The effects of parent training on child routines
Using the Child Routine Questionnaire – IS to assess the effects of parent training on families of children with symptoms of ADHD.

Katarina Duaas Nymoen

Lokaverkefni til BS-gráðu
Sálfræðideild
Heilbrigðísvisindasvið
The effects of parent training on child routines

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Katarina Duaas Nymoen
Ritgerð þessi er lokaverkefni til BS- gráðu í sálfræði og er óheimilt að afrita ritgerðina á nokkurn hátt nema með leyfi réttthafa.

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Abstract

Attention deficit/hyperactivity disorder is a common disorder starting in childhood which is characterized by symptoms of inattention, impulsivity and hyperactivity. These symptoms affect many aspects of life negatively, and are often associated with lower academic skills, decreased adaptive functioning, higher intrafamilial conflict and behavioral problems. This study assessed the effect of parent management training on childhood routines in a sample of children showing symptoms of attention deficit/hyperactivity disorder. The sample was a clinical sample consisting of children with symptoms of ADHD, ODD, CD and/or anxiety. The effects of the intervention were measured with the CRQ-IS, the translated version of the Child Routines Questionnaire; a parent-report measure of how frequently routines and rules are followed in the everyday life of the household. The participants were the parents of 77 children showing the aforementioned symptoms, attending a parenting class for ADHD in a local health clinic. The scores of the CRQ-IS administered pre- and post-intervention showed a significant difference in routines. Children in the referred sample showed fewer Household Responsibility routines, fewer Family Interaction routines and fewer Daily Life routines than children in a population sample, both before and after the intervention despite the increase from the intervention. However, the children in the sample were reported to have more Discipline Routines than children in the population. Girls showed more routines on the Family Interaction factor than boys, while older children in general scored higher than younger children on the Household Responsibilities factor. The study has several weaknesses, but indicates an effect of parent management training on routines and lends support to the use of the CRQ-IS.
Introduction

Attention deficit/hyperactivity disorder (ADHD) is one of the most common and the most widely researched mental disorder in children (Akinbami et al. 2011). Due to its relatively high prevalence, most people have direct or indirect experience with children showing symptoms of the disorder, as it is often said to be one child with the disorder in each classroom. The symptoms associated with the disorder are highly visible to the child’s family, teachers, and peers, especially as the child gets older. Then the environment becomes more demanding with regards to being able to sustain attention over time and to control impulsive behavior, often resulting in strained personal relationships (Smallish & Fletcher, 2004; Greene et al. 1996; Hoza et al., 2005). Children with ADHD are often described as inattentive, forgetful, restless, hyperactive and inappropriate in social situations, and much research has been carried out in order to help the families affected with the problematic behaviors resulting from the symptoms. Due to the sheer amount of research conducted on the disorder a description has to be limited, but the following introduction will briefly describe the history of ADHD, main symptoms, prevalence, characteristics, etiology and comorbidity before moving on to other disorders often comorbid with ADHD. Oppositional defiant disorder (ODD) and conduct disorder (CD) will be outlined and contrasted with each other, and anxiety and depression in children will be described. The parenting practices of parents of children with conduct problems will be described, in addition to the effect different parenting techniques have on children’s behavior. The core characteristics of different treatments of will be recounted, with a focus on parent training as was used in the current study. The role and effectiveness of routines in treatment of behavioral problems will also be outlined. Recent development of questionnaires suited to assess the functions of routines has led to an increase in research of these variables, and some of the resulting material will be summarized. The goal of this study is to assess the effects a parent training intervention has on the routines of children showing symptoms of ADHD, ODD and CD.
1.1.1 Attention deficit/hyperactivity disorder – History

Research on attention deficit/hyperactivity disorder has been accumulating rapidly since 1902, when Still first described a disorder characterized by a defect of moral control. The disorder has gone through a wide range of descriptions, possible causes and preferred treatments before reaching the current diagnosis and criteria for symptoms, and the suggested causes of the collection of symptoms seen in ADHD have been many, ranging from the first “lack of moral control”, to a lack of tolerance from mothers (Bettelheim, 1973; Harticollis, 1968) bad parenting styles, or the influence of specific food or nutrients – such as sugar-, and effects of toxins (Feingold, 1975). Hypothesizing bad parenting styles as a cause of ADHD with no substantial evidence has done more harm than good, by blaming parents for their child’s symptoms and causing more distress to a family already struggling to make daily life work (Barkley, 2005). A burst of research in the 1970s saw the emergence of characteristics closer to what is seen today; emphasizing impulsivity, short attention span, low frustration tolerance, distractibility and aggressiveness (Marwitt & Stenner, 1972; Safer & Allen, 1976). From the earlier focus on hyperactivity as a main symptom, more research started focusing on other symptoms such as attention deficits and impulsivity. These symptoms, although maybe not as immediately obvious, have consequences for daily chores and school performance that are at least as significant as in hyperactivity (Biederman et al. 2004). In addition to the increase in research about the etiology of the disorder, new studies investigated the effectiveness of medication in treatment, taking the first steps towards reliable improvement of the disorder’s core symptoms. ADHD has also been a controversial disorder, despite all the research, and was by many considered a myth (Conrad, 1975). The revised criteria for the disorder when changed from ADD to ADHD in the 1980s established the disorder more firmly as a clinical syndrome, due to the covariation of symptoms (DuPaul, Power, Anastopoulos & Reid, 1998; Hinshaw, 1987; Lahey et al. 1994)- especially inattention-restlessness, and impulsivity-hyperactivity- as well as its clear distinction from other disorders (August & Stewart, 1983; Barkley, DuPaul & McMurray, 1990; Barkley, DuPaul & McMurray, 1991; Barkley, Fischer, Edelbrock & Smallish, 1990). In addition, thanks in part to the
continuing research in neuroscience; ADHD has been shown to fulfill the requirements of Wakefield’s harmful dysfunction criteria; showing a dysfunction of a biological system that causes a harmful or impairing consequence to the individual (Wakefield, 1992; 1997). The recent reclassification of ADHD as a neurodevelopmental disorder instead of a behavioral disorder in the 5th edition of the Diagnostic and Statistical Manual (APA, 2013) signifies the final distinction of ADHD as a physiological deficit and not a socio-psychological disorder caused by situational, parental or psychological factors.

1.1.2 Attention deficit/hyperactivity disorder – Main symptoms

<table>
<thead>
<tr>
<th>Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by (1) and/or (2):</td>
</tr>
<tr>
<td>1. Inattention: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities.*</td>
</tr>
<tr>
<td>a. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).</td>
</tr>
<tr>
<td>b. Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy readings).</td>
</tr>
<tr>
<td>c. Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).</td>
</tr>
<tr>
<td>d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).</td>
</tr>
<tr>
<td>e. Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order, messy, disorganized work; has poor time management; fails to meet deadlines).</td>
</tr>
<tr>
<td>f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).</td>
</tr>
<tr>
<td>g. Often loses things necessary for tasks and activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).</td>
</tr>
<tr>
<td>h. Is easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).</td>
</tr>
<tr>
<td>i. Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).</td>
</tr>
</tbody>
</table>
### DSM-5 Diagnostic Criteria for Attention Deficit/Hyperactivity Disorder

#### 2. Hyperactivity and impulsivity
Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities.

- a. Often fidgets with or taps hands or feet or squirms in seat.
- b. Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or in the workplace).
- c. Often runs about or climbs in situations where it is inappropriate. (Note: In adolescents or adults, may be limited to feeling restless.)
- d. Often unable to play or engage in leisure activities quietly.
- e. Is often “on the go”, acting as if “driven by a motor” (e.g., is unable to be or is uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficulty (sic) to keep up with).
- f. Often talks excessively.
- g. Often blurts out an answer before a question has been completed (e.g., completes people’s sentences; cannot wait for turn in conversation).
- h. Often has difficulty waiting his or her turn (e.g., while waiting in line).
- i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults, may intrude or take over what others are doing).

#### B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years.

#### C. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).

#### D. There is clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning.

#### E. The symptoms do not occur exclusively during the course of Schizophrenia or another psychotic disorder and are not better explained by another mental disorder.

Specify whether:

- **Combined presentation:** If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6 months.
- **Predominantly inattentive presentation:** If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months.
- **Predominantly hyperactive/impulsive presentation:** If Criterion A2 (Hyperactivity-impulsivity) is met but Criterion A1 (inattention) is not met for the past 6 months.

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*The symptoms of inattention and/or hyperactivity-impulsivity are not solely a manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.*

**Figure 1.** DSM-5 Diagnostic Criteria for Attention Deficit/Hyperactivity Disorder (APA, 2013).
The symptoms that are thought to characterize ADHD today have seen some change since the 1970s, although inattention is still a main symptom that has been confirmed both through self-reports and observation (Abikoff, Gittelman-Klein & Klein, 1977; Barkley, DuPaul & McMurray, 1990; Borger & van der Meere, 2000). As can be seen in figure 1, the two main categories of symptoms of ADHD now consist of inattention, and impulsivity and hyperactivity. The symptom of inattention is multidimensional and includes alertness, arousal, selectivity and distractibility (Barkley, 1988; Barkley, 1994; Hale & Lewis, 1979; Mirsky, 1996), resulting in an inability of the child to persist in their efforts and sustain attention (Douglas, 1983; Newcorn et al. 2001; Swaab-Barneveld et al. 2000); symptoms that are the most obvious in boring or monotonous tasks (Barkley, DuPaul & McMurray, 1990; Fischer, Barkley, Smallish & Fletcher, 2004; Newcorn et al. 2001). This increase in frequency of problem behaviors in boring situations suggests that the behaviors serve a stimulation-seeking purpose (Antrop et al. 2000). Inattention is easily noticed in classroom settings, as difficulty sitting still, following requests and attending to information from the teacher affects these children strongly throughout their school years. Inattention is one of the symptoms often attributed to a lack of respect in the children, or to impatience, boredom or impoliteness. In order to avoid blaming the child and worsening the symptoms it is important to realize that these symptoms are not voluntary actions or dependent upon the child’s choices. Impulsivity is another dimension of ADHD, and can be defined as a combination of behavioral disinhibition and hyperactivity (Burns, Boe, Walsh, Sommers-Flannagan & Teegarden, 2001; Gioia, Isquith, Guy & Kenworthy, 2000; DuPaul, Power, Anastopoulos & Reid, 1998). One very noticeable consequence of increased impulsivity is increased risk-taking, not thinking about consequences, and lack of understanding in social interactions, such as waiting for instructions or turns. Other consequences often seen from impulsivity are taking shortcuts, interrupting conversations and not modifying responses based on feedback. Like the other symptoms, impulsivity is multidimensional. It is made up of deficits in executive control, delay of gratification and compliance (Olson, Schilling & Bates, 1999). The impulsivity symptom has been shown to be the most successful dimension when it comes to discriminating between children with ADHD and children with other disorders, or normally developing children. It is partly the tendency of
impulsivity and inattention that make children with ADHD benefit from a structured environment with good directions, which gives them fewer options to get distracted and act without thinking (McGoey, Eckert & DuPaul, 2002). Hyperactivity in turn is related to a lack of impulse control, restlessness, fidgeting and unnecessary gross motor movements (Barkley & Cunningham, 1979; Dane, Schachar & Tannock, 2000; Luk, 1985; Stewart, Pitts, Craig & Dieruf, 1996) and this overactivity is noticeable even during sleep (Barkley & Cunningham, 1979; Porrino et al. 1983). Each dimension of symptoms fluctuates across situations, and individuals usually exhibit a higher frequency of symptoms in more demanding situations, explaining the increased salience of inattentive and impulsive symptoms as the child starts formal schooling. The different presentations of symptoms have been divided into three “specifiers” to make categorization and description easier. The combined presentation is the most commonly shown combination of symptoms, and involves criteria from both the inattentive and the impulsive and hyperactive symptoms, reflecting the whole range of underlying problems (APA, 2013). The predominantly hyperactive/impulsive presentation consists, as the name implies, of symptoms mostly from the hyperactive and impulsive category, with symptoms from the inattentive category being either subthreshold or not present. Research has shown that this might be an early manifestation of ADHD, and that the impulsive/hyperactive symptoms decrease while the inattentive symptoms increase as the child gets older (APA, 2013). The last category is the predominantly inattentive presentation, characterized by mostly inattentive symptoms and is mostly seen in older children and adolescents (APA, 2013). Taken together, the symptoms understandably create distress and can lead to a number of difficult situations in social interaction, academic problems and family disputes.

1.1.3 Attention deficit/hyperactivity disorder – Prevalence and characteristics

The prevalence of ADHD is relatively high, with measures ranging from 3%-7% in the overall population. The disorder is much more common in childhood than it is in adolescence, and the prevalence decreases as the sample gets older (Akinbami et al. 2011). To be diagnosed, the disorder has to emerge in childhood, before age 12 years (APA,
Boys are much more likely to be diagnosed with the disorder than girls, some of which may be due to a referral bias or the difference in the most commonly shown symptoms across genders. Gender differences in the exhibition of symptoms is displayed in how boys tend to show more overtly aggressive symptoms and more externalizing behaviors when compared to girls (Brown, Abramowitz, Madan-Swain, Ecstrand & Duncan, 1989). This difference makes boys with the disorder more noticeable and more likely to be referred to clinicians, while girls exhibiting more covert and internalizing symptoms, as well as more relational aggression might be overlooked. There does however seem to be a naturally occurring difference in the prevalence of the disorder across genders, with boys being the majority of those affected (Gaub & Carlson, 1997). Fortunately the disorder seems to drop off in adolescence and adulthood, as 25-35% show no symptoms in adolescence (Claude & Firestone, 1995), and a whole 65% of boys previously diagnosed with ADHD exhibit no criteria as adults (Biederman et al. 2010; 2011). Children with ADHD generally show a somewhat lower intellectual functioning than is the norm, (Frazier, Demree & Youngstrom, 2004) but they nonetheless show the full spectrum of intelligence ranging from low IQ to slow learners to gifted individuals. However, the children tend to do worse in academics and on tests than their IQ scores would suggest; 54% require special tutoring, 30% repeat a class, and 10-35% drop out before completing high school (Barkley, DuPaul & McMurray, 1990; Stewart, Thach & Friedlin, 1970; Faraone et al. 1993). These academic problems are likely due to the inattentive, impulsive and restless behaviors exhibited by children with ADHD (Barkley, 1997; Pelham, Bender, Caddell, Booth & Moorer, 1985), and how the most common academic setup focuses on strict listen-and-learn skills and teaching methods, contrary to what would benefit these children. Additionally, adaptive functioning is often diminished in children with ADHD (Barkley, Fischer, Edelbrock & Smallish, 1990; Greene et al. 1996; Roizen, Blondis, Irwin & Stein, 1994); when compared to normally developing children, siblings (Stein, Szumowski, Blondis & Roizen, 1995) and peers with other disorders; and this deficit is not accounted for by lower IQ (Roizen, Blondis, Irwin & Stein, 1994). Adaptive functioning refers to the child’s capabilities in everyday life, from practical skills around the home, to personal hygiene, social skills and conceptual skills. A
deficit in these skills tends to be highly noticeable in the child’s life, and is often used as a measure of children’s functioning or as a target for intervention. Children with ADHD are also more likely to have specific learning disabilities (Safer & Allen, 1976); using a wide range of measurements it is estimated that 8-39% have a reading disability, 12-30% show a math disability, while 12-27% show a spelling disability (Frick et al. 1991; Casey, Rourke & Del Dotto, 1996; August & Garfinkel, 1990). The broad variety of academic and adaptive problems faced by these children and their families due to the core symptoms of ADHD makes them a prime target for interventions focusing on behavioral management. Another characteristic of ADHD is difficulties with rule-governed behavior and executive functioning (APA, 1987; 1994; 2013; Barkley, 1989; 1990) and research supports deficits in verbal working memory (Ackermann, Anhalt & Dykman, 1986; Barkley, DuPaul & McMurray, 1990; Mariani & Barkley, 1997) as well as mental computation, arithmetic and serial addition (Ownby & Matthews, 1985; Barkley, Murphy, O’Connell, Anderson & Connor, 2006). These deficits in working memory interact with the aforementioned distractibility, resulting in a lack of hindsight; the ability to change responses based on previously experienced consequences (Douglas, 1983; van der Meere, Vreeling & Sergeant, 1992). Seeing how these abilities are highly valued in western academic settings, it becomes clear why children with ADHD often struggle in school. These children have also been shown to value rewards less when they are delayed than do their normally developing peers; possibly as a consequence of their impulsivity (van der Meere, Vreeling & Sergeant, 1992). This deficit in delayed gratification becomes a problem in academic settings and when designing treatment which tend to rely on the child getting delayed or intrinsic rewards. Emotion regulation is another domain where children with ADHD often do poorly; these children are more likely to show increased frustration (Douglas & Parry, 1994; Wigal et al. 1993), anger, depression, and sadness in social interaction, especially those children who also show additional aggressive symptoms (Hinshaw & Melnick, 1995). Understandably, these problems with emotion regulation make social interactions much harder for these children than for their normally developing peers. Children with ADHD often experience the world as if no one understands them, and their inappropriate behavior is often attributed to malice or intent, when the children themselves deal with
these difficulties in social functioning and emotion regulation due to the core symptoms of ADHD. This constant negative appraisal by others can influence the child’s psychosocial functioning, and contribute to both internalizing and externalizing problems, possibly reflected in the common comorbidity of ADHD with anxiety and mood disorders. Children with ADHD also show greater intrafamilial conflict (Danforth, Barkley & Stokes, 1991; Johnston & Mash, 2001), more conflicts with teachers (Whalen, Henker & Dotemoto, 1980), as well as problems in social relations with peers (Pelham & Bender, 1982). These problems could be due to interrupting, inattentive, immature, provocative and aggressive behavior often exhibited as a result of the underlying symptoms mentioned previously (Johnston, Pelham & Murphy, 1985). These children are both more likely to bully and be bullied (Unnever & Cornell, 2003) and the rates of rejection and isolation experienced by them are very high (Hoza et al, 2005). The peer rejection could potentially contribute to the antisocial and defiant behavior, as children turn to other deviant and often older peers for companionship after being rejected. Comorbid with the symptoms of ADHD is sleep disturbances, including quality of sleep, duration of sleep and numbers of wakings (Cassoff, Wiebe & Gruber, 2012). It is still unclear whether the sleep disturbances contribute to the ADHD symptoms, whether the ADHD symptoms contribute to the sleep disturbances, or whether they are both related to a third variable (Cassoff, Wiebe & Gruber, 2012). Children with ADHD often have a higher rate of accidental injuries than normally developing peers, partly due to their inattentiveness, their unawareness consequences and their poor motor-coordination (Barkley, 2001; Leibson, Katusic, Barbaresi, Ransom & O’Brien, 2001; Swensen et al. 2004). In addition, these individuals show a higher frequency of speeding, crime (Satterfield, Hoppe & Schell, 1982), suicide attempts (Weiss & Hechtman, 1993) and use and abuse of substances when reaching adolescence and young adulthood (Weiss & Hechtman, 1993).

1.1.4 Attention deficit/hyperactivity disorder – Etiology

ADHD clearly runs in families, and children with the disorder are much more likely to have a parent and siblings with the disorder than do children without ADHD (Biederman et
The disorder was, as mentioned earlier, recently reclassified as a neurodevelopmental disorder, and research has shown the neurophysiological deficits that are present in children with ADHD. Some genetic and environmental risk factors associated with the development of ADHD have also been found, such as certain genes, i.e. the dopamine transporter and receptor genes, which help explain why the disorder runs in families (Asherson & Gurling, 2011). The environmental risk factors are varied, and include both prenatal and postnatal influences. The mother smoking, using substances or drinking alcohol during pregnancy has been associated with an increased risk of the child developing ADHD. Prenatal influences also include exposure to toxins and contracting infections during gestation. (Root & Resnick, 2003). After the child is born, factors such as the availability and quality of neonatal care and the incidence of teratogen exposure like lead poisoning are associated with the development of ADHD (Milichap, 2010). The structural abnormalities in the brains of children with ADHD reflect the symptoms they exhibit. These children show a reduction of volume and thickness in the prefrontal cortex compared to normally developing children (Castellano et al, 1996; 2001; 2002), an area that is associated with executive functioning; one of the dimensions children with ADHD show clear deficits in (Pennington & Ozonoff, 1996). Both the orbitofrontal and the dorsolateral prefrontal regions are smaller and less active in children with ADHD: The orbitofrontal area is commonly associated with inhibition and impulse control, two other common symptoms of ADHD, and the dorsolateral prefrontal region is associated with organization, planning and attending to stimuli (Langleben, Austin, Krikorian, Ridlehuber, Goris & Straus, 2001; Lee et al. 2001). Another brain structure that shows abnormality in children with ADHD compared to their normally developing peers is the striatum, which is involved in regulating behavior in response to feedback from the environment such as reinforcement or punishment. This area has been found to take longer to develop in children with ADHD (Vaidya, 2012). Deficits in the circuit connecting these brain structures, the frontal-striatal neural circuit, might account for a wide range of the symptoms seen in ADHD (Faraone & Biederman, 1998; Giedd, Blumenthal, Molloy & Castellanos, 2001). It has been suggested that these neurological deficits are due to maturational lag, suggesting that children with ADHD develop in the same way as
normally developing peers, just slower. This hypothesis has received support from structural imaging studies (Shaw et al. 2007) and fits the fact that the majority of children show no criteria of the diagnosis in adulthood (Biederman et al. 2010; 2011)

1.1.5 Attention deficit/hyperactivity disorder – Comorbid Disorders

ADHD displays a high comorbidity with other disorders; a whole 87% of individuals are diagnosable with at least one other disorder, while 67% are diagnosable with at least two (Daviss, 2008; Ghanizadeh, 2009). In fact, pure ADHD without a comorbid disorder seems to be the exception rather than the rule (Daviss, 2008). The most common comorbid disorders are anxiety (Jensen, Shervette, Xenakis & Richters, 1993; Pfiffner et al. 1999), depression (Jensen, Burke & Garfinkel, 1988; Jensen, Martin & Cantwell, 1997; Treuting & Hinshaw, 2001), and oppositional defiant disorder (ODD) (Anastopoulos et al. 2011). The probability of an individual developing an additional comorbid disorder increases with the number of present disorders; in August et al.’s study (1996) they found that when one comorbid disorder was present, the chances of the individual also developing ODD was 18%, the chances of conduct disorder (CD) was 7%, the chances of mood disorders 3% and the chances of anxiety disorders 6%. When the present comorbid disorders increased to 2 or more, the chances increased to 32% for ODD, 12% for CD, 30% for mood disorders and 34% for anxiety disorders. The chances of comorbid disorders were also found to increase with the age of the child, which is natural when considering the age of onset of mood and anxiety disorders. (August et al. 1996). The prevalence of comorbid ADHD and anxiety has been found to be around 25% (Anastopoulos et al. 2011) and the prevalence of comorbid anxiety increases with the number of present comorbid disorders (Levy, 2004; Spencer et al. 2007). The numbers available for Iceland indicate a prevalence of comorbid ADHD and anxiety of 41.9%, higher than the numbers reported from other countries (Mitchison, 2012). The prevalence of comorbid ADHD and depression has most commonly been measured between 20-30%, but measures have ranged as widely as 15% to 75% (Anastopoulos et al. 2011). The chances of developing comorbid depression increase with the presence of ODD or anxiety in combination with ADHD, especially in girls
(Daviss, 2008). In Iceland, the available numbers indicate a prevalence of comorbid ADHD and depression of 21%, which is similar to what has been reported elsewhere (Mitchison, 2012). ADHD has been considered as a possible precursor for ODD (Burns & Walsh, 2002) and more information is needed to confirm or rule out this possibility. Recent reclassification of ADHD as a neurodevelopmental disorder distinguishes the two, however (APA, 2013), as oppositional defiance disorder is classified as a behavioral disorder, but this doesn’t mean that the presence of ADHD cannot influence the probability of developing ODD. The prevalence of comorbid ADHD and oppositional defiant disorder has been estimated between 30-50% (Gilberg et al. 2004; Harrison et al. 2011), and it has been found that children with both ADHD and ODD exhibit more symptoms and more severe characteristics of both impulsivity and hyperactivity (Abikoff et al. 2002; Harty et al. 2009). The available information for Iceland indicate a comorbidity of ADHD and ODD of 19%, lower than other reports, but this could possibly be due to the young age of the sample used in the Icelandic study (Mitchison, 2012). In general, the more severe the symptoms of ADHD the more severe the comorbid disorders tend to be (Rommelse et al. 2009). Treating ADHD with present comorbid disorders has been found to be difficult, as the treatment appropriate for ADHD may not be appropriate for the comorbid disorder, and they often cannot be treated at the same time (Clarkin & Kendell, 1992). In addition, children exhibiting both ADHD and anxiety have been found to respond the least to the most common drug treatments (Abikoff & Klein, 1992; Levy, 2004).
1.2.1. Common comorbid disorders – Oppositional Defiant Disorder

Diagnostic Criteria for Oppositional Defiant Disorder

A. A pattern of angry/irritable mood, argumentative/defiant behavior, or vindictiveness lasting at least 6 months as evidenced by at least four symptoms from any of the following categories, and exhibited during interaction with at least one individual who is not a sibling.

**Angry/Irritable Mood**

1. Often loses temper.
2. Is often touchy or easily annoyed.
3. Is often angry and resentful.

**Argumentative/Defiant Behavior**

1. Often argues with authority figures or, for children and adolescents, with adults.
2. Often actively defies or refuses to comply with requests from authority figures or with rules.
3. Often deliberately annoys others.
4. Often blames others for his or her mistakes or misbehaviors.

**Vindictiveness**

1. Has been spiteful or vindictive at least twice within the past 6 months.

*Note:* The persistence and frequency of these behaviors should be used to distinguish a behavior that is within normal limits from a behavior that is symptomatic. For children younger than 5 years, the behavior should occur on most days for a period of at least 6 months unless otherwise noted. For individuals 5 years and older, the behavior should occur at least once per week for at least 6 months unless otherwise noted. While these frequency criteria provide guidance on a minimal level of frequency to define symptoms, other factors should also be considered, such as whether the frequency and intensity of the behaviors are outside a range that is normative for the individual’s developmental level, gender, and culture.

B. The disturbance in behavior is associated with distress in the individual or in others in his or her immediate social context (e.g., family, peer group), or it impacts negatively on social, educational, occupational, or other important areas of functioning.

C. The behaviors do not occur exclusively during the course of a psychotic, substance use, depressive, or bipolar disorder. Also, the criteria are not met for Disruptive Mood Dysregulation Disorder..

Specify current severity:

**Mild:** Symptoms are confined to only one setting (e.g., at home, at school, with peers).

**Moderate:** Symptoms are present in at least two settings.

**Severe:** Symptoms are present in three or more settings.

*Figure 2. DSM-5 Diagnostic Criteria for Oppositional Defiant Disorder (APA, 2013).*
Oppositional defiant disorder (ODD) is a behavioral disorder diagnosed when a child shows a persistent pattern of angry and irritable mood, and acts defiantly and vindictively. As seen in figure 2, common symptoms characterizing children with the disorders include frequent loss of temper, being touchy towards others, getting easily annoyed, and acting angry or resentful. The behavior of children diagnosed with ODD often includes frequent arguing, defying parents or deliberately annoying others or blaming them for the child’s own mistakes. In addition the child often acts in spiteful ways or seeks revenge for perceived slights. These tantrums or problem behaviors are often triggered by requests, for example to tidy one’s room, pick up toys or go to bed (APA, 2013). The behavior exhibited has to be out of proportion and acts with the frequency and intensity required is not commonly seen in the general population. In one study, 70% of referred children displayed repeated tantrums and disobeying, while only 4-8% in the non-referred sample did the same (Keenan & Wakschlag, 2004). The prevalence of ODD has been measured from 2-16%, with the disorder becoming visible around 6 years of age (Hamilton & Armando, 2008). The symptoms are quite heterogeneous, and the different behavioral profiles imply differences in response to treatment, and different developmental outcomes. In contrast to children with ADHD, children with ODD often show symptoms only in specific situations, which suggest that environmental factors greatly influence the disorder’s development and maintenance, and acts as triggers for certain responses (Eyberg, 2006). There are strong comorbidity rates between children diagnosed with ODD and ADHD (Angold et al. 1999) and the disorders used to be categorized together in earlier versions of DSM; as behavioral disorders. ODD symptoms tend to be directed at the parents (96%) or teachers (85%) of the child, and less commonly towards peers (68%). 62% of children show symptoms at home, at school, and with peers. These negative interactions often put stress on the child’s relationships (Angold et al. 1999).
1.2.2. Common comorbid disorders – Conduct Disorder

Diagnostic Criteria for Conduct Disorder

A. A repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of at least three of the following 15 criteria in the past 12 months from any of the categories below, with at least one criterion in the past 6 months:

Aggression to People and Animals
1. Often bullies, threatens, or intimidates others.
2. Often initiates physical fights.
3. Has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun).
4. Has been physically cruel to people.
5. Has been physically cruel to animals.
6. Has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery).
7. Has forced someone into sexual activity.

Destruction of Property
1. Has deliberately engaged in fire setting with the intention of causing serious damage.
2. Has deliberately destroyed others’ property (other than by fire setting).

Deceitfulness or Theft
1. Has broken into someone else’s house, building, or care.
2. Often lies to obtain goods or favors or to avoid obligations (e.g., “cons” others).
3. Has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery).
Conduct Disorder (CD) is often described as a more serious and more extreme version of ODD. The symptoms for CD can be seen in figure 3, and includes showing aggression towards people and animals, intentionally destroying property, being deceitful and thieving as well as seriously violating rules or the rights of others. There is a clear contrast to the
The symptoms of ODD, which focus on defiance and irritability but not violence or destruction. Only three of the possible fifteen indicators need to be fulfilled by the child to warrant a diagnosis, leading to a wide range of different behavioral profiles for children with CD. The child’s prognosis varies depending on what behavioral profile is displayed, how early symptoms develop, and environmental factors. The symptoms of CD can be divided into two broad dimensions; overt – covert and destructive – nondestructive (Frick et al. 1993) to make classification of behavior easier. Overt behavior is behavior that is observable and confrontational, like bullying, fighting, being physically cruel, or using weapons. Overt behavior can be divided into two kinds: reactive aggression is elicited in response to threat or provocation, while proactive aggression is a deliberate aggressive act, often for instrumental reasons. Proactive aggression appears to be a learned behavior, possible modeled by parents and strengthened through positive reinforcement. Covert behavior, on the other hand, is more hidden or secretive antisocial behavior that rarely involves physical aggression. Covert antisocial behavior includes stealing, running away, breaking in or skipping school. Boys have been found to show more overt symptoms than girls (Frick et al., 1993; Mick et al., 2002; Loeber & Hay, 1997). This might contribute to the higher referral of boys for behavioral problems, as their behavior is much more noticeable. When diagnosing a child it is also specified whether the CD symptoms appeared before the age of ten – early onset- or after – adolescent onset-. As with the different behavioral profiles, different types of onset is related to different developmental outcomes, where earlier onset is associated with a worse prognosis. Another process implicated in the development of CD in children and adolescents is selective affiliation, the idea that children who have been rejected by their peers seek out other similarly rejected peers, polarizing accepted behavior and introducing each other to more extreme activities (Snyder et al. 2003). Related to this is deviancy training, a process in which a group of children model antisocial behavior to each other through reinforcing and encouraging talk about these activities (Dishion, McCord & Poulin, 1999).
1.2.3. Oppositional defiant disorder and conduct disorder – Interaction

The symptoms and prevalence of ODD and CD change throughout childhood and adolescence. In Maughan, Rowe, Messer, Goodman & Meltzer’s study (2004), CD was found to be significantly more common in boys than in girls, showing a similar gender distribution to other early developmental disorders. In early childhood, rates of CD were low for both genders, then for boys the risk increased steadily with age, while for girls the rates remained low until adolescence, when it rose rapidly (Maughan et al., 2004). When researched separately, age trends in ODD symptoms seem to stay stable from onset through adolescence, but if clinicians follow the guidelines from previous versions of the DSM and exclude diagnoses of ODD in children who also qualify for CD, then reported prevalence rates of ODD will decrease in adolescence. The newest version of DSM changed this rule, allowing both ODD and CD to be diagnosed in the same individual (APA 2013). It remains to be seen if this changes the prevalence rates of the disorders. Rates of clinically significant oppositionality were found to stay stable from when they appeared in early childhood to mid-teens, while rates of conduct disorder increased markedly in adolescence. The majority of children later diagnosed with CD also showed high levels of oppositional symptoms, and this association did not change with increasing age (Maughan et al., 2004). Which symptoms of CD are the most prominent also changes throughout the developmental span. Aggressive behaviors decline in frequency between childhood and adolescence, and non-aggressive conduct problems show an inverse increase (Maughan et al., 2004). Status violations in particular increase during this period, as teenagers want to test new roles and stretch their increasing autonomy. As a result of this change in symptoms, the behavior profile of boys with CD is likely to vary with age. In Maughan, Rowe, Messer, Goodman & Meltzer’s study (2004), the most common symptoms among 8-10 year old boys were lying, fighting and bullying, while in the 13-15 age group fighting was less commonly reported, and stealing and staying up late had superseded it in the “top three” symptoms. Regarding gender differences, teenage girls were less likely to be involved in arson, breaking in to steal and cruelty to animals, but in all other aspects there was similarity across genders (Maughan et al., 2004). Both CD and
ODD show frequent comorbidity with ADHD, anxiety and depression, in both boys and girls. ADHD and anxiety disorders seem to be most strongly linked to oppositional rather than CD symptoms, suggesting that the symptoms of CD are independent of the co-varying group of ADHD and ODD symptoms (Maughan et al., 2004). Oppositionality may be a predisposing factor for more overtly conduct disordered behavior, or the behaviors currently included in the criteria for ODD could be markers for a broader behavioral dysregulation construct. More research is needed to decipher the connections between the comorbid disorders in childhood and adolescence. (Maughan et al., 2004)

1.3.1. Common comorbid disorders – Anxiety disorders

<table>
<thead>
<tr>
<th>Separation Anxiety Disorder:</th>
<th>Specific Phobia:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A conditioned fear disorder, characterized by anxiety about leaving caregivers or others they are emotionally attached to, and fear that harm will befall themselves or their caregivers during the separation period.</td>
<td>One of the most common and most untreated anxiety disorders, characterized by a fear of certain objects or situations, especially of animals or natural environments.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generalized Anxiety Disorder:</th>
<th>Social Anxiety Disorder:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A disorder characterized by excessive fear and worry about a number of events and activities, where the individual cannot control the worry. The worry does not lead to productive problem solving.</td>
<td>A disorder characterized by fear or anxiety about situations where the individual is exposed to possible scrutiny by others, fearing that he or she will be negatively evaluated.</td>
</tr>
</tbody>
</table>

*Figure 4. Introduction of anxiety disorders commonly comorbid with ADHD (APA, 2013).*

Anxiety disorders are characterized by anxiety, fear, or worry, in which the reaction is out of proportion, usually chronic, and interferes with the individual’s functioning. A certain degree of anxiety is adaptive to the individual, helping the person prepare for a
situation or seek safety in times of danger, but it is when it becomes maladaptive that it can be classified as a disorder (APA, 2013). Some of the more common childhood anxiety disorders can be seen in figure 4. Separation anxiety disorder occurs when a child experiences strong anxiety or fear about leaving their caregiver or another individual they show close attachment to. The fear often includes a belief that harm will come to themselves or the caregiver while they are separated, and the disorder often develops after a traumatic experience in which the child realizes that losing the caregiver is a possibility (APA, 2013). In a specific phobia, the child develops a fear of a certain situation, object or animal, which tends to be maintained through negative reinforcement (APA, 2013). Generalized anxiety disorder is characterized by excessive worry that doesn’t lead to any problem solving or preparing, and which is, as the name implies, generalized across a wide range of situations and activities (APA, 2013). Social anxiety disorder involves fear or anxiety in situations that involve real or perceived scrutiny by others, in which the individual is afraid of negative evaluations, and often results in the individual avoiding the situations as much as possible (APA, 2013). Anxiety disorders have shown a prevalence of 6-15% (Mazzone et al. 2007) and have been found to be persistent across childhood and adolescence (Beedo et al. 2009)
1.4.1. Common comorbid disorders – Depressive disorders

Diagnostic Criteria for Major Depressive Disorder

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning: at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). Note: In children and adolescents, can be irritable mood.

2. Marked diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).

3. Significant weight loss when not dieting or weight gain (e.g., change of more than 5% of body weight in a month, or decrease or increase in appetite nearly every day. Note: In children, consider failure to make expected weight gain.

4. Insomnia or hypersomnia nearly every day.

5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).

6. Fatigue or loss of energy nearly every day.

7. Feelings of worthlessness or excessive or inappropriate guilt nearly every day (not merely self-reproach or guilt about being sick).

8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).

9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

C. The episode is not attributable to the physiological effects of a substance or to another medical condition.

Note: Criteria A-C represent a major depressive episode.

D. The disturbance is not better explained by Schizophrenia or a psychotic disorder.

E. There has never been a manic episode or hypomanic episode.

Figure 5. Diagnostic Criteria for Major Depressive Disorder in DSM-5 (APA, 2013).

When an individual experiences mood problems that are persistent and causes him or her distress or impairment, a mood disorder may be present. One kind of mood disorder is
depressive disorder, for which the symptoms include pervasive depressed mood or lack of energy, diminished interest or pleasure, changes in sleeping, energy, and feelings of worthlessness, as can be seen in figure 5 (APA, 2013). In children especially, depression is often exhibited as irritable mood or temper outbursts out of proportion to what is expected from the situation. The mood changes must last for at least 2 weeks, and cause significant distress or impairment in order to justify a diagnosis (APA, 2013). The prevalence of depressive disorders in children has been found to be around 5%, while it increases in youth to around 10-20% (Luby, 2010). As opposed to anxiety and the behavioral disorders, depression is usually not found as a comorbid disorder itself, as it is usually seen first and then followed by other comorbid disorders. As an exception, depression is often found as a comorbid disorder to ADHD (Angold & Castello, 1993).

1.5.1. Parenting styles – Effects on children’s behavior and well-being

Research has shown that the largest effect on children’s behavior and well-being comes from the parenting style. There is some association between behavioral problems and education, age and socioeconomic status, but by far the most important variable is parenting style (Brenner & Fox, 1998). However, parenting style is not a set variable independent of the child, and the child’s temperament can elicit certain parenting responses and behaviors which in turn elicit responses from the child (Verhoeven et al. 2007). Positive parenting styles have been shown to be associated with an internal locus of control, better self-image, better social skills, less anxiety and higher scores on math and reading tests (Lee, Daniels & Kissinger, 2006). One parenting skill that has consistently been associated with the development of conduct problems in children is low parental monitoring (Loeber & Farrington, 2000; Rowe et al., 2002). Children whose parents are less involved in their lives and have less knowledge of their whereabouts and who they are with have more freedom to engage in antisocial and disruptive acts, and show increased likelihood of conduct problems. There are three parts to parental monitoring; knowing the child’s whereabouts, activities and peers; setting developmentally appropriate limits for
where the child can go, for how long and so forth, and finally; to consistently discipline when the child fails to adhere to the set rules (Snyder, Reid & Patterson, 2003). This lack of parental monitoring could be a contributing factor to conduct problems continuing from childhood into adolescence. Parents of children with ADHD have reported more challenges than controls when it comes to bedtime routines (Corkum, Tannock, Moldofsky, Johnson & Humphries, 2001), as well as problems with being consistent, monitoring the child’s activities and managing to disengage from an escalating situation (Weiss, Hechtman & Weiss, 2000). A large study looking into parenting and behavioral correlates of families of children with ADHD and ODD symptoms showed correlation between parenting styles and behaviors for these children (Cunningham & Boyle, 2002). It was found that in general, parents of children with ADHD and behavioral disorders like ODD interact with their children in less positive ways than controls (Gardner, 1994; Johnston, 1996). These controlling parenting strategies seem to be partly elicited by the hyperactive, inattentive and poorly regulated behavior of children with ADHD (Barkley & Cunningham, 1979), and in the families of children with ODD these similar strategies could result from parental psychopathology, family dysfunction and general social environmental adversity. Mothers of children in the normal subgroup felt more competent in their parenting than did the mothers in the ADHD and the ADHD/ODD subgroup, who also reported poorer family functioning and higher depression scores than the non-ADHD subgroup (Cunningham & Boyle, 2002). The mothers of the children in the ODD+ADHD group were also more controlling than those in the ODD subgroup. It is difficult to determine the direction of the correlation, and whether there are additional variables that influence the effects on behavior and emotional well-being (Cunningham & Boyle, 2002). Pelham et al. (1997) randomly assigned parents to interact with child actors who either simulated externalizing problem behaviors or no problem behaviors, and found that the parents interacting with the problem actors felt less successful, less effective and more hostile. On the other hand, the parents who interacted with non-problem actors showed none of these tendencies. Parent’s cognition and emotional health is clearly affected by children’s behavioral problems, which could influence their parenting styles, thereby influencing the children’s behavior in a vicious cycle (Cunningham & Boyle, 2002). White and Barrowclough (1998) reported
that depressed mothers of children with behavioral problems were more likely to attribute their children’s behavior to stable, unique characteristics than were mothers of children exhibiting no behavioral problems. This attributional style can lead to them assuming that the children can control their behavior and that it is intentional, a pattern that may result in a negative parental response (White & Barrowclough, 1998). When a parent attributes a child’s misbehavior to the child’s predisposition or personality, he or she is more likely to react with hostility and resentment. Had the parent attributed a tantrum to environmental factors rather than the child’s personality, he or she would be more likely to respond with understanding and sympathy (White & Barrowclough, 1998). When given tasks to solve problems relating to ADHD or ODD/CD, parents of children showing these symptoms suggested more controlling and negative solutions and fewer positive or preventive measures (Cunningham & Boyle, 2002). The mothers of children at risk for ODD also suggested fewer control-related strategies, which is consistent with research showing permissive parenting to be linked with disruptive behavior in children (Cunningham & Boyle, 2002). These strategies tended to become more negative and less preventive as the scenarios shifted from ADHD related problems to ODD or CD. These controlling and negative strategies could lead to a coercive parenting pattern that is detrimental to both the child and the parent if left untreated, and most parents of preschoolers with behavior problems never seek assistance (Pavluuri, Luk & McGee, 1996). It is possible that the low confidence and the family dysfunction reported by the mothers of children at risk for ODD, as well as the increased depression scores in parents of children at risk for ADHD may be part of the reason for the inconsistent parenting exhibited by these parents, further contributing to the negative cycle of interaction (Cunningham & Boyle, 2002).

1.6.1. Attention deficit/hyperactivity disorder – Treatment

The behavioral problems associated with ADHD can clearly lead to significant stress for the child, the family and its peers and teachers. Research has focused on finding ways of treating both the core symptoms of ADHD, and the consequences that these deficits have on the child’s functioning and the family as a whole. Due to the symptoms of ADHD
itself, treatment cannot rely on the intrinsic motivation of the child, as the poor executive functioning and problems with reward sensitivity does not allow the child to respond to such interventions (Barkley, 2004). The most common treatment is medication, which has been found to be an effective and relatively time-effective treatment. Stimulants in particular are a popular and effective treatment of the core symptoms of ADHD, and have been shown to be superior to behavioral treatment alone; while a combined treatment shows better results in the presence of other outcome variables such as disruptive behavior, internalizing behavior, achievement, parent-child relations and social skills. (MTA Cooperative Group, 1999). There’s been little difference found between different types of stimulants, and even though side effects is a concern for some patients, the adverse side-effects have been shown to be mostly mild, short in duration, and responsive to time or dosage adjustments (Brown, Amler, Freeman, Perrin, Stein, Feldman et al. 2005). The effects of medication come from the increase in dopamine activity in the brain regions that are typically underactive in children with ADHD, and the different medications targets different brain regions, accounting for the somewhat different effects that these pharmaceutical treatments have shown (Heal et al. 2011; Spencer et al. 2010). There are however several reasons to find and research additional types of treatment. 15-30% of children given medication in controlled studies have shown no response, and the number increases to a possible 50% in community samples, where dosage, administration and follow-ups are less strict (MTA Cooperative Group, 1999). In addition, discontinuation of medication tends to cause a return of the symptoms, and parents are often less positive to pharmaceutical treatment than behavioral interventions (Jensen et al. 2001). Fortunately, behavior interventions are not without merit. Even though medication alone is better than behavior interventions alone, the combination of both medication and behavior interventions has shown the best results for treating ADHD (Jensen, et al. 2001). Behavioral intervention has additional benefits, as both parents and teachers report higher treatment and consumer satisfaction when a behavioral treatment component is included in the intervention, and are more open to initiating such treatments over just medication (Jensen et al. 2001).
1.6.2. Attention deficit/hyperactivity disorder – Parent Training

Parent training is one type of behavioral intervention commonly used for behavioral problems and ADHD, to decrease the unwanted behaviors that are frequently a consequence of the core symptoms of the disorder. It is made up of a combination of aspects; teaching parents a wide range of skills and techniques, and educating them on the nature of the disorder. Extensive research has been conducted on the different components of parent training, and certain components have been shown to be consistently associated with a better outcome than others (Kaminske, Valle, Filene & Boyle, 2008). Parent training often starts with an educational component, where the parents are given information about the disorder, and more specifically, about how behavior is created and maintained. The parents are taught to notice how they elicit or maintain certain behaviors from their child, and are later told how to incorporate this knowledge when extinguishing unwanted behavior and rewarding wanted behavior. In some interventions the information is given by itself, while in others it is given as a foundation for learning techniques that apply the knowledge to everyday actions and skills (Kaminske, Valle, Filene & Boyle, 2008). The parents are often taught to give commands and requests more effectively; by being realistic about what their child can and cannot do, giving enough time, having clear, concise and visible rules, and always focusing on the positive aspects of the goal. In addition, parents are encouraged to praise obedience and give instant positive attention for all appropriate behavior (Kaminske, Valle, Filene & Boyle, 2008). The programs that educate parents by translating the information into behaviors and skills the parents need, such as time-out and how to respond to their children; are consistently associated with larger effects of treatment than just education in itself (Kaminske, Valle, Filene & Boyle, 2008). When learning about behavior, parents are often taught the “ABC” of behavior; learning to recognize the antecedents prior to the behavior, the behavior itself and the consequences following it. Once the parents know the ABC, and can recognize what elicits unwanted behavior and which consequences maintain it, they can be introduced to responses such as time-out; where the child is removed from the situation and ensures no reward for the unwanted behavior, or ignoring; which another kind of punishment where no attention is given after
the unwanted behavior. Differential reinforcement of incompatible behaviors involves reinforcing behavior that is incompatible with the behavior the parents want to reduce, while differential reinforcement of zero behavior involves reinforcing the child whenever it is not engaging in the unwanted behavior. In addition to punishment to reduce undesirable behavior, there are techniques for encouraging behavior the parents want to see more often. Most frequently the parents are taught general contingency management, such as immediately rewarding the behavior with positive attention, until techniques such as reward systems are introduced (Kaminske, Valle, Filene & Boyle, 2008). An important part of parent training is teaching parents positive emotional communication. This often focuses on the importance of having positive interactions with their children which are not intended as disciplinary measures, while using skills that encourage positive parent-child interactions, such as enthusiasm, showing interest, and offering appropriate recreational options. The intervention involves teaching the parents active listening, how to help their children identify and express emotions, and focuses on reducing negative communication, such as sarcasm and criticism. This is often achieved through structured homework or assignments while supervised by a therapist, where the parent is encouraged to spend some time every day in a scheduled play-session with the child. This focus on positive play and the change of interaction style has consistently been associated with larger effects of treatment when included in an intervention (Kaminske, Valle, Filene & Boyle, 2008). A commonly used component of both parent training and general contingency management is the reward system. The system is used to introduce a material, visible system in which child is rewarded for chores, to be used when positive attention is not enough. The system can be used with stamps, stickers or tokens, and clearly shows the child that if he/she puts the effort in, he/she will achieve. The progress towards the reward is visible and measurable, and does not rely on intrinsic motivation, which has earlier been pointed out as a weakness for children showing symptoms of ADHD. Even though medication is usually shown to be more effective than just behavioral interventions such as parent training, there is strong support for the viability of a combined treatment of pharmaceutical and behavioral interventions together (Jensen et al. 2001; MTA Cooperative Group, 1999). The combined intervention was especially successful when measured by outcome variables
other than the core ADHD symptoms, including disruptive and internalizing behavior, achievement, parent-child relations and social skills (MTA Cooperative Group, 1999). The behavioral treatment has also been shown to be more effective when ADHD was comorbid with anxiety (MTA Cooperative Group, 1999; Brown, Amler, Freeman, Perrin, Stein, Feldman et al. 2005). Even though combined interventions or pharmaceutical treatment alone has shown the best results, behavioral treatment in itself has also gained support. In Serketich & Dumas’ meta-analysis (1996), children whose parents had participated in parent training were better adjusted on all measures of functioning, both when judged by parents and by observers.

1.7.1. Routines – Benefits

A recurring factor in the components associated with the most success, is the establishment and clarification of structure and routines in the child’s life. A routine can be described as “a fixed sequence of typical daily events that provide predictability in the environment and may aid in the establishment of appropriate behavior” (Sytsma, Kelley & Wymer, 2001; Sytsma & Kelley, 2002; Sytsma-Jordan, 2003). Extensive research has provided backing for a wide range of positive effects of routines, supporting their inclusion in treatment programs. Routines have been thought to moderate impulsivity and overactivity in both preschool and elementary school children, while also aiding in the development of self-control (Pruitt, 1998). Research has shown that routines do in fact reduce impulsivity and hyperactivity in younger children, by building their self-control (Landy, 2002). This connection between routines and the moderation of the aforementioned symptoms have clear relevance for treatment of children with ADHD. If increasing routines could positively affect these symptoms it would seem like a relatively low cost, high benefit intervention. There is also support of routines as a critical part in the establishment of children’s sense of predictability, (Kase, 1999b), stability (Kase, 1999a) and feelings of security (Cassidy, 1992). Children from consistent, structured homes have also proved to be more likely to exhibit self-regulation and prosocial behaviors in the face of adverse experiences (Landy, 2002). In addition, routines help prepare preschool children
for school, by teaching them to follow rules and directions (Spagnola & Fiese, 2007). When it comes to specific routines, sleeping routines have stood out as particularly beneficial, as with good sleeping routines being associated with better sleep, falling asleep earlier and waking up less during the night (Fiese et al. 2002) as well as behaving better during the day (Mindell, Telofski, Wiegand & Kurtz, 2009). Children with ADHD have shown trouble with all these dimensions; self-regulation (Douglas & Parry, 1994), following rules and directions (APA, 2013; Barkley, 1990), and quality and duration of sleep (Cassoff, Wiebe & Gruber, 2012), indicating a possible benefit of implementing routines in their everyday lives. Parents benefit from routines as well, as they have been found to reduce parent-child conflict (Nelson, Erwin & Duffy, 1998) and increase positive parent-child interactions (Berg, 1991) while contributing to parents feeling calmer and more relaxed (Snyder, 1999). In general, family routines have been associated with increased child cooperation, social competence and child compliance (Snyder, 1999). These studies imply that routines form an important part of successful parenting, and indeed, the absence of routines have been significantly linked to child behavior problems, poor parenting practices and parental psychopathology (Sytsma, Kelley & Wymer, 2001; Sytsma & Kelley, 2002; Sytsma-Jordan, 2003). Lack of routines has also proved to be a significant predictor of externalizing behavior problems in children (Sytsma, Kelley & Wymer, 2001; Sytsma & Kelley, 2002; Sytsma-Jordan, 2003). The number of correlational studies mentioned lends strong support to the idea of a relationship between routines and improved functioning.

1.7.2. Routines – Effectiveness in treatment

In addition to the correlational studies, a wide range of studies have researched the effect that increasing routines in children’s lives has on behavior and well-being, in addition to the success of routines as a treatment for various behavioral problems. A study comparing the effect of routines and graduated extinction for bedtime troubles found them to be equally successful in reducing problems, but with slight differences in side-effects. Routines showed no negative side effects and had the added benefit of parents reporting
improved marital satisfaction as a result of establishing positive bedtime routines, while
graduated extinction did not show that bonus (Adams & Rickert, 1989). Routines alone or
as a part of a multi-component intervention have also been shown to successfully decrease
parent-child conflict and behavior problems as well as increase positive familial
addition, routines have been found to be an effective treatment for reducing problem
behaviors such as bedtime problems (Galbraith, Hewitt & Pritchard, 1993), morning
dawdling (Adams & Drabman, 1995) and problems while shopping (Clark et al. 1977).
Increasing routines therefore seems promising in reducing some of the problem behaviors
often associated with ADHD. Routines have also been implicated as an important variable
when it comes to treatment adherence. In a study on adherence to treatment for type 1
diabetes, Greening, Stoppelbein, Konishi, Jordan & Moll (2007) found that routines
mediated the relationship between behavior problems in children and their poor treatment
adherence, and that this therapeutic effect showed equally strong across racial and ethnic
groups. In a similar study, Murphy, Marelich, Herbeck & Payne (2009) researched
routines and parental monitoring as protective factors in families where the mother has HIV/AIDS,
and similarly found that routinized environments were associated with better academic
achievement, fewer externalizing and internalizing problems in females, and fewer
internalizing problems in males. Implementing routines in this setting had a powerful
impact on the outcomes of the children, and was associated with lowered aggressive
behaviors, as well as lower anxiety, worry, depressive symptoms; conduct disorder
behaviors and less binge-drinking (Murphy, Marelich, Herbeck & Payne, 2009).

1.7.3. Measuring routines – The Child Routines Questionnaire

An extensively researched and validated measure of children’s routines is the child
routines questionnaire (CRQ), developed by Sytsma, Kelley and Wymer (2001). The
inventory measures a range of routines across four factors, daily living, household
responsibilities, discipline routines and homework routines, by parental report. The
questionnaire has shown a clear association between children’s routines as measured with
the CRQ and a wide range of outcomes for both parent and child (Wittig, 2005). The inventory has shown a moderately strong negative relationship with scales measuring attention and internalizing problems, as well as a negative correlation with poor child adaptability and self-regulation. Findings support that the CRQ has excellent internal consistency (alpha 0.90), good test-retest reliability (0.86), and there is moderate evidence of construct validity, which negatively correlates with child behavior problems, and positively correlates with other measures of family routines. (Sytsma, Kelley & Wymer, 2001). The questionnaire seems well suited for measurement of children’s routines, and can be used both before and after treatment for an estimate of changes in routines (Angold et al. 1999). Further research has supported the relationship between child routines measured by the CRQ and outcomes for both the parent and the child, with a negative relationship with child behavioral problems (r=-0.35), maternal depression (r=-0.29) and parental stress (r=-0.57), but a positive relationship with family routines (r=0.54) (Wittig, 2005). For use in Iceland, the CRQ-IS was translated, and factor analysis showed slightly different dimensions, as instead of “Homework Routines” the factor “Family Interaction” appeared (Halldórsdóttir & Óskarsdóttir, 2009). “Daily Living” includes everyday habits and routines such as hygiene, sleeping schedule, eating habits and homework. “Household Responsibilities” include chores in the home, tidying up after oneself and helping out around the house. “Family Interaction” includes everything from signs of affection, sharing experiences and stories and taking part in shared family experiences. The last factor, “Discipline Routines” consist of following requests and rules, completing chores before going to play, setting consequences for broken rules and restricting and monitoring the child appropriately.

1.8.1. The study

The core symptoms of ADHD clearly vary in their severity and characteristics, and are seen in a wide range of situations in both boys and girls. Reducing these problematic behaviors and their associated negative interactions and feelings would improve the lives of many families. Pharmaceutical treatment has been the most successful at reducing the
core symptoms, while behavioral interventions show their merit when including other outcome variables like internalizing or disruptive behaviors, parent-child interactions, social-skills and behaviors, or instances in which the child has comorbid anxiety (MTA Cooperative Group, 1999). Parent training has also been associated with better adjustment across all measures, when providing education and teaching techniques for parents to control their child’s behavior through control of the environment and their own responses (Serketich & Dumas, 1996). Families with children with ADHD report more challenges with bedtime routines than do controls (Corkum, Tannock, Moldofsky, Johnson & Humphries, 2001) as well as problems being consistent, monitoring the child’s activities and disengaging from escalating situations (Weiss, Hechtman, Weiss, 2000). Implementing routines in everyday life is one important parental skill where an increase has been associated with reductions in impulsivity and overactivity (Pruitt, 1998; Landy, 2002), an increase in following rules and directions (Spagnola & Fiese, 2007), better quality of sleep and less night-time waking (Fiese et al. 2002), and increased treatment adherence for families affected by maternal HIV/AIDS (Murphy, Marelich, Herbeck & Payne, 2009) and children with Diabetes type 1 (Greening, Stoppelbein, Konishi, Jordan & Moll, 2007). The current study assesses the effect of a parent training intervention on the routines of children with symptoms of ADHD, ODD and CD, and based on previous research showing improved adjustment after parenting training (Serketich & Dumas, 1996) it was hypothesized that parents would report more routines after the completion of the intervention. Previous research highlighted the problem that parents of children with ADHD have with being consistent and maintaining routines (Weiss, Hechtman & Weiss, 2000; Corkum, Tannock, Moldofsky, Johnson & Humphries, 2001), and it could therefore be expected that they would report a lower number of routines before the intervention than the general population. The Child Routine Questionnaire is a parent-report measure of routines present in the home that has shown clear associations with a wide range of outcome variables (Wittig, 2005). Previous research on the CRQ-IS, -the version translated into Icelandic- suggests that routines go up with age, especially the Household Responsibilities factor. Demographic variables have also been implicated in the number of routines, with more siblings and a single home being associated with more routines.
(Kristinsdóttir & Baldvinsdóttir, 2010). A difference in scores depending on gender has been suggested, but studies have found contrasting results. Kristinsdóttir and Baldvinsdóttir (2010) in a study of children with ADHD found that girls showed more Discipline Routines and fewer Family Interaction routines than boys, while Halldórsdóttir and Óskarsdóttir (2009) found that girls in the general population showed fewer Discipline Routines and more Family Interaction routines. This study could shed more light on these differences.

Method

2.1 Participants

The participants in the intervention were the parents of 77 children, attending parent management training at Heilsugæslan Reykjavik. The sample consisted of 61 boys and 16 girls, between 5 and 14 years of age with a mean age of 7.8 years. All the children had been referred to the intervention due to symptoms of ADHD and behavioral problems, and it was reported that some displayed symptoms of ODD, CD and/or anxiety. Unfortunately, this was a retrospective study using a data base that was gathered during routine clinical practice and no demographic data was recorded regarding the parents participating in the training.

2.2 Measurements

The Child Routine Questionnaire -IS is a 38 item inventory parent-report measure that consists of four factors (See appendix A). Daily Living routines includes 11 routines centered on activities in Daily Living, such as morning and bedtime routines, meals and typical family social interaction. Household Responsibilities, or chores, consist of 9 items all related to the personal responsibilities of the child, household chores and hygiene. Discipline Routines include 11 items relating to rules, methods of discipline and structured family activities, while Family Interaction has 8 items, focusing on the family environment, sharing experiences and helping each other. Each item is rated by the parents.
on a 0 to 4 scale, where 0 represents never and 4 represents almost always. The CRQ-IS has shown satisfactory reliability and validity and –like the original CRQ-, the CRQ-IS shows moderate relationships with other behavioral measures (Halldórsdóttir & Óskarsdóttir, 2009).

2.3 Procedure

This study was retrospective, and used a database consisting of routine clinical data that was gathered during parent training classes at the Heilsugæsla in Reykjavik. The data was gathered from 13 parent training groups; the first starting in February 2011 and the last starting in October 2013. The initial CRQ-IS questionnaire was administered by the therapists in the first session of parent training, and parents were asked to fill it out at home and bring it back in the next session. The second administration was given out in the fifth session, and handed back by the parents in the 6th session.

2.4 Intervention

The parent training intervention conducted in this study was structured as 5 weekly sessions followed by a longer break, before conducting a final sixth session. There were specific goals for each session, including homework, to maximize the practical work and application of the information learned. In general the intervention focused on positive behavior, emphasizing the positive skills, attributes, and behaviors of each individual child as opposed to the negative focus these children are often met with in demanding settings. Session one was mainly for educational purposes; teaching parents about ADHD, and about how behavior is learned and maintained as well as common causes of disobedience in children. Parents were asked to list their child’s behaviors, and note which ones they would like to increase in frequency, and which they would like to decrease. The second session focused on their parenting style, the interaction between the child and the parent and the general family environment. Parents were taught to reward positive behavior that they would like to maintain or increase, and ignore unwanted behavior. For homework, the parents were asked to plan out and start a daily play session with their child where the focus was on the parent’s behavior, and avoiding restricting or teaching the child. Instead
they were told to interact together with positive attention in a setting suitable for the child. Examples of positive statements and reactions were provided to encourage constructive interactions. In the third session the importance of structure and rules in daily life was emphasized, as well as a continued focus on successful and positive attention for wanted behavior and teaching the parent to increase their control over the child’s behavior. Parents were encouraged to make rules and routines visible and clear, with pictures, lists or notes. They were also given instructions on how to give clear, realistic requests and how to ensure the child is paying attention and is ready to listen. For homework the parents were asked to practice praising obedience immediately after the behavior, giving clear requests, and to continue having daily play sessions. In session four reward systems were introduced to the parents. It was emphasized that reward systems were to provide structure and clear goals for when positive attention was not enough by itself, and not as a replacement for these techniques. The parents were encouraged to keep the focus on positive attention and interactions, but to make problematic behaviors visible in a reward system if necessary. The reward system was intended to teach the child that when you dedicate yourself you can achieve things, and works to make the child aware of the consequences of putting in effort. Examples of rewards were provided, and it was made sure the parents knew that the reward system was not to be used for punishments. The focus of session five was to learn how to deal with unwanted behavior. The parents were taught different executions of negative punishment, like ignoring the child to minimize positive attention for unwanted behavior, timeout and the use of response cost, or a removal of benefits. It was emphasized that response cost in reward systems was only to be used if the system was already working, and that no punishment should be overused. In addition the parents were given help with organizing and planning trips and other situations outside the house, to reduce stress and encourage routines and structure outside the home as well as inside. Between the fifth and the sixth session each parent was offered a personal session with the therapist, to personalize reward systems and help with any troubles they might have. In the final session the parents were told what to do if they see negative developments in their child’s behavior, and were reminded of the principles they had learned throughout the intervention.
2.4 Statistical Analyses

The data was entered into the statistics program SPSS, and tested for normality and outliers. 11 participants were excluded from further analysis for not having answered both questionnaires. The remaining 66 samples showed no outliers and a normal distribution. Descriptive statistics (means, standard deviations and sample size) were assessed, and paired t-tests were conducted to check for statistical significance of any change from the intervention on each factor of the CRQ-IS. Effect sizes were calculated for the differences between the pre- and post-treatment measures. Mann-Whitney U tests were conducted to check for any difference in the data based on gender or age of the participant.

Results

Table 1. Mean scores of the CRQ-IS factors pre- and post-treatment.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Before</th>
<th></th>
<th></th>
<th>After</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Household responsibilities</td>
<td>66</td>
<td>9.5</td>
<td>5.57</td>
<td>13.3</td>
<td>7.2</td>
</tr>
<tr>
<td>Family interaction</td>
<td>66</td>
<td>21.1</td>
<td>4.2</td>
<td>23.6</td>
<td>4.5</td>
</tr>
<tr>
<td>Daily living</td>
<td>66</td>
<td>31.1</td>
<td>4</td>
<td>32.5</td>
<td>3.6</td>
</tr>
<tr>
<td>Discipline Routines</td>
<td>66</td>
<td>20.2</td>
<td>4.5</td>
<td>23.2</td>
<td>4.5</td>
</tr>
</tbody>
</table>

The descriptive statistics in table 1 show the mean scores and standard deviations in the sample, before and after the intervention. At first glance it appears that the scores on each factor of the CRQ-IS have increased in the post-treatment condition.
Table 2. Paired t-test of differences in CRQ-IS factor means, pre- and post-treatment.

<table>
<thead>
<tr>
<th>Pair</th>
<th>Paired Differences</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>n</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td>Chores before - Chores after</td>
<td>-3.81</td>
<td>5.82</td>
<td>66</td>
<td>-5.33</td>
<td>65</td>
<td>.000*</td>
</tr>
<tr>
<td>Pair 2</td>
<td>Interaction before - Interaction after</td>
<td>-2.5</td>
<td>4.08</td>
<td>66</td>
<td>-4.98</td>
<td>65</td>
<td>.000*</td>
</tr>
<tr>
<td>Pair 3</td>
<td>Daily living before - Daily living after</td>
<td>-1.46</td>
<td>3.02</td>
<td>66</td>
<td>-3.94</td>
<td>65</td>
<td>.000*</td>
</tr>
<tr>
<td>Pair 4</td>
<td>Discipline routines before - Discipline routines after</td>
<td>-2.98</td>
<td>4.16</td>
<td>66</td>
<td>-5.82</td>
<td>65</td>
<td>.000*</td>
</tr>
</tbody>
</table>

The requirements for a paired t-test significance test were met, and the test is suited for comparing data from before and after an intervention and was therefore conducted on the scores from each of the factors of the CRQ-IS. As seen in table 2, there was a significant difference in the CRQ-IS scores before and after, at the $p < .001$ level on all four factors of the CRQ-IS.

Table 3. Effect sizes for differences in the mean CRQ-IS scores for each factor, before and after.

<table>
<thead>
<tr>
<th>Factor</th>
<th>n</th>
<th>Pre</th>
<th>Post</th>
<th>Cohens $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household Responsibilities</td>
<td>66</td>
<td>9.4</td>
<td>13.3</td>
<td>0.59</td>
</tr>
<tr>
<td>Family Interaction</td>
<td>66</td>
<td>21.1</td>
<td>23.6</td>
<td>0.57</td>
</tr>
<tr>
<td>Daily Living</td>
<td>66</td>
<td>31.1</td>
<td>32.5</td>
<td>0.36</td>
</tr>
<tr>
<td>Discipline Routines</td>
<td>66</td>
<td>20.2</td>
<td>23.2</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Effect sizes for the difference in means before and after were calculated, and can be seen in table 3. Household Responsibilities, Family Interaction and Discipline Routines all gave moderately high effect sizes (0.59, 0.57 and 0.66 respectively), while the factor Daily Living gave the smallest effect size at 0.36.
To check for any effect of age on the scores, the data was divided into three age categories: 5-8 years, 9-12 years and 13-15 years. The category 13-15 years only had one participant, and was therefore not included in the significance testing.

Table 4. CRQ-IS scores for each factor, by age category.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 5 - 8</td>
<td>42</td>
<td>7.9</td>
<td>11.1</td>
<td>31.1</td>
<td>32.5</td>
<td>20.2</td>
</tr>
<tr>
<td>Age 9 - 12</td>
<td>23</td>
<td>12.5</td>
<td>31.1</td>
<td>31.3</td>
<td>32.6</td>
<td>20.6</td>
</tr>
</tbody>
</table>

As seen in table 4, the scores are similar across the two age groups, but with slightly higher scores for the older group. The factor for Household Responsibilities and the total score both showed a large difference between the two age groups. A Mann-Whitney U significance test was conducted to check for any effect of age on the scores for the different factors, chosen due to the relatively large difference in sample sizes between the two categories. There was a significant effect of age at the $p<0.05$ level for the score of Household Chores pre-treatment ($U = 275.5$, $p = 0.004$), and the score of Household Chores post-treatment ($U = 211$, $p = 0.00$). The effect of age for the total score pre-treatment did not quite reach significance ($U = 389$, $p = 0.19$) but the total score in the post-condition was significant at the $p<0.05$ level ($U = 323$, $p = 0.028$). None of the other factors showed a significant effect of age.
Looking at the total for the CRQ-IS, figure 6 shows the distribution between genders from pre- and post-treatment scores. The average total scores and standard deviations for boys and girls before the intervention were 81 (12.3) and 84.7 (13.6) respectively, while the scores after were 92.2 (14.6) and 93.9 (11.3). There is a clear increase in scores in the after measurement for both genders; and a slight difference between boys and girls, with girls showing a somewhat higher total score than boys -both before and after-, but this difference was not statistically significant. Difference in total between boys and girls before: $F (0.935) = p > .05$, after: $F (0.161) = p > .05$.

Table 5. CRQ-IS scores for each factor, by gender.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>14</td>
<td>10.7</td>
<td>12.8</td>
<td>32.3</td>
<td>33.6</td>
<td>18.6</td>
<td>22.3</td>
<td>23.1</td>
</tr>
<tr>
<td>Boys</td>
<td>52</td>
<td>9.1</td>
<td>13.4</td>
<td>30.7</td>
<td>32.3</td>
<td>20.6</td>
<td>23.4</td>
<td>20.5</td>
</tr>
</tbody>
</table>
Table 5 shows further the gender differences in the CRQ-IS scores for each factor. Girls had a slightly higher score on each factor in the pre-treatment condition except for the Discipline Routines factor. In the post-treatment condition girls still had higher scores on most factors, except, again, for the Discipline Routines factor, but also the factor for Household Responsibilities. A Mann-Whitney U significance test was conducted due to the large difference in sample size, and it showed no significant effect of gender on the scores. The largest difference was for the Family Interaction factor in the before condition, but it did not reach significance (U=245.5, $p = 0.062$)

![Image](image_url)

*Figure 7. CRQ-IS scores for each factor, before and after the intervention, compared with a population mean.*

To add perspective to the numbers from the CRQ-IS, Figure 7 shows the mean scores on each dimension compared to the mean of the population as found in Halldórsdóttir & Óskarsdóttir (2010). As would be expected of a sample referred due to symptoms of ADHD and behavioral problems; the scores from the current study seem to fall below that of the population on three of the four factors, both pre- and post-treatment.
Table 6. CRQ-IS scores before and after intervention, difference and population mean.

<table>
<thead>
<tr>
<th>Categories</th>
<th>n</th>
<th>Sample before</th>
<th>Sample after</th>
<th>Difference</th>
<th>Population mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household Responsibilities</td>
<td>66</td>
<td>9.4</td>
<td>13.2</td>
<td>3.8</td>
<td>19.36</td>
</tr>
<tr>
<td>Family Interaction</td>
<td>66</td>
<td>21.1</td>
<td>23.6</td>
<td>2.5</td>
<td>26.77</td>
</tr>
<tr>
<td>Daily living</td>
<td>66</td>
<td>31.1</td>
<td>32.5</td>
<td>1.4</td>
<td>34.56</td>
</tr>
<tr>
<td>Discipline Routines</td>
<td>66</td>
<td>20.2</td>
<td>23.2</td>
<td>3</td>
<td>17.89</td>
</tr>
</tbody>
</table>

Table 6 shows the scores for each factor before and after the intervention, the difference between the two and the population mean from Halldórsson & Óskarsdóttir (2010). The lowest scoring factor for the study sample was Household Responsibilities, and the biggest difference from the intervention was found for this factor. Even after the intervention, the factors Household Responsibilities, Family Interaction and Daily Living all had lower scores than the population mean. On the Discipline Routine factor however the population mean was lower than in the study sample, even before the intervention was conducted, which is noteworthy.

Discussion

Attention deficit/hyperactivity disorder is a neurodevelopmental disorder characterized by symptoms of inattention, and impulsivity and/or hyperactivity; usually emerging before 12 years of age (APA, 2013). Parents of children with ADHD have reported problems with keeping consistent bedtime routines and monitoring of their children (Corkum, Tannock, Moldofsky, Johnson & Humphries, 2001; Weiss, Hechtman, Weiss, 2000), and also report fewer routines in the home than do parents in the general population (Kristinsdóttir and Baldvinsdóttir, 2010). One way of helping these children and their families is to conduct parent training courses, which has been associated with better adjustment on several variables (Serketich & Dumas, 1996), is well-received by parents and has a generally positive effect on symptoms (Jensen et. al., 1999). A part of parent training is the creation and maintenance of routines and the Child Routine Questionnaire is a parent-report...
measure of routines present in the home. Routines as measured by the CRQ have been positively associated with attention, and negatively associated with poor adaptability and self-regulation (Wittig, 2005). Increasing routines has previously been associated with an increase in impulsivity and hyperactivity (Landy, 2002), an increase in the ability to follow rules and directions (Spagnola & Fiese, 2002) and increased child cooperation, social competence, and compliance (Snyder, 1999).

4.1. Differences pre- and post-treatment

This retrospective study assessed the effects that parent training had on the amount of routines reported by the parents of children showing symptoms of ADHD. The data was collected at the Heilsugæsla in Reykjavík, before and after a 6 week intervention for the parents. Parents were educated about ADHD in general, and taught positive emotional communication and how to reinforce with attention and avoid reinforcing unwanted behavior, in addition to other common components of a parent training intervention. It was hypothesized that parents would report more routines after the parent training intervention compared to before, and this was supported (see Table 2), which is congruent with previous research where parent training has improved adjustment on all variables (Serketich & Dumas, 1996). The study showed a clear increase in the amount of routines reported by the parents post-intervention on all factors of the CRQ-IS as well as on the total score (see Table 2). Statistical testing indicated that there was a significant increase on every factor of the CRQ-IS measured from pre- to post-treatment and all the effect sizes were of moderate size, except the Daily Living factor which was slightly smaller but still notable (see Table 3). This implies that parental reported routines are another variable that see an increase after parent training interventions, similar to the previously reported internalizing behaviors, parent-child interactions, social-skills, and achievement (MTA Cooperative Group, 1999), as was hypothesized.
4.2. Differences based on age and gender

Some differences in the scores of each factor emerged, dependent on both gender and age. Girls scored a slightly higher total CRQ-IS score than boys, but this difference was not significant (see Figure 6). Looking at the individual factors, only one factor came close to a significant gender effect, and that was Family Interaction in the pre-treatment condition (see Table 5). Girls had a slightly higher score on the Family Interaction factor before the intervention was conducted, but this effect was not significant when using a non-parametric test to make up for the difference in sample size. A gender difference in the Family Interaction factor has been found previously when using the CRQ-IS, both in Kristinsdóttir and Baldvinsdóttir (2010) and in Halldórsdóttir and Óskarsdóttir, (2009). Kristinsdóttir and Baldvinsdóttir (2010) reported that girls had fewer Family Interaction routines than boys in a sample of 6 girls and 25 boys, but there was no report of the results of significance testing. Halldórsdóttir and Óskarsdóttir, (2009) found that girls had significantly more Family Interaction routines than boys in a sample from the general population, consisting of 272 girls and 232 boys, with a score of 27.22 and 26.28, respectively. The current study could not support either result, as no difference reached significance. Boys with ADHD do tend to exhibit more aggressive and more externalizing behaviors, which could contribute to their lower score on a factor that reflects positive and inclusive family interaction (Brown, Abramowitz, Madan-Swain, Ecstrand & Duncan, 1989).

The lack of significance for the difference on this factor found in this study could be partly due to the small sample size of girls, as the entire sample only had 14. Even though the Mann-Whitney U test accounts for the unequal number of boys and girls in the sample when calculating significance, the low number of girls might not be representational of all girls with ADHD. This difference in sample size is understandable based on the difference in prevalence of ADHD between genders (Gaub & Carlson, 1997), but makes it hard to generalize based on the sample. Kristinsdóttir and Baldvinsdóttir (2010) reported a difference between boys and girls on the Discipline Routines factor, where girls scored higher than boys (21.5 and 19.4, respectively) but no significance testing was reported.
Halldórsdóttir and Óskarsdóttir (2009) also reported a significant difference on the Discipline Routines for boys and girls, however, in their sample of the general population of children boys scored higher than girls (18.31 and 17.52, respectively). In the current study the average scores on this factor were slightly higher for boys than for girls, but this difference did not reach significance (see Table 5).

A clearer difference emerged when assessing the data by age groups. The results showed that the age group of 9-12 year olds scored significantly higher than the younger group on the Household Responsibilities factor. There was also a difference on the total score on the CRQ-IS, where the older group scored higher (see table 4). This age difference was also reported in a previous study of routines in children with ADHD; however, no significance tests were reported (Kristinsdóttir & Baldvinsdóttir, 2010). The difference in the Household Responsibilities factor could be due to a natural difference in how capable children of different ages are at helping with the relevant task, and how they might be given more responsibilities as they grow older (Fiese et al. 2002). Household Responsibilities include tasks like “cleaning their room every day” and “taking out the trash”, which the younger children might not be old enough to be included in. On average however, this factor was considerably lower than the others, and the sample’s score on the Household Responsibilities factor was much lower than the population mean, even after the intervention (see Table 6). In addition, the routines on this factor may be neglected in families with children with ADHD, as the effort to make the child do the required chore might be too much for parents who are already facing challenges with being consistent and maintaining routines such as bedtime routines (Weiss, Hechtman, Weiss, 2000; Corkum, Tannock, Moldofsky, Johnson & Humphries, 2001). Household Responsibilities was the factor that increased the most after the parent training program, suggesting that the strategies learned in the intervention helped parents implement routines enabling the child to carry out his or hers responsibilities around the house. However, the increase was not enough to bring the scores up to the level of the population mean (see Table 6). As mentioned briefly earlier, the scores on this factor might be lower both pre- and post-treatment because the majority of the children in the study were in the lower age group. 42 participants were between 5 and 8 years old and 23 participants were between 9 and 12
years old, and the average age across the sample was 7.8. This is very similar to the age in the sample in Kristinsdóttir and Baldvinsdóttir (2010); where the average age was 7.7. These children may therefore have been too young to be included in the chores reflected in the Household Responsibilities factor, resulting in a lower average score than the population mean. This factor could be a direction to look into in future research, to discover whether this difference is natural or dependent on other variables like severity of ADHD symptoms or demographic variables.

4.3 Differences from the population mean

Another noteworthy point is the factor for Discipline Routines, where the sample mean in the current study appears to be higher than the population mean both before and after the intervention (see Table 6 and Figure 7). This is the same result as was found in Kristinsdóttir & Baldvinsdóttir (2010), where every factor but Discipline Routines was lower in the sample than in the population mean. It might seem counterintuitive that parents of children showing symptoms of ADHD, ODD and CD would report more disciplinary routines present in the home, but this may not be unnatural considering that these children could require a relatively large and stable number of routines just to reach the same effect on behavior as their normally developing peers. It would be worth researching whether this increase in the factor for Discipline Routines above the population mean continues to correlate with other variables associated with increased routines, like decreased impulsivity and hyperactivity (Pruitt, 1998; Landy, 2002), and following rules and directions (Spagnola & Fiese, 2007), or if there is a ceiling effect where further increase would bring no additional gain. Comparing children with ADHD to children in the general population on Discipline Routines and direct outcome variables could shed light on the amount of routines needed for each group to score the same on outcome variables. Previous research on the CRQ-IS supports the high score that found in this sample for the Discipline Routine factor when compared to the general population (Kristinsdóttir & Baldvinsdóttir, 2010). The low scores of the current sample on the CRQ-IS factors in general could be partly explained by the findings of previous research on the
problems experienced by parents of children with ADHD, who report challenges with keeping bedtime routines (Corkum, Tannock, Moldofsky, Johnson & Humphries, 2001) and being consistent in their daily life (Weiss, Hechtman, Weiss, 2000). The sample scored lower than the population on three of the four factors (see Table 6), and this result may also be partly due to the low adaptive functioning seen as a symptom of ADHD (Barkley, Fischer, Edelbrock & Smallish, 1990). The sample’s lower score on the Family Interaction factor compared to the population could be explained in part by the strained relationships often found for children with ADHD, who report more conflict with their peers, their teachers, and within their family when compared to the general population (Smallish & Fletcher, 2004; Greene et al., 1996; Hoza et al., 2005; Johnston & Mash, 2001). These children are also more likely to report high rates of feelings of rejection and isolation (Hoza et al, 2005), and are more likely to both bully and be bullied themselves (Unnever & Cornell, 2003). These problems with social interaction could be influenced by the poor emotion regulation often seen in children with ADHD (Douglas & Parry, 1994; Wigal et al. 1993), and could be reflected in the low scores on Family Interaction.

4.4 Strengths and weaknesses of the study

The study suffered from some attrition -like most studies assessing participants over a longer period of time- and 8% of participants had to be excluded due to a failure in submitting both questionnaires. Compared to other studies which have found an attrition rate as high as 28%-59%, with a mean dropout rate of 46.8% (Gould, Shaffer & Kaplan, 1985; Wierzbicki & Pekarik, 1993), the intervention conducted by Heilsugæslan had a relatively low attrition rate, and this is a strength. The study also replicated the differences found in routines in a sample exhibiting symptoms of ADHD and the population mean that was reported in Kristinsdóttir & Baldvinsdóttir (2010). The gender difference on the Family Interaction factor supported the results found in Halldórsdóttir and Óskarsdóttir’s (2009) study on the general population, where girls scored higher than boys, which is the opposite direction of what was found in in Kristinsdóttir & Baldvinsdóttir’s (2010) study of children with ADHD. Of the weaknesses in the study, first and foremost is the fact that
there is no control group of children whose parents did not receive the training, and there is therefore nothing eliminating the possible effect of time or placebo on the results. The study is retrospective and the data used was collected by the clinic providing the intervention, and there was therefore no opportunity to include a control group. In addition, the data collected did not include any diagnostic information so there was no way of knowing which of the children were diagnosed with ADHD, nor was it possible to ascertain whether any of the participating children were diagnosed with any comorbid disorders. The children were referred to the clinic for symptoms or a full diagnosis of ADHD, with some additionally showing symptoms of ODD, CD, anxiety, depression and tic disorder, but none of the information was detailed or listed by participant, and could therefore not be used in the analysis. As the data collected was limited to the child’s age and gender in addition to the CRQ-IS scores, it was impossible to control for potentially confounding variables. These potentially confounding variables include medication taken for ADHD symptoms, possible additional treatment received, previous experience with treatments and other demographic information like number of siblings, socioeconomic status and parents’ marital status (single-parent or two living together). All of these variables have the potential to affect the results and previous research has suggested that certain demographic variables are associated with differences in routines. Kristinsdóttir and Baldvinsdóttir (2010) reported that one stable home and more siblings was associated with more routines, and –maybe surprisingly- that single parents were associated with an increase in routines. Single parents have, however, also been associated with fewer routines (Sytsma et al. 2001). If other variables, like parents’ attendance to group sessions and adherence to homework had been included, this could possibly have helped explain some of the variance currently attributed to the effect of the intervention. The outcome was only measured directly after the intervention finished, and adding another measurement after 6 months or a year could supply valuable information on the long-term effects of parent training on routines.
4.5 Summary and future research

In conclusion, the study supported the hypothesis that an increase in routines would be found in children exhibiting ADHD symptoms after their parents attended a 6 week parent training course at a health clinic. The differences between the sample and the population replicated what was reported in Kristinsdóttir & Baldvinsdóttir (2010), where every factor was lower in the sample, except the Discipline Routines, which was higher than the general population both pre- and post-treatment. The study supported Halldórsdóttir and Óskarsdóttir, (2009) when it came to gender differences in the Family Interaction factor, where girls scored higher than boys, which is the opposite direction of what was found in Kristinsdóttir & Baldvinsdóttir (2010), however, Halldórsdóttir and Óskarsdóttir's (2009) study was on scores in the general population, not children with ADHD in particular. The scores on the CRQ-IS seemed to increase with age, especially in the factor Household Routines and this difference was also found in Kristinsdóttir & Baldvinsdóttir (2010) and could be due to their increasing ability to partake in chores (Fiese et al. 2002). Future research could look into whether the higher number of Discipline Routines is actual or perceived by the parents due to a difficulty with consistency (Weiss, Hechtman, Weiss, 2000), and whether the continued increase in this factor is reflected in other correlated variables or if it reaches a ceiling. Additionally it could be worth researching whether the demographic differences in parents affects the results, as these variables could not be included in this retrospective study, but has been implicated as affecting the amount of routines in previous studies (Halldórsdóttir & Óskarsdóttir, 2009). The study provided further information on the connection between parent training and routines, and supported previous research on routines in the daily life of children with ADHD and their families.
Appendix

Appendix A: The Child Routine Questionnaire - IS

<table>
<thead>
<tr>
<th>Hve oft gesta þetta á nýsum sama tíma eða nýsum sama hátt?</th>
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</thead>
<tbody>
<tr>
<td>0 = Aldrei</td>
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<tr>
<td>1 = Spjólan</td>
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<tr>
<td>2 = Stundum</td>
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<td>3 = Oft</td>
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<tr>
<td>4 = Nýsum alltaf</td>
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| Rútun eru atburðir sem gerast á spviðum tíma, í somuð og eða á sama hátt í hvert skipti. Vinsamlegast svaraðu hve oft barnið jätí fylgir hverri rútúnu með því að setja hring utan um viðeigandi svarmoguleika frá 0 (aldei) til 4 (nýsum alltaf). Miðaðu svör þin við hve oft barnið hefur fylgt hverri rútúnu síðast íliðina móður. Ef eitt hvöð atriði a ekki við um barnið þitt, vinsamlegast merktu við 0. |

<p>| 1) ... höfði fasta rútina með meðgunverklegu (t.d. bursta tennar, þvo sér, greiða sér og kæða sig) | 0 1 2 3 4 |
| 2) ... veit hvað verist ef hogn eða hún fyrir reikið og fyrirvelum foreldra | 0 1 2 3 4 |
| 3) ... settið dörfum, þjóðskyldum, eða þrýrnum, þrýrnum | 0 1 2 3 4 |
| 4) ... að sínna þúværum eða þúværum, þeir nemur sér við þúværum, sína galdrýrri fjólsvyldum | 0 1 2 3 4 |
| 5) ... skyrir herbergi sínu daglega | 0 1 2 3 4 |
| 6) ... þaðað málmiður með fjólsvyldum við matbarðið, þatnam degi | 0 1 2 3 4 |
| 7) ... fæðunar / kysað vorðru á hátíðum | 0 1 2 3 4 |
| 8) ... göngur frá efir sig þegar hann húr fer | 0 1 2 3 4 |
| 9) ... eyðir sérstökum tíma til að spjalla við hún (t.d. í bók ílýwdla á hátíðina) á hverjum degi | 0 1 2 3 4 |
| 10) ... sér fyrir tíma, s.s. plánir eða dæmisari, því að fær að tíma á hverjum | 0 1 2 3 4 |
| 11) ... gerir sinnu blyðina á hverju kvöldi áður en hann hún fer að hún, þurfaða þurfaða, leisa sågu, fara með barni og kyssa foreldri göða nótt | 0 1 2 3 4 |
| 12) ... á heimili eru settur reglu s.s. “Banna að blótta” “Enginn með fullan mun_orig” “Ekki hlaupa ínari” | 0 1 2 3 4 |
| 13) ... vaknar á spviðum tína á virkum dögum | 0 1 2 3 4 |
| 14) ... verður að lítuka skyldustórum (t.d. heimilinun, eða húsverk) áður en þeir hun má leika sínu | 0 1 2 3 4 |
| 15) ... fær verðlaun eða sérstök friðindi fyrir að standa sig vel við að dæma verkefnir (t.d. fyrir heimilinun eða klara húsverk) | 0 1 2 3 4 |
| 16) ... þaðað kveðnat á spviðum tína á hverjum degi | 0 1 2 3 4 |
| 17) ... þurfaðar þennmar áður en hann hún fer eða sofa | 0 1 2 3 4 |
| 18) ... þinir upp þráinn frá efir að hafa skipunum fyrir | 0 1 2 3 4 |
| 19) ... hver sér um hendur fyrir matartima | 0 1 2 3 4 |
| 20) ... fer í hátíð á spviðum tíma í virkum dögum | 0 1 2 3 4 |
| 21) ... þrápar til við að gagna frá efir málmiður | 1 2 3 4 |
| 22) ... hefur tímanokur á aðferðina (t.d. leikinni umandra, sjónvarp, þvöllveiskur, eða sínamot) | 0 1 2 3 4 |
| 23) ... hver sér um hendur efir að hafa notað sæmillur | 0 1 2 3 4 |
| 24) ... er refræð fyrir objekt (t.d. ikkannafrókur eða mismir fröindi eins og sjónvarp eða tölva | 0 1 2 3 4 |
| 25) ... þrápar til við að skvéda og undirvísu fjólsvyldumveiktin eða ábreyti | 1 2 3 4 |
| 26) ... hlutu varagi reiðingu fyrirminnis háttar objekt (t.d. að fylgja ekki fyriramunum) og þaðari reiðingu fyriraltvarla | 0 1 2 3 4 |</p>
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Example
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