



BEHAVIOURAL, EMOTIONAL AND SOCIAL ADJUSTMENT IN SIBLINGS OF CHILDREN WITH AUTISM SPECTRUM DISORDER. A THEORETICAL REVIEW

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Las personas con Trastorno del Espectro Autista (TEA) tienen características únicas y hay una falta de conocimiento sobre cómo estas características podrían influir en sus familias y en el ajuste conductual, emocional y social de sus hermanos. El presente estudio tiene el objetivo de centrarse en los hermanos de estas personas con TEA y realizar una revisión teórica relacionada con el ajuste conductual, emocional y social de hermanos de niños con TEA. Un total de 24 artículos han sido incluidos y analizados con el fin de encontrar resultados relevantes que puedan ayudar a entender las necesidades de estos hermanos. El estudio sugiere, en ocasiones, resultados diferentes pero identifica aquellos factores de riesgo que podrían impactar en el núcleo familiar y, principalmente, en los hermanos de niños con TEA.

Palabras clave: TEA, Hermanos, Ajuste, Revisión, Estado del arte.

Many individuals with Autism Spectrum Disorder (ASD) have unique characteristics and very little is known about how these characteristics may influence the family and the behavioural, social and emotional adjustment of their siblings. The purpose of the current study is to focus on the siblings and to review the literature related to the behavioural, social and emotional adjustment of siblings of individuals with ASD. We have identified and analysed 24 articles to find the relevant results that may help us to understand the needs of these siblings. The findings suggest mixed results but they also bring to light a number of risk factors that could have an impact on the entire family and particularly on the siblings of children with ASD.

Key words: ASD, Siblings, Adjustment, State of the art.

Autism Spectrum Disorder (ASD) is a disorder developed throughout life that is characterised by persistent deficits in two fundamental areas: social communication and social interaction (APA, 2013). These difficulties must occur in multiple contexts, be manifested currently or in the past and they must be marked by repetitive patterns of behaviour in activities and interests.

Today, the classification of ASD represents one of the main changes with regards to the previous edition of the DSM-IV-TR manual and its classification has been one of the most controversial. The group of pervasive developmental disorders (PDD) has been unified under a single diagnosis of ASD, eliminating the previously existing categories (autistic disorder, Rett syndrome, childhood disintegrative disorder, Asperger's syndrome and pervasive developmental disorder not otherwise specified). Now ASD is classified within neurodevelopmental disorders under the one group and with the same criteria for diagnosis. There are three levels of severity depending on the support the child needs, with

3 being the maximum and 1 the minimum level of support.

Additionally, it must be specified whether the child with ASD has a comorbid condition, such as intellectual disability, language impairment, or a disorder associated with a known medical or genetic condition, environmental factors or catatonia.

The latest research in the USA indicates that ASD has a prevalence of 1/68 (Centers for Disease Control and Prevention, 2010). This number has increased significantly since 2006, when its prevalence was estimated at 1/110 children.

This theoretical review examines one of the least studied topics in the scientific literature on ASD: the relationships of children with ASD with their siblings and the emotional repercussions of these.

Systems theory holds that the family unit is made up of four specific subsystems: father figure, mother figure, siblings and extended family. Each of these subsystems influences the interactions, the functions and the members of the family (Turnbull et al., 2006). Therefore, any relevant action or condition of a member of the family unit will have positive or negative effects on the structure of the



unit. As stated by Pérez & Verdugo (2008), the quality of family life is closely related to the quality of life of each of its members in particular.

Furthermore, the relationship between siblings can be a very significant and lasting emotional bond for many people. Siblings are a major source of support on the emotional level, they often act as role models and represent one of the first sources of social interaction for children.

Most of the current studies on this issue have begun to consider demographic factors that were not previously included as variables. Some of these include age, gender, number of members of the family unit or the degree to which the child with ASD is affected. Many of them, such as gender, age, the socioeconomic level of the family or maternal stress are viewed by some authors as risk factors or indicators of future problems in the social skills or behaviour of the siblings of children with ASD (Hastings, 2003; Kaminsky & Dewey, 2002; Macks & Reeve, 2007; Verte, Roeyers & Buysse, 2003).

Even with these advances in the research, there is still no consensus on whether the presence of a child with ASD in the family has negative emotional implications for their siblings, because the results on this issue are contradictory, which is most likely due to the great heterogeneity of ASD.

New contributions shed some light on the subject, offering new lines of research as they view the concept of the family as a system where the individual with ASD must be seen as part of the family unit and not separate from it. In addition, the siblings are seen as an integral part of the family, their experiences are taken into consideration and it is understood that these can affect their self-regulation either positively or negatively. These studies are carried out in order to find results that will help the development of

supportive interventions that will possibly help not only the brother or sister of the child with ASD but also the quality of life for all of the members of the family.

METHOD

The articles related to the behavioural, emotional and social adjustment of siblings of children with ASD were identified and selected based on various inclusion criteria, as follows:

- a) Articles published between 2009 and 2014.
- b) Written in English or Spanish.
- c) Indexed in Google Scholar, PsycINFO, ERIC and Pubmed.
- d) Studies focused on the behavioural, emotional and social adjustment of children with ASD. Articles focused only on the sibling relationships were avoided.
- e) The siblings were between 3 and 18 years of age.
- f) The families studied could be from any country of origin. Most of the studies were conducted in Anglo-Saxon countries.
- g) Articles that were comparative studies between siblings of children with ASD and siblings of children with normal development or other functional diversities that met the above criteria were included.

After refining the initial searches, a total of 24 articles were obtained. All of these studies used standardised assessment instruments. A table summarising the main results of this theoretical review is displayed below.

DISCUSSION

The articles included in the review have been grouped according to the results found in each one:

- ✓ A first block of studies obtained results of a greater presence of problems or difficulties in the behavioural, emotional and social adjustment of siblings of children with

RESULTS					
Year/Authors	Objectives of the study	Participants Siblings of children with ASD (S: years) Children with ASD (ASD: years)	Method Assessment instruments	Constructs evaluated	Results
Fisman, Wolf, Ellison, & Freeman (2000)	To compare the behavioural, emotional and social adjustment in siblings of children with PDD, children with Down syndrome and children with typical development, over a period of three years.	S: 8-16 42 siblings ASD (PDD): 4-18 Down syndrome: 4-18 85 siblings	<ul style="list-style-type: none"> ✓ The Survey Diagnostic Instrument (adaptation of the Child Behavior Checklist) ✓ Self-Perception Profile for Children ✓ Social Support Scale for Children ✓ Parenting Stress Index (PSI) ✓ Dyadic Adjustment Scale (DAS) ✓ Beck Depression Inventory (BDI) ✓ Family Adaptability and Cohesion Evaluation Scale (FACES) ✓ Sibling Relationship Questionnaire (SRQ) 	<ul style="list-style-type: none"> ✓ Behaviour of children with PDD ✓ Self-concept of siblings ✓ Social support perceived by siblings ✓ Psychological characteristics and the parental relationship. ✓ Family environment ✓ Sibling relationships Informants: parents, teachers and siblings	The siblings of children with PDD show more difficulties in adapting over time than the siblings of children with Down syndrome or siblings of children with typical development. The longitudinal perspective (three years) of this study states that there is a risk of poor adaptation in siblings of children with PDD.



RESULTADOS (continued)					
Year/Authors	Objectives of the study	Participants Siblings of children with ASD (S: years) Children with ASD (ASD: years)	Method Assessment instruments	Constructs evaluated	Results
Kaminsky & Dewey (2002)	To analyse the psychological adjustment of siblings of children with ASD compared with siblings of children with Down syndrome and siblings of children with typical development.	S: 8-18 30 siblings ♀ 15 ♂ 15 ASD: younger than their siblings ♀ 15 ♂ 15 Down syndrome: ♀ 15 ♂ 15	<ul style="list-style-type: none"> ✓ Child Behavior Checklist (CBCL) ✓ Social Support Scale for Children ✓ Loneliness and Social Dissatisfaction Questionnaire ✓ The Vineland Adaptive Behavior Scale (VABS) 	<ul style="list-style-type: none"> ✓ Conduct of siblings ✓ Social support perceived by the siblings ✓ Loneliness and social dissatisfaction perceived by the siblings ✓ Adaptive behaviours of children with ASD <p>Informants: parents and siblings</p>	The siblings of children with ASD show good behavioural adjustment. The sisters of children with ASD show a greater degree of social skills than the brothers. The more siblings the child with ASD has, the greater the psychological adjustment among them.
Verte, Roeyers & Buysse (2003)	To analyse the psychological adjustment of siblings of children with ASD compared with siblings of children with normative development	S: 6-16 29 siblings ♀ 12 ♂ 17 ASD: 9-16 (Asperger & PDD)	<ul style="list-style-type: none"> ✓ CBCL ✓ Matson Evaluation of Social Skills with Youngsters (MESSY) ✓ Self Description Questionnaire I & II (SDQ-I & SDQ-II) 	<ul style="list-style-type: none"> ✓ Conduct of siblings ✓ Social skills of siblings ✓ Self-concept of siblings <p>Informants: parents and siblings</p>	The siblings of children with ASD are not predisposed to have greater adaptation problems than the siblings of children with normal development. The sisters of children with ASD, 12-16 years old, have high social skills and a positive self-concept. The siblings of children with ASD, 6-11 years old, have more behavioural problems than the siblings of children with normal development.
Hastings (2003a)	To explore the behavioural and psychological adaptation of siblings of children with ASD, through an intervention program (ABA - Applied Behaviour Analysis).	S: 4-16 78 siblings ASD: ± 5 years	<ul style="list-style-type: none"> ✓ Autism Behavior Checklist (ABC) ✓ Family Support Scale (FSS) ✓ Strengths and Difficulties Questionnaire (SDQ) 	<ul style="list-style-type: none"> ✓ Degree affected by the disability ✓ Social support perceived by parents ✓ Adjustment of siblings <p>Informants: mothers</p>	No evidence of a negative effect on the siblings of young children with ASD was found through the ABA program. The siblings of families with children with ASD displayed fewer problems if the family has social benefits.
Hastings (2003b)	To analyse the variables affecting the psychological adjustment of siblings of children with ASD	S: 6-16 22 siblings ♀ 11 ♂ 11 ASD: 7-16 years	<ul style="list-style-type: none"> ✓ Teacher Report version of the Developmental Behavior Checklist (DBC) ✓ Questionnaire on Resources and Stress (QRS-F) ✓ SDQ 	<ul style="list-style-type: none"> ✓ Behavioural problems in children with ASD ✓ Maternal stress ✓ Adjustment of siblings <p>Informants: mothers and teachers</p>	Siblings of children with ASD are at greater risk of having a less functional psychological adjustment when compared with other children. Male siblings of children with ASD and those who are younger than their siblings with ASD displayed fewer prosocial behaviours.
Pilowsky, Yirmiya, Doppelt, Gross-Tsur & Shalev (2004)	To explore the social and emotional adjustment of siblings of children with ASD	S: 6-15 30 siblings ♀ 18 ♂ 12 ASD: under 16	<ul style="list-style-type: none"> ✓ Weinberger Adjustment Inventory (WAI) ✓ VABS ✓ CBCL ✓ Daily Hassles and Uplifts Questionnaire ✓ Respondents had to talk about their siblings with ASD for 5 minutes. 	<ul style="list-style-type: none"> ✓ Emotional and social adjustment of siblings ✓ Relationship between siblings ✓ Family characteristics <p>Informants: parents and siblings</p>	Most of the siblings of children with ASD show good adjustment. The siblings of children with ASD show good capacity for empathy. The degree of severity of the ASD can adversely affect the sibling.
Tarafder, Mukhopadhyay & Basu (2004)	To examine the personal profile of siblings of children with ASD compared with siblings of children with normative development.	S: 12-18 10 siblings	<ul style="list-style-type: none"> ✓ Standard Progressive Matrices ✓ Rorschach Inkblot Test 	<ul style="list-style-type: none"> ✓ Personality of the siblings <p>Informants: siblings</p>	The siblings of children with ASD make an effort to deal with the demands resulting from having a sibling with ASD. They also have a good level of self-control and a good capacity for stress tolerance.
Mascha & Boucher (2006)	To explore the experiences and feelings of the siblings of children with ASD	S: 7-17 51 siblings ♀ 30 ♂ 21 ASD: ½ older ½ younger	<ul style="list-style-type: none"> ✓ Semi-structured interviews on family situations and on the thoughts and feelings of the siblings of children with ASD. 	<ul style="list-style-type: none"> ✓ Family situation of siblings of children with ASD <p>Informants: siblings</p>	Having a sibling with ASD has positive aspects for most siblings. There are more negatives when the sibling with ASD has aggressive or disruptive behaviours.
Ross & Cuskelly (2006)	To analyse the adjustment and coping strategies of siblings of children with ASD.	S: 8-15 22 siblings ♀ 6 ♂ 19 ASD: 6-16 (autism or Asperger's)	<ul style="list-style-type: none"> ✓ Gillian Autism Rating Scale (GARS) -CBCL ✓ Knowledge of Autism/Asperger Syndrome (KAAS) ✓ Kidcope 	<ul style="list-style-type: none"> ✓ Degree of affectation of disability ✓ Conduct of the siblings ✓ Siblings' knowledge about autism and Asperger's. ✓ Siblings' imitation strategies <p>Informants: parents and siblings</p>	Siblings of children with Asperger's syndrome and autism show a good knowledge of ASD. On the other hand, the siblings of these children are at high risk of developing an internalisation of behaviour problems. Aggression is the commonly identified factor that causes the most stress.



RESULTADOS (continued)					
Year/Authors	Objectives of the study	Participants Siblings of children with ASD (S; years) Children with ASD (ASD; years)	Method Assessment instruments	Constructs evaluated	Results
Hastings (2007)	To compare the behavioural adjustment among siblings of children with ASD, siblings of children with Down syndrome and siblings of children with intellectual disability over 2 years.	S: 3-18 24 siblings ASD: 3-19 years Down syndrome: 26 Intellectual disability: ♀ 25 ♂ 50	<ul style="list-style-type: none"> ✓ Index of Multiple Deprivation ✓ VABS ✓ SDQ 	<ul style="list-style-type: none"> ✓ Socio-economic status ✓ Adaptive behaviours in children with ASD ✓ Behavioural problems in children with ASD and their siblings Informants: mothers	There are no significant differences in the behavioural adjustment among siblings of children with different disabilities. This longitudinal study shows that the behavioural problems of children with functional diversity predict the behavioural adjustment of the sibling over two years.
Macks & Reeve (2007)	To compare the emotional and psychological adjustment of siblings of children with ASD and siblings of children with typical development	S: 7-17 51 siblings ♀ 30 ♂ 21 ASD: ½ older, ½ younger	<ul style="list-style-type: none"> ✓ Children Depression Inventory (CDI-S) ✓ Piers-Harris Children's Self-Concept Scale ✓ Behaviour Assessment System for Children-Parent Rating Scale (BASC PRS) 	<ul style="list-style-type: none"> ✓ Depression of siblings ✓ Self-concept of siblings ✓ Conduct of siblings Informants: parents and siblings	Demographic factors predict the emotional and psychological adjustment of siblings of children with ASD but not that of the siblings of children with typical development. Siblings of children with ASD have a higher risk of presenting behavioural, emotional and social problems when their socio-economic status is low, when they have only one sibling or the sibling with ASD is older. Siblings of children with ASD with lower adaptive risk are as follows: sisters, children whose families have a high socio-economic status, having more than one brother and being the elder brother.
Benson & Karlof (2008)	To examine the social, emotional and behavioural adjustment of siblings of children diagnosed with ASD.	S: 3-17 72 siblings ♀ 36 ♂ 36 ASD: 3-7	<ul style="list-style-type: none"> ✓ SDQ ✓ PSI ✓ Questionnaire on the severity of symptoms exhibited by the child with autism ✓ Semi-structured interview 	<ul style="list-style-type: none"> ✓ Adaptation of sibling ✓ Degree of severity of the symptoms of children with ASD ✓ Stressful life events in the family ✓ Family atmosphere ✓ Degree of therapeutic involvement and educational level of parents Informants: parents (mostly mothers)	Siblings of children with ASD are significantly more likely to have difficulty in adjusting. There are direct relationships between the difficulty of adjustment and the severity of the symptoms of the child with ASD. This may cause parental stress.
Verdugo & Pérez (2008)	To evaluate the influence of a sibling with ASD on the quality of family life from the perspective of the siblings.	S: 6-36 17 siblings (½ older) ASD: 6-18	<ul style="list-style-type: none"> ✓ Spanish adaptation of the Family Quality of Life Scale (Sainz, Verdugo & Delgado, 2006) ✓ Qualitative technique: group interviews by age group with open questions (Burke & Montgomery, 2003) 	<ul style="list-style-type: none"> ✓ Influence of child with ASD on the quality of family life ✓ Characteristics of the relationship between siblings Informants: siblings	The most valuable elements for successful family functioning are: health, security and support for the child with autism. The presence of a child with ASD in the family does not have a substantial negative impact on family well-being. Siblings of children with ASD (13-18 years) report limitations when sharing activities or communicating. They also believe that they do not have enough information about autism and they admit that they have little free time and have felt overwhelmed by family responsibilities.
Petalas, Hastings, Nash, Dowey & Reilly (2009a)	To explore the perception and experience of siblings of children with ASD in childhood	S: 9-12 8 siblings ♀ 5 ♂ 3 (3 younger, 4 older, 1 twin) ASD: 5-17	<ul style="list-style-type: none"> ✓ Semi-structured interviews ✓ The interviews were analysed using Interpretative Phenomenological Analysis (IPA) 	<ul style="list-style-type: none"> ✓ The perceived impact on their lives of having a sibling with ASD ✓ The perception of the environment of the sibling ✓ The tolerance and acceptance of the siblings ✓ The positive experiences and attitudes of the siblings ✓ Perceived social support for them and their siblings with ASD Informants: siblings	The siblings take on greater responsibility and spend time playing with their siblings with ASD, reducing their time with others and reducing the fun activities with the family. The siblings of children with ASD face aggressive situations with their siblings and they feel that they have to fight the ignorance and curiosity of others, as well as experiencing situations of anger, embarrassment and anxiety because of their siblings. However, they present a high degree of acceptance toward their siblings and indicate many positive aspects associated with living with them. Good communication between parents and siblings facilitates the process of psychological adjustment.



RESULTADOS (continued)					
Year/Authors	Objectives of the study	Participants Siblings of children with ASD (S: years) Children with ASD (ASD: years)	Method Assessment instruments	Constructs evaluated	Results
Petalas, Hastings, Nash, Lloyd & Dowey (2009b)	To analyse the emotional and behavioural adjustment of siblings of children with cognitive disability with and without ASD.	49 mothers: 29-52 S: 5-17 15 siblings ♀ 6 ♂ 9 S: 8-16 ♀ 3 ♂ 4 ASD: ♂ 15 12 mothers and 2 fathers	<ul style="list-style-type: none"> ✓ SDQ ✓ Demographic questionnaire 	<ul style="list-style-type: none"> ✓ Emotional and behavioural adjustment of siblings of children with ASD (according to mothers) ✓ Influence of maternal education, annual family income and neighbourhood deprivation. <p>Informants: mothers</p>	Siblings of children with ASD present more emotional issues than siblings of children with cognitive disabilities or siblings of children with typical development. Male siblings of children with ASD have greater emotional problems. The families of children with ASD are affected when family financial resources are low.
Rao & Beidel (2009)	To analyse the impact on parental stress, family functioning and adjustment of siblings of children with autism when there is a child with high functioning autism present in the family	Control group: 14 children S Control group: 8-15 ♀ 2 ♂ 16 12 mothers and 2 fathers	<ul style="list-style-type: none"> ✓ PSI ✓ Family Environment Scale (FES) ✓ Symptom Checklist-90-Revised (SCL-90-R) ✓ Health Survey Short Form 36 (SF-36) ✓ Piers-Harris Children's Self Concept Scale-Second Edition ✓ CBCL 	<ul style="list-style-type: none"> ✓ Parental stress ✓ Psychological adjustment of siblings of children with high-functioning autism ✓ Family functioning <p>Informants: parents and siblings</p>	The siblings of children with high-functioning autism score higher on self-concept items than the siblings in the control group. The other results were not significantly different. The parents of these children have higher levels of stress and a greater limitation on family functioning than the parents in the control group.
Quintero & Lee (2010)	To examine the social, behavioural and emotional adjustment in older siblings of children with ASD compared with older siblings of children without functional diversity.	43 families S: 6-10 43 siblings ASD: 2-5 43 children (receiving specialist care) ♀ 15 ♂ 28	<ul style="list-style-type: none"> ✓ The Parenting Daily Hassles (PDH) ✓ Parenting Stress Index-Third Edition (PSI-3) ✓ The Center for Epidemiologic Studies-Depression Scale (CES-D) ✓ Child Behavior Checklist for Ages 6-18 (CBCL/6-18) ✓ The Social Skills Rating System-Elementary Parent version (SSRS-EP) ✓ The Teacher's Report Form (TRF/6-18) ✓ The Social Skills Rating System: Elementary Teacher Version (SSRS-ET) ✓ Academic Competence subscale of the SSRS-ET (9 items). 	<ul style="list-style-type: none"> ✓ Variables that influence maternal well-being ✓ The emotional, behavioural and social adjustment of older siblings of children with ASD ✓ The relationship between maternal well-being and the adjustment of older siblings of children with ASD <p>Informants: teachers, parents and siblings</p>	There are no signs of large differences in scores relating to behavioural problems, social skills or skill level between older siblings of children with ASD and older siblings of children with normative development. Mothers who display more stress are more likely to have a negative influence on the behavioural problems and social skills of their children.
Meyer, Ingersoll & Hambrick (2011)	To examine possible factors that predict difficulties in the psychological adjustment of siblings of children with ASD.	S: 6-18 ASD: 2-18 90 mothers	<ul style="list-style-type: none"> ✓ ABC ✓ The Family Impact Questionnaire (FIQ) ✓ CES-D ✓ The Social Responsiveness Scale (SRS) ✓ SDQ 	<ul style="list-style-type: none"> ✓ The behaviour of children with ASD and the impact on their siblings ✓ The symptoms of ASD and their relationship with behavioural problems ✓ Depressive problems ✓ Adjustment behaviour of the children <p>Informants: mothers</p>	Siblings of children with ASD show a higher level of difficulty in psychological adjustment than the sample of siblings of children with typical development. The mothers of children with ASD show higher levels of depression than mothers of children with typical development. The sibling relationship is highly influenced by the depressive indicators of the mothers.
Moyson & Roeyers (2011)	To analyse how the siblings of children with ASD perceive their quality of life	S: 4-18 ♀ 10 ♂ 7 ASD: 5-16 ♂ 17	<ul style="list-style-type: none"> ✓ Qualitative study: 3 interviews ✓ History of the siblings ✓ Experience of the siblings ✓ Relationship between siblings 	<ul style="list-style-type: none"> ✓ Patience, mutual understanding, shared activities, private time, family well-being, acceptance, exchange of experiences, social support and dealing with the outside world. <p>Informants: siblings</p>	For the siblings of children with ASD, quality of life lies in the fulfilment of the 9 items evaluated during the interviews: patience training, mutual understanding, shared activities, having private time, a good family climate, acceptance of the sibling with ASD, exchanging experiences with other families, receiving adequate social support and having social relationships with others.
Brewton, Nowell, Lasala & Goin-Kochel (2012)	To analyse the fraternal relationship and social skills of the siblings of children with ASD.	S: 4-18 1,351 siblings ♀ 716 ♂ 635 ASD: 4-18 1355 people ♀ 177 ♂ 1178	<ul style="list-style-type: none"> ✓ Autism Diagnostic Observation Schedule (ADOS) ✓ Differential Ability Scales- Second Edition (DAS-II) ✓ Mullen Scales of Early Learning ✓ Wechsler Intelligence Scale for Children (WISC-IV) or Wechsler Abbreviated Scale of Intelligence ✓ Autism(WASI) Diagnostic Interview-Revised ADI-R) ✓ SRS ✓ Social Communication Questionnaire-Lifetime (SCQ) ✓ CBCL ✓ Vineland Adaptive Behavior Scales-II (VABS-II) 	<ul style="list-style-type: none"> ✓ Relationship between the results of the CBCL, SRS, SCQ and VABS-II of the sibling of the child with ASD and the results of the child with ASD on the ADOS and ADI-R and VABS-II tests. <p>Informants: children with ASD and their siblings</p>	The children with ASD scored lower on the VABS-II test than their typically developing siblings, i.e., they have a lower rate of adaptability. No significant relationship was found between the SCQ, SRS and CBCL tests of the sibling of the child with ASD and the ADI-R and ADOS tests of the child with ASD. If the siblings of the children with ASD are older, the children with ASD are likely to acquire more social skills.



RESULTADOS (continued)					
Year/Authors	Objectives of the study	Participants Siblings of children with ASD (S: years) Children with ASD (ASD: years)	Method Assessment instruments	Constructs evaluated	Results
Petalas, Hastings, Nash, Hall, Joannidi & Dowey (2012)	To explore the interaction between genetic predisposition (Broader Autism Phenotype) and environmental stressors in predicting the adjustment of siblings of children with ASD and the quality of their sibling relationships	S: 8-17 166 siblings ♀ 82 ♂ 84 ASD: 5-17 166 people ♀ 29 ♂ 137	<ul style="list-style-type: none"> ✓ CBCL ✓ Vineland Adaptive Behavior Scales-II (VABS-II) ✓ Demographic questionnaire ✓ SDQ ✓ Autism Spectrum Quotient (AQ) ✓ SRQ ✓ Five Minute Speech Sample (FM55) ✓ Hospital Anxiety and Depression Scale (HADS) 	<ul style="list-style-type: none"> ✓ Socio-economic circumstances of the family ✓ Emotional adjustment of the parents ✓ Sibling relationships ✓ Level of expression of emotions of parents ✓ Mental state of parents <p>Informants: siblings and parents</p>	When the behavioural problems of people with ASD increase, so do those of their siblings. Demographic factors predict conflicts between brothers. High levels of stress in mothers are associated with behavioural problems of adolescents with ASD. Siblings of children with autism that have a higher Broader Autism Phenotype exhibit less prosocial behaviour.
Petalas & Hastings (2013)	To compare the fraternal relationship between children with ASD and children with typical neuronal development.	S: 7-17 ♀ 47 ♂ 47 ASD: 4-17 ♀ 21 ♂ 73 (53 autism) Mothers: 29-53	<ul style="list-style-type: none"> ✓ SDQ ✓ SRQ ✓ Hospital Anxiety and Depression Scale (HADS) 	<ul style="list-style-type: none"> ✓ Level of emotional and behavioural difficulties of siblings of children with ASD (+11 years) ✓ The relationship between siblings ✓ Maternal depression <p>Informants: mothers and brothers and sisters of children with typical development</p>	The results do not reflect significant evidence of the existence of emotional and behavioural problems in siblings of children with ASD compared with the normative sample.
Hesse, Danko & Budd (2013)	To examine the predictors of adjustment in siblings of children with autism.	200 families S: mean age 6.61 ♀ 100 ♂ 100 ASD: mean age 6.82 ♀ 26 ♂ 174 186 mothers and 14 fathers	<ul style="list-style-type: none"> ✓ Sociodemographic questionnaire ✓ Parent Involvement Questionnaire-Parent Version (adapted version) ✓ PSOC Questionnaire ✓ PSI (short form) ✓ SDQ 	<ul style="list-style-type: none"> ✓ Sociodemographic information ✓ Participation of parents in education and therapy ✓ Parental stress ✓ The emotional and behavioural adjustment of the siblings <p>Informants: parents and siblings</p>	Half of the parents showed stress related to caring for a child with autism. The sisters of children with autism have better scores on the SQD than the brothers.
Tomeny, Barry & Bader (2014)	To analyse the relationship between the birth order of siblings and the appearance of internal and/or external difficulties in a typically developing sibling.	S: 6-18 ♀ 25 ♂ 17 ASD: 8-18 ♀ 9 ♂ 33 (19 autism) 40 mothers and 2 fathers: 32-58 years	<ul style="list-style-type: none"> ✓ Demographic and Diagnostic Questionnaire ✓ Child Behavior Checklist for ages 6-18 (CBCL/6-18) ✓ Children's Social Behavior Questionnaire (CSBQ) 	<ul style="list-style-type: none"> ✓ Sociodemographic information ✓ Child psychopathology of the child with ASD and their siblings ✓ Degree of severity of the symptoms of the children with ASD <p>Informants: parents and siblings</p>	Typically developing siblings born after the child with ASD show a high probability of manifesting problems in adaptation.

ASD compared with siblings of children with neurotypical development (Fisman et al., 2000; Hastings, 2003b; Meyer, Ingersoll & Hambrick, 2011; Ross & Cuskelly, 2006). Moreover, socioeconomic factors have an inverse influence since the lower the socioeconomic status of the family, the greater the difficulties in self-regulation of the siblings of children with ASD (Macks & Reeve, 2007; Petalas et al., 2009b).

✓ However, a second block of studies found that siblings of children with ASD are not more likely to develop problems of behavioural, emotional or social adjustment than siblings of children with normative development (Benson & Karlof, 2008; Hastings & Petalas, 2013; Kaminsky & Dewey, 2002; Pilowsky et al., 2004; Quintero & Lee, 2010; Rao & Beidel, 2009; Verte et al., 2003).

It is also important to note that the adjustment problems in siblings of children with ASD significantly decrease when these families receive social support, either through financial benefits or care support services at school or at home (Hastings, 2003a; Macks & Reeve, 2007; Moyson & Roeyers, 2011).

- ✓ The sisters of children with ASD present more and better social skills than the brothers of children with ASD. According to several studies that take into account demographic variables such as gender, there is evidence of a reduced risk of poor behavioural, emotional and social adjustment in the sisters of children with ASD than in the brothers (Hesse, et al., 2013; Kaminsky & Dewey, 2002; Macks & Reeve, 2007; Petalas et al., 2009b; Verte et al., 2003).
- ✓ The larger the number of siblings that the child with



ASD has, the greater that psychological adjustment that is established among them.

The risk of maladaptive behaviours increases in siblings of children with ASD when there is no presence of other siblings in the nuclear family (Kaminsky & Dewey, 2002; Macks & Reeve, 2007).

- ✓ The birth order among the siblings of children with ASD and the child with ASD, regulates the appearance of external and internal behaviours of the former. The siblings who are younger than the child with ASD have a lower tendency to develop prosocial behaviours (Hastings, 2003b; Macks & Reeve, 2007; Tomeny et al., 2014; Verte et al., 2003). On the contrary, the older siblings of children with ASD may be more likely to acquire social skills in the natural context of the relationship among siblings (Brewton et al., 2012).

- ✓ The degree of severity of the symptoms of the child with ASD may contribute to the occurrence of behavioural problems in the sibling.

The severity of the symptoms of ASD may have a negative influence on the behavioural adjustment of their siblings with typical development (Benson & Kaulof, 2008; Pilowsky et al., 2004). Aggressiveness in children with ASD is a predictive factor in the behavioural, social and emotional adjustment of their siblings since the more aggressive or disruptive the behaviours of the children with ASD, the more problems of self-regulation the sibling of the child with ASD presents (Hastings, 2007; Mascha & Boucher, 2006; Ross & Cuskelly, 2006).

- ✓ The presence of children with ASD in the nuclear family could generate positive behaviours or conducts in their siblings.

The siblings of children with ASD generally show greater empathy, stress tolerance and dexterity in self-control strategies (Petalas et al., 2009a; Pilowsky et al., 2004; Tarafder et al., 2004). Similarly, the siblings of children with ASD manifest a good self-concept (Macks & Reeve, 2007; Rao & Beidel, 2009) and a greater sense of responsibility and taking care of the family (Petalas et al., 2009a; Pérez & Verdugo, 2008).

- ✓ The presence of children with ASD in the family could have negative effects on the family.

Mainly, the negative effect that affects the majority of parents is parenting stress (Benson & Karlof, 2008; Hesse et al., 2013; Rao & Beidel, 2009). This parental stress does not help the development of social skills or good conduct of the siblings (Petalas et al., 2012;

Quintero & Lee, 2010). Along with parental stress, other negative effects are found such as depression (Meyer et al., 2011; Quintero & Lee, 2010), the shortage of family fun activities or less attention paid by parents to the children without ASD (Petalas et al., 2009a).

As some researchers have already indicated (Meagan et al., 2010), the theoretical reviews on the behavioural, emotional and social adjustment of siblings of children with ASD, reveal mixed results.

For this reason, many of the results of these studies show a positive relationship between children with ASD and their siblings, significantly reducing psychological adjustment problems in the case of the sisters of children with ASD or the older siblings. Furthermore, the presence of a third typically developing brother is also a factor that decreases the presence of maladaptive behaviours among them.

However, other studies support the presence of a negative relationship between children with ASD and their siblings. One of the most influential risk factors is the degree of severity of the symptoms of the child with ASD, because the greater the disruptive or aggressive behaviour he or she manifests, the more behavioural problems, emotional and social adjustment their brother or sister will have. Furthermore, the presence of a child with ASD may generate parental stress and this, in turn, can cause major problems in the development of social skills in siblings of children with ASD, caused by the lack of parental attention or the family environment among other things.

Moreover, as unanimously demonstrated by the results of the studies included in this theoretical review, socioeconomic and cultural factors have a direct influence. The more socioeconomic resources the family of the child with ASD has and the greater the support from social policies in their environment, the fewer problems the sibling of the child with ASD will have in self-regulation, the less parental stress there will be and, consequently, the better the family atmosphere will be.

In conclusion, this theoretical review aims to understand how the presence of a sibling with ASD affects the behavioural, emotional and social adjustment of a child, in order to subsequently implement effective, valuable and functional programmes for their siblings. Understanding their needs helps us to design interventions from a systemic and effective perspective. An example of this would be the interventions for managing emotions, learning strategies and dealing with problem behaviours,



support programs and active participation, resilience training, preventive interventions, etc.

The siblings need a place where they can ask questions and share their experiences with others in their same situation. Gradually, we are gaining more knowledge of the needs of the siblings of children with ASD, which will enable us to implement real functional actions and to offer them the support that they need.

REFERENCES

- (*) This mark indicates the articles analysed in this theoretical review.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- (*) Benson, P., & Karlof, K. L. (2008). Child, parent, and family predictors of latter adjustment in siblings of children with autism. *Research in Autism Spectrum Disorders*, 2(1), 583-600.
- (*) Brewton, C. M., Nowell, K. P., Lasala, M. W., et al. (2011). Relationship between the social functioning of children with Autism Spectrum Disorders and their siblings' competencies/problem behaviors. *Research in Autism Spectrum Disorders*, 6(2), 646-653.
- Centers for Disease Control and Prevention. (2014). Prevalence of Autism Spectrum Disorder among children aged 8 years. *Surveillance Summaries*, 63.
- (*) Fisman, S., Wolf, L., Ellison, D., & Freeman, T. (2000). A longitudinal study of children with chronic disabilities. *Canadian Journal of Psychiatry*, 45, 369-375.
- (*) Hastings, R. P. (2003a). Behavioral adjustment of siblings of children with autism engaged in applied behavior analysis early intervention programs: the moderating role of social support. *Journal of Autism and Developmental Disorders*, 33(2), 141-150.
- (*) Hastings, R. P. (2003b). Brief report: behavioral adjustment of siblings of children with autism. *Journal of Autism and Developmental Disorders*, 33(1), 99-104.
- (*) Hastings, R. P. (2007). Longitudinal relationships between sibling behavioral adjustment and behavior problems of children with developmental disabilities. *Journal of Autism and Developmental Disorders*, 37, 1485-1492.
- (*) Hastings, R. P. & Petalas, M. A. (2013). Self-reported behavior problems and sibling relationship quality by siblings of children with Autism Spectrum Disorder. *Child: Care, Health and Development*, 40(6), 833-839.
- (*) Hesse, T. L., Danko, C. M. & Budd, K. S. (2013). Siblings of children with autism: Predictors of adjustment. *Research in Autism Spectrum Disorders*, 7(11), 1323-1331.
- (*) Kaminsky, L., & Dewey, D. (2002). Psychosocial adjustment in siblings of children with autism. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 43(2), 225-233.
- (*) Macks, R. J., & Reeve, R. E. (2007). The adjustment of non-disabled siblings of children with autism. *Journal of Autism and Developmental Disorders*, 37(6), 1060-1067.
- (*) Mascha, K., & Boucher, J. (2006). Preliminary investigation of a qualitative method of examining siblings' experiences of living with a child with ASD. *The British Journal of Developmental Disabilities*, 52, 19-28.
- Meadan, H., Stoner, J. B. & Angell, M. E. (2010). Review of Literature Related to the Social, Emotional and Behavioral Adjustment of Siblings of Individuals with Autism Spectrum Disorder. *Journal of Development and Physical Disabilities*, 22, 83-100.
- (*) Meyer, K. A., Ingersoll, B. & Hambrick, D. Z. (2011). Factors influencing adjustment in siblings of children with Autism Spectrum Disorders. *Research in Autism Spectrum Disorders*, 5(4), 1413-1420.
- (*) Moyson, T. & Roeyers, H. (2011). The Quality of Life of siblings of children with Autism Spectrum Disorder. *Exceptional Children*, 78, 41-55.
- (*) Pérez, C. G. & Verdugo, M. A. (2008). La influencia de un hermano con autismo sobre la calidad de vida familiar [The influence of a sibling with autism on the quality of family life]. *Revista española sobre Discapacidad Intelectual*, 39(3), 75-90.
- (*) Petalas, M. A., Hastings, R. P., Nash, S., et al. (2009a). "I like that he always shows who he is": The perceptions and experiences of siblings with a brother with Autism Spectrum Disorder. *International Journal of Disability, Development and Education*, 56(4), 381-399.
- (*) Petalas, M. A., Hastings, R. P., Nash, S., et al. (2009b). Emotional and behavioural adjustment in siblings of children with intellectual disability with and without autism. *Autism*, 13, 471-483.
- (*) Petalas, M. A., Hastings, R. P., Nash, S., et al. (2012). Psychological adjustment and sibling relationships in



- siblings of children with autism spectrum disorders: environmental stressors and the broad autism phenotype. *Research in Autism Spectrum Disorders*, 6, 546-555.
- (*) Pilowsky, T., Yirmiya, N., Doppelt, O., Gross-Tsur, V., & Shalev, R. S. (2004). Social and emotional adjustment of siblings of children with autism. *Journal of Child Psychology*, 45(4), 855-865.
- (*) Quintero, N. & McIntyre, L. L. (2010). Sibling adjustment and maternal well-being: An examination of families with and without a child with an Autism Spectrum Disorder. *Focus on Autism and Other Developmental Disabilities*, 25(1), 37-46.
- (*) Rao, P. A. & Beidel, D. C. (2009). The impact of children with High-Functioning Autism on parental stress, sibling adjustment and family functioning. *Behavior Modification*, 33, 437-451.
- (*) Ross, P., & Cuskelly, M. (2006). Adjustment, sibling problems, and coping strategies of brothers and sisters of children with autistic spectrum disorder. *Journal of Intellectual & Developmental Disability*, 31(1), 77-86.
- (*) Tarafder, S., Mukhopadhyay, P., & Basu, S. (2004). Personality profile of siblings of children with autism: A comparative study. *SIS Journal of Projective Psychology and Mental Health*, 11, 52-58.
- (*) Tomeny, T. S., Barry, T. D. & Bader, S. H. (2014). Birth order rank as a moderator of the relation between behavior problems among children with an autism spectrum disorder and their siblings. *Autism*, 18(2), 199-202.
- Turnbull, A., Turnbull, R., Erwin, E., & Soodak, L. (2006). Families, professionals, and exceptionality: Positive outcomes through partnerships and trust (5th ed.). Upper Saddle River: Merrill/Prentice Hall.
- In Meadan, H., Stoner, J. B. & Angell, M. E. (2010). Review of literature Related to the Social, Emotional and Behavioral adjustment of siblings of individuals with Autism Spectrum Disorder. *Journal of Development and Physical Disabilities*, 22, 83-100.
- (*) Verte, S., Roeyers, H., & Buysse, A. (2003). Behavioural problems, social competence and self-concept in siblings of children with autism. *Child: Care, Health and Development*, 29(3), 193-205.

