It is proposed that inattention is not a homogenous phenomenon. Patterns of coexistence of inattention's signs and other behavioral symptoms could reflect different psychological mechanisms. **Method:** In first study teachers described 242 children aged 9 to 10 years using Inattention Checklist for Teachers (ICT). In second study teachers described 361 children aged 8 to 10 years using modified version of the ICT. **Results:** Factor analysis conducted in the first study resulted in extraction of five factors (withdrawal of attention, distractibility and tiredness, impulsivity and hyperactivity, high emotional control, low emotional control). In the second study previous extracted factors were validate by cluster analyses and profiles referring to co-occurring behavioral symptoms were developed. **Conclusions:** Analysis of profiles has shown that attention disorders comprise at least two groups of inattention's symptoms (distractibility and tiredness, and withdrawal of attention) that in relation to other factors and learning difficulties constitute different patterns of inattention. These patterns reflect differences between attention disorders caused by cognitive malfunctioning, impaired behavioral or emotional control.

Key words: attention disorder, emotional control, self control, learning disabilities, checklist for teacher.

Abbreviations: ADHD: Attention Deficit Hyperactivity Disorder, ICT: Inattention's Checklist for Teachers; IH: impulsivity and hyperactivity; WA: withdrawal of attention; DT: distractibility and tiredness; LEC: low emotional control; HEC: high emotional control; LD: learning difficulties.

Introduction

Inattention is a problem significantly hindering normal functioning in the various groups of children. It constitutes the diagnostic criteria of attention deficit hyperactivity disorder (ADHD) and may accompany anxiety disorders, psychoses, mental retardation and specific learning disabilities. Studies, which would elucidate psychological mechanisms underlying the phenomenon of inattention itself, as well as studies aiming at development of methods and techniques of psychological help (diagnosis and therapy), are needed. Teachers particularly easily observe symptoms of inattention, as it exerts a clearly deleterious effect on the course and effects of their pupils' work. Therefore, teachers' observations might constitute an invaluable source of the data concerning specific aspects of inattention symptoms, as well as other aspects of behavior of inattentive children. Development of a technique enabling collection of reliable and comprehensive data concerning the behavior of inattentive children would be of significant theoretical importance, contributing to a better understanding of this disorder. It would also have a great practical value, providing psychologists with a novel diagnostic method. There are many checklists (e.g., CBCL, Conner's scale), that embody lists of inattention symptoms mentioned in diagnostic classification (Hart & Lahey, 1999). These lists don't comprise a whole variety of behaviors, which reflect the impairments in the attention processes. In our opinion only observations of a wide range of inattentive behaviors would enable researchers to distinguish among possible patterns of attention disorders.

Inattention is not a homogenous phenomenon and may be an expression of the various psychological problems. There are some arguments supporting this thesis that will be discussed in the following section.

Clinical characteristic of attention disorders

The clinical picture of attention disorders in children is variegated and may change depending on which psychopathological syndrome it is associated with. Symptoms reported to psychologists by parents and teachers are most frequently those appearing during execution of tasks that require intensive mobilization of the child's cognitive processes, as is the case with the majority of academic tasks. These symptoms consist of careless errors, tendency to distraction and of not enough cognitive effort in task execution. Attention disorders manifest themselves in everyday activities in the form of absent-mindedness, staring attitude and forgetfulness, as well. The above mentioned symptoms are listed by the DSM-IV (American

Psychiatric Association, 1994) as criterial diagnostic signs of the group of inattention's symptoms included in the ADHD syndrome. Symptoms associated with attention disturbances are listed in the DSM-IV among the key symptoms of generalized anxiety disorders as "difficulty concentrating or mind going blank" (American Psychiatric Association, 1994), they are mentioned also in clinical description of anxiety disorders as tendency to "daydreaming". Attention disorders may appear also in mentally retarded and psychotic children (Taylor, 1995) and in children with organic brain damages (Mateer et al., 1996). As behavioral signs of attention disorders are heterogeneous and their character depends on the psychopathological syndrome they are associated with, one may assume that behavioral expression of attention disorders reflects the variability of underlying mechanisms.

Studies concerning distinctness of the ADHD subtypes with inattention component (ADHD combined subtype and ADHD inattentive subtype) evidence heterogeneity of mechanisms underlying attention disorders. Findings of many researches point out that these two disorders differ in their cognitive and behavioral profiles, patterns of comorbidities, responses to pharmacological therapy and underlying neurobiological problems (Barkley et al., 1990, 1991; Barkley, 1997; Bauermeister et al., 2005; Diamond, 2005; Milich et al., 2001). Children manifesting hyperactivity are more often aggressive, have more conduct problems whereas inattentive children usually do not pose conduct problems. They often have more serious learning problems and comorbied anxiety disorders (Barkley et al., 1990, Bauermeister et al., 2005). Laboratory measures of inattention show also different character of problems in these groups of children: predominantly inattentive children reveal difficulties with focused attention and slow cognitive processing, and children with inattention associated with hyperactivity show poor sustained attention (Barkley, 1997). Differences of behavioral signs of inattention in the two ADHD subtypes are indicated as well. Predominantly inattentive children present tendency to daydreaming and behavioral patterns of *sluggish cognitive tempo* that don't manifest children with the combined subtype (Bauermeister et al., 2005, McBurnett et al., 2001).

Barkley (1997) elucidated differences in the patterns of inattention's symptoms appearing in the ADHD subtypes. According to Barkley, core deficit in the ADHD combined type is a dysfunction of inhibition expressed by inability to delay and modify prepotent reactions causing impairments in the self-control processes. Children presenting with these difficulties are unable to refrain themselves from immediate conversion of the impulse into the action, this being manifested by excessive activity and impulsiveness. These children's behavior is variegated, chaotic and purposeless. Their cognitive processes follow their ever-

changing, chaotic, uncontrolled behavior, therefore leading to ever-changing attention focus and inability to concentrate on one purposeful activity. This kind of attention disorders resulting from the poor self-control should be distinguished from the type characteristic for inattentive children, resulting from the specific features of cognitive processing. In these children, mainly difficult concentration and slower cognitive process express attention disorders. Recently Diamond (2005) referring to the wide review of studies argues also that the core cognitive deficit of attention deficit disorder (ADD) is in working memory and the core deficit of ADHD is in broadly defined executive function deficit, especially in response inhibition than in working memory.

Studies concerning a comorbidity of the three ADHD subtypes and other psychopathological syndromes revealed that the both ADHD subtypes including inattention component coexist with learning disabilities, especially with reading disabilities (Bauermeister et al., 2005; Carroll et al., 2005; Gadow et al., 2004; Willcutt, Pennington, 2000). While the hyperactive-impulsive subtype is more often associated with behavioral disorders and the inattentive subtype coexists with anxiety disorders (Bauermeister et al., 2005; Carroll et al., 2005; Gadow et al., 2004; Willcutt, Pennington, 2000). The frequent coexistence of the ADHD inattentive subtype and anxiety disorders needs closer consideration. Inattention symptoms characteristic for these disorders include daydreaming. It points out that daydreaming may have a different origin in these two disorders. In anxious children daydreaming may be a result of an escape into a world of fantasy from overly threatening reality, while in inattentive children it may be a result of a feeling of being lost due to disorientation in details of a situation.

Attention processes

Another argument in favor of the heterogeneity of attention disorders is the complexity of the phenomenon of attention itself. Theoretical knowledge concerning attention, based on empirical studies having a long history, indicates that it encompasses several psychological processes. As may be expected, disturbances may occur in many different components of attention, leading to different disorders. Whether dysfunction of various psychological processes underlying attention will be expressed in the form of different clinical patterns of inattention is under question. According to Taylor's opinion, on the basis of behavioral symptoms of inattention it is difficult to indicate, which psychological processes may be responsible for their occurrence. Behavioral expression of attention is influenced by many

complex processes and dysfunctions of any of them may disorganize the same behavioral pattern (Taylor, 1995). It appears, however, that by analyzing groups of inattention signs together with coexisting psychopathological symptoms in the light of theoretical knowledge, we may try to develop patterns of attention disorders which are an expression of dysfunction of particular processes.

Attention is defined as mental mechanism of selection, which serves to choose which environmental stimulus will undergo processing, which information from long-term memory store will be recalled and into which mental operations and physical actions the subject will engage (Nęcka, 2000). Control over selection processes is exerted on several levels. Starting with processes coordinating selection at the perceptive level (Pashler, 1998), passing by control of cognitive operations engaged in execution of routine tasks, ending up by processes associated with higher supervisory attentional system named as *executive attention*, which are activated if the task is a new one or includes a problem, which requires additional thinking (Rothbart et al., 1994; Posner & DiGirolamo, 1998; Posner, 1999). The construct of *executive attention* is related to the construct of *central executive*, being one of the components of working memory. This component controls the process of activation of information contained in working memory store (Baddeley, 2002; Baddeley & Logie, 1999; Courteney, 2004). Executive attention is the point where attention is connected with executive functions, i.e. processes engaged in self-control of behavior, associated with the activity of frontal lobes of the brain (Pennington & Ozonoff, 1996).

Attention, as a selection process, is based upon criteria of choice (Święcicka, 2005). Most basic is the perceptual criterion, increasing the probability of further processing for stimuli, which possess such characteristics as expressiveness, suddenness of appearance and newness (Pashler, 1998). Selection of material on which attention will be focused may rely also on emotional criteria, i.e. priority is assigned to information, cognitive operations and activities which have an emotional value for the subject. First of all, these are stimuli carrying information, which is important for biological survival of the subject (e.g., information concerning menace or danger). In the course of development and accumulation of experience, the scope of "important" information is expanded to include many other, which become important from the point of view of the subject's psychical well-being (LeDoux, 2000). Thanks to this criterion, attention may function as a regulator of emotions (Calkins, Fox, 2002; Derryberry & Reed, 1994, 1996, 2002, Thompson, 1994; Wilson, 2003). Derryberry and Rothbart (1984, 1988) emphasize the regulatory function of attention in their theory of temperament, pointing out that selective enhancement or inhibition of sensory and semantic

information reaching a subject has a significant impact on regulation of behavior and in particular on regulation of emotional tension. Inter-individual differences of temperament in children are expressed, among others, by their proneness to use attention as a regulatory mechanism and in their ability to control attention engaged in emotional regulation.

Next criterion used by attention in selection process is the efficacy criterion; i. e. attention promotes thoughts relevant to the task, which enhance effectiveness of purpose-orientated behavior. Use of this criterion requires some maturity and is present only in older children. Ability to use this criterion is included in the construct *effortful control* of the temperament theory by Rothbart and is realized using *executive attention* (Eisenberg et al., 2003; 2004; Posner & Rothbart, 2000). Some situations may create a conflict between emotional and efficacy criteria. Solution of this conflict will require mobilization of voluntary processes of attention control (Święcicka, 2005).

The presented model of attention indicates a correlation between attention, ability to self-control and the emotionality. This may explain the coexistence of attention disorders with other conditions associated with dysfunction of self-control and disordered emotions. Coexistence of symptoms of inattention and hyperactivity in the combined ADHD type may result from self-control deficit, which is a common factor in both groups of symptoms (Barkley, 1997). Close correlation between attention and working memory may explain coexistence of symptoms of inattention and specific learning problems (Gathercole & Alloway, 2006; Geary, 2004; Swanson, 1999). Furthermore children with emotional disorders may present an excessive tendency to be driven by emotional criterion, thus compromising effective task-solving activity. Children with high emotional reactivity may present excessive distractedness by emotionally charged stimuli, which are often endogenous in nature. They may also present symptoms of withdrawal of attention from reality if it is perceived as excessively threatening (Derryberry & Reed, 1996).

Views concerning the essence of attention processes presented here seem to confirm the already mentioned prediction that an analysis of specific features of behavioral symptoms of inattention associated with other psychopathological symptoms may significantly contribute to improve our understanding of psychological mechanisms underlying attention disorders in children.

Method

Construction of the inattention's checklist for teachers (ICT)

Considering the purpose of our study we decided to construct a checklist of inattentive behaviors that wasn't limited to diagnostic criteria. The items in our scale are based on teacher's descriptions of inattentive children's behaviors, which we have collected during our previous research. From teacher's descriptions of pupils having serious problems with attention, we derived two groups of items: inattentive behaviors, and coexisting behaviors, encompassing symptoms of resourcelessness, hyperactivity, impulsivity and symptoms of disturbed emotional expression. Finally experimental version of Inattention Checklist for Teachers (ICT) comprised 35 items. The teacher's task was to rate on a four-degree scale to what extent the behavior described in the item matches the child - the higher the degree, the better the item fits the child.

In order to getting information concerning school achievement that are important for this study, short questionnaire rating problems in reading, writing and mathematics and the level of general intellectual functioning of pupils was enclosed. Teachers are asked to rate the level of learning difficulties on a four-degree scale.

Procedure and Participants

The project was divided into two studies. In the first study 12 teachers from six primary schools from Warsaw described their pupils using the first version of the Inattention Checklist for Teachers. We obtained 242 descriptions of children, aged from 9 to 10 (121 boys; 109 girls; sexes of 12 children weren't indicated). Collected results were analyzed using factor analyses, in order to separate factors rated by the ICT. According to these findings 2 items were removed, order of items and graphical scheme of questionnaire was modified.

In the second study 18 teachers from 7 primary schools (3 from Warsaw, 2 from villages, and 2 from small towns) described their pupils. We received descriptions of 361 children, in age 8 to 10 (194 boys, 167 girls). The goals of this study were to validate previous extracted factors and to find out typical patterns of inattention, using cluster analyses.

Results

I Study

The outcomes of teachers' descriptions were subjected to factor analyses aimed at dividing items of the Inattention Checklist for Teachers into the distinct groups – factors.

Factor Analyses

Firstly four items referring to tendency not to express emotion (e.g. *In general doesn't express her/his emotions)* were discriminated as separate group that constituted the subscale of high emotional control (HEC). This group of items entered into unrotated principal component. Then next four items (e.g. *It is easy to provoke her/ him to outburst of emotions)* formed separate group, using rotation of remaining principal components. These items established the subscale of low emotional control (LEC). Thus in first stages of factor analyses items describing child's emotional functioning formed scales clearly distinct from each other and from other ICT's items. In next stages further statistical operations were conducted in order to form reliable and valid scales from remaining items. Within preliminary computations the number 3 of "factors" was established as a most adequate. Principal components were computed and the Varimax rotation with the Kaiser normalization was applied. Table 1 presents results of two analyses that were performed for the group of girls and the group of boys. Power of loadings (higher then 0.30) clearly indicated to which scale particular item should belong.

<Table 1 here >

The first subscale described impulsive and hyperactive behaviors and therefore was named the subscale of impulsivity/hyperactivity (IH). Items of the second subscale were connected with such feature of functioning as withdrawing attention and carelessness. For that reason this scale was named the subscale of withdrawal of attention (WA). Last scale is consisted of items describing tendency to be easily distracted and to get tired of mental activities quickly. Therefore this scale was named the subscale of distractibility/tiredness (DT).

II Study

The analyses of outcomes obtained in the II study have the aim to make a partial validation of the subscales extracted by factor analyses.

Correlation between factors

The following Table 2 presents the actual Pearson inter-correlations of the factors for the second sample.

<Table 2 here>

It should be pointed out that similarly, as for factor loadings computed for the first sample (see Table 1) there were no important differences in inter-correlations patterns between girls and boys. Actually the same details that influenced some small sex differences in factor loadings for the first sample appeared as the reason for small differences in inter-correlations for sexes in the second sample. These are the reasons that we decided to present inter-correlations for the whole second sample without sex division. Non-significant sex differences seem to be an important finding with several consequences. According to one of possible consequence teachers perceive similarly co-occurrence of symptoms in the group of boys and in the group of girls, but it doesn't mean that the intensity of symptoms is the same in both groups. Boys achieved in all five factors greater results that could indicate higher intensity of all measured psychopathological symptoms in this group. Especially significant differences between girls and boys referred to the *impulsivity/hyperactivity* subscale.

As Table 2 shows four factors: *impulsivity/hyperactivity*, *distractibility/tiredness*, *withdrawal of attention* and *low emotional control* are strongly correlated. Within this general tendency one can notice special more significant inter-relationships: between the *withdrawal of attention* and the *distractibility/tiredness* subscales and between the i*mpulsivity/hyperactivity* and the *low emotional control* subscales. Strong correlation of these four subscales doesn't justify joining them into one "super" factor. This tendency could be explained by the characteristics of the study sample. In the school-aged population, children are divided into the two groups – without any or rather without any psychopathological symptoms and with significant psychopathological problems. Such distribution of children is itself the reason of inter-correlation's growing. It is also important to notice that we analyze

symptoms observed by the teachers. One can suppose that teachers are prone to attribute children with any kind of difficulties in school work also other behavioral problems or to overestimate an intensity of observed symptoms.

Strong inter-correlation between the *withdrawal of attention* factor and the *distractibility/tiredness* factor confirm that symptoms constituted these subscales refer to the same psychological problem, which could be described as attention disorder. The fact that by factor analyses these two subscales formed different list of symptoms suggests that it is not a homogenous disorder. However different dysfunctions of attention processes could be reflected in very similar behaviors, which are difficult to distinguish for teachers. Strong inter-correlation between the *impulsivity/hyperactivity* subscale and the *low emotional control* subscale can result from the fact that the both group of symptoms are the signs of child's inefficient self-control mechanism, especially poor inhibition. The *impulsivity/hyperactivity* symptoms reflect poor behavioral inhibition and the *low emotional control* symptoms express poor emotional control. Inter-correlation between the *high emotional control* factor and other factors are not strong. Between the *high emotional control* and the *low emotional control* subscales as well as between the *high emotional control* and the *impulsivity/hyperactivity* subscale correlations are negative, what results from the characteristic of these factors. Inter-correlation between the *high emotional control* and the *low emotional control* subscales are not strong, what point out that these subscales are not opposite extreme limits of the same psychological phenomenon, but that the symptoms of high and low emotional control results from different processes.

As shows Table 3 all subscales have satisfactory internal consistence. Alpha Cronbach coefficients for four factors except the *high emotional control* subscale feature better consistence of girls' descriptions. Only scores obtained by items formed the *high emotional control* factor show reverse dependency, what additionally points distinctness of the *high emotional control* scale from the other subscales.

<Table 3 here>

Cluster Analysis

In order to further validation of the separateness previous extracted factors we decided to conduct cluster analysis. The aim of applied statistical operations was to indicate groups of children in which correlated symptoms rather do not co-occur.

We used a two-stage procedure of clustering and further analysis. Firstly the so-called atom clusters were computed, using K-means method (this and further clustering operations are subject of intensive research within statistics see Fraley et al., 2005; Yu, 2005). At this stage we considered three groups of variables: age, sex and scholastic achievements divided into four variables corresponding to the four questions concerning learning difficulties (LD). As the result of these operations 20 atom-clusters were extracted. Two variables – sex and age appeared not to be significant and were excluded from further analyses. On the basis of strong correlations between scores referring learning difficulties we decided to join four variables of scholastic achievements into one variable. In next step similar atom-clusters were joined into final clusters using further statistical operations. Hierarchical cluster analyses resulted in agglomerative clustering of ten atom-clusters referring to children that obtained low scores in every subscale, what indicate that teachers didn't observe in this group of children any psychopathological symptoms. Remaining ten atom- clusters referring children that manifested some behavioral symptoms were further analyzed and two pairs of atom-clusters were joined.

We obtained one final cluster that grouped children without any behavioral problems observed by teachers using ICT. 164 children that refer to 45% of studied sample formed this final cluster. Girls constituted 45% of this group what was more than in analyzed sample. Eight final clusters grouped children that manifested some behavioral problems and formed patterns of comorbid problems observed by the teachers. In order to present extracted profiles of children with psychopathological symptoms in more meaningful, graphic way we applied standardization of obtained results. From averages of the particular final clusters of children with behavioral symptoms were subtracted averages of the final cluster of children without observed behavioral symptoms and obtained scores were divided by standard deviation of population. In next section particular profiles showed by graphs are analyzed theoretically.

Profile Analysis

Conducted profile analyses indicate that both the impulsivity and hyperactivity symptoms and the two groups of symptoms of emotional disorders can occur independently from the symptoms of inattention. Two groups of children have heightened scores only on scales considering emotional functioning. Group 1 (N=22) consists of children whose only problem is tendency to suppress their emotions. In group 2 (N=12) the only problem was a tendency toward uncontrolled emotional outbursts. Separation of this group of children in

cluster analysis proves the justness of isolation of the *low emotional control* subscale as an independent factor. This indicates that difficulties in emotional control cannot be identified with difficulties in activity control, described as impulsivity.

<Graph 1 here>

Children from group 3 (N=39) were described by the teachers as presenting intensive hyperactivity and lowered emotional control; this symptoms are accompanied by average functioning on both scopes of attention investigated, lack of tendency toward inhibition of emotional expression and lack of learning difficulties. This profile of symptoms is close to clinical descriptions of ADHD hyperactive/impulsive subtype. Inhibitory deficit appears to be the core problem in this group.

Symptoms of attention's dysfunctions are the hallmark of the remaining five groups of children. These children are the subjects of further more detailed analyses. Among them are two groups of children characterized by occurrence of both hyperactivity and impulsivity symptoms and symptoms of attention disorders, so they have a pattern of symptoms similar to ADHD combined subtype. Profiles of these groups are showed on the Graph 1.

Group 4 (N=34) has moderately heightened scores on all scales; this profile reaches its maximum on the WA subscale, and minimum on the subscales measuring emotional functioning. Group 5 (N=46) has a very similar profile. The only difference is that all groups of symptoms manifest themselves with considerably greater intensity. Interestingly, in both groups of children hyperactivity and attention disorder symptoms are accompanied by learning difficulties. One may thus presume that these children have some sort of cognitive problems in addition to inhibitory deficit, which is probably the core problem in group 3.

<Graph 2 here>

Profiles of groups of children who have high scores on both inattention subscales connected with low scores on the *impulsivity/hyperactivity* subscale, thus exhibiting pattern of symptoms which resembles ADHD inattentive type are shown on Graph 3. In children from group 6 (N=16) teachers observe significantly greater tendency to withdraw attention than to distraction; they do not observe uncontrolled emotional outbursts, but just the opposite – a very strong tendency to not express their emotions; this children have moderate learning difficulties. The reverse pattern of scores achieved by children on the subscales measuring

attentional and emotional functioning appeared in group 7 (N=11). In teacher's opinion they have greater inclination toward distraction than toward withdraw attention, and do not have problems with emotional expression; these children have serious learning difficulties. Children from group 8 (N=17) have serious attentional problems (elevated scores on both scales measuring attentional functioning); they do not express their emotions and have serious learning difficulties.

Comparing the results of all groups, in which different intensity of symptoms of two scopes of inattention is observed by teachers (i.e., group 6 and 7, Graph 3; and group 4, Graph 2) one can notice, that children who tend more to withdraw than to distract their attention and who do not exhibit symptoms of hyperactivity and impulsivity (group 6), are perceived as not expressing their emotions. Whereas, if the symptoms of hyperactivity/impulsivity are present, and withdrawal of attention outweighs distraction (group 4), this tendency toward suppressing emotional expression is not observed. One can ask, whether withdrawal of attention means the same in both cases (group 6 and 4)? It is possible that the nature of withdrawal is different in these groups – one mechanism may underlie symptoms of disorganization connected with self-control deficit, (indicated by elevated scores on the *impulsivity/hyperactivity* scale) and another symptoms of "daydreaming" connected with emotional problems. However, from teacher's perspective, both groups of children manifest similar symptoms of inattention.

However the impulsivity/hyperactivity symptoms and the two groups of symptoms connected with emotional functioning appear in some group of children independent on inattention's symptoms, learning difficulties of different intensity always accompany inattention. Interestingly, children whose inattention is limited to the symptoms of distractibility and tiredness (group 7) or who have attentional problems of both kinds (groups 5 and 8) have significantly greater learning difficulties than children whose dominating problem is withdrawal of attention (group 4 and 6). Intensity of learning difficulties is not connected with the presence of hyperactivity/impulsivity symptoms and is similar whether they co-occur with inattention symptoms (group 5) or not (groups 7 and 8); it is even lesser when the hyperactivity and impulsivity is present. All this data suggest that the distractibility and tiredness subscale could be connected with children's cognitive abilities more strongly then other examined factors.

Discussion

Analyzing the profiles we may conclude that attention disorders do not appear as an isolated psychopathological symptom. Learning difficulties are the problem that always co-occurs with inattention's symptoms, what could point out at the influence of cognitive dysfunctions in mechanisms underlying attention disorders in children. Firstly inattentiveness and learning difficulties may be the outcome of malfunctioning of cognitive processes especially the dysfunctions of working memory (Diamond, 2005; Gathercole & Alloway, 2006). Secondly inattentiveness may be a secondary symptom of learning difficulties that appears due to the lowered capacity of other intellectual functions. Children with some school difficulties achieve harder automatized ability to do school's tasks (Hazell et al. 1999), so they have to give more effort and as a result they would probably be soon tired and not concentrated, and that is what teachers report.

In some groups of children symptoms of inattention are accompanied by hyperactivity and impulsiveness and lowered emotional control, what could suggest influence of self-control dysfunctions in the forming of observed symptoms. Co-occurrence of these symptoms is elucidated by Barkley's theory (Barkley, 1997).

Other symptoms typical for some inattentive children have appeared to be problems with emotional control. Descriptions of children's behavior enriched by characteristics of their emotional functioning enables better understanding of the mechanisms underlying different inattention symptoms. Coexistence of the low emotional control symptoms along with the signs of hyperactivity and impulsivity could reflect the wider range of the dysfunctions in self-control processes. Descriptions of children's behavior on the *high emotional control* subscale result in many significant informations. Pattern of behavior characterized by the great scores on the *high emotional control* subscale accompanied by intensification of the *withdrawal of attention* signs seems to describe children tending to cope with difficult situations by behavioral and attention's withdrawal. In order to avoid exorbitant emotional tension they divert attention from situation, what manifests as being unaware, and daydreaming (Derryberry, Reed, 1996). These children probably avoid also communication with external threatening world by blocking their emotional expression, what reveals in great scores on the *high emotional control* subscale. If this style of functioning is combined with cognitive dysfunctions, the group of inattention's symptoms is enlarged by symptoms of distractibility (connected strongly with children's cognitive functioning); consequently

symptoms of both form of inattention (withdrawal of attention, and distractibility and tiredness) become more intensive.

Presented analyses reveal the existence of at least two separate groups of inattention's symptoms: withdrawal of attention, distractibility and tiredness that may appear independently and could form together with coexisting symptoms different patterns of disorders. More detailed analysis suggests that withdrawal of attention may occur in two forms, hard to distinguish for teachers on the basis of observed behavioral symptoms. First form is combined with the impulsivity and hyperactivity and probably connected with self-control dysfunctions and the other one is combined with emotional overcontrol and probably related to dysfunctions in emotion regulation. It seems also that symptoms described as distractibility and tiredness may be the manifestation of the two different problems. First one when the distractibility and tiredness symptoms are accompanied by learning difficulties, what points at relation with cognitive dysfunctions and another one when these symptoms are combined with impulsivity and hyperactivity as well, what suggests relation with self-control dysfunction. The behavioral symptoms of attention disorder in all four cases are similar, hard to differentiate for teachers. Anyway, we are able to make hypotheses concerning differences in the mechanisms that reveal hardly to distinguish types of inattention's symptoms on the basis of co-occurred disorders.

Presented analyses are the basis for differentiating following five patterns of attention disorder. They are to relate with different psychological mechanisms:

1. distractibility and tiredness accompanied by cognitive dysfunctions (group 7),
2. withdrawal of attention accompanied by lowered behavioral control (group 4),
3. withdrawal of attention accompanied by emotional overcontrol (group 6);
4. withdrawal of attention as well as distractibility and tiredness accompanied by self-control deficits (disinhibition and malfunctioning of other executive functions) (group 5),
5. distractibility and tiredness accompanied by cognitive dysfunctions along with withdrawal of attention connected with emotion suppression (group 8).

Presented findings imply that in further study concerning attention disorders researchers should take into consideration the differentiation of inattention's behavioral signs, because different group of inattention's symptoms could reflect different mechanisms underlying attention disorders. It seems also to be worth to conduct research on interaction between groups of psychopathological symptoms apart from their belonging to particular disorder. Studying comorbidity of different psychopathological syndromes it's hard to tell, which of their elements connect them and on the basis of which mechanism they are

combined. Analysis of the coexistence of groups of symptoms in various configurations, not foreseen in diagnostic classifications might be a source of interesting hypotheses explaining the mechanisms underlying particular disorders. From these findings could arise also recommendation for psychological practice. In our opinion therapy of children with attention disorder should be based on diagnosis of child's emotional and cognitive functioning as well as on diagnosis of functioning of self-control mechanism. Psychologist should try to reveal and explain an interaction between different disturbances in child's functioning.

Limitation of this study is only one source of information concerning children – teachers' descriptions. Teachers could observe children under specific circumstances, from peculiar point of view. In next step of our further research we have planed to construct analogous inattention's checklist for parents. This method enables to compare informations concerning children from teachers' and parents' point of view.

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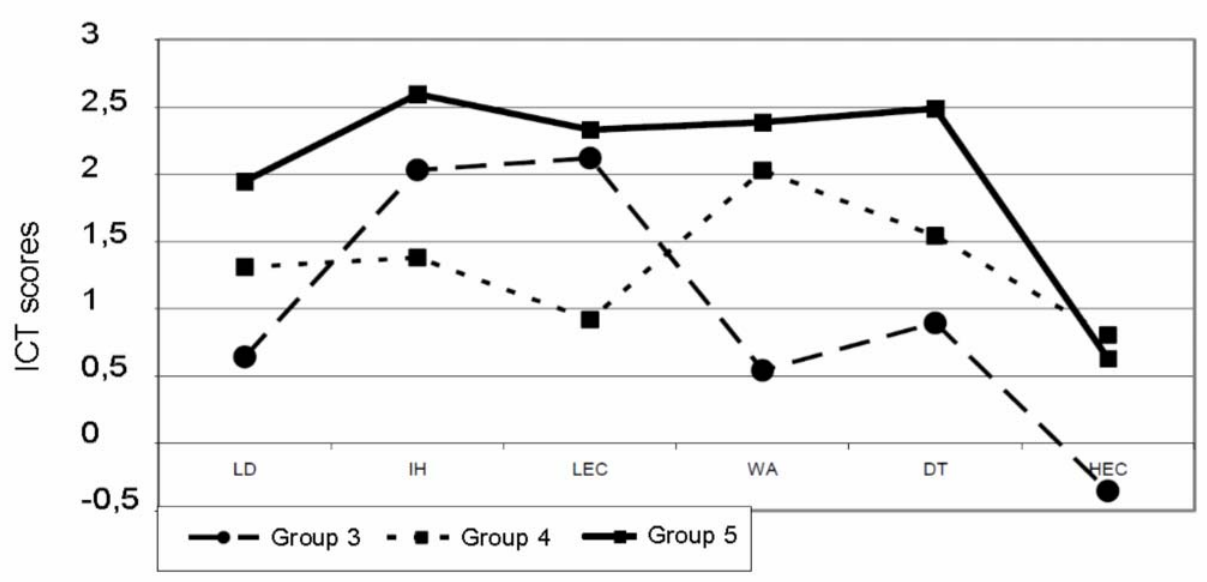
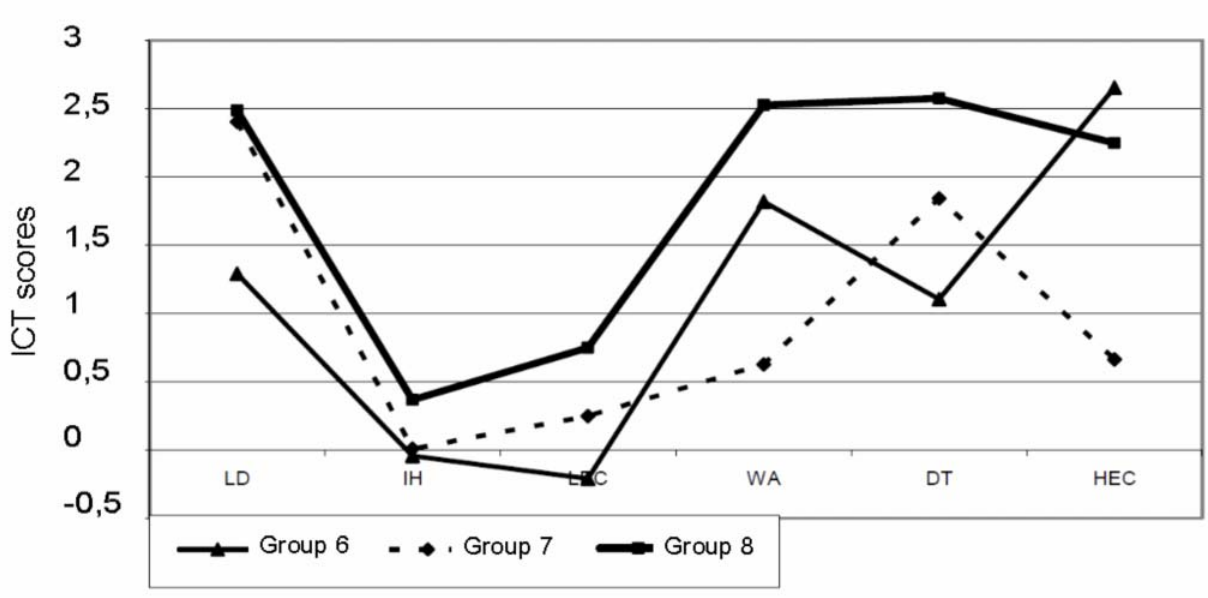


Graph 1. Profile of co-occuring behavioral symptoms in groups 3, 4, and 5. LD – learning difficulties; HEC - high emotional control ; LEC - low emotional control; IH - impulsivity/hyperactivity; WA - withdrawal of attention; DT – distractibility/tiredness.



Graph 2. Profile of co-occuring behavioral symptoms in groups 6, 7, and 8.

Table 1. Results of a basic factor analysis of the ICT

Item	Girls			Boys		
	IH	WA	DT	IH	WA	DT
Is hyperactive	**.823**			**.870**		
Can't remain seated; during lesson goes out from his/her bank	**.776**	.269		**.837**	.328	
Has difficulty awaiting his/her turn, e.g. blurts out answers before teacher allows him/her to speak	**.763**			**.902**		
Squirms and fidgets in situations in which quiet seating is expected	**.763**	.346		**.808**	.293	.207
Unexpectedly intrudes into other people's doings	**.725**	.250		**.800**	.232	
Takes every opportunity of overactivity e.g. after lesson runs already to school's corridor	**.717**			**.857**		
During the lesson does useless activities e.g. moves things on the desk	**.660**	.443		**.685**	.418	.329
Acts very quickly, often without thinking	**.630**		.226	**.735**		.231
Often seems to be absent minded		**.765**	.318		**.786**	.358
Often seems to day-dream		**.751**	.294		**.818**	
Is little resourceful in everyday activities e.g. it is difficulty for her/him to dress herself/himself dexterous after gymnastic		**.733**			**.825**	
Has difficulty organizing work e.g. preparing the materials necessary for doing the task	.239	**.699**	.292	.226	**.725**	.442
Seems no to be aware, what is going on around him/her	.382	**.672**	.356	.231	**.745**	.398
Often lost in thoughts, fails to pay attention		**.670**	.400	.231	**.732**	.439
Habitually does such activities like biting her/his nails, gnawing pen	.367	**.633**	.335	.437	**.567**	.378
Needs to be managed by adult in his/her work during solving tasks		.283	**.784**		.311	**.738**
Avoids to engage in work that requires sustained mental effort	.211	.376	**.733**	.236	.466	**.725**
Once solves good, once solves bad tasks requiring the same abilities		.276	**.719**		.246	**.801**
Seems that mental effort makes him/her tired		.402	**.691**		.564	**.694**
Quickly manifests tiredness caused by mental activity	.299	.465	**.639**	.267	.498	**.680**
It is difficulty for her/him to bring to an end already initiated activity	.228	.496	**.599**	.266	.545	**.644**
Makes by inattention small mistakes in schoolwork e.g. misleads signs in arithmetical tasks	.201	.261	**.598**	.296		**.712**
Needs ideal silence to pay attention to schoolwork	.382		**.595**			**.817**
Even little important events disturb her/him in schoolwork	.508	.238	**.418**	.318	.344	**.690**
Is easily distracted by unimportant, extraneous stimuli	.537		**.488**	.458	.379	**.605**

IH - impulsivity/hyperactivity, WA - withdrawal of attention, DT - distractibility and tiredness

Table 2. Pearson inter-correlations of the factors computed for the second sample

	IH	*WA*	*DT*	*LEC*	*HEC*
IH	1				
WA	.540	1			
DT	.616	.829	1		
LEC	.739	.409	.518	1	
HEC	-.148	.347	.263	-.151	1

LD - learning difficulties, IH - impulsivity/hyperactivity, LEC - low emotional control, WA - withdrawal of attention, DT - distractibility and tiredness, HEC - high emotional control

Table 3. Internal consistence of 5 subscales of the SON

Gender	*IH*	*LEC*	*WA*	*DT*	*HEC*
Boys[a]	.919[c]	.883	.901	.942	.830
Girls[b]	.951	.928	.921	.947	.752

[a]There were 194 boys in the sample
[b]There were 167 girls in the sample
[c]Alpha Cronbach coefficients non-standarized
LD - learning difficulties, IH - impulsivity/hyperactivity, LEC - low emotional control, WA - withdrawal of attention, DT - distractibility and tiredness, HEC - high emotional control