Inattention and hyperactivity in children adopted from Eastern Europe

Description, causes and implications

Neus Abrines Jaume

PhD thesis

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You can't connect the dots looking forward; you can only connect them looking backwards. So you have to trust that the dots will somehow connect in your future. You have to trust in something — your gut, destiny, life, karma, whatever.

Steve Jobs, June 2005

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CONTENTS

1. SUMMARY

In English

High levels of Attention Deficit Hyperactivity Disorder (ADHD) symptoms have been observed among internationally adopted children but these levels seem to be even higher among children adopted from Eastern Europe. However, there is a lack of studies directly comparing ADHD symptom levels in a sample of children adopted from Eastern Europe with samples of children adopted from other regions of the world.

The objectives of this thesis were to compare the levels of ADHD symptoms in a sample of children adopted from Eastern Europe with a sample of children adopted from other countries and also to examine the interrelations between the display of ADHD symptoms and selected personal and family factors such as sex and age of the child, age at adoption, attachment pattern and anxiety levels. Our results confirmed that children adopted from Eastern Europe are more likely to show ADHD symptoms than children adopted from other regions of the world, according to their parents' opinion. When looking at possible factors related to the display of these symptoms, we observed that the age and the attachment pattern of the child were related to the level of attention problems: children who were older or who had an insecure attachment were more likely to show inattention. Also, higher levels of anxiety were

related to higher levels of hyperactivity/impulsivity. On the other hand, we found that neither the sex of the children nor their age at adoption had any effect on the display of ADHD symptoms.

It is important to consider that there are other factors that might be related to the display of ADHD symptoms and were not analysed in this research, such as the existence of prenatal alcohol exposure, the quality of pre-adoptive care or the attachment pattern and expectations of the adoptive parents. Therefore, further research is required to best understand the causes of higher levels of ADHD symptoms in children adopted from Eastern Europe.

Nevertheless, we suggest some clinical applications of these results and further areas of research. Children adopted from Eastern Europe might have a higher predisposition to show ADHD symptoms due to their pre-adoptive experiences but these symptoms can be exacerbated or diminished depending on the post-adoptive experiences. In this regard, more information and support should be provided to adoptive families and teachers, which would allow them to best understand the symptoms and find the best way to manage them. Also, more research assessing the effectiveness of the first line treatments in adopted children who show inattention, hyperactivity and attachment difficulties is required. This will allow for the provision of the best diagnosis and treatment for these children, according to their specific needs and taking the characteristics and their vital history into account. One of the disorders that should be considered when assessing these children is the Fetal Alcohol Spectrum Disorder (FASD). Being more aware of its symptoms and its treatment would help children, families and teachers to adjust expectations, manage the symptoms and

overcome the challenges. Finally, the interaction between the story and characteristics of the adopted child and the story and characteristics of adoptive parents should be further explored in order to best help these families.

In Catalan

S'han observat alts nivells de símptomes de TDAH (Trastorn per dèficit d'atenció i hiperactivitat) en nens/es adoptats internacionalment, però aquests nivells semblen ser encara més alts en nens/es adoptats a Europa de l'Est. No obstant, hi ha una manca d'estudis que comparin directament el nivell de símptomes de TDAH en una mostra de menors adoptats a Europa de l'Est amb mostres de menors adoptats a altres parts del món.

Els objectius d'aquesta tesi són comparar els nivells de símptomes de TDAH en una mostra de nens/es adoptats a Europa de l'Est amb una mostra de nens/es adoptats a altres països així com també examinar les interrelacions entre la presència de símptomes de TDAH i determinats factors personals i familiars com el sexe i l'edat del menor, l'edat d'adopció, el patró de vincle i el nivell d'ansietat. Els nostres resultats confirmen que els nens/es adoptats a Europa de l'Est tenen més probabilitats de mostrar símptomes de TDAH que els nens/es adoptats a altres parts del món, segons els seus pares. Valorant els possibles factors relacionats amb l'aparició d'aquests símptomes, es va observar que tant l'edat com el patró de vincle del nen/a estaven relacionats amb el nivell de problemes d'atenció: els nens/es més grans i els que tenien un patró de vincle insegur tenien més probabilitats de mostrar inatenció. També, alts nivells d'ansietat estan relacionats amb alts nivells d'hiperactivitat/impulsivitat. Per altra banda, vam observar que ni el sexe del menor ni la seva edat d'adopció tenien cap efecte sobre l'aparició dels símptomes de TDAH.

És important tenir en compte que hi ha altres factors que podrien estar relacionats amb la presència de símptomes de TDAH i que no van ser analitzats durant aquesta investigació, com la existència d'exposició prenatal a l'alcohol, la qualitat de la cura rebuda abans de l'adopció o el patró de vincle i les expectatives dels pares adoptius. Per tant, és necessari portar a terme més recerca per tal d'entendre millor les causes d'aquests majors nivells de símptomes de TDAH en menors adoptats a Europa de l'Est.

Tot i així, es suggereixen algunes aplicacions clíniques d'aquests resultats i properes àrees a investigar. És possible que els nens/es adoptats a Europa de l'Est tinguin una elevada predisposició a presentar símptomes de TDAH degut a les seves experiències pre-adoptives, però aquests símptomes poden augmentar o disminuir en funció de les experiències post-adoptives. En aquest sentit, s'hauria de proporcionar més informació i suport tant a les famílies com als mestres, cosa que els permetria entendre millor els símptomes i trobar la millor manera de treballar-los. També es necessita més recerca per avaluar l'efectivitat dels tractaments indicats per a nens/es que presenten inatenció, hiperactivitat i problemes de vincle. Tal cosa permetria la provisió del millor diagnòstic i tractament per aquests nens/es, en funció de les seves necessitats específiques i tenint en compte les característiques i la història vital de cada nen. Un dels trastorns que s'hauria de considerar durant les valoracions d'aquests menors és el Trastorn de l'Espectre Alcohòlic Fetal (FASD). Estar més informat dels seus símptomes i del seu tractament ajudaria als nens/es, famílies i mestres a adaptar les seves expectatives, treballar els símptomes i superar les dificultats. Finalment, s'hauria d'explorar millor la interacció entre la història i les

característiques del nen/a adoptat i la història i característiques dels pares adoptius per tal d'ajudar millor a aquestes famílies.

2. INTRODUCTION

2.1. Attention Deficit Hyperactivity Disorder (ADHD)

Attention deficit hyperactivity disorder (ADHD) is defined as a psychiatric disorder which involves the following symptoms: lack of attention, hyperactivity and impulsiveness. To diagnose a child with ADHD, these core symptoms must appear before the age of 7 and be observed in at least two different situations (for example, at home and at school).

Several authors estimated its prevalence to range from 3 to 10% in school aged children (Barkley, 1998; Faraone, Sergeant, Gillberg, & Biederman, 2003) and to be homogeneous around the world (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007). However, these studies have normally focused on developed countries (Faraone et al., 2003) and therefore less is known about its prevalence in other regions of the world. No studies of ADHD in African and Eastern European populations were identified in the meta-analytic study by Faraone et al. (2003) and in Polanczyk et al. (2007) lower ADHD prevalence rates were observed in Africa and the Middle East, compared with North America.

In spite of all the existent studies focusing on the ADHD etiology, no direct causes have been identified and gene-by-environment interactions appear likely to explain its etiology (Nigg, Nikolas, & Burt, 2010).

As neurobiological factors, structural and functional differences have been described in different cerebral regions such as the pre-frontal lobe, the cerebellum and the basal ganglia (Castellanos et al., 2002). Concerning ADHD and genetic heredity, many studies show evidence supporting the existence of a genetic influence in the display of this disorder (Faraone et al., 2005; Hudziak, Derks, Althoff, Rettew, & Boomsma, 2005). However, others have disputed these results: Heiser et al. (2006) found no significant influence of genetic factors for activity, attention, and impulsivity. Also, Joseph (2000) examined the evidence cited in favour of the operation of genetic factors in ADHD and concluded that a role for a genetic factor is not yet supported and that future research should be directed toward psychosocial causes.

In reference to the environmental factors, the influence of some prenatal (tobacco and/or alcohol consumption by the mother during pregnancy, high level lead exposure, etc.) and perinatal factors (birth complications) in the appearance of these symptoms has been observed (Eubig, Aguiar, & Schantz, 2010; Purper-Ouakil, Lepagnol-Bestel, Grosbellet, Gorwood, & Simonneau, 2010).

Finally, pathogenic environments generated by social factors (socioeconomic status, disorganized family dynamics, family psychopathology) are considered to favor the appearance of the symptoms. At the same time, they can lead to an increase of the severity of the symptoms and its associated impairments in multiple domains (Biederman et al., 1995; Biederman, 2005). Children with ADHD tend to have a lower school performance and poor social relationships.

The indicated treatment for ADHD can consist of psychological and/or pharmacological treatment. The pharmacological approach includes stimulants such as methylphenidate and amphetamine and some non-stimulant medications like

atomoxetine and extended-release guanfacine. Non-pharmacological treatments have also been reported as being useful interventions. These include parent training, cognitive-behavioural therapy, social skills training, etc (Young & Amarasinghe, 2010).

Although ADHD has become one of the most common diagnoses in child mental health during the last years, it has also become very controversial and many authors have raised their concerns (*Critical new perspectives on ADHD,* 2006; *Rethinking ADHD: From brain to culture,* 2009). According to Timimi (2007), ADHD is just a label to name a series of symptoms that a child might display when experiencing some kind of mental distress. Furthermore, he claims that there is no evidence of ADHD being the result of specific genetic, biochemical, developmental or other brain abnormalities that cause the behaviour by themselves and therefore, an ADHD diagnosis tells very little about cause, treatment or outcome. This doesn't mean that child psychiatric diagnoses aren't useful for some people and in certain circumstances, but it does mean that these diagnoses should be viewed as a "social construct", rather than a concrete entity that a person "has". The main problem associated with viewing ADHD as a biological condition is that increases the chances of children who get this diagnosis to be treated with "biological" treatments, such as drugs, which give the impression of providing a quick and rational solution to the problem. Such a model often makes the broader context of the child (such as their emotions, familial circumstances, school, cultural background, peer relationships and so on) invisible or not important.

2.2. Intercountry adoption in Catalonia

The purpose of adoption, defined as a childhood protection measure, is to provide a family to abandoned children or those whose biological families are not able to care for them. A marked increase in the number of international adoptions has been observed in Spain since the late nineties, with more than 40,000 children having been internationally adopted in the country (Selman, 2009). From this total 10.832 were adopted in Catalonia, a north eastern region in Spain and the place with the highest world rate of international adoption (Selman, Forthcoming).

This sharp rise in the number of adoptions has been promoted by the appearance of new family structures and a higher participation of women in the working world. Without the development of policies supporting the family and working life conciliation, women postpone their motherhood and as a consequence their fertility decreases (Marre, 2009).

The two donor countries where Spanish families have been adopting most frequently during the last years are China and Russia. In Catalonia, out of the 3686 children that were internationally adopted between 2007 and 2011, 1595 (43.19%) were adopted from some Eastern European country, 1355 (36.76%) children from Russia, and 705 (19.12%) from China (Institut Català de l'Acolliment i de l'Adopció, 2011).

2.3. ADHD in children adopted from Eastern Europe

High rates of ADHD diagnosis and/or a marked presence of ADHD symptoms have been lately observed among internationally adopted children, according to parental assessment (Barcons-Castel, Fornieles-Deu, & Costas-Moragas, 2011; Jacobs, Miller, & Tirella, 2010; Simmel, Brooks, Barth, & Hinshaw, 2001) and to medication rates (Lindblad , Ringbäck Weitoft, & Hjern, 2010).

Different possible explanations for this fact have been proposed by several authors, like the effects of early deprivation (Colvert et al., 2008; Stevens et al., 2008), the amount of time these children spend in critical situations (Jacobs et al., 2010), difficulties in the establishment of a secure attachment between the adoptees and their adoptive families (Franc, Maury, & Purper-Ouakil, 2009, Finzi-Dottan, Manor, & Tyano, 2006), the length of time spent with the adoptive family and the age of the child. According to Rojewski, Shapiro, & Shapiro (2000) the older they get, the more likely they are to be rated as hyperactive.

But more specifically, the existence of ADHD symptoms seems to be higher in children adopted from Eastern Europe. A national cohort study conducted in Sweden, found that the Eastern Europe group showed the highest rate of ADHD medication prescribed, except for the group of females aged between 16 and 21 (Lindblad et al., 2010). In Minnesota, Gunnar & Van Dulmen (2007) established a relationship between being adopted from Eastern Europe and the existence of several behavioural disorders, like aggressive behaviour, attention problems and social problems. In reference to the ADHD label, to the best of our knowledge three studies have examined the proportion of children to have received an ADHD diagnosis among children adopted from Eastern

Europe. Knowing that the prevalence of this disorder is 3-10% in general population, a higher proportion of this label was observed among children adopted from Eastern Europe in these studies: 25% (Glennen & Bright, 2005), 42% (Beverly, McGuinness, & Blanton, 2008) and 46% (Miller, Chan, Tirella, & Perrin, 2009). Unfortunately none of these three studies included samples of children adopted from other countries, in order to compare with the results of children adopted form Eastern European countries.

2.4. Factors related to ADHD and children adopted from Eastern Europe

2.4.1. Fetal alcohol exposure

One of the most important factors that has been considered to explain the lower developmental and behavioural performance of children adopted from Eastern European countries is the higher rate of alcohol consumption during pregnancy by mothers of institutionalized children in these countries (Gunnar & Van Dulmen, 2007, Miller et al., 2009). According to the World Health Organisation Global Database on alcohol use, in Russia, 1 in 3 women of childbearing age regularly consumes alcohol and an increase in the consumption of substances has been observed in groups of any age in the former Soviet Union countries in general (Davis, 1994). Furthermore, 45% of 50 children institutionalized in Russia showed facial phenotypes compatible with

prenatal alcohol exposure (Miller et al., 2006). In Sweden, Landgren, Svensson, Stromland, & Andersson Gronlund (2010) observed that fetal alcohol spectrum disorders were identified for 52% and ADHD for 51% in a sample of 71 children adopted from Eastern Europe. In Canada, Robert et al. (2009) concluded that 69% of 29 children adopted from these countries showed physical parameters and/or neurological anomalies compatible with Fetal Alcohol Spectrum Disorder (FASD).

Hyperactivity and attention deficits are part of the symptoms that can be seen in children with FASD, like developmental delay, microcephaly, seizures, cognitive deficits, learning and memory impairments, poor psychosocial functioning and motor coordination deficits (Kvigne et al., 2004). Therefore, some symptoms of FASD can overlap with ADHD and can lead to misdiagnosis and consequent mistreatment.

However, assuming that all the difficulties observed in children adopted from Eastern Europe are due to the events that happened during the pregnancy period would be a very simplistic interpretation of the situation. Actually, Goldman & Ryan (2011) found that prenatal alcohol, tobacco and/or other drug exposure significantly influenced pre-adoption functioning, but not post-adoption adjustment.

2.4.2. Sex, Age and age at adoption

In community samples, boys are more likely to be diagnosed with ADHD than girls, with a male-female ratio of approximately 4:1 (Cantwell, 1996). Therefore it is important to bear this in mind when comparing samples that do not have the same proportion of boys and girls.

The age of the child has also been related to higher rates of ADHD symptoms among adoptees: the older they get, the more likely they are to be rated as hyperactive (Rojewski et al., 2000).

Finally, the age at adoption has been found to be a very strong predictor of many of the outcome measures tested, including Hyperactivity and Attention deficit, with children who were younger at arrival scoring better in each of these areas (Jacobs et al., 2010). In contrast to this, other studies found that the age at adoption had no effect on behavioural outcomes (Groza & Ryan, 2002; Juffer & Van Ijzendoorn, 2005).

2.4.3. Attachment

ADHD symptoms have been related in different ways and by several studies with the inability to establish and maintain a secure attachment (e.g. Niederhofer, 2009). According to the attachment theory, the relationship between the child and his main caregiver during the first stages of infancy allows him to acquire self-regulation abilities (Ainsworth, Blehar, Waters, & Wall, 1978; Main & Solomon, 1990), skills that are lacking in children with ADHD. Furthermore, having low emotional regulation skills could affect the early development of attention processes and behavioral inhibition in pre-school aged children, leading them to show hyperactivity and attention deficit during their primary school years (Franc et al., 2009).

Finally, attachment patterns and ADHD have been linked to children's temperament. A difficult temperament is considered as a risk factor for ADHD and for

the development of an insecure attachment (e.g., Franc et al., 2009). Also, Finzi-Dottan et al. (2006) found that children with ADHD are characterized by a difficult temperament manifested in high emotional reactivity and difficulties in self-regulation. According to these authors, parents of these children might try to manage their behavior by employing either intrusive control or permissive parenting. These strategies would contribute to the consolidation of insecure attachment patterns. In contrast, a secure attachment pattern and the consequent development of self-regulation skills, which allow children to deal with increased levels of arousal, would be promoted by an optimal parental style including flexible emotional responsiveness, consistency, and sensitivity to the full range of the child's emotions. These authors suggest the inclusion of parent training as an essential component in the treatment of children with ADHD.

Previous studies have assessed attachment patterns and the presence of inattention/over-activity among children adopted from Romania (Colvert et al., 2008; Kreppner, O'Connor, Rutter, & English and Romanian Adoptees Study Team, 2001; Rutter, Kreppner, & O'Connor, 2001; Rutter et al., 2007) and yielded the hypothesis that inattention/overactivity (I/O) could constitute a specific deprivation syndrome and that it could also involve attachment difficulties. No studies assessing both the presence of ADHD-like symptoms and attachment insecurity in samples adopted from other countries were found.

2.4.4. Anxiety

Studies of comorbidity in clinical samples have found that about one quarter to one third of children with ADHD will meet criteria for Anxiety disorders (Schuler et al., 2012). Also, for our purposes, it is relevant to mention that children with prenatal alcohol exposure seem to obtain scores that exceed cut-offs for generalized and separation anxiety (Way, 2012).

Focusing on international adoption, although children adopted from China seem to obtain the same scores as non-adopted children in behavioural or emotional problems (Rojewski et al., 2000; Tan & Marfo, 2006; Tan, Dedrick, & Marfo, 2007), as they get older, their likelihood of showing internalizing symptoms seems to increase considerably (Cohen & Farnia, 2011; Tan, 2009).

In comparison, children adopted from Eastern European countries seem to be more likely to present developmental, behavioural and/or emotional problems and particularly, ADHD symptoms (Beverly et al., 2008; Gunnar & Van Dulmen, 2007; F. Lindblad et al., 2010).

Hyperactivity, inattention and anxiety symptoms could be related in many different ways. Hyperactivity and inattention are symptoms that could be expressing some kind of emotional distress like anxiety. Also, a child who is struggling with focusing his/her attention or controlling his/her behaviours is likely to feel anxious. Exploring the interrelation between all these symptoms seems relevant for best understanding the adjustment outcomes of international adoptees.

3. AIMS OF THE THESIS

3.1. Justification

Nowadays, there is a trend in psychology towards looking for a biological/genetic cause for the display of emotional or behavioural symptoms in order to find a quick method for understanding these symptoms and how to get rid of them as soon as possible. According to (Gauthier, 2011) "The history of the symptom, of the child who owns it, and of the family in which this child is being raised are not emphasized as strongly".

In the context of intercountry adoption, the lack of consideration for all the factors involved in the histories of adoptive children and also of adoptive parents can contribute to the misinterpretation of some symptoms and to the consequent misdiagnosis of ADHD. Consequently, the election of the treatment might be inadequate and symptoms might persist for longer periods, interfering with the adaptation process of the child to the family and social environment. This, together with the fact that accessing to information about pre-natal experiences or genetic inheritance of international adoptees is highly complicated, are the main reasons why this thesis will focus on the influence of emotional, relational and social factors on the display of ADHD symptoms, rather than in biological factors.

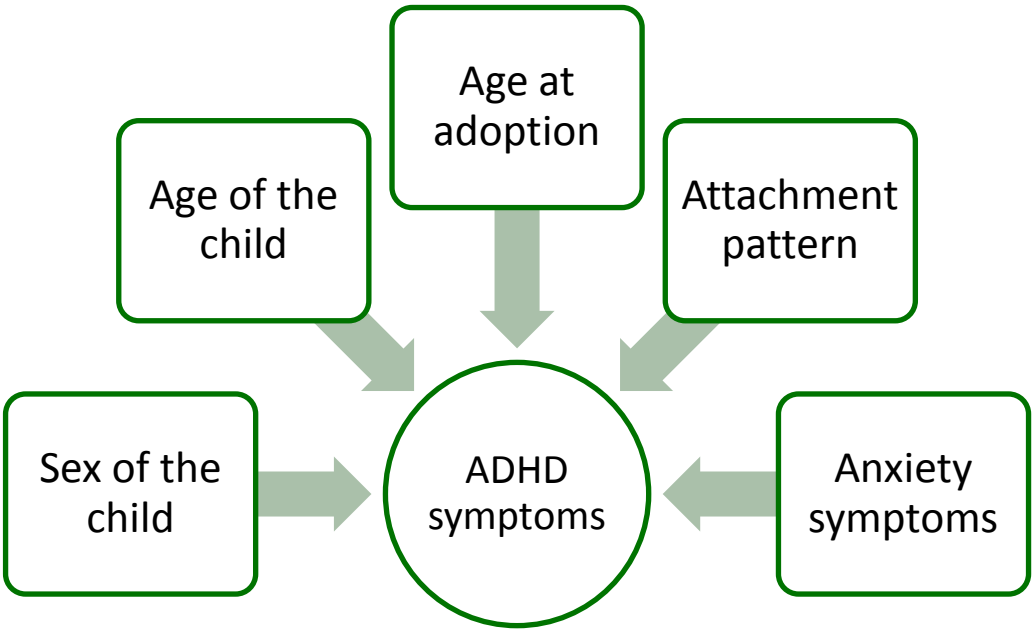
Understanding the interrelations between these environmental factors and the ADHD symptoms might give some orientations on which social or educational changes could be made in our country in order to best improve these children's development.

3.2. Research objectives

Until now, several studies have analysed the display of ADHD symptoms in samples of children adopted from Eastern Europe and others have compared the existence of several behavioural problems in children adopted from Eastern Europe with children adopted from other regions of the world. However, as far as we know, no studies have compared the display of ADHD symptoms in a sample of children adopted from Eastern Europe with a sample of children adopted from other regions of the world.

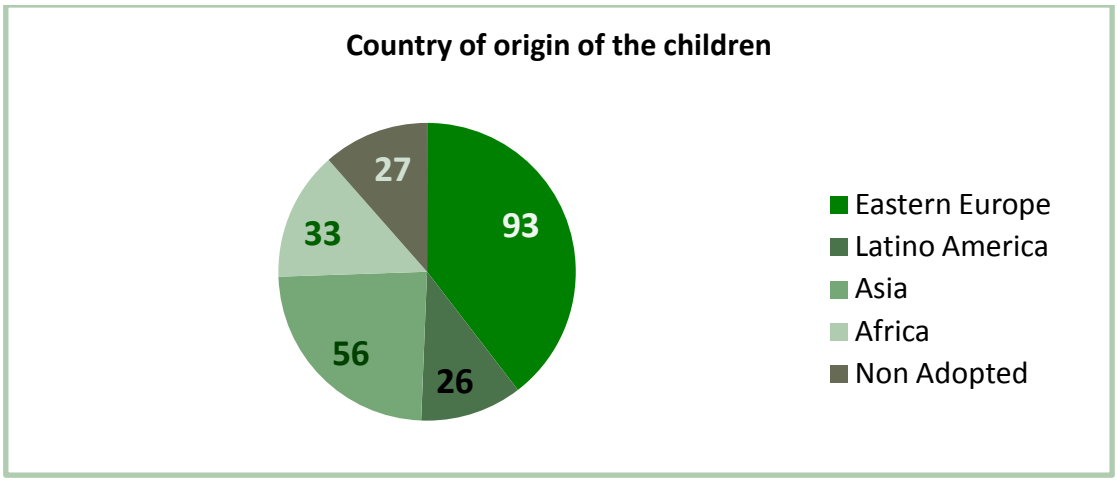
Therefore, the main objectives of this thesis are:

1. To compare ADHD symptoms levels in children adopted from Eastern Europe with levels in children adopted from other countries.
2. To explore the interrelations between the display of ADHD symptoms and the following factors:



4. METHOD AND RESULTS

In order to pursue the objectives of this thesis, a sample of 208 internationally adopted children and 27 non adopted children was recruited.



Children were assessed using the following measures:

- Ad-hoc questionnaire
- Swanson, Nolan and Pelham-IV scale - SNAP-IV (Bussing et al., 2008).
- Behavioral Assessment System for Children checklist – BASC (Reynolds & Kamphaus, 1992).
- Screen for Child Anxiety Related Emotional Disorders – SCARED (Birmaher et al., 1997; Vigil-Colet et al., 2009).
- Hollingshead Four Factor index of social status (Hollingshead, 1975).
- Friends and Family Interview-FFI (Steele & Steele, 2005).

Results of this research have been described and discussed in three articles which are presented in this section of the thesis:

- **Comparison of ADHD symptom levels in children adopted from Eastern Europe and other countries: possible factors involved. Abrines, N.**; Barcons, N.; Brun, C.; Marre, D.; Sartini, C.; Fumadó, V. (2012). *Children and Youth Services Review, available on line*.

- **ADHD – like symptoms and attachment in internationally adopted children. Abrines, N.;** Barcons, N.; Marre, D.; Brun, C.; Fornieles, A.; Fumadó, V. (2012). *Attachment & Human Development, 14 (4).*

- **A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours. Abrines, N.;** Barcons, N.; Görzig, A.; Marre, D.; Brun, C.; Fumadó, V. (2012). *Clínica y Salud, In press*.

4.1. Comparison of ADHD symptom levels in children adopted from Eastern Europe and other countries: possible factors involved.

Abrines, N.; Barcons, N.; Brun, C.; Marre, D.; Sartini, C.; Fumadó, V. (2012)

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Comparing ADHD symptom levels in children adopted from Eastern Europe and from other regions: Discussing possible factors involved

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ABSTRACT

Higher rates of ADHD symptoms have been observed among internationally adopted children but these symptoms seem to be even more frequent among children adopted from Eastern European countries. Therefore, the aims of this study were to compare the presence of ADHD symptoms in a sample of children adopted from Eastern Europe with a sample of children adopted from other regions and also to examine the influence of selected personal and family factors in the display of these symptoms. Ninety-three children adopted from Eastern Europe were assessed with the *Swanson, Nolan, and Pelham-IV* (*SNAP-IV*) scale and their scores were compared with the scores of 115 children adopted from other regions. Children adopted from Eastern Europe showed more ADHD symptoms than children adopted from other regions. Being a girl was a protective factor for the Hyperactivity/impulsivity scale and older children were more likely to show inattention. However, the reasons why these symptoms are more frequent in children adopted from Eastern Europe are still uncertain: the interaction between the stories and characteristics of the adopted child and adoptive parents should be further explored in order to best help these children to adapt to their new family and society.

1. Introduction

1.1. Attention deficit hyperactivity disorder (ADHD)

Attention deficit hyperactivity disorder (ADHD) is one of the most common diagnoses in child mental health. Its symptoms include lack of attention, hyperactivity and impulsiveness and its estimated prevalence ranges from 3 to 10% in school aged children (Barkley, 1998; Faraone, Sergeant, Gillberg, & Biederman, 2003). Boys are more likely to be diagnosed with this disorder than females, with a male–female ratio of approximately 4:1 in community samples (Cantwell, 1996).

The interaction between biological predisposition (neurobiological and genetic factors) and environmental factors is assumed as the main cause for this disorder (Aguiar, Eubig, & Schantz, 2010). Some of the environmental factors related to the onset of the disorder are tobacco and/or alcohol consumption by the mother during pregnancy and birth complications (Froehlich et al., 2009; Millichap, 2008).

Furthermore, some social factors such as socioeconomic status, disorganized family dynamics, and family psychopathology, are considered as a pathogenic environment that may favor the display of these symptoms, increase their severity, worsen prognosis and put them at higher risk for comorbidity (Biederman, 2005; Biederman et al., 1995).

The indicated treatment for ADHD can consist of psychological and/or pharmacological treatment. The pharmacological approach includes stimulants such as methylphenidate and amphetamine and some non stimulant medications like atomoxetine and extended-release guanfacine. Non-pharmacological treatments have also been reported as being useful interventions, especially when symptoms are milder. These include parent training, cognitive-behavioral therapy, social skills training, etc. (Young & Amarasinghe, 2010). A combined approach with pharmacological and psychological treatment is considered the most effective treatment with severe impairments.

1.2. Intercountry adoption

A marked increase in the number of international adoptions has been observed in Spain since the late nineties, with more than 40,000 children having been internationally adopted in the country (Selman, 2009). Catalonia is a north eastern region of the country and has the highest rate of international adoption in the world, with 10,832 children adopted from other countries (Selman, Forthcoming).

Different risk factors frequently involved in the adoption process might affect the development of these children (Johnson, 2002; Juffer & Van Ijzendoorn, 2005; Miller, 2005): prenatal and perinatal

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complications, being raised in unstructured families and/or overcrowded institutions with the subsequent low physical and emotional care, lack of hygiene and under stimulation (Brinich, 1995; Everett, 1999; Gunnar & Van Dulmen, 2007; Harlow, 1958; Hughes, 2007). Furthermore, early parental separation, institutionalization periods and frequent caretakers replacements, which are common in the early years of an adoptees' life, might facilitate later attachment problems. Also, it is important to emphasize the importance of the child-environment interactions during the first phases of the life for the appropriate development of the brain (Gunnar, Bruce, & Grotevant, 2000).

1.3. ADHD in children adopted from Eastern Europe countries

High rates of ADHD diagnosis and/or a marked presence of ADHD symptoms have been lately observed among internationally adopted children, according to parental assessment (Barcons-Castel, Fornieles-Deu, & Costas-Moragas, 2011; Jacobs, Miller, & Tirella, 2010; Simmel, Brooks, Barth, & Hinshaw, 2001) and to medication rates (Lindblad, Ringbäck Weitoft, & Hjern, 2010).

Different possible explanations for this fact have been proposed by several authors, like the effects of early deprivation (Colvert et al., 2008; Stevens et al., 2008), the amount of time these children spend in critical situations (Jacobs et al., 2010) and difficulties in the establishment of a secure attachment between the adoptees and their adoptive families (Abrines et al., 2012; Finzi-Dottan, Manor, & Tyano, 2006; Franc, Maury, & Purper-Ouakil, 2009). Other factors have also been related to higher rates of ADHD symptoms among adoptees, like the length of time spent with the adoptive family and the age of the child: the older they get, the more likely they are to be rated as hyperactive (Rojewski, Shapiro, & Shapiro, 2000).

However, the existence of ADHD symptoms seems to be higher in children adopted from Eastern Europe. As 34% of the internationally adopted children in Catalonia come from these countries, this will be the focus of this study.

A national cohort study conducted in Sweden, found that the Eastern Europe group showed the highest rate of ADHD medication prescribed, except for the group of females aged between 16 and 21 (Lindblad et al., 2010). In Minnesota, Gunnar and Van Dulmen (2007) established a relationship between being adopted from Eastern Europe and the existence of several behavioral disorders, like aggressive behavior, attention problems and social problems. In Columbia, Beverly, McGuinness, and Blanton (2008) observed that 42% of 55 children adopted from the former Soviet Union were labeled with ADHD. However, Jacobs et al. (2010) found no relation between the country of origin and scores in language, fine motor skills, visual reception, executive function, attention and sensory skills in a sample of 37 children adopted internationally in the United States.

One of the most important factors that has been considered to explain the lower developmental and behavioral performance of children adopted from Eastern European countries is the higher rate of alcohol consumption during pregnancy by mothers of institutionalized children in these countries (Gunnar & Van Dulmen, 2007; Miller, Chan, Tirella, & Perrin, 2009). According to the *World Health Organisation Global Database on alcohol use*, in Russia, 1 in 3 women of childbearing age regularly consumes alcohol and an increase in the consumption of substances has been observed in groups of any age in the former Soviet Union countries in general (Davis, 1994). Furthermore, 45% of 50 children institutionalized in Russia show facial phenotypes compatible with prenatal alcohol exposure (Miller et al., 2006). In Sweden, (Landgren, Svensson, Stromland, & Andersson Gronlund, 2010) observed that fetal alcohol spectrum disorders were identified for 52% and ADHD for 51% in a sample of 71 children adopted from Eastern Europe. In Canada, Robert et al. (2009) concluded that 69% of 29 children adopted from these countries showed physical parameters and/or neurological anomalies compatible with fetal alcohol spectrum disorder (FASD).

Hyperactivity and attention deficits are part of the symptoms that can be seen in children with FASD, like developmental delay, microcephaly, seizures, cognitive deficits, learning and memory impairments, poor psychosocial functioning and motor coordination deficits (Kvigne et al., 2004). Therefore, some symptoms of FASD can overlap with ADHD and can lead to misdiagnosis and consequent mistreatment.

However, assuming that all the difficulties observed in children adopted from Eastern Europe are due to the events that happened during the pregnancy period would be a very simplistic interpretation of the situation. Actually, Goldman and Ryan (2011) found that prenatal alcohol, tobacco and/or other drug exposure significantly influenced pre-adoption functioning, but not post-adoption adjustment. Nowadays, there is a trend in psychology toward looking for a biological/genetic cause for the display of these symptoms in order to find a quick method for understanding these symptoms and how to get rid of them as soon as possible. According to Gauthier (2011) "The history of the symptom, of the child who owns it, and of the family in which this child is being raised are not emphasized as strongly". In this context, the lack of consideration for all the factors involved in the histories of adoptive children and also of adoptive parents can contribute to the misinterpretation of some symptoms and to the consequent misdiagnosis of ADHD. Sometimes "the power dynamics of the medical, educational and welfare systems lock the diagnosis with its embedded meanings into the child's life" (Karnik, 2001). Therefore, the election of the treatment might be inadequate and symptoms might persist for longer periods, interfering with the adaptation process of the child to the family and social environment.

Until now, several studies have analyzed the display of ADHD symptoms in samples of children adopted from Eastern Europe and others have compared the existence of several behavioral problems in children adopted from Eastern Europe with children adopted from other regions of the world. However, as far as we know, no studies have compared the display of ADHD symptoms in a sample of children adopted from Eastern Europe with a sample of children adopted from other regions of the world.

So, the purposes of the present study were:

To compare the presence of ADHD symptoms in a sample of children adopted from Eastern Europe with a sample of children adopted from other regions and also to examine the influence of some personal and family factors in the display of ADHD symptoms: Sex, age, country of origin, age at adoption and socioeconomic and marital status of the adoptive parents.

2. Methods

2.1. Participants

Results from a total sample of 208 children (109 females, 99 males) aged between 7 and 10 were included in this study (Table 1). In order to avoid the influence of the adaptation period, children who had been living with their adoptive families for less than two years were excluded from the sample. Ninety-three children (34 females, 59 males) adopted by Catalonian families from Eastern European countries were assessed and compared with a sample of children adopted from other regions: 56 from Asia (51 females, 5 males), 33 from Africa (11 females, 22 males) and 26 from Latin America (13 females, 13 males).

About half of the families (53%) had a medium-high socioeconomic status and only 6% of the parents were under 40 years old.

Children adopted from Africa and Asia had a lower proportion of parents living as a couple (64% and 73% respectively) in

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Table 1
Characteristics of the sample.

	Country of origin											
	EE		LA		AS		AF		OR		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Sex												
Masculine	59	63.4	13	50	5	8.9	22	66.7	40	34.8	109	52.4
Feminine	34	36.6	13	50	51	91.1	11	33.3	75	65.2	99	47.6
Age												
7 years old	26	28	5	19.2	17	30.4	14	42.4	36	31.3	62	29.8
8 years old	28	30.1	12	46.2	22	39.3	10	30.3	44	38.3	72	34.6
9 years old	18	19.4	5	19.2	10	17.9	6	18.2	21	18.3	39	18.8
10 years old	21	22.6	4	15.4	7	12.5	3	9.1	14	12.2	35	16.8
Socioeconomic status												
High	14	15.4	4	15.4	14	25	11	33.3	29	25.2	43	20.9
Medium/high	45	49.5	17	65.4	29	51.8	18	54.5	64	55.7	109	52.9
Medium	22	24.2	3	11.5	7	12.5	4	12.1	14	12.2	36	17.5
Medium/low	10	11	1	3.8	4	7.1	0	0	5	4.3	15	7.3
Low	0	0	1	3.8	2	3.6	0	0	3	2.6	3	1.5
Age categories for both parents												
Older is ≤40	7	7.5	1	3.8	1	1.8	0	0	2	1.7	9	4.3
Older is 40–50	62	66.7	22	84.6	38	67.9	25	75.8	85	73.9	147	70.7
Older is 50–60	24	25.8	3	11.5	17	30.4	8	24.2	28	24.3	52	25
Is the parent who answers the questionnaire living as a couple?												
No	9	9.7	2	7.7	15	26.8	12	36.4	29	25.2	38	18.3
Yes	84	90.3	24	92.3	41	73.2	21	63.6	86	74.8	170	81.7
ADHD diagnosis												
Yes	21	22.6	2	7.7	1	1.8	0	0	3	2.6	24	11.5
No	72	77.4	24	92.3	55	98.2	33	100	112	97.4	184	88.5
ADHD treatment												
Yes	17	18.3	1	3.8	1	1.8	0	0	2	1.7	19	9.1
No	76	81.7	25	96.2	55	98.2	33	100	113	98.3	189	90.9

Note: NA = Non-adopted; EE = Eastern Europe; LA = Latin America; AS = Asia; AF = Africa; OR = Total other regions (including LA, AS and AF).

comparison to the other groups (Eastern Europe 90% and Latin America 92%).

Twenty-four children had a diagnosis of ADHD (21 adopted from Eastern Europe, 2 from Latin America, 1 from Asia) and nineteen children were in treatment.

2.2. Procedure

Children were recruited from the pediatric service of the *Hospital Sant Joan de Déu* in Barcelona. Invitation letters were sent from the hospital to the families of children aged between 7 and 10. Participants had been in contact through the general practitioner for the regular follow-up and therefore their contact details were in the data base of the hospital. All children included in the sample had been assessed by the pediatrician and at the moment of the assessment they did not present any nutritional deficit, infectious or parasitic disease.

Families who were interested in participating contacted the research team and had a 45 minutes appointment in the hospital offices. At the beginning of this appointment, participants and their parents were informed about the details of the procedure by a psychologist, and the informed consent form was signed by the parents. Finally, the parents filled in the questionnaires while the psychologist was available to clarify any concerns related to the questions. Afterwards, a psychological report with the results of the assessment was delivered to the family and, if required, treatment orientations were given. The whole sample was assessed between March 2009 and July 2010 by two psychologists.

2.3. Measures

One ad hoc questionnaire was administered in order to obtain relevant information about family data, health and development of the children. Data about the age at adoption, the country of origin, the marital status of the parents and the medical history of the children were collected through this questionnaire.

ADHD symptoms were analyzed using the *Swanson, Nolan, and Pelham-IV scale — SNAP-IV* (Bussing et al., 2008) completed by parents. The SNAP IV is a scale that quantifies the presence of ADHD symptoms specified by the DSM manuals.

The scale was based on the concept that the items (symptoms) in each ADHD domain describe an underlying dimension of behavior and each item was evaluated on a 4-point scale (Not at All = 0, Just a Little = 1, Pretty Much = 2, and Very Much = 3). In this study, scores from two subscales were taken into account:

- *Inattention*, which is characterized primarily by easy distractibility, disorganization, procrastination, and forgetfulness. E.g.: often makes careless mistakes in schoolwork, often loses things necessary for activities, often has difficulty executing directions, etc.
- *Hyperactivity/impulsivity*, which is characterized by a combination of abnormally high levels of activity and a tendency to initiate behavior with a lack of planning and without adequate forethought as to the consequences of the actions. E.g.: Often fidgets with hands or feet, often is "on the go", often has difficulty awaiting turn, and often interrupts or intrudes on others.

The *Hollingshead Four factor index of social status* (Hollingshead, 1975) was used to assess the socioeconomic status (SES) of the children. This scale combines information about the education level and the occupation of both parents to calculate the socioeconomic status of the family. It provides an overall SES score that is weighted as an average of an individual's education and occupation.

2.4. Data analysis

Statistical analyses were conducted using statistical software *Stata 11* (Release Stata/MP 11.1 for windows. College Station, TX: Copyright 2009 StataCorp LP).

A *T*-test was conducted in order to compare the presence of ADHD symptoms depending on the country of origin and a multivariate analysis was used to examine the influence of the following factors in the display of ADHD symptoms: sex, age, country of origin, age at adoption and socioeconomic and marital status of the adoptive parents.

3. Results

During preliminary analysis, to compare the presence of ADHD symptoms depending on the country of origin, *T*-tests for two group mean comparison was used. Table 2 shows that the group of children adopted from Eastern Europe showed significantly higher scores for Hyperactivity/impulsivity [t (3.71), $p<0.001$, $M=1$, $SD=0.66$] than the group of children adopted from other regions ($M=0.68$, $SD=0.55$). Also, significant higher means of Inattention scores [t (6.48), $p<0.001$] were observed for the group of children adopted from Eastern Europe ($M=1.41$, $SD=0.66$), compared to the group of children adopted from other regions ($M=0.82$, $SD=0.65$).

The effect of the country of origin – Eastern Europe vs. Other regions – in the display of ADHD symptoms was investigated using logistic regression (Table 3). First of all, two dichotomic outcomes were created: Hyperactivity/impulsivity and Inattention scores were

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Table 2
Comparison of the SNAP-IV mean scores depending on the country of origin.

	Country of origin		t	Df
	Eastern	Non Eastern		
Inattention	1.41 (0.66)	0.82 (0.65)	6.48***	204
Hyperactivity	1.00 (0.66)	0.68 (0.55)	3.71***	204

Note. Standard Deviations appear in parentheses below
*** $= p < 0.001$.

categorized according to the cut-offs of the SNAP-IV scale (1.78 for Hyperactivity/impulsivity and 1.44 for Inattention), obtaining clinical or non clinical scores for each participant. Odds ratio (ORs) and Confidence Intervals (CIs) are reported for both Hyperactivity/impulsivity and Inattention variables. Model was adjusted for possible confounders: sex and current age of the child, socioeconomic and marital status of the adoptive parents, country of origin and age of the child at adoption.

Logistic regression results show that the odds of obtaining clinical scores for the SNAP-IV scales were higher for the group of children adopted from Eastern Europe: more than three times higher for the Inattention scale ($OR = 3.3$) and more than twice as high for the Hyperactivity/impulsivity scale ($OR = 2.55$). Regarding the effects of the covariates in the model for the Hyperactivity/impulsivity scale, being a girl was a protective factor on the display of these symptoms (*OR*, 0.38), whereas non significant effects were observed for the other possible confounders on the display of these symptoms, such as socioeconomic and marital status of the adoptive parents, age of the child and age at adoption.

In the case of the Inattention scale, the age of the child was observed to have a significant effect, with older children demonstrating greater probability of showing inattention. The remaining covariates of this model had no significant effects.

Table 3
Logistic regression ADHD symptoms based on the country of origin.

Covariate	OR	95% Conf. Interval
Outcome variable: inattention (SNAP-IV), n = 195		
Country of origin by groups		
Other regions*	1	
Eastern Europe	3.3	(1.43–7.64)
Sex		
Masculine*	1	
Feminine	0.51	(0.23–1.14)
Socio economical status		
Medium/high*	1	
Medium	1.43	(0.55–3.71)
Medium/low	1.39	(0.38–5.13)
Age at adoption		
Per unit	0.99	(0.80–1.23)
Age at assessment		
Per unit	1.36	(1.00–1.85)
Is the parent who answers the questionnaire living as a couple?		
No*	1	
Yes	1.55	(0.48–5.01)
Outcome variable: hyperactivity/impulsivity (SNAP-IV), n = 195		
Country of origin by groups		
Other regions*	1	
Eastern Europe	2.55	(1.05–6.16)
Sex		
Masculine*	1	
Feminine	0.38	(0.16–0.91)
Socio economical status		
Medium/high*	1	
Medium	0.82	(0.28–2.36)
Medium/low	0.68	(0.13–3.50)
Age at adoption		
Per unit	1.11	(0.87–1.41)
Age at assessment		
Per unit	0.72	(0.49–1.05)
Is the parent who answers the questionnaire living as a couple?		
No*	1	
Yes	2.22	(0.59–8.28)

* Baseline category.

4. Discussion

As expected, these results confirm that children adopted from Eastern Europe are more likely to show ADHD symptoms than children adopted from other regions, according to their parents' opinion. Therefore, our results are in tune with the existent bibliography (Gunnar & Van Dulmen, 2007; Landgren et al., 2010; Lindblad et al., 2010).

Besides other factors involved in most of the international adoptions (institutionalization, environmental deprivation, low birth weight, poor care after birth, etc.), prenatal alcohol exposure is considered to be one of the main factors that might facilitate the existence of higher levels of hyperactivity, impulsivity and inattention among children adopted from Eastern Europe (Landgren et al., 2010; Miller et al., 2006). However, we could not demonstrate the relation of alcohol consumption during pregnancy by the mother with the display of the mentioned symptoms because most families did not have any information about the birth mothers of the children.

Given that some authors have observed that prenatal exposure to alcohol did not have a significant influence on post adoption adjustment (Goldman & Ryan, 2011), other specifics of the sample of children adopted from Eastern Europe should be explored in further research. Families who decided to adopt in Eastern European countries tend to believe that their child comes from the same cultural background as them and therefore they make less effort to acknowledge and incorporate the origin of the child in their lives and they seem to be less interested in a 'culture' that they feel is very similar to their own (Marre, 2007). As there is a need for openness of information in adoption in order to help children to manage their adoptive status (Neil, 2012), these families might need extra support in terms of helping their children make sense of their story.

Moreover, in Spain, there is a consensus among the adoption agencies and adoptive families according to which, in Eastern Europe, health problems must be exaggerated to allow the judge to authorize an international adoption (Marre, 2007). Furthermore, there is a widespread (and false) belief that the medical records of all children adopted in the former Soviet Union are not true and therefore parents are not prepared enough for the difficulties that their children might present. In this context, families who adopt in these countries are more likely to have an unrealistic idea of the child that they are expecting and more likely to struggle to accept – and deal with – the difficulties.

The second objective of this study was to explore which factors influence the higher display of ADHD symptoms among these children. In this regard, our results show that being a girl was a protective factor for the display of hyperactivity/impulsivity symptoms. Knowing that the prevalence of ADHD is higher among boys, and that girls with ADHD are more likely to be inattentive than hyperactive/impulsive, these data are not unexpected and are in tune with other studies.

Furthermore, our results show that the older children had more probabilities of showing inattention. In this regard, Rojewski et al. (2000), studied a sample of 39 girls adopted from China (aged between 1 and 9 years) and concluded that older adoptees were more likely to be rated hyperactive by their parents than young children. Our data show that this effect was not observed regarding the Hyperactivity/impulsivity scale but it was observed with respect to the inattention scale. Differences in the characteristics of the sample (this is a larger sample, including males and females, and children are adopted from other regions and of older ages) might account for the

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differences in these results. However, it is important to note that, in both cases, older children show more symptoms than younger children. Some environmental factors (e.g. increment of the stress and pressure in the school along the pass of the years, development of difficult family dynamics, etc.) might contribute to prompt the symptoms. Also, the current approach used to deal with these symptoms might not be helping enough, in which case a change in the approach to monitor and treat these symptoms should be considered.

In this study, the age of the child at adoption had no significant effects on the display of hyperactivity/impulsivity or inattention. These results seem to be contradictory to other studies where children adopted at older ages showed more inattention and received more pharmacological treatment for ADHD (Lindblad et al., 2010). According to Beverly et al. (2008), girls who were adopted after 36 months were more likely than girls adopted before 36 months to be labeled as ADHD. On the other hand, other studies did not find any relation between the age at adoption and the level of hyperactivity or inattention. Rojewski et al. (2000) observed that the age at adoption did not significantly influence hyperactivity and attention problems in a sample of girls adopted from China. Moreover, Miller et al. (2009) affirm that the age at arrival was not related with behavioral problems in a sample of 50 children adopted from Eastern Europe. This variety of results might be partly explained by differences in the life-events experienced by adopted children before the adoption moment, which are more important than the age of arrival to the adoptive family. The mentioned differences could be influencing the effect of the age at adoption, but the analysis of this variable is complicated due to the frequent lack of knowledge about the pre-adoptive information.

Finally, neither the socioeconomic nor the marital status of the adoptive parents had any significant effects on the appearance of hyperactivity/impulsivity or inattention symptoms. A better prognosis for children adopted by high socioeconomic status families would be expected, as they might have more access to resources to cope with the possible difficulties (economic, educational, support of their partner, etc.). However, our results did not support this hypothesis, which might be due to little intergroup differences regarding these variables. Also, it is worth considering that there might be other family characteristics that might be more important and that were not analyzed in this study. Adoptive parents have also their own story which has neither been easy or straight forward: accepting the inability to have a biological child (not always but in many cases), being examined to prove that they were able to raise a child, waiting for the child and raising expectations and anxieties, etc. (St-André & Keren, 2011). Furthermore, a higher percentage of insecure attachments among adoptive parents has been observed, which could mediate their capability to deal with the challenging behaviors of the child (St-André & Keren, 2011). Therefore, the interaction between the story of the adopted child and the adoptive parents is crucial in the understanding of the symptoms displayed by the child.

The limitations of this study must be considered to interpret the results. The sample includes children that were diagnosed with ADHD and receiving treatment, children that were diagnosed but not under treatment and children that were not diagnosed but who scored above the cutoffs in the questionnaires. We consider that whether or not a child receives a diagnosis depends on so many factors (e.g. the level of school demand, the willingness of the parents to consult when having problems, the personal opinion of the doctor, etc.). Therefore we decided to focus on the symptoms instead of on the diagnosis. Also, the increment of the sample of children adopted from other regions would be useful in order to segregate the group in three subgroups (Africa, Asia and Latin America) when conducting the statistical analysis.

5. Conclusion

Our results show that the frequencies of ADHD symptoms were markedly higher for children adopted from Eastern Europe when compared to children adopted from other regions. Therefore this group of children is at higher risk for the display of ADHD symptoms. However, the factors that might be involved in the onset of these symptoms are still very uncertain and difficult to analyze. The interaction between the story and characteristics of the adopted child and the story and characteristics of adoptive parents should be further explored in order to best help these children to adapt to their new family and society. Furthermore, we believe that understanding which post-adoptive events are more beneficial for the adaptation of these children would be more helpful (and easier to put into practice) than understanding the pre-adoptive factors that were more harmful.

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4.2. ADHD – like symptoms and attachment in internationally adopted children.

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ADHD-like symptoms and attachment in internationally adopted children

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Internationally adopted children seem to be more likely to show ADHD-like symptoms than non-adopted children. The aims of this study were to explore the existence of ADHD-like symptoms and/or diagnosis in a sample of internationally adopted children depending on their country of origin and to describe the links that may exist between the display of these symptoms and observed narrative-based attachment patterns. A Catalan sample of 58 adopted children aged 7–8 (24 from Eastern Europe, 23 from China, and 11 from Ethiopia) was assessed with the Behavioral Assessment System for Children to identify ADHD-like symptoms, and the Friends and Family Interview to identify children's' attachment patterns. Results indicated that children adopted from Eastern Europe showed a trend toward more hyperactivity and significantly more attention problems than girls adopted from China. Children with a secure attachment showed significantly less attention problems and a trend toward less hyperactivity. More studies focusing on the etiology and treatment of these symptoms in adopted children are needed.

Keywords: international adoption; ADHD; attachment

Introduction

International adoption: the case of Catalonia (Spain)

The purpose of the adoption, defined as a childhood protection measure, is to provide a family to abandoned children or those whose biological families are not able to care for them. Since the end of the nineties, about 40,000 children born in foreign countries have been adopted in Spain. From this total, 10,832 were adopted in Catalonia, a north eastern region in Spain and the place with the highest world rate of international adoption. This sharp rise in the number of adoptions has been promoted by the appearance of new family structures and a higher participation of women in the working world. Without the development of policies supporting the

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family and working life conciliation, women postpone their motherhood and as a consequence their fertility decreases (Marre, 2009).

The existence of prenatal (lack of prenatal control and substance exposure) and perinatal (low birth weight and prematurity) complications is quite frequent in internationally adopted children (Johnson, 2002; Miller, 2005). Besides, the environment where these children have been raised is not always the most adequate to promote the child's development, including unstructured families with limited economic resources and/or overcrowded institutions with great deprivations including low physical and emotional attention, lack of hygiene with exposure to infectious diseases, and absence of vaccination (Brinich, 1995; Everett, 1999; Gunnar & Van Dulmen, 2007; Harlow, 1958; Hughes, 2007). Furthermore, the importance of appropriate child-environment interactions during the first years of life for the healthy development of the brain has been highlighted by several authors (Gunnar, Bruce, & Grotevant, 2000). All of these pre-adoptive conditions could have consequences in the later physical and/or mental health of these children, with immediate (e.g. rickets and malnutrition) and longer-term (post-adoption) consequences including deficits in emotional functioning, cognitive impairment, and developmental delays (Gunnar & Van Dulmen, 2007; Juffer & van IJzendoorn, 2005).

Attention deficit hyperactivity disorder (ADHD)

ADHD is a behavioral disorder characterized by hyperactivity, impulsiveness, and a lack of attention. Its estimated prevalence ranges from 3–10% in school-aged children (Barkley, 1998) and some authors have described the prevalence of ADHD around the world as homogenous (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007). Even though it has been deeply studied in developed countries (Faraone, Sergeant, Gillberg, & Biederman, 2003), less is known about its prevalence in other regions of the world. No studies of ADHD in African and Eastern European populations were identified in the meta-analytic study by Faraone et al. (2003), and in the meta-analytic study by Polanczyk et al. (2007) lower ADHD prevalence rates were observed in Africa and the Middle East, compared with North America.

The core symptoms of this disorder must appear before the age of seven and be observed in at least two different situations (for example, at home and at school). Children with ADHD tend to have a lower school performance and poor social relationships. In spite of all of the existent studies focusing on the ADHD etiology, no direct causes of this disorder have been identified and gene-by-environment interactions appear likely to explain the etiology of this disorder (Nigg, Nikolas, & Burt, 2010).

As neurobiological factors, structural and functional differences have been found in different cerebral regions such as the pre-frontal lobe, the cerebellum, and the basal ganglia (Castellanos et al., 2002). Concerning ADHD and genetic heredity, most studies show evidence supporting the existence of a genetic influence in the display of this disorder (Faraone et al., 2005; Hudziak, Derks, Althoff, Rettew, & Boomsma, 2005). However, others have disputed these results. In one study they found no significant influence of genetic factors for activity, attention, and impulsivity (Heiser et al., 2006). Also, Joseph (2000) examined the evidence cited in favor of the operation of genetic factors in ADHD and concluded that a role for a genetic factor is not yet supported and that future research should be directed toward psychosocial causes.

In reference to the environmental factors, the influence of some prenatal (tobacco and/or alcohol consumption by the mother during pregnancy, high level lead exposure, etc) and perinatal (birth complications) factors in the appearance of the disorder has been observed (Eubig, Aguiar, & Schantz, 2010; Purper-Ouakil, Lepagnol-Bestel, Grosbellet, Gorwood, & Simonneau, 2010).

Finally, pathogenic environments generated by social factors (socio-economic status, disorganized family dynamics, family psychopathology) are considered to favor the appearance of the disorder. At the same time, they can lead to an increase of the severity of the symptoms and its associated impairments in multiple domains (Biederman, 2005; Biederman et al., 1995).

Attachment theory

Even though the origin of the attachment theory was in its origins focused on the relationship with the main caregiver during the early stages of life (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1971), Bowlby (1973) maintained that attachment is a lifespan process, and so attachment research came to focus on how best to observe or assess attachment beyond infancy and into adulthood. This venture began, it may be said, with the development of the Adult Attachment Interview (George, Kaplan, & Main, 1985, and an associated method of discourse analysis, Main, Goldywn, & Hesse, 2008) and, since then, many methods to assess attachment in middle childhood and early adolescence have also been developed including interviews focused on the identification of important attachment figures (e.g. Important People Interview; Kobak & Rosenthal, 2003) scales or questionnaires (e.g. Avoidant and Preoccupied Scales; Finnegan, Hodges, & Perry, 1996), methods to analyze drawings (e.g. Family Drawing; Fury, Carlson, & Sroufe, 1997), and several narrative discourse measures (e.g. Doll Story Completion Task; Granot & Mayseless, 2001).

For this study, the Friends and Family Interview (FFI) (Steele & Steele, 2005) was selected to analyze the narrative discourse of the children. This is an interview modeled after the AAI specifically for children aged 8–15 years that allows both the observation of the quality of the relationship with a specific person relevant to the child as well as to observe the general child's state of mind towards attachment. It was considered that with a sample of adopted children it would be difficult to assess the attachment of the child with the main carer, because the figure of the main carer might have changed many times along the life of these children. Therefore it was decided that it would be interesting to have information regarding the quality of the relationships of these children with different important people in their life, such as friends and teachers, which are a central focus of the FFI questioning.

According to Steele and Steele (2005), school-age children with a secure attachment are considered to have the capacity for missing, needing, and depending on others, to show openness to explore important relationships, and to have an ease with imperfections of self. On the other hand, children with an insecure/ambivalent attachment tend to be inflexible in their relationships, appear in need of constant confirmation from their caregivers, and show excessive blaming of parents or self. Finally, in the case of insecure/avoidant children, the self is portrayed as strong, with minimal articulation of being hurt, distressed, or needing others, and negative experiences are minimized. The FFI coding system also asks of the rater to consider the relevance of the disorganized/disoriented category, typified by fearful, anomalous, bizarre affects and cognitions.

Main and Solomon (1990) initially created this disorganized category of attachment in order to classify children who did not fit easily in any of the existing other categories (secure, resistant, avoidant). This new category was labeled as disorganized-disoriented attachment (after Bowlby's words to describe the normative response to loss), and included children who showed contradictory or incompatible strategies with the adult (AAI) correlate being lapses in monitoring of reasoning or discourse (Main & Hesse, 2008). This notion can also be applied to certain FFI responses governed by apprehension, fear, and signs of dissociation.

Links between ADHD and attachment patterns

ADHD-like symptoms have been related in different ways and by several studies with the inability to establish and maintain a secure attachment (e.g. Niederhofer, 2009). According to attachment theory, the relationship between the child and his main caregiver during the first stages of infancy allows him to acquire self-regulation abilities (Ainsworth et al., 1978; Main & Solomon, 1990), skills that are lacking in children with ADHD. Furthermore, having low emotional regulation skills could affect the early development of attention processes and behavioral inhibition in preschool aged children, leading them to show hyperactivity and attention deficit during their primary school years (Franc, Maury, & Purper-Ouakil, 2009).

Finally, attachment patterns and ADHD have been linked to children's temperament. A difficult temperament is considered as a risk factor for ADHD and for the development of an insecure attachment (e.g., Franc et al., 2009). Also, Finzi-Dottan, Manor, and Tyano (2006) found that children with ADHD are characterized by a difficult temperament manifested in high emotional reactivity and difficulties in self-regulation. According to these authors, parents of these children might try to manage their behavior by employing either intrusive control or permissive parenting. These strategies would contribute to the consolidation of insecure attachment patterns. In contrast, a secure attachment pattern and the consequent development of self-regulation skills, which allow children to deal with increased levels of arousal, would be promoted by an optimal parental style including flexible emotional responsiveness, consistency, and sensitivity to the full range of the child's emotions. These authors suggest the inclusion of parent training as an essential component in the treatment of children with ADHD.

ADHD symptoms in internationally adopted children

Several authors have stated that internationally adopted children are more likely to show ADHD-like symptoms than non-adopted children. In California, the existence of ADHD-like symptoms was examined with parent's reports in a sample of 808 adopted children and 21.8% of them met symptoms cutoffs for ADHD (Simmel, Brooks, Barth, & Hinshaw, 2001).

Likewise, in the United States, a sample of 37 internationally adopted children was assessed with the Conners' Parent Rating Scale completed by parents (Conners, 1997). "Significant problem" scores for hyperactivity were found for 14% of children and attention regulation parameters scored as "atypical" for inattention, hyperactivity, and ADHD traits, respectively, in 26, 42, and 28% of the children (Jacobs, Miller, & Tirella, 2010). In the same study, the age at arrival was found to be a very strong predictor of many of the outcome measures tested, including hyperactivity

and attention deficit, with children who were younger at arrival scoring better in each of these areas.

More specifically, this higher presence of ADHD symptoms seems to be more frequent in children adopted from Eastern Europe, which is the place of origin for 34% international adoptees in Catalonia. In Minnesota, Gunnar and Van Dulmen (2007) found that being adopted from Eastern Europe was related to the existence of several behavioral disorders, like aggressive behavior, attention problems, and social problems, according to the parent's opinion.

In reference to the ADHD label, to the best of our knowledge three studies have examined the proportion of children to have received an ADHD diagnosis among children adopted from Eastern Europe. Knowing that the prevalence of this disorder is 3–10% in general population, a higher proportion of this label was observed among children adopted from Eastern Europe in these studies: 25% (Glennen & Bright, 2005), 42% (Beverly, McGuinness, & Blanton, 2008), and 46% (Miller, Chan, Tirella, & Perrin, 2009). Unfortunately none of these three studies included a sample of children adopted from other countries, in order to compare the results of children adopted from Eastern Europe countries. However Jacobs et al. (2010), in the United States, assessed a sample of 37 internationally adopted children and found no relation between the country of origin and scores in executive function and attention skills.

One of the main suggested reasons to explain the possible presence of more difficulties in the adaptation process of children coming from Eastern Europe is the high rate of alcohol consumption during pregnancy by mothers of children institutionalized in these countries (Gunnar & Van Dulmen, 2007; Miller et al., 2009). In the former Soviet Union countries, an increase in the consumption of substances has been observed in all age groups (Davis, 1994) and more specifically, in Russia, where there is a high prevalence of alcohol consumption among women of childbearing age: 89% of non-pregnant women reported consuming alcohol and 65% reported binge drinking in the past 3 months, even if they were likely to become pregnant (Balachova et al., 2012). Furthermore, an increase of adolescent pregnancies has been observed. These problems are compounded by the inaccessibility of abortion and the absence of programs providing information about the effects of alcohol consumption during pregnancy in these countries. In this regard, 45% of children institutionalized in Russia show facial phenotypes compatible with prenatal alcohol exposure (Miller et al., 2006).

Despite the frequent lack of information about the pregnancy period and birth of many of these children, Johnson (2000) reports that more than 50% of the children institutionalized in Eastern European countries present low birth weight. In many cases they are premature, and some of them have been exposed to alcohol during pregnancy. In Canada, some authors found that 33% of the children adopted from Eastern European countries had alcoholic mothers (Feshbach, 2001; Landgren et al., 2006). Other authors concluded that 69% of children adopted from these countries showed physical parameters and/or neurological anomalies compatible with Fetal Alcohol Spectrum Disorder (FASD) (Robert et al., 2009).

ADHD and attachment in internationally adopted children

Several studies have assessed attachment patterns and the presence of inattention/over-activity among children adopted from Romania (Colvert et al., 2008; Kreppner, O'Connor, Rutter, & English and Romanian Adoptees Study Team, 2001; Rutter

et al., 2007; Sonuga-Barke & Rubia, 2008; Stevens et al., 2008) but no studies assessing both the presence of ADHD-like symptoms and attachment insecurity in samples adopted from other countries were found. Results from the English and Romanian Adoptees (ERA) study (Colvert et al., 2008; Kreppner et al., 2001; Rutter, Kreppner, & O'Connor, 2001; Rutter et al., 2007) yielded the hypothesis that inattention/overactivity (I/O) could constitute a specific deprivation syndrome and that it could also involve attachment difficulties. They assessed a sample of 165 children adopted into the UK from Romania following severe early deprivation and were compared with 52 UK adoptees (from within) who did not suffer deprivation.

Against this background, the aims of this study are two-fold:

- To explore the existence of ADHD-like symptoms and /or diagnosis in a sample of internationally adopted children depending on their country of origin.
- To describe the relationship between the display of these symptoms and their observed attachment patterns identified in their FFI-responses.

Methodology

Participants

Fifty-eight Catalan children aged between seven and eight and adopted from Eastern Europe, China, or Ethiopia were assessed. To meet inclusion criteria, children must have been living with their adoptive families for more than two years in order to avoid the influence of the adaptation period. The characteristics of the sample are presented in Table 1.

Table 1 shows that 24 children (12 male, 12 female) were adopted from Eastern Europe, 11 (five male, six female) from Ethiopia, and 23 girls from China. The group of children adopted from China had the lowest mean age at adoption ($M = 13.17$, $SD = 3.713$) and the group of children adopted from Ethiopia had the highest ($M = 49.91$, $SD = 19.445$).

Three children of the whole sample had received a diagnosis of ADHD at the moment of the assessment and all of them were from Eastern Europe. Two out of these three diagnosed children were receiving some kind of treatment (one of them was attending weekly psychology sessions and receiving homeopathic treatment and the other one was receiving methylphenidate).

Table 1. Descriptive analysis of the sample.

	Eastern Europe		*Ethiopia*		*China*		*TOTAL*	
Sex of the child	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Masculine	13	54.2	7	63.6	0	0	20	34.5
Feminine	11	45.8	4	36.4	23	100	38	65.5
TOTAL	**24**	**100**	**11**	**100**	**23**	**100**	**58**	**100**
	μ	**DS**	**μ**	**DS**	**μ**	**DS**	**μ**	**DS**
Age at assessment	7.46	0.509	7.45	0.688	7.52	0.511	7.48	0.538
Age at adoption	25.88	14.19	49.91	19.45	13.17	3.73	25.4	18.15
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
ADHD diagnosis	3	21	0	23	0	11	3	55
ADHD treatment	2	22	0	23	0	11	2	56

Measures

ADHD symptoms were analyzed using the Spanish version of the Behavioral Assessment System for Children checklist (BASC; Reynolds & Kamphaus, 1992). The BASC was designed to evaluate various aspects of behavior and personality, including positive (adaptive) as well as negative (clinical) dimensions. This assessment measure is multidimensional and information can be gathered and analyzed from the perspectives of the parent, teacher, and child. It consists of five components that can either be used in combination or separately: the Teacher Rating Scales, the Parent Rating Scales, the Self-Report of Personality (for children over 7), the Structured Developmental History form, and the Student Observation System. However, only the Self-Report of Personality and the Parent Rating Scales (PRS) were administered to this sample and only the attention problems and hyperactivity subscales of the PRS were used for this study. The PRS is composed of 134 items and provides separated punctuations for 12 subscales. T-Scores for each subscale can be obtained according to the BASC scales ($M = 50$, $SD = 10$). T-Scores over 70 are considered *clinical scores*, and T-Scores between 60 and 69 are considered *risk scores* (Reynolds & Kamphaus, 1992). The information obtained from this scale is not enough to make a diagnosis, but it gives information about the presence and extent of hyperactivity symptoms and/or attention problems.

Further details about the family data and the mental health of the child were collected with an *ad hoc* questionnaire, which included questions about the existence of an ADHD diagnosis and/or treatment.

Attachment was assessed using the Spanish version of the Friends and Family Interview (FFI; Steele & Steele, 2005), which is a semi-structured interview for children and adolescents (aged eight through 15) that asks young people a series of questions about themselves and their relationships with the most significant persons in their lives, including parents, friends, siblings, and teachers. This interview (as reported in Steele & Steele, 2005) is rated on a four-point scale (for low to high) coherence based on Grice's well-known maxims of good conversation: (1) truth, (2) economy, (3) relation, and (4) manner; also, a four-point rating is given evidence of safe/haven secure base availability from mother/father.

The FFI coding system (Steele, Steele, & Kris, 2009) also allows for the classification of overall interview-responses into one of four categories, based on the highest four-point rating assigned to each of the four patterned types of response: Secure attachment, Insecure-dismissing attachment, Insecure-preoccupied attachment, or Insecure-disorganized attachment. Interviews were video-recorded and transcribed. To the best of our knowledge, this is the first study assessing a Spanish sample with the Friends and Family Interview.

Procedure

The total sample was recruited from the database of the pediatric service of the Hospital Sant Joan de Déu, in Barcelona. It is a general pediatric service that conducts the general pediatric follow-up of healthy children. Therefore, children who were invited to participate did not have any specific disorder; what they had in common was that they were adopted 1–2 years before.

Invitation letters were sent from the hospital to all of the families having adopted children aged seven and eight. Parents of 58 children gave their agreement to

participate in the study and they were given a 45 minute appointment in the hospital offices, in order to take part in the assessment. As a first step of the assessment, the details of the procedure were explained by a psychologist and the informed consent form was signed by the parents. Then, a short and private interview was conducted with the parents to explore any relevant information about the child and/or the family. Finally, the child was interviewed by another psychologist (blind to the comments of the parents) while parents filled in the questionnaire in a separate office. In order to obtain the results of the assessment, T-Scores for the BASC scale were obtained.

Videos of the FFIs were transcribed verbatim and these were studied independently by two psychologists (trained by Dr H. Steele) to code the interviews. Both coders were blind to the parental responses regarding the ADHD diagnosis and symptoms. Afterwards, a psychological report with the results of the assessment was delivered to the family and treatment orientations were given if required.

In order to assess the inter-raters agreement, all of the interviews were double-coded. The inter-raters reliability was assessed by calculating the Spearman's RHO for each dimension (Table 2).

Table 2 indicates moderate to strong inter-rater agreement (range = .67–.82; median = .69). Ratings by the two coders were averaged for the resulting single scores, and classifications, relied on in the results below. The statistical analysis of the data was conducted with the 19.0 version of the Statistical Package for Social Science (SPSS).

In order to compare the effect of the country of origin on the display of attention problems and hyperactivity symptoms, a one-way between subjects ANOVA was conducted. We also compared the group of children adopted from each country of origin with regard to the scores on the FFI subscales using the Kruskal-Wallis test.

To compare the degree of hyperactivity and attention problems depending on the attachment pattern, independent-samples *t*-tests were conducted. Also, knowing that the ADHD prevalence is higher in boys and given the absence of boys in the group of children adopted from China, independent-samples *t*-tests were conducted to compare the degree of hyperactivity and attention problems depending on the sex of the child.

Finally, as the age at adoption seems to be related with the display of hyperactivity and attention problems and there were inter-group differences regarding the mean age at adoption, a Pearson's correlation coefficient was computed to assess the relationship between the degree of attention problems and hyperactivity symptoms and the age at adoption.

Table 2. Correlation between Rater 1 and Rater 2.

Friends and Family Interview subscales	Rho
Coherence	.73*
Evidence of safe/haven secure base	.69*
Secure attachment	.82*
Insecure dismissing attachment	.67*
Insecure preoccupied attachment	.67*
Insecure disorganized attachment	N/A because there is only one case

*$p < 0.01$.

Results

A one-way between subjects ANOVA was conducted to compare the effect of the country of origin on the display of hyperactivity and attention problems symptoms in children adopted from Eastern Europe, China, and Ethiopia (Table 3).

Table 3 reveals that there was a significant effect of the country of origin on the display of both hyperactivity symptoms [$F(2) = 3.239$, $p = .047$] and attention problems [$F(2) = 3.404$, $p = .04$] for the three conditions.

Post hoc comparisons for the display of hyperactivity using the Bonferroni test indicated that the mean score for the children adopted from Eastern Europe ($M = 54.50$, $SD = 9.031$) was trended toward being higher ($p = .09$) than the mean of children adopted from China ($M = 48.04$, $SD = 10.93$). However, the mean of children adopted from Ethiopia did not significantly differ from the mean of children adopted from China or from Eastern Europe.

Regarding the display of attention problems, post hoc comparisons using the Tamhane test indicated that the mean score for the children adopted from Eastern Europe ($M = 56.83$, $SD = 8.63$) was significantly higher ($p = .02$) than the mean of children adopted from China ($M = 49.13$, $SD = 9.86$). However, the mean of children adopted from Ethiopia did not significantly differ from the mean of children adopted from China or from Eastern Europe. Descriptive analysis regarding the attachment pattern of the children are presented in Table 4.

Table 4 shows that 60% ($n = 35$) of the sample was considered to have a secure attachment and the remaining children were considered to have some type of insecure attachment, 26% ($n = 15$) dismissing, 12% ($n = 7$) preoccupied, and only 2% ($n = 1$) disorganized. The group of girls adopted from China was the group with the highest proportion of children with secure attachment: 82.6% vs. 54.4% for Ethiopia and 41.7% for Eastern Europe. Table 4 further reveals that children adopted from Ethiopia had the highest proportion of children with an insecure dismissing attachment: 45.5% vs. 29.2 for Eastern Europe and 13% for China.

We compared the group of children adopted from each country of origin with regard to the scores on the FFI subscales (Table 5).

As Table 5 shows, statistical analyses using Kruskal-Wallis tests revealed significant differences between the countries of origin for the coherence, $\chi^2(2, N = 24) = 7.91$ ($p = .02$) though not for secure base/safe haven.

Post hoc testing of contrasts using Mann-Whitney was done for the Coherence scale and revealed significantly higher scores for the group of girls adopted from China when compared with the group of children adopted from Eastern Europe $U(N = 58) = 160.5$, $p = .01$ and Ethiopia $U(N = 58) = 66$, $p = .03$. No significant differences were observed between the group of children adopted from Ethiopia and Eastern Europe. In other words, the girls adopted from China showed a higher coherence when interviewed regarding their important relationships than children adopted from Eastern Europe or Ethiopia. Independent-samples *t*-tests were conducted to analyze if the higher scores in Coherence for the group of girls adopted from China were related to their gender, but no significant differences were found between boys and girls for this scale.

Given the small proportion of children with insecure-preoccupied and insecure-disorganized attachment, all children having insecure attachment were grouped in the same category in order to make comparisons with children showing a secure attachment, permitting an independent samples *t*-test comparing mean values for ADHD scores. In order to compare the degree of hyperactivity and attention

Table 3. Between subjects ANOVA for hyperactivity and attention problems depending on the country of origin.

	Eastern Europe			China			Ethiopia			Total					
BASC P2	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev	*df*	F	*p*
Hyperactivity	24	54.5	9.031	23	48.04	10.9	11	55.55	9.95	58	52.14	10.38	2	3.239	.047
Attention Problems	24	56.83	8.631	23	49.13	9.859	11	54.55	13.92	58	53.34	10.68	2	3.404	.040

Table 4. Distribution of the attachment patterns depending on the country of origin.

Attachment pattern	Eastern Europe		China		Ethiopia		Total	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Secure	10	41.7	19	82.6	6	54.5	35	60.3
Insecure	14	58.3	4	17.4	5	45.5	23	39.7
Insecure dismissing	7	29.2	3	13	5	45.5	15	25.9
Insecure preoccupied	6	25	1	4.3	0	0	7	12.1
Insecure disorganized	1	4.2	0	0	0	0	1	1.7
TOTAL	**24**	**100**	**23**	**100**	**11**	**100**	**58**	**100**

problems in children with secure and insecure attachment two independent-samples *t*-tests were conducted (Table 6).

Table 6 reveals that children with an insecure attachment trended toward higher hyperactivity scores ($M = 55.17$, $SD = 10.04$) than children with a secure attachment ($M = 50.14$, $SD = 10.26$) [$t(56) = 1.843$, $p = .071$]. Regarding the degree of attention problems, children with an insecure attachment obtained significantly higher attention problems scores ($M = 58.13$, $SD = 11.28$) than children with a secure attachment ($M = 50.20$, $SD = 9.13$) [$t(56) = 2.943$, $p = .005$].

Regarding the effect of the sex of the child on the display of the ADHD-like symptoms, independent-samples *t*-tests were conducted to compare the degree of hyperactivity and attention problems depending on the sex of the child and no significant differences were found between boys and girls.

A Pearson's correlation coefficient was computed to assess the relationship between the degree of attention problems and hyperactivity symptoms and the age at adoption, but no correlation was found.

Discussion

The existence of a higher presence of attention problems and hyperactivity among internationally adopted children compared to the general population has been suggested by several authors (Jacobs et al., 2010; Lindblad, Ringbäck Weitoft, & Hjern, 2010; Simmel et al., 2001). In this regard, with respect to the first hypothesis guiding the current study, our results showed that the scores for the hyperactivity and attention problems scales obtained by the group of children adopted from Ethiopia and Eastern Europe were higher than expected, but lower for the group of girls adopted from China. However, the comparison of these results with the scores obtained by a sample of Catalonian and non-adopted children assessed with the same instrument would be required to more fully understand this picture.

Our findings also showed possible differences in the existence of ADHD-like symptoms depending on the country of origin. In our sample the group of children adopted from Eastern Europe showed significantly higher attention problems scores and a trend toward significantly higher hyperactivity scores than the group of children adopted from China. These results were consistent with other studies where the children adopted from Eastern Europe were showing more ADHD-like symptoms (Gunnar & Van Dulmen, 2007) and were receiving more ADHD

Table 5. Kruskal-Wallis comparisons of scores on the friends and family interview depending on the country of origin.

Friends and Family Interview	Eastern Europe			China			Ethiopia			Total					
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	*df*	χ^2	*p*
Coherence	24	2.65	.739	23	3.21	.821	11	2.67	.608	58	2.88	.787	2	7.906	.019
Safe haven/ Secure base	24	2.27	.737	23	2.58	.703	11	2.31	.643	58	2.4	.710	2	2.353	.308

Table 6. Hyperactivity and attention problems depending on the attachment pattern.

	Attachment pattern						
	Secure ($n = 35$)		Insecure ($n = 23$)				
	M	*SD*	*M*	*SD*	*t*	*df*	*Sig. (2-tailed)*
Hyperactivity	50.14	10.26	55.17	10.04	1.84	56	.07
Attention problems	50.20	9.129	58.13	11.28	2.95	56	.005

medication (Lindblad et al., 2010). However, no differences were observed between the group of children adopted from Eastern Europe and the group of children adopted from Ethiopia, but the small sample of the children from Ethiopia makes it difficult to draw any conclusions.

Knowing the higher incidence of ADHD among boys (especially for the hyperactivity/impulsivity subtype), the absence of boys in the group of children adopted from China could be considered as one possible reason for the lower hyperactivity scores in this group. However, no relation was found between sex and the existence of these symptoms in our sample and, therefore, the distribution of sex regarding the ADHD-like symptoms in our sample of internationally adoptees does not show a male predominance as has been suggested by the ERA studies (Kreppner et al., 2001; Stevens et al., 2008). The current results (stemming from the study's second hypothesis) suggest that attachment status, rather than gender, may be a more significant factor in the occurrence of ADHD symptoms among internationally adopted children.

The fact that the group of girls adopted from China had a significant lower age at adoption than the group of children adopted from Eastern Europe was considered as another possible reason for the lower display of ADHD-like symptoms among the group of girls adopted from China, but no relation was found between the display of these symptoms and the age at adoption in our sample. Consequently, the age at adoption could not justify the differences observed between these two groups.

The length of the institutionalization period has been linked to the child's behavioral outcomes by several authors, proposing a "sensitive period" after which institutionalization is particularly detrimental. This period ranges from two months (Groza & Ryan, 2002) to 24 months (Gunnar & Van Dulmen, 2007) and has been related to the appearance of difficulties in many areas, including frustration tolerance, adaptation to change, establishment of affective bonds, attention, executive functions, self-motivation, self-regulation, etc (Bimmel, Juffer, van IJzendoorn, & Bakermans-Kranenburg, 2003). Studies of the ERA sample stated that the effect of the institutionalization was significantly higher after six months (Colvert et al., 2008; Kreppner et al., 2001; Stevens et al., 2008). In contrast to these studies (and in agreement with our results) other studies found that the age at adoption had no effect on behavioral outcomes (Groza & Ryan, 2002; Juffer & van IJzendoorn, 2005).

It is important to bear in mind that the age at adoption is not the same as the time of institutionalization, given that some children have spent time with their biological families or in foster care before they were adopted. Also differences in the quality of the care given in each institution may account for some of the disparities in

these results. Therefore, the effect of the age at adoption is modulated by the different events experienced by each child during the pre-adoptive period. Unfortunately this information could not be analyzed in this study because the majority of the families had very little information about their children's life before they were adopted. In this regard, the existence of more studies comparing institutionalized children with children who lived with their biological or foster families is required.

Furthermore, differences in the background of the adoption process in each country of origin are considered as another factor influencing the hyperactivity scores of each group. In the case of children adopted from Eastern Europe, outcomes in many areas are related with the alcohol consumption by their mothers during pregnancy. In Russia, 899 women were interviewed about their alcohol consumption habits and their findings showed that nearly all pregnant women drank during the year before they became pregnant; of these, 60% reported drinking when they knew they were pregnant, and 34.9% drank in the 30 days before the interview (Kristjanson, Wilsnack, Zvartau, Tsoy, & Novikov, 2007). Knowing the high level of alcohol consumption by pregnant women in Russia, the higher risk of some difficulties during their children's development is assumed, including more hyperactivity and attention problems.

In the case of China, the increase of the international adoption was justified by the abandonment of girls in orphanages, as a result of the government's one child per family policy, which penalizes families for having more than one child. Therefore, institutionalized children in China are more likely to be associated with political reasons and less likely to be associated with a low socio-economic status and alcohol abuse by birth parents, in comparison with the situations given in other countries of origin. In this regard, it is assumed that biological mothers of children adopted from China may take more care of themselves during pregnancy than mothers from other countries of origin, as it is not the child that is unwanted but the gender. Therefore, a better health status of the child is hypothesized.

In Ethiopia, the adoption process is more often associated with poverty, parent illness, or death. Biological families tend to keep their children for a longer time than in China or Eastern Europe and, in many cases, children live with their extended family or neighbors for as long as possible. Consequently, the mean time of institutionalization tends to be shorter than in other countries, with many children living with their families until a few months before the adoption moment. In this way, it is suggested that these children must receive a more individualized and higher quality care during the pre-adoptive period.

However, the prenatal information about institutionalized children and the life-events they experienced before the moment they were adopted is unlikely to be available after adoption because in many cases adoptive families cannot provide detailed information about the pre-adoptive period of their children. Even though the direct assessment of these pre-adoptive variables is highly complicated, it is important to take them into consideration.

With respect to the study's second hypothesis, the observed narrative-based attachment patterns of the children, it is interesting to mention that when children adopted from Ethiopia were insecure, they were always categorized as dismissing. Cultural differences in child rearing practices between Europe and Africa should be further explored and considered a useful route to understanding the way these children relate to their adoptive families. Interestingly, no differences in secure base/safe haven availability were observed across all groups, and only one child fit with

the disorganized group, highlighting the non-clinical nature of the sample, albeit that they all shared the status of being adopted. That safe haven/secure base scores did not distinguish the groups, while coherence (a strong feature of security) was linked to lower ADHD symptoms, points to the probable integrating and regulating influence of coherent speech concerning attachment issues.

Girls adopted from China seem to show higher narrative coherence when describing their relationships with friends and family. Again, differences in their pre-adoptive experiences and the quality of the institutionalization period might explain some of these differences but more pre-adoptive information would be needed to allow further analysis.

Regarding the possible links between attachment patterns and the appearance of ADHD-like symptoms, our findings confirm the results obtained by other authors (e.g. Niederhofer, 2009); children with a secure attachment showed less attention problems than children with an insecure attachment. The same tendency could be observed for the hyperactivity scale, although differences were only trending toward significance.

Despite the observation of the relationship between the ADHD-like symptoms and an insecure attachment, the difficulty falls on the determination of which disorder is the origin of the symptoms or if there are other factors mediating the relation between these two disorders. The development of an insecure attachment during the first period of childhood can generate the appearance of ADHD-like symptoms later during the school age, and vice versa, children with an ADHD diagnosis can have more difficulties in the establishment of a secure attachment pattern with their caretakers. Also, as suggested by other authors (Colvert et al., 2008; Kreppner et al., 2001; Stevens et al., 2008), the existence of a deprivation syndrome including attachment difficulties, inattention, and hyperactivity should be considered.

In any case, the promotion of family bonds and parenting strategies to deal with their children's behavior would help these children to regard their parents as secure bases and to improve their self-regulatory abilities. Thus, this increase in the security of their attachment to their parents may facilitate their capacity to deal with anxiety. This, in turn, would be followed by a decrease in hyperactivity and attention problems, enhancing the wellbeing of the child and his family.

The emergence and/or severity of ADHD symptoms have been linked to the absence of parental skills thought to be vital in promoting a secure attachment pattern with their children (Pinto, Turton, Hughes, White, & Gillberg, 2006). These authors found that the existence of maternal unresolved mourning during pregnancy was related with the appearance of ADHD symptoms in the child. These authors concluded that "a vicious cycle may be set up where a mother who is dissociating (because of her unresolved mourning status) is inadvertently frightening to her child, who then becomes more demanding and difficult (ADHD-like behavior)" (Pinto et al., 2006, p. 89). In the same vein, it is important to consider that in the case of adoptive parents the existence of some kind of unresolved mourning related with parenthood is quite a common phenomenon (e.g. over fertility issues and the inability to conceive a child). In this regard, the possibility of impoverished parenting skills to promote a secure attachment among adoptive parents due to their unresolved mourning should be considered, as well as its possible influence on the display of ADHD-like symptoms among adopted children. It is a limitation of the current work that the AAI was not administered to the adoptive parents and a suggestion for further work to take this valuable informative step.

Limitations

The limitations of this study reach beyond this absence of the AAI, and contribute to difficulty in interpreting the results. First of all, the characteristics of the sample should be discussed given that only 208 out of 1700 invited children gave their agreement to participate in the study and this could produce a considerable bias in the sample. Many families had their last appointment with the pediatrician more than five years ago, so the address on their database records was not their current address. Consequently we assume that some of the invitation letters were not received by the families. Also, there were many families who were living more than 200 kilometers from the hospital and they might have not accepted to participate given the substantial distance to travel. Regarding the families that participated in the study, we are aware that some of the parents were motivated to participate in the study because they were having troubles with their child and it was a good opportunity to seek help. Still, the motivation to participate by of some other families was to demonstrate that the adoption of their child was a very successful one. In this regard, even though the sample is not randomized, there is a representation of both healthy and unhealthy children.

Additionally an increase of the sample size would be required, especially for the group of children adopted from Ethiopia, in order to obtain a higher similarity of the groups. Moreover, there is a need of the comparison of these findings with the results obtained by a sample of non-adopted children.

Conclusions

The display of attention deficit and/or hyperactivity in internationally adopted children might be related with different factors when compared with the display of these symptoms in the general population, such as the health conditions of the mother during pregnancy, their history of different placements, the length of institutionalization, etc. In our study, these ADHD-like symptoms were mostly related with being adopted from Eastern Europe and with having an insecure attachment. More studies focusing on the etiology of these symptoms in adopted children is needed.

Furthermore, more research assessing the effectiveness of the first line ADHD treatments in adopted children who show inattention, hyperactivity, and attachment difficulties is required. This will allow for the provision of the best diagnosis and treatment for these children, according to their specific needs and taking the characteristics and their vital history into account.

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4.3. A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours.

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Comparación directa de niñas adoptadas en China y Europa del Este: Ansiedad, hiperactividad/impulsividad, inatención y conductas desafiantes.

A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours.

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Short title**:** *Eastern European and Chinese adopted girls*

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This study is included from 2008 until 2009 in the Research project MEC *R*+D SEJ 2006-2009 15286 *International Adoption: social and familial inclusion of the internationally adopted children. Interdisciplinary and comparative perspectives,* and from 2010 in the continuation of the same project: *National and international adoption: family, education and pertinence: interdisciplinary and comparative perspectives* (CSO2009-14763-C03-01) (Subprogram SOCI), both funded by the Spanish Ministry of Science and Innovation.

Comparación directa de niñas adoptadas en China y Europa del Este: Ansiedad, hiperactividad/impulsividad, inatención y conductas desafiantes.

Estudios previos sobre menores adoptados han mostrado que los menores adoptados en Europa del Este (EE) tienen más probabilidades de mostrar inatención e hiperactividad/impulsividad mientras que las niñas adoptadas en China (CH) suelen obtener puntuaciones normales en adaptación, aunque a medida que crecen, puede que aumenten las conductas internalizantes. Comparamos directamente las puntuaciones obtenidas en el *SNAP-IV* (Hiperactividad/Inatención) y el *SCARED* (Ansiedad) por niñas adoptadas en CH (*n*=42), EE (*n*=34) y en otros países (*n*=32). EE muestran más inatención, hiperactividad/impulsividad y conductas desafiantes que CH, independientemente de la edad de adopción y del número de hermanos. La edad de adopción solo tiene un efecto significativo sobre las conductas desafiantes. No se observan diferencias significativas en ansiedad entre los grupos. En general, los niveles de ansiedad están relacionados con la hiperactividad/impulsividad. Factores específicos relacionados con la adopción en cada una de estas regiones podrían explicar parte de las diferencias en inatención, hiperactividad/inatención y conductas desafiantes y se deberían tener en cuenta para potenciar la adaptación de los adoptados.

Palabras clave: Adopción internacional, China, Europa del Este, Ansiedad, Inatención, Hiperactividad/impulsividad, conductas desafiantes.

A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours.

Previous research looking at adopted children has shown that children adopted from Eastern Europe (EE) are more likely to show inattention and hyperactivity/impulsivity whereas girls adopted from China (CH) tend to have normative adjustment scores, although as they grow up, internalising behaviours might increase. We directly compare parental ratings of the *SNAP-IV* (Hyperactivity/Inattention) and *SCARED* (Anxiety) of girls adopted from CH (*n*=42), EE (*n*=34) and other countries (*n*=32). EE were more likely to show inattention, hyperactivity/impulsivity and defiant behaviours than CH, independent of age at adoption and number of siblings. The age of the child only had a significant effect on defiant behaviours. No significant differences in anxiety were observed between groups. Overall anxiety levels were related to hyperactivity/impulsivity. Specific factors related to adoption in each region might account for differential levels in inattention, hyperactivity/impulsivity and defiant behaviours and should be taken into account to aid the adjustment of adoptees.

Key words: Intercountry adoption, China, Eastern Europe, Anxiety, Inattention, Hyperactivity/impulsivity, defiant behaviours.

Introduction

During the last decade, the adjustment of international adoptees has become an important area of interest within the field of developmental and clinical child psychology and therefore a broad range of research is now available. The country of origin seems to be an important factor related with the post-adoptive adjustment of international adoptees. However, most of the studies have either looked at mixed samples or samples of children adopted from a particular region of the world, but fewer studies have directly compared samples of children adopted from specific regions.

The two donor countries where Spanish families have been adopting most frequently during the last years are China and Russia. In Catalonia, where this study was performed, out of the 3686 children that were internationally adopted between 2007 and 2011, 1595 (43.19%) were adopted from some Eastern European country, 1355 (36.76%) children from Russia, and 705 (19.12%) from China (Institut Català de l'Acolliment i de l'Adopció, 2011).

Existing literature has observed relevant differences in the adjustment and development of children coming from these two regions of the world. So far, research looking at the development of children adopted from China has observed that they seem to adjust quite easily to their adoptive families and they are not likely to show major developmental, behavioural or emotional problems. Rojewski, Shapiro, & Shapiro, (2000) examined the behaviour of 45 children adopted from China aged between one and nine years and found that all the scales were in the average range and that age at adoption had no influence on their behaviours. However, older adoptees from this country were more likely to be rated as hyperactive or aggressive while younger adoptees were more likely to exhibit withdrawal. Tan & Marfo (2006) examined 517

preschool and 178 school-age adopted girls and observed that Chinese adoptees were significantly better adjusted than normative US samples and preschool-age adoptees had better behavioural adjustment than school age adoptees, independent of the age at adoption. However, pre-adoption neglect and post-adoption initial rejection behaviours were predictors of behavioural adjustment scores. In a longitudinal follow up of this sample, Tan (2009) observed that there was a moderate to strong stability from time 1 to time 2 in the children's behavioural adjustment and academic performance but there was a significant increase in the number of children with deviant internalizing problems. At both times higher degrees of pre-adoption adversity were related to more internalising problems and poorer academic performance. Tan, Dedrick, & Marfo, (2007) assessed the behavioural adjustment of 707 girls adopted from China and observed that while they showed similar or better behavioural adjustment than normative samples, they also tended to manifest higher levels of sleep problems. Cohen & Farnia (2011) examined internalizing and externalizing behaviours in 70 girls adopted from China within the first month of adoption and again at 6, 12 and 24 months later. Results indicated that from six months post-adoption onward, adopted children exhibited a rapid increase in emotion reactivity (internalising behaviours).

In comparison, children adopted from Eastern European countries seem to be more likely to present developmental, behavioural and/or emotional problems and therefore their adjustment to the adoptive family seems to be more complicated. Particularly, previous research has shown that these children are more likely to display ADHD symptoms and/or to be diagnosed with ADHD, according to parental ratings and to medication rates. Lindblad , Ringbäck Weitoft, & Hjern (2010) conducted a national cohort study in Sweden and observed that the Eastern Europe group showed the highest rate of ADHD medication prescribed. In Minnesota, Gunnar & Van Dulmen (2007)

found that being adopted from Eastern Europe was related to the display of several behavioural disorders, such as aggressive behaviour, attention problems and social problems. According to Beverly, McGuinness, & Blanton (2008) 42% of 55 children adopted from the former Soviet Union were diagnosed with ADHD in Columbia.

Previous to this study, Abrines et al. (2012) compared the scores of 93 children adopted from Eastern Europe obtained with the *Swanson, Nolan, and Pelham–IV (SNAP-IV)* scale with the scores of 115 children adopted from other regions. They observed that children adopted from Eastern Europe showed more ADHD symptoms than children adopted from other regions. Also, being a girl was a protective factor for the Hyperactivity/impulsivity scale and older children were more likely to show inattention.

To the best of our knowledge, three studies have directly compared children adopted from China with children adopted from Eastern European countries. Tessler, Adams, Houlihan, & Groza (2004) compared matched samples of school-aged girls adopted from China and Romania and found that mothers with children adopted from Romania tended to report more strain in these relationships than mothers of children adopted from China. Pomerleau et al. (2005) compared the psychological development of 123 children adopted from China, East Asia and Eastern Europe and found that children adopted from Russia had a lower Mental Development Index (Bayley, 1993) than the others. Abrines et al., 2012b) compared 24 children from Eastern Europe with 23 from China and 11 from Ethiopia and observed that children adopted from Eastern Europe showed a trend toward more hyperactivity/impulsivity and significantly more attention problems than girls adopted from China.

Several factors have been considered when trying to explain why children adopted from China present a better adjustment than children adopted from Eastern

Europe, including differences in the pre-natal and pre-adoptive conditions experienced by institutionalised children in these countries. Also, gender differences have been considered, as most of the children adopted from China are girls. That means that studies looking at Chinese adoptees normally look at girls whereas studies looking at children adopted from Eastern Europe normally use mixed samples. Knowing that in normative samples, girls are more likely to show internalizing symptoms whereas boys tend to present externalizing symptoms and that internalizing behaviours are less noticeable, this could partly explain why Chinese adoptees are perceived to have a better post-adoptive adjustment. Taking into account this information, the aims of this study are:

1. To directly compare girls adopted from China with girls adopted from Eastern Europe in terms of levels of anxiety, hyperactivity/impulsivity, inattention and defiant behaviours, in order to avoid a confounding of gender between the two samples.
2. To observe the effect of socio-demographic variables (country of origin, age, age at adoption and number of siblings) on the display of anxiety, hyperactivity/impulsivity, inattention and defiant behaviours.
3. To assess the relationship between the display of anxiety and the levels of hyperactivity/impulsivity, inattention and defiant behaviours independent of the socio-demographic variables.

Method

Participants

A sample of 108 girls was recruited from the paediatric service of the *Sant Joan de Déu Hospital* in Barcelona. The girls were aged between 7 and 11 (M = 8.26; SD = 1.20) and

had been adopted at a mean age of 27.19 months (SD = 21.52). The sample was divided in three groups depending on the country of origin: 42 from China, 34 from Eastern Europe and 32 from other countries, as a comparison group (including Ethiopia, Madagascar, Colombia, Nepal, Guatemala, Mexico, India, Congo and Haiti). All girls included in the sample had been assessed by the paediatrician and did not present any nutritional deficit, infectious or parasitic disease when participating in the study. Also, children who had spent less than two years living with their adoptive family were excluded of the sample, in order to avoid the possible influence of the adaptation period.

Procedure

Invitation letters were sent to the families of adopted children aged between 7 and 10 who attended the paediatric service for regular follow-up (the participants' contact details were obtained from the data base of the hospital).

Families interested in participating contacted the research team and attended a 45 minutes appointment at the hospital offices. First of all, families were informed about the details of the procedure by a psychologist and informed consent forms were signed by the parents. Then, the parents filled in the questionnaires while the psychologist was available to clarify any concerns related to the questions. Afterwards, a psychological report with the results of the assessment was delivered to the family and, if required, treatment orientations were given. The whole sample was assessed between March 2009 and July 2010 by two psychologists.

Measures

The *Screen for Child Anxiety Related Emotional Disorders - SCARED* (Birmaher et al., 1997; Vigil-Colet et al., 2009) was administered to the parents to analyse the existence of anxiety symptoms. The SCARED is a self-report questionnaire composed of 41 items

and parents are asked the frequency of each symptom on a 3-point-scale: 0 (Almost ever), 1 (sometimes) and 2 (often). The scale yields four first order factors related to the DSM-IV classification of anxiety disorders (*Panic/somatic, Generalised anxiety, Separation anxiety,* and *Social phobia)* and a second order factor of general anxiety.

The *Swanson, Nolan, and Pelham–IV scale - SNAP-IV* (Bussing et al., 2008) was administered to the parents to analyse the display of ADHD symptoms. The SNAP IV is a scale that quantifies the presence of ADHD symptoms specified by the DSM manuals. The scale was based on the concept that the items (symptoms) in each ADHD domain describe an underlying dimension of behaviour and each item was evaluated on a 4-point scale (Not at All = 0, Just a Little = 1, Pretty Much = 2, and Very Much = 3). In this study, scores from three subscales were taken into account: *Inattention, Hyperactivity/impulsivity, and defiant behaviours*.

Finally, relevant information regarding the adoption of the child was collected using one *ad hoc questionnaire*. E.g: age at adoption, country of origin, number of siblings.

Data analysis

Statistical analyses were conducted using SPSS statistical software (SPSS for Windows, Rel. 19.0.0. 2010. Chicago: SPSS Inc.).

A one-way between subjects ANOVA was conducted to compare the effect of the country of origin in the levels of anxiety, hyperactivity/impulsivity, inattention and defiant behaviours in girls adopted from China, Eastern Europe and other countries.

Hierarchical multiple regression analysis were performed for all children adopted from China and Eastern Europe (n = 76) in order to observe the effect of demographic variables (age, age at adoption and number of siblings) on the display of

on total anxiety, hyperactivity/impulsivity and defiant behaviour in the first step of the analyses. Furthermore, the effect of country of origin on symptoms independent of demographics was included in a second step.

Finally, to assess the interrelations between the display of anxiety and the levels of hyperactivity/impulsivity, inattention and defiant behaviours independent of socio-demographic characteristics, a partial correlation was performed with country of origin, age, age at adoption and number of siblings as control variables.

Results

In the first step of the analyses standard techniques were used for the analysis of between group differences (e.g., analysis of variance with Tukey's HSD post hoc comparisons) to test whether the levels of anxiety, hyperactivity/impulsivity, inattention and deviant behaviours for adopted children would differ dependent on their country of origin as hypothesised. Socio-demographic variables (age of the child, age at adoption and number of children in the family) were also included in the analysis.

As represented in Table 1, no significant differences were observed between the three groups in terms of age of the girls or the number of children in the family. However, significant differences were observed for the age at adoption ($F(2, 105) = 26.58$, $p<.001$). On average, girls adopted from China were adopted at the youngest age (M=13.31 months, SD=4.98) whereas girls adopted from other countries were adopted at the oldest age (M=43.44 months, SD=21.67).

Regarding the SNAP-IV, there were no differences between groups in hyperactivity ($F(2, 105) = 2.15$, $p=.12$) but differences were significant for inattention

($F(2, 105) = 12.27$, $p<.001$) and defiant behaviours ($F(2, 105) = 5.64$, $p=.005$). Simple comparisons revealed that girls adopted from Eastern Europe obtained significantly higher scores than girls adopted from China on bot inattention [EE (*M*=1.24, *SD*=.62) vs. CH (*M*=.55, *SD*=.58)] and defiant behaviours [EE (*M*=.76, *SD*=.53) vs. CH (*M*=.41, *SD*=.38)] (all *p's* <.005). In addition, in comparison to girls adopted from other countries girls adopted from Eastern Europe obtained higher scores on defiant behaviours [EE (*M*=.76, *SD*=.53) vs. Others (*M*=.48, *SD*=.55)] while girls adopted from China were rated by their parents as showing less inattention [CH (*M*=.55, *SD*=.58) vs. others (*M*=.94, *SD*=.61)] (all *p*'s < .05)

As for the scales measured by the SCARED, no significant differences were observed between any of the groups (*F*'s (2, 105) = .4 to 1.9, all *p*'s > .15).

========== Table 1 about here ==========

In the second step of the analysis, hierarchical multiple regression analysis were performed on total anxiety, hyperactivity/impulsivity and defiant behaviours scales for all girls adopted from China and Eastern Europe (*N*= 76), entering predictor variables in two subsequent steps (see Table 2).

Demographic variables (child age, child age at adoption, number of children in the family) were entered in Step 1 to test and control for scale differences on these variables. As showed in Table 2, the older girls are at a higher risk of presenting defiant behaviours (β=.34, $p<.01$). No other significant results were observed at this first step.

Then, a dummy variable to compare adoptees from China to those from Eastern Europe (China = 0) was entered in Step 2 to determine the effect of the country over and above the effects of demographics. As expected according to results in the previous

section, girls adopted from Eastern Europe were at a higher risk than girls adopted from China of displaying inattention (β=.51, p<.001) and defiant behaviours (β=.35, p<.01), but not of showing more anxiety symptoms. However, when controlling for demographic variables, girls adopted from Eastern Europe are also more likely to be rated as hyperactive by their parents (β=.28, p<.05). Effect sizes for the independent effect of country of adoption as measured by *R*-square change proved to be small to medium for defiant behaviours (R^2_{change} = .10) and hyperactivity (R^2_{change} = .06)and medium to large for inattention (R^2_{change} = .20) (Cohen, 1992).

========== Table 2 about here ==========

Finally, partial correlations were carried out on the full sample (i.e., girls adopted from China, Eastern Europe or other countries) to assess the interrelations between the display of anxiety and the levels of hyperactivity/impulsivity, inattention and defiant behaviours while controlling for demographics. Table 3 shows that anxiety symptoms were significantly related to hyperactivity/impulsivity (r = .29, n = 109, p<.01). On the other hand, as expected, the three subscales of the SNAP-IV showed the following significant correlations: the display of defiant behaviours was related to hyperactivity/impulsivity (r = .51, n = 109, p<.001) and inattention (r = .23, n = 109, p<.05) and the relation between inattention and hyperactivity/impulsivity symptoms was also significant (r = .49, n = 109, p<.001).

========== Table 3 about here ==========

Discussion

According to our results, girls included in our sample seem to have normal levels of anxiety when compared to a normative sample (Vigil-Colet et al., 2009) and there are no differences between girls adopted from China and girls adopted from Eastern Europe. However girls adopted from Eastern Europe show more hyperactivity, inattention and defiant behaviours than girls adopted from China. These results are in tune with existing research, where groups of Chinese girls obtained the same, or even better, behavioural scores (internalising and externalising) than normative samples (Rojewski et al., 2000; Tan & Marfo, 2006; Tan et al., 2007; Tan, 2009a) and children adopted from Eastern Europe showed high levels of aggressive behaviour, attention problems (Gunnar & Van Dulmen, 2007), high rates of ADHD symptoms (Abrines et al., 2012), ADHD diagnosis (Beverly et al., 2008) and ADHD medication (Lindblad et al., 2010).

Regarding the effect of demographic variables on these results we observed, like other authors, that the age at adoption was not related to any of the behavioural adjustment scores (Abrines et al., 2012; Tan & Marfo, 2006). Moreover, the age of the child only had a significant influence on the display of defiant behaviours. This result was unexpected as other studies have observed that older adoptees seem to be more likely to show hyperactivity, aggressive behaviours (Rojewski et al., 2000) and inattention (Abrines et al., 2012) whereas younger adoptees seem to have better adjustment scores (Tan & Marfo, 2006). Differences in the age of the children included in these samples might account for differences in the results. There might be specific life periods when children are more vulnerable to display some kind of emotional or

behavioural symptoms. E.g.: Start of school years, early adolescence, etc. Further research exploring these issues would be required.

Results from this study confirmed previous studies showing difference between adoptees from Eastern Europe and China on a sample of girls only thereby suggesting that these and previous findings might not be biased due to different gender compositions between Eastern European or Chinese subsamples. Therefore, other factors explaining the differences observed between children adopted from these two regions of the world should be considered. On one hand, in Eastern European countries there is a higher rate of alcohol consumption during pregnancy by mothers of institutionalized children (Gunnar & Van Dulmen, 2007; Miller, Chan, Tirella, & Perrin, 2009). For example, in Sweden, Landgren, Svensson, Stromland, & Andersson Gronlund (2010) observed that fetal alcohol spectrum disorders were identified for 52% of 71 children adopted from Eastern Europe and in Canada, Robert et al. (2009) concluded that 69% of 29 children adopted Eastern Europe showed physical parameters and/or neurological anomalies compatible with Fetal Alcohol Spectrum Disorder (FASD). Hyperactivity/impulsivity and attention deficits are part of the symptoms that can be seen in children with FASD (Kvigne et al., 2004) and these similarities could lead to misinterpret the symptoms.

Differences in the temperament of these children have been considered as another factor that might provide partial explanation for the satisfactory behavioural adjustment of children adopted from China (Tan & Marfo, 2006) as according to (Kagan, Kearsley, & Zelazo, 1979), Chinese infants are temperamentally more adaptable than Caucasian infants.

Furthermore, social, cultural and/or environmental differences have also been considered. In terms of differences between the countries of origin, according to Tan et al. (2007) Chinese societal norms, child-rearing practices, and adult expectations may promote behaviours associated with typical adjustment as assessed on the Child Behavior Checklist - CBCL. Additionally, the conditions of the welfare system in China are considered to be clearly better than the conditions in the Eastern European countries (Tessler et al., 2004).

Regarding differences in the post adoptive placement, in Spain, there is a widespread (and false) belief that the medical records of all children institutionalized in the former Soviet Union are exaggerated to allow the judge to authorize an international adoption (Marre, 2007) and therefore families who decide to adopt in these countries might have an unrealistic idea of the child that they will adopt which could make them less prepared to deal with the difficulties presented by their child. Moreover, families who decide to adopt in Eastern European countries tend to see the cultural background of their children as more similar to their own than families who adopt in other countries where the physical differences are more evident, like China. Consequently they make less effort to incorporate the origin of the child in their lives (Marre, 2007).

Although our results are quite optimistic regarding the adjustment of girls adopted from China, it is important to bear in mind that two recent longitudinal studies looking at samples of Chinese adoptees have observed a significant increase in internalizing problems at a later point in time (Cohen & Farnia, 2011; Tan, 2009). They discussed that some children may encounter difficulties to cope as pressures for social relationships and the cognitive demands of school increase (Cohen & Farnia, 2011). A

follow up assessment of this sample would be required in order to see if the anxiety levels remain low or increase.

Finally, in our sample, the display of hyperactivity/impulsivity is related to higher levels of anxiety. Therefore it is important to keep in mind that some hyperactivity symptoms could be expressing an increase in anxiety levels. Or, on the other hand, children who are more hyperactive and don't know how to cope with it could feel higher levels of anxiety. In any case, adoptive parents would benefit from more realistic expectations of what their child will be like and a deeper understanding of what emotional and behavioural symptoms mean for a specific child.

The main limitation of this study is that results are based only on the parents' ratings. Having ratings from others like teachers and or the child would strengthen our findings.

Conclusions

Girls adopted from Eastern Europe tend to show more inattention, hyperactivity/impulsivity and defiant behaviours than girls adopted from China, independent of the age at adoption. Although further research is required to best understand the reasons of these differences, it is important that families who are considering adopting internationally are aware of these differences. These families face a big and difficult decision when trying to choose in which country they want to adopt and it is important that they have as much information as possible in order to build realistic expectations and to be able to cope with possible difficulties in the development of their future child.

Notes

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Appendix

Table 1*: Between subjects ANOVA for demographic variables, SNAP-IV and SCARED by country of origin.*

	Eastern Europe	China	Other countries	Total	Normative sample
	n = 34	n = 42	n = 32	n = 108	
	M (SD)	M (SD)	M (SD)	M (SD)	
Age of the child (years)	8.44 (1.35)	8.02 (1.09)	8.36 (1.17)	8.26 (1.20)	
Age at adoption (months)	**29.06[ab] (22.92)**	**13.31[ab] (4.98)**	**43.44 (21.67)**	27.19 (21.52)	
Number of children in the family	1.94 (.89)	1.81 (.80)	2.12 (.86)	1.94 (.85)	
SNAP					Bussing et al., 2008
Hyperactivity/Impulsivity	.85 (.59)	.58 (.45)	.70 (.61)	.70 (.55)	.50 (.52)
Inattention* **	**1.24[a] (.62)**	**.55[ab] (.58)**	**.94 (.61)**	.88 (.66)	.52 (.64)
Defiant behaviours **	**.76[ab] (.53)**	**.41[a] (.38)**	**.48 (.55)**	.54 (.50)	.45 (.65)
SCARED					Vigil-Colet et al., 2009
Panic disorder	2.26 (2.45)	1.52 (1.49)	1.47 (1.69)	1.74 (1.91)	4.10 (3.50)
Generalised anxiety	6.21 (2.47)	6.55 (3.58)	6.13 (3.63)	6.31 (3.26)	7.61(3.31)
Separation anxiety	4.50 (2.69)	5.12 (2.97)	4.06 (2.36)	4.61 (2.72)	6.44 (3.39)
Social phobia	4.85 (3.10)	5.21 (3.49)	4.50 (3.57)	4.89 (3.38)	6.31 (2.86)
School anxiety	.56 (.89)	.38 (.73)	.56 (.72)	.49 (.78)	
Total Anxiety	18.38 (9.26)	18.57 (8.99)	16.72 (7.50)	17.96 (8.62)	25.36 (9.94)

Notes: Analysis of Variance F (2, 105) statistics is significant at **p < .01, ***p < .001
a Adoptees from Eastern Europe and China differ significantly (p < .05)
b Adoptees from Eastern Europe or China differ significantly from those of other countries (p < .05)

Table 2: *Hierarchical regressions predicting total anxiety (SCARED), inattention, hyperactivity/impulsivity and defiant behaviours.*

	Anxiety			**Hyperactivity/impulsivity**			**Inattention**			**Defiant behaviours**		
	Step 1 (β)	Step 2 (β)	R2	Step 1 (β)	Step 2 (β)	R2	Step 1 (β)	Step 2 (β)	R2	Step 1 (β)	Step 2 (β)	R2
Age of the child	-.02	-.02		-0.10	-0.08		.00	.03		**.34****	**.36****	
Age at adoption	.05	.07		0.10	-0.04		.21	-.04		.06	-.10	
Number of children in the family	-.07	-.07	.01	0.06	0.05	.01	.06	.05	.05	.11	.10	.16[c]
Country of adoption[1]		-.03	.01		**0.28***		**.07**[a]	**.51*****	**.25**[b]		**.35****	**.26**[c]

* p < .05, **p < .01, ***p < .001

[a] R^2 *change* is significant at p <.05, [b] R2 change is significant at p <.001, [c] R2 change is significant at p <.01

[1] Variable was dummy coded with 1=Eastern Europe and 0=China

Table 3: *Correlations between levels of anxiety, inattention, hyperactivity/impulsivity and defiant behaviours (n=109).*

	1	2	3	4
1 Total anxiety (SCARED)	1.00			
2 Hyperactivity (SNAP-IV)	**.29****	1.00		
3 Inattention (SNAP-IV)	.15	**.49*****	1.00	
4 Defiant behaviours (SNAP-IV)	.19	**.51*****	**.23***	1.00

Note: the correlations were carried out for those children adopted from Eastern Europe, China or other countries. Correlations were controlled for demographic characteristics: Country of adoption, Age of the child, Age at adoption and Number of children in the family.

***. Correlation is significant at the 0.001 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

5. DISCUSSION

5.1. Objective 1: To compare ADHD symptoms levels in children adopted from Eastern Europe with levels in children adopted from other countries.

In order to achieve the first aim of this thesis, the three articles included have compared ADHD symptoms levels in children adopted from Eastern Europe with levels obtained in other samples. The first one, *Comparison of ADHD symptom levels in children adopted from Eastern Europe and other countries: possible factors involved,* compared them with a mixed sample of children from other regions of the world; the second one, *ADHD – like symptoms and attachment in internationally adopted children,* with two different samples of children adopted from China and Ethiopia and finally, the third one, *A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours,* has compared two samples of girls, adopted from Eastern Europe and China. All these different comparisons allow us to confirm, that children adopted from Eastern Europe are more likely to show ADHD symptoms than children adopted from other regions, according to their parents' opinion. Therefore, our results are in tune with the existent bibliography (Gunnar & Van Dulmen, 2007; Landgren et al., 2010; F. Lindblad et al., 2010). Consequently, specific characteristics of the adoption process in each country of origin are considered as factors influencing the ADHD scores of each group:

In the case of China, the increase of the international adoption was justified by the abandonment of girls in orphanages, as a result of the government's one child per family policy, which penalizes families for having more than one child. Therefore, institutionalized children in China are more likely to be associated with political reasons and less likely to be associated with a low socioeconomic status, in comparison with the situations given in other countries of origin. In this regard, it is assumed that biological mothers of children adopted from China may take more care of themselves during pregnancy than mothers from other countries of origin, as it is not the child that is unwanted, but the gender. As a result of this, a better health status of the child is hypothesized. According to Tan et al. (2007), Chinese societal norms, child-rearing practices, and adult expectations may promote behaviours associated with typical adjustment as assessed on occidental measures. Additionally, the conditions of the welfare system in China are considered to be clearly better than the conditions in the Eastern European countries (Tessler, Adams, Houlihan, & Groza, 2004). Also, differences in the temperament of these children have been considered as another factor that might provide partial explanation for the satisfactory behavioural adjustment of children adopted from China (Tan & Marfo, 2006) as according to Kagan, Kearsley, & Zelazo (1979), Chinese infants are temperamentally more adaptable than Caucasian infants.

In Ethiopia, the adoption process is more often associated with poverty, parent illness or death. Biological families tend to keep their children for a longer time than in China or Eastern Europe, and in many cases, children live with their extended family or neighbours for as long as possible. Consequently, the mean time of institutionalization tends to be shorter than in other countries, with many children living with their

families until a few months before the adoption moment. In this way, it is suggested that these children receive a more individualized and higher quality care during the pre-adoptive period.

In the case of children adopted from Eastern Europe, prenatal alcohol exposure is considered to be one of the main factors that might facilitate the existence of higher levels of hyperactivity, impulsivity and inattention (Landgren et al., 2010; Miller et al., 2006). In Russia, 899 women were interviewed about their alcohol consumption habits and their findings showed that nearly all pregnant women drank during the year before they became pregnant; of these, 60% reported drinking when they knew they were pregnant, and 34.9% drank in the 30 days before the interview (Kristjanson, Wilsnack, Zvartau, Tsoy, & Novikov, 2007). Knowing the high level of alcohol consumption by pregnant women in Russia, the higher risk of some difficulties during their children's development is expected, including more hyperactivity and attention problems.

However, given that some authors have observed that prenatal exposure to alcohol did not have a significant influence on post adoption adjustment (Goldman & Ryan, 2011) other specifics of the sample of children adopted from Eastern Europe should be considered.

Families who decided to adopt in Eastern European countries tend to believe that their child comes from the same cultural background as them and therefore they make less effort to acknowledge and incorporate the origin of the child in their lives, they seem to be less interested in a 'culture' that they feel is very similar to their own (Marre, 2007). As there is a need for openness of information in adoption in order to

help children to manage their adoptive status (Neil, 2012), these families might need extra support in terms of helping their children make sense of their story.

Moreover, in Spain, there is a consensus among the adoption agencies and adoptive families according to which, in Eastern Europe, health problems must be exaggerated to allow the judge to authorize an international adoption (Marre, 2007). Furthermore, there is a widespread - and false - belief that the medical records of all children adopted in the former Soviet Union are not true and therefore parents are not prepared enough for the difficulties that their children might present. In this context, families who adopt in these countries are more likely to have an unrealistic idea of the child that they are expecting and more likely to struggle to accept - and deal with - the difficulties.

5.2. Objective 2: To explore the interrelations between the display of ADHD symptoms and relevant factors.

5.2.1. Sex

Knowing the higher incidence of ADHD among boys (especially for the Hyperactivity/impulsivity subtype), the influence of the variable sex was assessed in the three articles. In the first one, *Comparison of ADHD symptom levels in children adopted from Eastern Europe and other countries: possible factors involved*, our results show that being a girl was a protective factor for the display of

hyperactivity/impulsivity symptoms, but not for attention problems. In the second one, *ADHD – like symptoms and attachment in internationally adopted children*, no relation was found between the sex of the child and the existence of these symptoms. Finally, in the third study, *A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours,* where two samples of girls were compared, girls adopted from Eastern Europe presented significantly higher ADHD scores than girls adopted from China, thereby suggesting that these and previous findings might not be biased due to different gender compositions between Eastern European or Chinese subsamples. Overall, our results support the idea that the distribution of sex regarding the ADHD symptoms in international adoptees does not show a male predominance as has been suggested by the ERA study (Kreppner et al., 2001; Stevens et al., 2008). These results suggest that other factors, rather than gender, may be more significant in the occurrence of ADHD symptoms among internationally adopted children.

5.2.2. Age

Results from the first article, *Comparison of ADHD symptom levels in children adopted from Eastern Europe and other countries: possible factors involved*, show that older children had more probabilities of showing inattention. In the third article, *A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours*, the age of the child only

had a significant influence on the display of defiant behaviours, but not on hyperactivity and inattention.

Rojewski et al. (2000), studied a sample of 39 girls adopted from China (aged between 1 and 9 years) and concluded that older adoptees were more likely to be rated hyperactive by their parents than young children. Our data show that this effect was not observed regarding the hyperactivity/impulsivity scale but it was observed with respect to the inattention and defiant symptoms. Differences in the characteristics of the sample might account for the differences in these results, as our sample is a larger sample, including older children - males and females - adopted from different regions of the world. However, it is important to note that, in all cases, older children show more symptoms than younger children. There might be specific life periods when children are more vulnerable to display some kind of emotional or behavioural symptoms. E.g.: Start of school years, early adolescence, etc. Also, some environmental factors such as increment of the stress and pressure in the school along the pass of the years or development of difficult family dynamics, might contribute to prompt the symptoms. On the other hand, the current approach used to deal with these symptoms might not be helpful enough, in which case a change in the approach to monitor and treat these symptoms should be considered. Further research exploring these issues would be required.

5.2.3. Age at adoption

As described by the three articles included in this thesis, the age of the child at the moment of the adoption had no significant effects on the display of hyperactivity/impulsivity or inattention in our sample.

These results are in tune with other studies: Rojewski et al. (2000) observed that the age at adoption did not significantly influence hyperactivity and attention problems in a sample of girls adopted from China. Moreover, Miller et al. (2009) affirm that the age at arrival was not related with behavioural problems in a sample of 50 children adopted from Eastern Europe. On the contrary, other studies did find significant relations between the age at adoption and the level of hyperactivity or inattention: Lindblad et al. (2010) observed that older children received more pharmacological treatment for ADHD and according to Beverly et al. (2008), girls who were adopted after 36 months were more likely than girls adopted before 36 months to be labeled as ADHD.

It is important to bear in mind that the age at adoption is not the same as the time of institutionalization, given that some children have spent time with their biological families or in foster care before they were adopted. Also differences in the quality of the care given in each institution may account for some of the disparities in these results. Therefore, the effect of the age at adoption must be modulated by the different events experienced by each child during the pre-adoptive period. Unfortunately this information could not be analyzed in this study because the majority of the families had very little information about their children's life before

they were adopted. In this regard, the existence of more studies comparing institutionalized children with children who lived with their biological or foster families is required.

5.2.4. Attachment

Regarding the relation of the attachment pattern with the appearance of ADHD-like symptoms, our findings confirm the results obtained by other authors (Niederhofer, 2009): children with a secure attachment showed less attention problems than children with an insecure attachment. The same tendency could be observed for the Hyperactivity scale, although differences were only trending toward significance.

Despite the observation of the relationship between the ADHD-like symptoms and an insecure attachment, the difficulty falls on the determination of which disorder is the origin of the symptoms or if there are other factors mediating the relation between these two disorders. The development of an insecure attachment during the first period of childhood can generate the appearance of ADHD-like symptoms later during the school age, and vice versa, children with an ADHD diagnosis can have more difficulties in the establishment of a secure attachment pattern with their caretakers. Also, as suggested by other authors (Colvert et al., 2008; Kreppner et al., 2001; Stevens

et al., 2008), the existence of a deprivation syndrome including attachment difficulties, inattention and hyperactivity should be considered.

In any case, the promotion of family bonds and parenting strategies to deal with their children's behavior would help these children to regard their parents as secure bases and to improve their self-regulatory abilities. Thus, this increase in the security of their attachment to their parents may facilitate their capacity to deal with anxiety. This, in turn, it can hoped would be followed by a decrease in hyperactivity and attention problems, enhancing the wellbeing of the child and his family.

The emergence and/or severity of ADHD symptoms have been linked to the absence of parental skills thought to be vital in promoting a secure attachment pattern with their children (Pinto, Turton, Hughes, White, & Gillberg, 2006). These authors found that the existence of maternal unresolved mourning during pregnancy was related with the appearance of ADHD symptoms in the child. These authors concluded that "a vicious cycle may be set up where a mother who is dissociating (because of her unresolved mourning status) is inadvertently frightening to her child, who then becomes more demanding and difficult (ADHD-like behavior)" (p. 89).

In the same vein, it is important to consider that in the case of adoptive parents the existence of some kind of unresolved mourning related with parenthood is quite a common phenomenon (e.g. over fertility issues and the inability to conceive a child). Furthermore, a higher percentage of insecure attachments among adoptive parents has been observed, which could mediate their capability to deal with the challenging behaviours of the child (St-André & Keren, 2011). Also, it is important to bear in mind that the adoption process is not easy for the adoptive parents, as involves being

examined to prove that they are able to raise a child and managing expectations and anxieties while waiting for the child (St-André & Keren, 2011). In this regard, the possibility of impoverished parenting skills to promote a secure attachment among adoptive parents due to their own story should be considered, as well as its possible influence on the display of ADHD-like symptoms among adopted children. The interaction between the story of the adopted child and the adoptive parents is crucial in the understanding of the symptoms displayed by the child and the attachment pattern. It is a limitation of the current work that the AAI was not administered to the adoptive parents and a suggestion for further work to take this valuable informative step.

Respect to the observed narrative-based attachment patterns of the children, no differences in secure base/safe haven availability were observed across all groups, and only one child fit with the disorganized group, highlighting the non-clinical nature of the sample, albeit that they all shared the status of being adopted. It is also worth mentioning that, when children adopted from Ethiopia were insecure, they were always categorized as dismissing and girls adopted from China seem to show higher narrative coherence when describing their relationships with friends and family. Cultural differences in child rearing practices between Asia, Europe and Africa should be further explored and considered as a useful route to understanding the way these children relate to their adoptive families. Furthermore, differences in their pre-adoptive experiences and the quality of the institutionalization period might explain some of these differences but more pre-adoptive information would be needed to allow further analysis.

5.2.5. Anxiety

According to the results obtained in the article *A direct comparison of girls adopted from China and Eastern Europe: anxiety, hyperactivity/impulsivity, inattention and defiant behaviours*, girls adopted from both China and Eastern Europe seem to have normal levels of anxiety when compared to a normative sample (Vigil-Colet et al., 2009) and there are no differences between girls adopted from these two regions of the world.

We also observed that the display of hyperactivity/impulsivity is related to higher levels of anxiety. Therefore it is important to keep in mind that some hyperactivity symptoms could be expressing an increase in anxiety levels. Or, on the other hand, children who are more hyperactive and don't know how to cope with it could feel higher levels of anxiety. In any case, children, their parents and their teachers might find beneficial to have a deeper understanding of what emotional and behavioural symptoms might mean for each specific child.

6. LIMITATIONS

The limitations of this study must be considered to interpret the results. First of all, the characteristics of the sample should be discussed given that only 208 out of 1,700 invited children gave their agreement to participate in the study and this could produce a considerable bias in the sample. Many families had their last appointment with the pediatrician more than 5 years ago, so the address on their database records was not their current address. Consequently we assume that some of the invitation letters were not received by the families. Also, there were many families who were living more than 200 kilometres far from the hospital and they might have not accepted to participate given the substantial distance to travel. Regarding the families that participated in the study, we are aware that some of the parents were motivated to participate in the study because they were having troubles with their child and it was a good opportunity to seek help. Still, the motivation to participate of some other families was to demonstrate that the adoption of their child was a very successful one. In this regard, even though the sample is not randomized, there is a representation of both healthy and unhealthy children.

The sample includes children that were diagnosed with ADHD and receiving treatment, children that were diagnosed but not under treatment and children that were not diagnosed but who scored above the cut-offs in the questionnaires. We

consider that whether or not a child receives a diagnosis, depends on so many factors (e.g. the level of school demand, the willingness of the parents to consult when having problems, the personal opinion of the doctor, etc.). Therefore we decided to focus on the symptoms instead of on the diagnosis.

Also, the increment of the sample of children adopted from other regions of the world would be useful in order to directly compare a sample of children adopted from Eastern Europe with samples of children adopted from Africa, Asia and Latin America. Moreover, there is a need of the comparison of these findings with the results obtained by a sample of non-adopted children (which in our case was too small to draw any conclusions).

Finally, another limitation of the study is that the results about ADHD symptoms are based only on the parents' ratings. Having ratings from others like teachers and/or the child would strengthen our findings.

7. CONCLUSIONS

Our results clearly show that, according to parental ratings, the levels of ADHD symptoms are markedly higher for children adopted from Eastern Europe than for children adopted from other regions of the world. When trying to understand which factors were related to the display of these symptoms, we observed that the age and the attachment pattern of the child were related to the level of attention problems with children who were older or who had an insecure attachment being more likely to show inattention. Also, higher levels of anxiety were related to higher levels of hyperactivity/impulsivity. However, we found that neither the sex of the children nor their age at adoption had any effect on ADHD symptom levels.

On the other hand, there are other factors that might be related to the onset and maintenance of ADHD symptoms which could not be analysed in this research, such as the existence of prenatal alcohol exposure, the quality of pre-adoptive care or the attachment pattern or expectations of the adoptive parents. Therefore, the causes of higher levels of ADHD symptoms in children adopted from Eastern Europe still remain quite uncertain.

Although further research is required to best understand all the factors involved, some clinical applications of our results can be suggested:

- More research assessing the effectiveness of the first line treatments in adopted children who show inattention, hyperactivity and attachment difficulties is required. This will allow for the provision of the best diagnosis and treatment for these children, according to their specific needs and taking the characteristics and their vital history into account.

- Children adopted from Eastern Europe might have a higher predisposition to show ADHD symptoms due to their pre-adoptive experiences. However, these symptoms can be exacerbated or diminished depending on the post-adoptive experiences. In this regard, more information and support should be provided to adoptive families and teachers, which would allow them to best understand the symptoms and find the best way to manage them.

- More information about the Fetal Alcohol Spectrum Disorder (FASD), its symptoms and its treatment should be provided to both children and adoptive parents. The more they know about this disorder, the easier will be for them to adjust expectations, manage the symptoms and overcome the challenges they will face.

- The interaction between the story and characteristics of the adopted child and the story and characteristics of adoptive parents should be further explored in order to best help these families.

- It is important for families who are considering adopting internationally to be aware of these findings. These families face a big and difficult decision when trying to choose in which country they want to adopt and it is important that they have as much information as possible in order to build realistic expectations and to be more prepared to cope with possible difficulties in the development of their future child.

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9. APPENDIX

School performance, cognitive competence and school related self-perceptions of children adopted from Eastern Europe.

Abrines, N.; Barcons, N.; Marre, D.; Brun, C.; Sartini, C.; Fumadó, V.

International Social Work, Submitted

This study compares the cognitive competence (CC) and the school performance (SP) of children adopted from Eastern Europe (EE; n = 93), from other counties (OC; n = 115) and non-adopted children (NA; n = 27) and analyzes some related factors. EE showed the lowest SP, the highest *sense of inadequacy* and a higher *attitude to teachers* than OC. Inattention was related with lower SP whereas hyperactivity was not. The older adopted the lower SP. The *attitude to teachers* and the *sense of inadequacy* of children correlated with their SP. Improving school related self-perceptions seems relevant for the SP.

We concluded that children adopted from Eastern Europe present more difficulties to adapt to school settings but these difficulties are not justified by their cognitive competence. The fact that these children have strong perceptions of being unsuccessful in school and unable to achieve goals plus their beliefs that teachers are unfair, uncaring, or overly demanding towards them could be affecting their motivation to learn, which would also decrease their attention span and ability to

focus, creating a vicious circle that would make school success difficult. Interventions should help these children with their attention skills but also with their self-esteem and self-confidence. Also, our results suggest that the development of a better relationship between these children and their teachers would help the children to feel more self-confident and would have a positive effect on their school performance.

This article is currently submitted in *International Social Work* but because the editor still has not decided whether they will publish it or not, the article could not be included in the main body of the thesis. However we believe it will provide complementary information and therefore it has been included as an appendix.

School performance, cognitive competence and school self-perceptions of children adopted from Eastern Europe

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Abstract

This study compares the cognitive competence (CC) and the school performance (SP) of children adopted from Eastern Europe (EE; n = 93), from other counties (OC; n = 115) and non-adopted children (NA; n = 27) and analyzes some related factors.

EE showed the lowest SP, the highest *sense of inadequacy* and a higher *attitude to teachers* than OC. Inattention was related with lower SP whereas hyperactivity was not. The older adopted the lower SP. The *attitude to teachers* and the *sense of inadequacy* of children correlated with their SP. Improving school related self-perceptions seems relevant for the SP.

Key words: International Adoption, School performance, Cognitive Competence, Self-perceptions, Eastern Europe.

Introduction

The development of internationally adopted children has been related with a higher risk for mental-health problems and social adjustment difficulties (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005; L. C. Miller, 2005; Verhulst, 2008) as well as for diminished cognitive development and poor school performance. Uderstimulation and malnutrition during institutionalization may have delayed their brain development.

Van IJzendoorn, Juffer, & Klein (2005) carried out a meta-analytic analysis and found no significant differences between the IQ of adopted children and the IQ of their non-adopted environmental siblings or peers. However, adopted children performed worse at school, were more delayed in language abilities and were more referred to special education due to learning problems than their non-adopted peers. Van IJzendoorn et al. (2005) described this gap between the cognitive competence of the adopted children and their actual school performance as the "adoption decalage".

In Sweden, several studies focused on the school performance and the cognitive competence of Korean adoptees in comparison with non-Korean adoptees and non-adopted children (Dalen et al., 2008; Lindblad, Dalen, Rasmussen, Vinnerljung, & Hjern, 2009; Odenstad et al., 2008; Vinnerljung, Lindblad, Hjern, Rasmussen, & Dalen, 2010). They found no significant differences between the school performance of Korean adoptees in comparison with their non-adopted peers, but non-Korean adoptees performed worse than the other two groups (Lindblad et al., 2009; Vinnerljung et al., 2010). They concluded that the lower performance of the non-Korean adoptees was related to a lower than average cognitive competence and therefore, their results did not support the hypothesis of the "adoption decalage" (Lindblad et al., 2009).

They also observed that children adopted after the age of 4 years had lower cognitive performance if they were not adopted from Korea, while age at adoption did not influence test scores in the group of Korean adoptees or non-Korean adopted before the age of 4 years. Consequently, they discussed the possibility of a better quality of care in Korean institutions, in comparison with other countries of origin and concluded that the age at adoption may not influence the cognitive development if the quality of care before adoption has been good enough (Odenstad et al., 2008).

In Spain, about 40.000 children have been internationally adopted since the late nineties, and 34% of them come from Eastern Europe. These children seem to present more behavioural problems, attention difficulties, overactivity, attachment disorders, etc (Colvert et al., 2008; Jacobs, Miller, & Tirella, 2010; Kreppner, O'Connor, Rutter, & English and Romanian Adoptees Study Team, 2001; F. Lindblad , Ringbäck Weitoft, & Hjern, 2010; Rutter et al., 2007; Simmel, Brooks, Barth, & Hinshaw, 2001; Stevens et al., 2008). Moreover children adopted from these countries are considered to have an increased risk for foetal alcohol spectrum disorders – FASD (Landgren, Svensson, Stromland, & Andersson Gronlund, 2010; L. C. Miller et al., 2006). Some symptoms related with these disorders are hyperactivity, attention problems, developmental delay, cognitive deficits and poor psychosocial functioning (Kvigne et al., 2004).

However there are not many studies that have focused on the cognitive competence and school performance of children adopted from Eastern Europe.

O'Connor et al. (2000) observed that the mean Global Cognitive Index (GCI) of children adopted from Romania before 6 months of age did not differ of the GCI of children adopted within UK. Moreover the mean GCI of both groups was higher than the mean GCI for the general population. Nevertheless, the mean GCI of children adopted from Romania after 6 months of age was lower. Their results indicate that children adopted after 24 months of age exhibited significant lower cognitive scores and general development impairment

compared with earlier adopted Romanian children. Another study also evaluated a sample of children adopted from Romania and found that they scored lower than their non-adopted peers on all cognitive measures (Morison & Ellwood, 2000). Moreover, the development of children adopted from Romania was negatively related to time in institution and positively related to the quality of the adoptive home environment. Finally, Beverly, McGuinness, & Blanton (2008) observed that Speech-language, learning, and attention deficits were higher than expected in a sample of 55 early adolescents who were late-adopted from the Former Soviet Union. To the best of our knowledge there are no studies comparing cognitive competence and school performance of children adopted form Eastern Europe vs. children adopted from other countries.

Several factors have been related with the lower school performance of children adopted from Eastern Europe. However, as far as we know, no studies have evaluated the relationship between the school related self-perceptions of the adopted children and their school performance. How children experience the schooling and the feelings they have towards the school might have a strong relation with how they perform.

Consequently the specific research questions of this study are:

- Do children adopted from Eastern Europe perform worse at school compared to children adopted from other countries and to non-adopted children?
- Do children adopted from Eastern Europe have a lower cognitive competence compared to children adopted from other countries and to non-adopted children?
- Do children adopted from Eastern Europe have different school related self-perceptions than children adopted from other countries or than children non-adopted?
- Is the school performance of adopted children influenced by
    - Hyperactivity symptoms?

- Attention problems?
- Age at adoption?
- IQ?
- Socioeconomic status?

- Is the school performance of these children related with their school related self-perceptions?

Method

Participants

As Table 1 describes, 235 Catalan children aged between 7 and 12 were evaluated: 93 adopted from Eastern Europe, 115 adopted from non-European countries and 27 non-adopted. Children who had been placed with their adoptive families less than two years ago were excluded of the sample to avoid the influence of the adaptation period.

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Table 1 about here

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Measures

Ad hoc questionnaire (parents report)*:* Specifically, three questions about the *school performance* of the children were included: 1- Is the child performing as expected according to his age? (Yes/With some difficulties/ No); 2 - Is the child in the corresponding year for his/her age? (Yes/One below/Two below) 3 - Is the child receiving any kind of extra school support? (Yes/No).

Hollingshead Four factor index of social status (Hollingshead, 1975): It takes into account the job and the educational level of both parents.

Test of Nonverbal Intelligence, Second Edition – TONI 2 (Brown, Sherbenou, & Johnsen, 1990): It is a language-free measure of cognitive competence which was designed to be as free as possible of linguistic, motoric, and cultural factors. It contains 55 items arranged in order of difficulty and to determine the test, the subject simply points to the appropriate response. This is an untimed test, which requires 15 minutes to complete and provides a general IQ (M=100; SD:15).

Behaviour Assessment System for children – BASC (Reynolds & Kamphaus, 1992)*:* Two components were used in this study:

Parent Rating Scale (PRS) measures problem and adaptive behaviours at home as perceived by the parents. The scales used in this study are *Hyperactivity (*Tendency to be overly active and act without thinking*)* and *Attention problems* (tendency to be easily distracted or have difficulty concentrating).

Self Report of Personality (SRP) evaluates personality and self-perceptions of children. The scales used in this study are: *Attitude to school* (feeling of alienation, hostility and dissatisfaction regarding school) *Attitude to teachers* (feelings of resentment and dislike of teachers; beliefs that teachers are unfair, uncaring, or overly demanding) and *Sense of Inadequacy* (perceptions of being unsuccessful in school, unable to achieve one's goals, and generally inadequate).

Procedure

The sample of adopted children was recruited from the paediatric service of the Hospital Sant Joan de Déu in Barcelona. Invitation letters were sent to children that had been in contact with the paediatrician to do the regular follow-up, were aged between 7 and 12 and

did not present any nutritional deficit, infectious or parasitic disease when this study was conducted. The sample of non-adopted children was recruited through the general practitioner from a public medical centre. These children were also healthy and aged between 7 and 12. Families interested in participating established contact to make an appointment. During the appointment the informed consent form was signed by the parents and children verbally agreed to participate. Children were assessed while parents filled in the questionnaires. The results of the assessment were later on delivered to the family.

Data Analysis

Statistical analyses were conducted using statistical software Stata 11 (Release Stata/MP 11.1 for windows. College Station, TX: Copyright 2009 StataCorp LP).

Descriptive statistics were used as preliminary analysis to describe the school performance of children, the display of hyperactivity and attention problems according to parent's perceptions, the school related self-perceptions of children and their cognitive competence.

A one-way analysis of variance (ANOVA) was used to compare the effect of the country of origin on the cognitive competence, the school performance and the school related self-perceptions of the children when adopted from Eastern Europe, from other countries and when they were non-adopted.

Pearson's correlation was computed to assess the relationship between the school performance of the children and their school related self-perceptions.

Finally, a multiple logistic regression was used for multivariate analyses to investigate the relationship between school performance (outcome) and several variables (hyperactivity, attention problems, country of origin, sex, age, socioeconomic status, cognitive competence and age at adoption).

Results

Descriptive analyses of the school performance, the display of hyperactivity and attention problems according to the parent's perceptions, the school related self-perceptions of the children and their cognitive competence are presented in Table 2.

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Table 2 about here

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Table 2 reveals that the group of adoptees from Eastern Europe have the highest percentage of children having difficulties to perform in school according to their age (51.1%), children who are placed below the corresponding school year for their age (20.4%) and children receiving extra school support (54.8%).

Table 3 shows the results of the one-way ANOVA conducted to compare the effect of the country of origin on the cognitive competence, the school performance and the school related self-perceptions of the children when adopted from Eastern Europe, from other countries and when they were non-adopted.

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Table 3 about here

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As Table 3 indicates, there was a significant effect of the country of origin on the *school performance* at the $p<.05$ level [$F(2) = 16.039$, $p = .000$]. Post hoc comparisons using Tamhane test show that the mean level of school difficulties of children adopted from Eastern Europe ($M = 1.64$, $SD = 0.704$) was higher than the mean level for children adopted

from other countries (M = 1.25, SD = 0.494) and the mean score for non-adopted children (M = 1.08, SD = 0.272). The mean level of school difficulties of children adopted from other countries (M = 1.25, SD = 0.494) was also significantly higher than the mean level for non-adopted children (M = 1.08, SD =0.272). Taken together, these results suggest that children adopted from Eastern Europe have more school difficulties than children adopted from other countries and non-adopted children. Also, children adopted from other countries seem to perform worse than non-adopted children.

Differences on the *attitude to teachers* depending on the country of origin were significant [F(2) = 4.556, p = .012]. Post hoc comparisons using Bonferroni test reveal that the group of children adopted from Eastern Europe had a higher *attitude to teachers* (M = 53.63, SD = 10.588) than children adopted from other countries (M = 48.81, SD = 9.133). However, their mean score did not differ from the mean score obtained by the group of non-adopted children (M = 52, SD = 8.435).

Also, differences on the *sense of inadequacy* according to the country of origin were significant [F (2) = 10.341, p = .000]. Post hoc comparisons using Tamhane test show that the group of children adopted from Eastern Europe had a higher *sense of inadequacy* (M = 57.17, SD = 12.184) than children adopted from other countries (M = 49.72, SD = 8.862) and than non-adopted children (M = 49.41, SD = 9.743).

However, there was not a significant effect of the country of origin on the *cognitive competence* and the *attitude to school*.

A Pearson's correlation was computed to assess the relationship between the school performance of the children and their school related self-perceptions

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Table 4 about here

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Table 4 shows that there was a positive correlation between the *school performance* and the *attitude to teachers* (r = 0.234, n = 163, p = 0.003) and the *sense of inadequacy* (r = 0.323, n = 163, p = 0.000). However, no correlation was observed between the *school performance* and the *attitude to school.*

Finally, the influence of several factors (hyperactivity, attention problems, country of origin, sex age, socioeconomic status, cognitive competence and age at adoption) in the school performance of the children was investigated using logistic regression and results are presented in the Table 5.

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Table 5 about here

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Hyperactivity/impulsivity and Inattention scores were categorized according to the cut-offs of the BASC scale (> 60 indicates risk or clinical scores), obtaining clinical or non clinical scores for each participant. Given the small size of the group of non adopted children, it was not included in the model. Odds ratio (ORs) and Confidence Intervals (CIs) are reported for the *school competence* variable. The model was adjusted for possible confounders: country of origin, sex and current age of the child, socioeconomic status of the adoptive parents, cognitive competence and age of the child at adoption.

Logistic regression results show that showing Hyperactivity symptoms (>60) had no significant effect on the school performance of the children, but showing inattention difficulties did significantly increased (OR: 7.07 [3.14-15.91]) the possibility of having difficulties to perform in school.

Also, the odds of having difficulties to perform in school were more than three times as high for the group of children adopted from Eastern Europe, in comparison with children adopted from other countries.

Regarding the effects of the covariates in the model, the age at adoption of the child was observed to have a significant effect, being the older adopted the children who have more probabilities of having difficulties to perform in school. The cognitive competence was a protective factor on the school performance, whereas non significant effects were observed for the other possible confounders on the school performance, such as sex of the child, socioeconomic status of the adoptive parents and the current age of the child.

Discussion

In our sample, children adopted from Eastern Europe perform worse at school compared to children adopted from other countries and to non-adopted children. In this regard, the country of origin and the specific circumstances experienced by children adopted from different backgrounds should be considered when investigating the school performance of adopted children. In the case of Eastern Europe, a higher existence of Fetal Alcohol Spectrum Disorders (FASD) due to the alcohol consumption by mothers during pregnancy has been observed. Also, the reasons for ending up in institutions, and the quality of care of the institutions are different in each country. Nevertheless, in our sample, children adopted from other countries also perform worse than non-adopted children, which means that there must be some common factors in the development of adopted children that affect their school performance, independently of their country of origin.

However, there were no significant differences between the three groups regarding the cognitive competence. These results would support the “adoption decalage” hypothesis

(Adopted children may recover their cognitive competence but they do not completely catch up in school performance) suggested by Van IJzendoorn et al. (2005).

Two studies have assessed the school performance of children adopted from Eastern Europe and both obtained results that would be along the same lines than ours. Beverly et al., (2008) observed that Speech-language, learning, and attention deficits were higher than expected in a sample of children adopted from the Former Soviet Union and McGuinness & Pallansch (2000) found that children adopted from Eastern Europe had lower performance in daily activities required for personal and social sufficiency. Though, any of these studies assessed the cognitive competence of the children which makes it difficult to draw any conclusions regarding the hypothesized "adoption decalage".

On the other hand, Lindblad et al. (2009) found that non-Korean adoptees performed worse than non adopted children but, against the "adoption decalage" theory, they observed that the lower performance of non-Korean adoptees was related to their lower cognitive competence. However, the group of non-Korean adoptees did not include children adopted from Eastern Europe which makes it difficult to make comparisons with our sample.

If the cognitive competence cannot account for the differences in the school performance of children adopted from Eastern Europe, other factors must be involved. According to our results, the age at adoption of the children had a significant effect on their school performance, being the older adopted the children who have more probabilities of having difficulties to perform in school.

Other studies have analyzed the effect of the age at adoption on the cognitive performance observing that the later adopted the lower cognitive scores (Morison & Ellwood, 2000; O'Connor et al., 2000; Odenstad et al., 2008) but, as far as we know, no studies have assessed the effect of the age at adoption on the school performance in a sample of children adopted from Eastern Europe.

Also, having inattention difficulties was significantly related with a lower school performance of the children, but hyperactivity symptoms were not related. Knowing that there is a high percentage of children adopted from these countries that have been exposed to prenatal alcohol consumption and that this fact can cause attention problems, it is a possibility that the higher difficulties to focus of these children are complicating their learning activities and their adaptation to the school system. In this regard, interventions should be more oriented to help these children with their attention problems rather than their hyperactivity symptoms, as these do not seem to have a great impact on the school performance of the children.

Concerning the school related self-perceptions of the children, children adopted from Eastern Europe had a higher *attitude to teachers* than children adopted from other countries, which means that they had stronger feelings of resentment and dislike of teachers and beliefs that they are unfair, uncaring, or overly demanding towards them. Also, the group of children adopted from Eastern Europe had the highest *sense of inadequacy* in comparison with the other groups, which means that they had strong perceptions of being unsuccessful in school, unable to achieve one's goals, and generally inadequate. However all the groups showed the same level of *attitude to school* (feeling of alienation, hostility and dissatisfaction regarding school), which was over the expected value for all the groups. As both *attitude to teachers* and *sense of inadequacy* were related with a lower school performance, these school related self-perceptions could be affecting the school performance of these children.

The limitations of this study should be taken into account in order to avoid misleading interpretations. First of all, school performance of children was measured from not standardized research questions. Also, parents were the only source for information relating to hyperactivity and attention problems and children don't always behave the same at school as they do at home for a wide variety of reasons. Including a measure from

teachers would have made this research more reliable. Due to logistic reasons the sample of non-adopted children had to be recruited from a different service than the sample of adopted children, although they were from the same residential area. However, due to the lack of existing research looking at these specific variables in children adopted from Eastern Europe, we believe that it is worth considering the results of this study, despite its limitations.

Conclusions

Children adopted from Eastern Europe present more difficulties to adapt to school settings but these difficulties are not justified by their cognitive competence. The fact that these children have strong perceptions of being unsuccessful in school and unable to achieve goals plus their beliefs that teachers are unfair, uncaring, or overly demanding towards them could be affecting their motivation to learn, which would also decrease their attention span and ability to focus, creating a vicious circle that would make school success difficult. Interventions should help these children with their attention skills but also with their self-esteem and self-confidence. Also, our results suggest that the development of a better relationship between these children and their teachers would help the children to feel more self-confident and would have a positive effect on their school performance.

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Appendix

Table 1: *Characteristics of the Sample*

	NA		EE		Other Countries								Total	
					LA		AS		AF		Total			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Sex of the child														
Masculine	18	67	59	63	13	50	5	9	22	67	40	35	117	50
Feminine	9	33	34	37	13	50	51	91	11	33	75	65	118	50
Total	27	100	93	100	26	100	56	100	33	100	115	100	235	100
Age in completed years at assessment														
7 years old	6	22	26	28	5	19	17	30	14	44	36	32	68	29
8 years old	10	37	28	30	12	46	22	39	9	28	43	38	81	35
9 years old	5	19	18	19	5	19	10	18	6	19	21	18	44	19
10+ years old	6	22	21	23	4	15	7	13	3	9	14	12	41	18
Total	27	100	93	100	26	100	56	100	32	100	114	100	234	100
Socioeconomic status														
High	5	19	14	15	4	15	14	25	11	33	29	25	48	21
Medium/high	14	52	45	49	17	65	29	52	18	55	64	56	123	53
Medium	4	15	22	24	3	12	7	13	4	12	14	12	40	17
Medium/low	2	7	10	11	1	4	4	7	0	0	5	4	17	7
Low	2	7	0	0	1	4	2	4	0	0	3	3	5	2
Total	27	100	91	100	26	100	56	100	33	100	115	100	233	100
			M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Age at adoption (in months)			29.47	19.085	32.92	23.049	18.38	12.117	42.97	24.748	28.82	21.829	29.11	20.595

* Note: NA= Non-Adopted; EE = Eastern Europe; LA = Latino America; AS = Asia; AF = Africa)

Table 2: *Descriptive Analysis*

	Eastern Europe			**Other Countries**			**Non Adopted**			**Total**		
	Freq	%		Freq	%		Freq	%		Freq	%	
Have difficulties to follow the course	47	51.1		26	22.8		2	7.7		75	32.3	
Is one school year below	19	20.4		10	8.8		0	0		29	12.4	
Receives extra school support	51	54.8		32	28.1		5	19.2		88	37.8	
	N	M	SD	N	M	SD	N	M	SD	N	M	SD
BASC												
Hyperactivity	93	53.63	11.141	114	48.54	10.994	27	51.89	8.903	234	50.95	11.058
Attention Problems	93	59.20	10.406	114	51.80	10.807	27	58.07	13.234	234	55.47	11.458
Attitude to school	65	56.15	8.952	79	54.04	9.040	22	55.82	12.366	166	55.10	9.499
Attitude to teachers	65	53.63	10.588	79	48.81	9.133	22	52	8.435	166	51.12	9.855
Sense of inadequacy	65	57.17	12.184	79	49.72	8.862	22	49.41	9.743	166	52.60	10.970
Cognitive Competence	91	112.46	17.364	114	116.12	19.121	27	119.81	15.758	232	115.12	18.169

Table 3: *Between subjects ANOVA for Cognitive Competence, School Performance and School Related Self-Perceptions Depending on the Country of Origin.*

	df	***F***	***p***
Cognitive Competence	2	2.068	.129
School performance	2	14.913	.000
Attitude to school	2	.956	.386
Attitude to teachers	2	4.556	.012
Sense of inadequacy	2	10.341	.000

Table 4: *Correlations between School Performance and School Related Self-perceptions*

	Attitude to teachers	**Attitude to school**	**Sense of inadequacy**
School Performance	.234**	.150	.323**

Note. *p<.01, **p<.001

Table 5: *Logistic Regressions School Performance Based on Hyperactivity and Attention Problems.*

Inatention BASC

Outcome variable: Follow courses with difficulties, n=192

Covariate	OR	95% Conf. Interval
Inatention score		
<60*	1	
>=60	7,07	(3.14-15.91)
Country of origin		
Non Eastern Europe*	1	
Eastern Europe	3,38	(1.50-7.63)
Sex of the child		
Masculine*	1	
Femenine	0,9	(0.41-1.98)
Socio economical status		
Medium/High*	1	
Medium	0,77	(0.27-2.21)
Medium/Low	1,38	(0.33-5.80)
Age at adoption		
per unit	1,35	(1.07-1.69)
Age_ass		
per unit	1,15	(0.84-1.57)
Cognitive assessment per unit	0,94	(0.91-0.96)

* *Baseline category*

Hyperactivity BASC

Outcome variable: Have difficulties to follow the course, n=192

Covariate	OR	95% Conf. Interval
Hyperactivity score		
<60*	1	
>=60	1,7	(0.74-3.89)
Country of origin		
Non Eastern Europe*	1	
Eastern Europe	3,57	(1.67-7.65)
Sex of the child		
Masculine*	1	
Femenine	0,79	(0.38-1.64)
Socio economical status		
Medium/High*	1	
Medium	0,9	(0.35-2.30)
Medium/Low	1,51	(0.40-5.63)
Age at adoption		
per unit	1,31	(1.06-1.61)
Age_ass		
per unit	1,22	(0.90-1.66)
Cognitive assessment per unit	0,94	(0.92-0.96)

* *Baseline category*

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