

Πρόγραμμα Μεταπτυχιακών Σπουδών Εξειδίκευσης
του Τμήματος Ελληνικής Φιλολογίας του Δημοκριτείου Πανεπιστημίου Θράκης
σε συνεργασία με το
ΕΚΕΦΕ Δημόκριτος – Ινστιτούτο Πληροφορικής και Επικοινωνιών
με τίτλο: «Εξειδίκευση στις Τ.Π.Ε. και Ειδική Αγωγή – Ψυχοπαιδαγωγική της ένταξης»

**ΟΙ ΔΕΞΙΟΤΗΤΕΣ ΤΗΣ ΛΕΠΤΗΣ ΚΙΝΗΣΗΣ ΣΕ ΠΑΙΔΙΑ ΜΕ ΔΙΑΤΑΡΑΧΗ
ΑΥΤΙΣΤΙΚΟΥ ΦΑΣΜΑΤΟΣ ΚΑΙ Η ΣΥΜΒΟΛΗ ΤΗΣ ΕΡΓΟΘΕΡΑΠΕΙΑΣ**

**THE FINE MOTOR SKILLS IN CHILDREN WITH AUTISM SPECTRUM
DISORDER AND THE CONTRIBUTION OF OCCUPATIONAL THERAPY**

του

Διβόλη Ιωσήφ

Μεταπτυχιακή διατριβή που υποβάλλεται
στην τριμελή επιτροπή για την απόκτηση του μεταπτυχιακού τίτλου του
Προγράμματος Μεταπτυχιακών Σπουδών Εξειδίκευσης
του Τ.Ε.Φ.-Δ.Π.Θ. σε συνεργασία με το Ε.Κ.Ε.Φ.Ε. Δημόκριτος – Ινστιτούτο
Πληροφορικής και Επικοινωνιών
με τίτλο: «Εξειδίκευση στις Τ.Π.Ε. και Ειδική Αγωγή – Ψυχοπαιδαγωγική της
ένταξης»

Η τριμελής επιτροπή:

1. Δρ. ΔΡΙΓΚΑΣ ΑΘΑΝΑΣΙΟΣ
ΔΙΕΥΘΥΝΤΗΣ ΕΡΕΥΝΩΝ ΚΑΙ ΕΡΕΥΝΗΤΗΣ Α' ΒΑΘΜΙΔΑΣ Ι.Π.Τ. Ε.Κ.Ε.Φ.Ε.
“ΔΗΜΟΚΡΙΤΟΣ”
2. Δρ. ΚΑΡΑΜΠΑΤΖΑΚΗ ΖΩΗ
ΣΥΝΕΡΓΑΖΟΜΕΝΗ ΕΡΕΥΝΗΤΡΙΑ Ι.Π.Τ. Ε.Κ.Ε.Φ.Ε. “ΔΗΜΟΚΡΙΤΟΣ”
3. Δρ. ΣΤΑΘΟΠΟΥΛΟΥ ΑΓΑΘΗ
ΣΥΝΕΡΓΑΤΙΔΑ ΕΡΕΥΝΗΤΡΙΑ Ι.Π.Τ. Ε.Κ.Ε.Φ.Ε. “ΔΗΜΟΚΡΙΤΟΣ”

Αθήνα

2019

Περίληψη

Η λεπτή κίνηση φαίνεται να αποτελεί μία εξίσου με τις άλλες σημαντική συνιστώσα στην ανάπτυξη του παιδιού. Ωστόσο παρατηρείται να επηρεάζει και να επηρεάζεται από τα άλλα αναπτυξιακά ορόσημα. Αυτό έχει σαν αποτέλεσμα στη διαταραχή του αυτιστικού φάσματος, η ανάπτυξη να πλήγεται χωρίς να υπάρχει σαφής αιτιολογία. Ταυτόχρονα, εμφανή είναι τα χαρακτηριστικά των παιδιών με αυτισμό σε όλες τις εκφάνσεις των ρόλων που αναλαμβάνουν. Αφού προκύπτουν σημαντικά ελλείμματα, στην επικοινωνία, στην κοινωνική αλληλεπίδραση και στην κινητικότητα του συγκεκριμένου πληθυσμού. Επομένως, μέσω της εργοθεραπείας στα προγράμματα παρέμβασης που υλοποιούνται, χρησιμοποιούνται διάφορες προσεγγίσεις, που έχουν ως στόχο μεταξύ άλλων τη βελτίωση και την αποκατάσταση των δυσκολιών αυτών.

Λέξεις – κλειδιά: διαταραχή αυτιστικού φάσματος, λεπτή κίνηση, εργοθεραπεία

Abstract

Fine motor seems to be just as important as the other important component in child development. However, it is observed to affect and be influenced by the other developmental milestones. This has the effect of disturbing the autistic spectrum, the growth being affected without a clear reasoning. At the same time, the characteristics of children with autism are evident in all aspects of the roles they undertake. After significant deficits occur, communication, social interaction and mobility of the particular population. Therefore, through occupational therapy in the intervention programs being implemented, various approaches are used, which aim, among other things, to improve and remedy these difficulties.

Key – words: autism spectrum disorder, fine motor, occupational therapy

Βιβλιογραφικές Αναφορές

- Abrahams, B. S., & Geschwind, D. H. (2008). Advances in autism genetics: on the threshold of a new neurobiology. *Nature reviews genetics*, 9(5), 341.
- Accardo, P. J., & Barrow, W. (2015). Toe walking in autism: further observations. *Journal of child neurology*, 30(5), 606-609.
- Ameis, S. H., & Catani, M. (2015). Altered white matter connectivity as a neural substrate for social impairment in Autism Spectrum Disorder. *Cortex*, 62, 158-181.
- Ament, K., Mejia, A., Buhlman, R., Erklin, S., Caffo, B., Mostofsky, S., & Wodka, E. (2015). Evidence for specificity of motor impairments in catching and balance in children with autism. *Journal of autism and developmental disorders*, 45(3), 742-751.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.
- American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders. *American Psychiatric Association Press, Washington, DC*.
- Anzulewicz, A., Sobota, K., & Delafield-Butt, J. T. (2016). Toward the autism motor signature: Gesture patterns during smart tablet gameplay identify children with autism. *Scientific reports*, 6, 31107. Ανακτήθηκε από: <https://www.nature.com/articles/srep31107>
- American Occupational Therapy Association (AOTA), T. A. (2010). *Frequently asked questions (FAQ): What is occupational therapy's role in supporting persons with an Autism Spectrum Disorder?*.
- American Occupational Therapy Association (AOTA). (1994). *Pediatric Resource Guide*. Rockville, M.D. : American Occupational Therapy Association.
- APA, A. (2013a). *Autism Spectrum Disorder fact sheet*. Arlington, VA: American Psychiatric Publishing.
- APA, A. (2013b). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Arlington, VA: American Psychiatric Publishing.
- Ayres, K. M., Mechling, L., & Sansosti, F. J. (2013). The use of mobile technologies to assist with life skills/independence of students with moderate/severe

intellectual disability and/or autism spectrum disorders: Considerations for the future of school psychology. *Psychology in the Schools*, 50(3), 259-271.

Ανακτήθηκε

από:

<https://onlinelibrary.wiley.com/doi/full/10.1002/pits.21673>

Bailey, A., Luthert, P., Dean, A., Harding, B., Janota, I., Montgomery, M., ... & Lantos, P. (1998). A clinicopathological study of autism. *Brain: a journal of neurology*, 121(5), 889-905.

Ανακτήθηκε

από:

<https://academic.oup.com/brain/article/121/5/889/313174>

Baio, J., Wiggins, L., Christensen, D. L., Maenner, M. J., Daniels, J., Warren, Z., ... & Durkin, M. S. (2018). Prevalence of autism spectrum disorder among children aged 8 years—autism and developmental disabilities monitoring network, 11 sites, United States, 2014. *MMWR Surveillance Summaries*, 67(6), 1. Ανακτήθηκε , 201 , από <https://stacks.cdc.gov/view/cdc/22182>

Βαλαμουτοπούλου, Χ. & Κουτελέκος, Ι. (2009). Το σύνδρομο Asperger στα παιδιά. *ΤΟ ΒΗΜΑ ΤΟΥ ΑΣΚΛΗΠΙΟΥ*, 8(1), 78-92. Ανακτήθηκε από: <http://hypatia.lb.teiath.gr/handle/11400/4160>

Baranek, G. T. (1999). Autism during infancy: A retrospective video analysis of sensory-motor and social behaviors at 9–12 months of age. *Journal of autism and developmental disorders*, 29(3), 213-224. Ανακτήθηκε από: <https://link.springer.com/article/10.1023/A:1023080005650>

Barkocy, M., Dexter, J., & Petranovich, C. (2017). Kinematic Gait Changes Following Serial Casting and Bracing to Treat Toe Walking in a Child With Autism. *Pediatric Physical Therapy*, 29(3), 270-274.

Baron-Cohen, S., Scott, F.J., Carrie Allison, C., Williams, J., Bolton, P., Matthews, F., et al (2009). Prevalence of autism-spectrum conditions: UK school-based population study. *The British Journal of Psychiatry*, 194, 500-509. Ανακτήθηκε από: <https://www.cambridge.org/core/journals/the-british-journal-of-psychiatry/article/prevalence-of-Autismspectrum-conditions-uk-schoolbased-population-study/BD4DEF69A99238234E6E39BD844083B9>

Bauminger, N. (2002). The facilitation of social-emotional understanding and social interaction in high-functioning children with autism: Intervention outcomes. *Journal of autism and developmental disorders*, 32(4), 283-298.

- Bernard-Opitz, V., Ross, K., & Tuttas, M. L., (1990). Computer assisted instruction for children with autism. *Annals of the Academy of Medicine*, 19, 611-616
- Bornstein, M. H., Hahn, C. S., & Suwalsky, J. T. (2013). Physically developed and exploratory young infants contribute to their own long-term academic achievement. *Psychological science*, 24(10), 1906-1917.
- Bradshaw, J., Steiner, A. M., Gengoux, G., & Koegel, L. K. (2015). Feasibility and effectiveness of very early intervention for infants at-risk for autism spectrum disorder: A systematic review. *Journal of Autism and Developmental Disorders*, 45(3), 778-794.
- Bremer, E., & Lloyd, M. (2016). School-based fundamental-motor-skill intervention for children with autism-like characteristics: an exploratory study. *Adapted Physical Activity Quarterly*, 33(1), 66-88.
- Bremer, E., Balogh, R., & Lloyd, M. (2015). Effectiveness of a fundamental motor skill intervention for 4-year-old children with autism spectrum disorder: A pilot study. *Autism*, 19(8), 980-991.
- Burton, C. E., Anderson, D. H., Prater, M. A., & Dyches, T. T. (2013). Video self-modeling on an iPad to teach functional math skills to adolescents with autism and intellectual disability. *Focus on Autism and Other Developmental Disabilities*, 28(2), 67-77.
- Cacola, P., Miller, H. L., & Williamson, P. O. (2017). Behavioral comparisons in autism spectrum disorder and developmental coordination disorder: a systematic literature review. *Research in autism spectrum disorders*, 38, 6-18.
- Caeyenberghs, K., Taymans, T., Wilson, P. H., Vanderstraeten, G., Hosseini, H., & Van Waelvelde, H. (2016). Neural signature of developmental coordination disorder in the structural connectome independent of comorbid autism. *Developmental science*, 19(4), 599-612.
- Calhoun, M., Longworth, M., & Chester, V. L. (2011). Gait patterns in children with autism. *Clinical biomechanics*, 26(2), 200-206.

- Casartelli, L., Molteni, M., & Ronconi, L. (2016). So close yet so far: Motor anomalies impacting on social functioning in autism spectrum disorder. *Neuroscience & Biobehavioral Reviews*, 63, 98-105.
- Centers for Disease Control and Prevention. (2014). Prevalence of autism spectrum disorder among children aged 8 years. *Morbidity and Mortality Weekly Report – Surveillance Summaries*, 63, 1-21. Ανακτήθηκε από: <https://stacks.cdc.gov/view/cdc/22182>
- Colombo-Dougovito, A. M., & Reeve, R. E. (2017). Exploring the interaction of motor and social skills with autism severity using the SFARI dataset. *Perceptual and motor skills*, 124(2), 413-424.
- Courchesne, E., Karns, C. M., Davis, H. R., Ziccardi, R., Carper, R. A., Tigue, Z. D., ... & Lincoln, A. J. (2001). Unusual brain growth patterns in early life in patients with autistic disorder: an MRI study. *Neurology*, 57(2), 245-254.
- Criscimagna-Hemminger, S. E., Bastian, A. J., & Shadmehr, R. (2010). Size of error affects cerebellar contributions to motor learning. *Journal of neurophysiology*, 103(4), 2275-2284. Ανακτήθηκε από: <https://www.physiology.org/doi/full/10.1152/jn.00822.2009>
- Cummins, A., Piek, J. P., & Dyck, M. J. (2005). Motor coordination, empathy, and social behaviour in school-aged children. *Developmental medicine and child neurology*, 47(7), 437-442. Ανακτήθηκε από: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.603.7271&rep=re&p1&type=pdf>
- Dewey, D., Cantell, M., & Crawford, S. G. (2007). Motor and gestural performance in children with autism spectrum disorders, developmental coordination disorder, and/or attention deficit hyperactivity disorder. *Journal of the International Neuropsychological Society*, 13(2), 246-256.
- Donchin, O., Francis, J. T., & Shadmehr, R. (2003). Quantifying generalization from trial-by-trial behavior of adaptive systems that learn with basis functions: theory and experiments in human motor control. *Journal of Neuroscience*, 23(27), 9032-9045. Ανακτήθηκε από: <http://www.jneurosci.org/content/jneuro/23/27/9032.full.pdf>

- Donchin, O., Rabe, K., Diedrichsen, J., Lally, N., Schoch, B., Gizewski, E. R., & Timmann, D. (2011). Cerebellar regions involved in adaptation to force field and visuomotor perturbation. *Journal of neurophysiology*, 107(1), 134-147.
- Ανακτήθηκε από:
<https://pdfs.semanticscholar.org/4a13/87b92a6263ace77c66bb33d512f817183704.pdf>
- Doumas, M., McKenna, R., & Murphy, B. (2016). Postural control deficits in autism spectrum disorder: the role of sensory integration. *Journal of autism and developmental disorders*, 46(3), 853-861.
- Dowell, L. R., Mahone, E. M., & Mostofsky, S. H. (2009). Associations of postural knowledge and basic motor skill with dyspraxia in autism: implication for abnormalities in distributed connectivity and motor learning. *Neuropsychology*, 23(5), 563.
- Dziuk, M. A., Larson, J. G., Apostu, A., Mahone, E. M., Denckla, M. B., & Mostofsky, S. H. (2007). Dyspraxia in autism: association with motor, social, and communicative deficits. *Developmental Medicine & Child Neurology*, 49(10), 734-739.
- Ανακτήθηκε από:
<https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1469-8749.2007.00734.x>
- Einspieler, C., Sigafoos, J., Bartl-Pokorny, K. D., Landa, R., Marschik, P. B., & Bölte, S. (2014). Highlighting the first 5 months of life: general movements in infants later diagnosed with autism spectrum disorder or Rett syndrome. *Research in Autism Spectrum Disorders*, 8(3), 286-291.
- Elyda, C. (2013). Jakarta takes first tentative steps to becoming an autism-friendly city. *The Jakarta Post*, April 8.
- Ευρωπαϊκός Φορέας Ειδικής Αγωγής (2003). *Η Ειδική Αγωγή στην Ευρώπη*, Brussels:
- Meijer, Soriano, Watkins. Ανακτήθηκε από:
http://dea.sch.gr/ThematicPublication_Greek.pdf
- Fernell, E., Eriksson, M. A., & Gillberg, C. (2013). Early diagnosis of autism and impact on prognosis: a narrative review. *Clin Epidemiol.*, 5, 33-40. Ανακτήθηκε από:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3583438/>
- Floris, D. L., Barber, A. D., Nebel, M. B., Martinelli, M., Lai, M. C., Crocetti, D., ... & Mostofsky, S. H. (2016). Atypical lateralization of motor circuit functional

- connectivity in children with autism is associated with motor deficits. *Molecular autism*, 7(1), 35. Ανακτήθηκε από: <https://molecularautism.biomedcentral.com/articles/10.1186/s13229-016-0096-6>
- Focaroli, V., Taffoni, F., Parsons, S. M., Keller, F., & Iverson, J. M. (2016). Performance of motor sequences in children at heightened vs. low risk for ASD: A longitudinal study from 18 to 36 months of age. *Frontiers in psychology*, 7, 724. Ανακτήθηκε από: <https://www.frontiersin.org/articles/10.3389/fpsyg.2016.00724/full>
- Folstein, S., & Rutter, M. (1977). Infantile autism: a genetic study of 21 twin pairs. *Journal of Child psychology and Psychiatry*, 18(4), 297-321.
- Fournier, K. A., Hass, C. J., Naik, S. K., Lodha, N., & Cauraugh, J. H. (2010). Motor coordination in autism spectrum disorders: a synthesis and meta-analysis. *Journal of autism and developmental disorders*, 40(10), 1227-1240.
- Fuentes, C. T., Mostofsky, S. H., & Bastian, A. J. (2009). Children with autism show specific handwriting impairments. *Neurology*, 73(19), 1532-1537.
- Ζαφειρίου, Δ. (2009). Διάχυτες αναπτυξιακές διαταραχές και αυτισμός. *Νέα Παιδιατρικά Χρονικά*, 9(1), 3-4.
- Geschwind, N., & Galaburda, A. M. (1985). Cerebral lateralization. Biological mechanisms, associations and pathology. *Archives of Neurology*, 42, 428-459.
- Gilger, J. W., & Kaplan, B. J. (2001). Atypical brain development: a conceptual framework for understanding developmental learning disabilities. *Developmental neuropsychology*, 20(2), 465-481.
- Gillberg, C. (2010). The ESSENCE in child psychiatry: early symptomatic syndromes eliciting neurodevelopmental clinical examinations. *Research in developmental disabilities*, 31(6), 1543-1551.
- Hallett, M., Lebiedowska, M. K., Thomas, S. L., Stanhope, S. J., Denckla, M. B., & Rumsey, J. (1993). Locomotion of autistic adults. *Archives of Neurology*, 50(12), 1304-1308.
- Hallmayer, J., Cleveland, S., Torres, A., Phillips, J., Cohen, B., Torigoe, T., ... & Lotspeich, L. (2011). Genetic heritability and shared environmental factors among twin pairs with autism. *Archives of general psychiatry*, 68(11), 1095-

1102.

Ανακτήθηκε

από:

<https://jamanetwork.com/journals/jamapsychiatry/article-abstract/1107328>

Hardan, A. Y., Kilpatrick, M., Keshavan, M. S., & Minshew, N. J. (2003). Motor performance and anatomic magnetic resonance imaging (MRI) of the basal ganglia in autism. *Journal of Child Neurology, 18*(5), 317-324.

Hartman, E., Houwen, S., Scherder, E., & Visscher, C. (2010). On the relationship between motor performance and executive functioning in children with intellectual disabilities. *Journal of Intellectual Disability Research, 54*(5), 468-477.

Hashimoto, T., Tayama, M., Murakawa, K., Yoshimoto, T., Miyazaki, M., Harada, M., & Kuroda, Y. (1995). Development of the brainstem and cerebellum in autistic patients. *Journal of autism and developmental disorders, 25*(1), 1-18.

Howlin, P., Magiati, I., & Charman, T. (2009). Systematic review of early intensive behavioral interventions for children with autism. *American journal on intellectual and developmental disabilities, 114*(1), 23-41.

Individuals with Disabilities Education Act (IDEA) (2004). 34 CFR (Code of Federal Regulations) Section 300.8 (c) (1) (i-iii). Ανακτήθηκε από:
<https://www.law.cornell.edu/cfr/text/34/300.8>

Iverson, J. M. (2010). Developing language in a developing body: The relationship between motor development and language development. *Journal of child language, 37*(2), 229-261.

Izadi-Najafabadi, S., Mirzakhani-Araghi, N., Miri-Lavasani, N., Nejati, V., & Pashazadeh-Azari, Z. (2015). Implicit and explicit motor learning: Application to children with Autism Spectrum Disorder (ASD). *Research in developmental disabilities, 47*, 284-296.

Izawa, J., Criscimagna-Hemminger, S. E., & Shadmehr, R. (2012). Cerebellar contributions to reach adaptation and learning sensory consequences of action. *Journal of Neuroscience, 32*(12), 4230-4239. Ανακτήθηκε από:
<http://www.jneurosci.org/content/jneuro/32/12/4230.full.pdf>

Jansiewicz, E. M., Goldberg, M. C., Newschaffer, C. J., Denckla, M. B., Landa, R., & Mostofsky, S. H. (2006). Motor signs distinguish children with high

- functioning autism and Asperger's syndrome from controls. *Journal of autism and developmental disorders*, 36(5), 613-621.
- Jasmin, E., Couture, M., McKinley, P., Reid, G., Fombonne, E., & Gisel, E. (2009). Sensori-motor and daily living skills of preschool children with autism spectrum disorders. *Journal of autism and developmental disorders*, 39(2), 231-241.
- Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous child*, 2(3), 217-250. Ανακτήθηκε από: http://mail.neurodiversity.com/library_kanner_1943.pdf
- Kaur, M., Srinivasan, S. M., & Bhat, A. N. (2018). Comparing motor performance, praxis, coordination, and interpersonal synchrony between children with and without Autism Spectrum Disorder (ASD). *Research in developmental disabilities*, 72, 79-95.
- Kemper, T. L., & Bauman, M. (1998). Neuropathology of infantile autism. *Journal of neuropathology and experimental neurology*, 57(7), 645-652. Ανακτήθηκε από: https://www.researchgate.net/profile/Margaret_Bauman/publication/11239069_Neuropathology_of_infantile_autism/links/0c96051bb48d4f012f000000.pdf
- Kim, H., Carlson, A. G., Curby, T. W., & Winsler, A. (2016). Relations among motor, social, and cognitive skills in pre-kindergarten children with developmental disabilities. *Research in developmental disabilities*, 53, 43-60.
- Kogan, M. D., Blumberg, S. J., Schieve, L. A., Boyle, C. A., Perrin, J. M., Ghandour, R. M., ... & van Dyck, P. C. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. *Pediatrics*, 124(5), 1395-1403. Ανακτήθηκε από: https://pediatrics.aappublications.org/content/124/5/1395?ijkey=7ef90e852ca2dcca0f78a6e98340a84158a5b84f&keytype2=tf_ipsecsha
- Kuhn, R. & Cahn, C.H. (2004). Eugen Bleeder's concepts of psychopathology. *History of Psychiatry*, Vol.15 (3), p.361-366. Ανακτήθηκε από: <http://journals.sagepub.com/doi/pdf/10.1177/0957154x04044603>

- Kurtz, L. A. (2007). *Understanding motor skills in children with dyspraxia, ADHD, autism, and other learning disabilities: A guide to improving coordination*. Jessica Kingsley Publishers. Ανακτήθηκε από: https://books.google.gr/books?hl=el&lr=&id=CDB31DDLfWIC&oi=fnd&pg=PP1&dq=Understanding+motor+skills+in+children+with+dyspraxia,+ADHD,+autism,+and+other+learning+disabilities:+A+guide+to+improving+coordination.&ots=dB2Zcmz6fg&sig=5NaRI65eLMe0Zs9Ktp23Pbgl6YQ&redir_esc=y#v=onepage&q&f=false
- Lai, M.C., Lombardo, M.V., Baron-Cohen, S. (2014). *Autism Lancet* 383, 896-910.
- Landa, R. J., Gross, A. L., Stuart, E. A., & Faherty, A. (2013). Developmental trajectories in children with and without autism spectrum disorders: the first 3 years. *Child development*, 84(2), 429-442.
- Leonard, H. C., Bedford, R., Pickles, A., Hill, E. L., & BASIS Team. (2015). Predicting the rate of language development from early motor skills in at-risk infants who develop autism spectrum disorder. *Research in Autism Spectrum Disorders*, 13, 15-24.
- Leonard, H. C., Bedford, R., Charman, T., Elsabbagh, M., Johnson, M. H., Hill, E. L., & BASIS team. (2014). Motor development in children at risk of autism: a follow-up study of infant siblings. *Autism*, 18(3), 281-291.
- Levy, S. E., & Mandell, D. S. (2009). Schultz RT. *Autism. Lancet*, 374(9701), 1627-1638.
- Λιάπη, Ε. (2016). *Ποσοτική αξιολόγηση μετρήσεων προτίμησης χεριού: προβλήματα και συνεπαγωγές που συνδέονται με την έρευνα για την κινητική ασυμμετρία σε πληθυσμούς ατόμων με τυπική ανάπτυξη και νευροαναπτυξιακές διαταραχές*. Αδημοσίευτη Διδακτορική Διατριβή, Πανεπιστήμιο Δυτικής Μακεδονίας/Π.Τ.Δ.Ε.Φ. Φλώρινα, Ελλάδα.
- Libby, M. E., Weiss, J. S., Bancroft, S., & Ahearn, W. H. (2008). A comparison of most-to-least and least-to-most prompting on the acquisition of solitary play skills. *Behavior Analysis in Practice*, 1(1), 37-43.
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P., ... & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions:

explanation and elaboration. *PLoS medicine*, 6(7), e1000100. Ανακτήθηκε από:

<https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000100>

Libertus, K., Sheperd, K. A., Ross, S. W., & Landa, R. J. (2014). Limited fine motor and grasping skills in 6-month-old infants at high risk for autism. *Child development*, 85(6), 2218-2231.

Libertus, K., & Needham, A. (2010). Teach to reach: The effects of active vs. passive reaching experiences on action and perception. *Vision research*, 50(24), 2750-2757. Ανακτήθηκε από:

<https://www.sciencedirect.com/science/article/pii/S0042698910004359>

Lim, B. O., O'Sullivan, D., Choi, B. G., & Kim, M. Y. (2016). Comparative gait analysis between children with autism and age-matched controls: analysis with temporal-spatial and foot pressure variables. *Journal of physical therapy science*, 28(1), 286-292.

MacDonald, M., Lord, C., & Ulrich, D. A. (2013). The relationship of motor skills and social communicative skills in school-aged children with autism spectrum disorder. *Adapted Physical Activity Quarterly*, 30(3), 271-282.

MacDonald, M., Lord, C., & Ulrich, D. A. (2014). Motor skills and calibrated autism severity in young children with autism spectrum disorder. *Adapted physical activity quarterly*, 31(2), 95-105.

Mache, M. A., & Todd, T. A. (2016). Gross motor skills are related to postural stability and age in children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 23, 179-187.

Maenner, M. J., Rice, C. E., Arneson, C. L., Cunniff, C., Schieve, L. A., Carpenter, L. A., ... & Durkin, M. S. (2014). Potential impact of DSM-5 criteria on autism spectrum disorder prevalence estimates. *JAMA psychiatry*, 71(3), 292-300.

Marko, M. K., Crocetti, D., Hulst, T., Donchin, O., Shadmehr, R., & Mostofsky, S. H. (2015). Behavioural and neural basis of anomalous motor learning in children with autism. *Brain*, 138(3), 784-797. Ανακτήθηκε από:

<https://academic.oup.com/brain/article/138/3/784/336095>

- Mattingly, S. M. (2012). The Experiences Of An Occupational Therapist Delivering Occupation-Based Practice At A Skilled Nursing Facility. Ανακτήθηκε από: <https://encompass.eku.edu/cgi/viewcontent.cgi?referer=https://scholar.google.gr/&httpsredir=1&article=1069&context=etd>
- McPhillips, M., Finlay, J., Bejerot, S., & Hanley, M. (2014). Motor deficits in children with autism spectrum disorder: a cross-syndrome study. *Autism Research*, 7(6), 664-676.
- Mechling, L., & O'Brien, E. (2010). Computer-based video instruction to teach students with intellectual disabilities to use public bus transportation. *Education and Training in Autism and Developmental Disabilities*, 230-241.
- Μικρόπουλος, Τ.Α. (2008). *Ο Υπολογιστής ως γνωστικό εργαλείο (4η έκδ)*. Αθήνα: Ελληνικά Γράμματα. Ανακτήθηκε από: http://ecourse.uoi.gr/pluginfile.php/2446/mod_resource/content/0/Dialekseis/01SimVis_ICTCognitiveTool.pdf
- Miller, M., Chukoskie, L., Zinni, M., Townsend, J., & Trauner, D. (2014). Dyspraxia, motor function and visual-motor integration in autism. *Behavioural brain research*, 269, 95-102.
- Mintz, M. (2017). Evolution in the Understanding of Autism Spectrum Disorder: Historical Perspective. *The Indian Journal of Pediatrics*, Vol.84 (1), p.44-52. Ανακτήθηκε από: <https://link.springer.com/article/10.1007/s12098-016-2080-8>
- Mosconi, M. W., Mohanty, S., Greene, R. K., Cook, E. H., Vaillancourt, D. E., & Sweeney, J. A. (2015). Feedforward and feedback motor control abnormalities implicate cerebellar dysfunctions in autism spectrum disorder. *Journal of Neuroscience*, 35(5). Ανακτήθηκε από: <http://www.jneurosci.org/content/jneuro/35/5/2015.full.pdf>
- Mostofsky, S. H., Dubey, P., Jerath, V. K., Jansiewicz, E. M., Goldberg, M. C., & Denckla, M. B. (2006). Developmental dyspraxia is not limited to imitation in children with autism spectrum disorders. *Journal of the International Neuropsychological Society*, 12(3), 314-326.

- Μπελλάλη, Θ. (2011). Βασικές Αρχές και Μεθοδολογία της Συστηματικής Ανασκόπησης Ποσοτικών Μελετών. *Νοσηλευτική*, 50(1), 10-22. Ανακτήθηκε από: http://hjn.gr/wp-content/uploads/2014/10/get_pdf-8.pdf
- Murakami, J. W., Courchesne, E., Press, G. A., Yeung-Courchesne, R., & Hesselink, J. R. (1989). Reduced cerebellar hemisphere size and its relationship to vermal hypoplasia in autism. *Archives of neurology*, 46(6), 689-694.
- Murzynski, N. T., & Bourret, J. C. (2007). Combining video modeling and least-to-most prompting for establishing response chains. *Behavioral Interventions: Theory & Practice in Residential & Community-Based Clinical Programs*, 22(2), 147-152.
- Ozonoff, S., Young, G. S., Belding, A., Hill, M., Hill, A., Hutman, T., ... & Steinfeld, M. (2014). The broader autism phenotype in infancy: when does it emerge?. *Journal of the American Academy of Child & Adolescent Psychiatry*, 53(4), 398-407.
- Ozonoff, S., Young, G. S., Goldring, S., Greiss-Hess, L., Herrera, A. M., Steele, J., ... & Rogers, S. J. (2008). Gross motor development, movement abnormalities, and early identification of autism. *Journal of autism and developmental disorders*, 38(4), 644-656.
- Papadopoulos, N., Rinehart, N. J., Bradshaw, J. L., Taffe, J., & McGinley, J. (2015). Is there a link between motor performance variability and social-communicative impairment in children with ADHD-CT: A kinematic study using an upper limb Fitts' aiming task. *Journal of attention disorders*, 19(1), 72-77.
- Parker, D., & Kamps, D. (2011). Effects of task analysis and self-monitoring for children with autism in multiple social settings. *Focus on Autism and Other Developmental Disabilities*, 26(3), 131-142.
- Πατελάρου, Ε., & Μπροκαλάκη, Ή. (2010). Μεθοδολογία της συστηματικής ανασκόπησης και μετα-ανάλυσης. *Νοσηλευτική*, 49(2), 122-130. Ανακτήθηκε από: http://hjn.gr/wp-content/uploads/2014/10/get_pdf-123.pdf
- Penfield, W., & Boldrey, E. (1937). Somatic motor and sensory representation in the cerebral cortex of man as studied by electrical stimulation. *Brain*, 60(4), 389-443. Ανακτήθηκε από:

- <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.873.4232&rep=rep1&type=pdf>
- Pennington, B. F. (2006). From single to multiple deficit models of developmental disorders. *Cognition*, 101(2), 385-413.
- Piek, J. P., Bradbury, G. S., Elsley, S. C., & Tate, L. (2008). Motor coordination and Social–Emotional behaviour in Preschool-aged children. *International journal of disability, development and education*, 55(2), 143-151.
- Pollock, N. (2009). Sensory integration: A review of the current state of the evidence. *Occupational therapy now*, 11(5), 6-10. Ανακτήθηκε από: <https://autismodiario.org/wp-content/uploads/2011/05/Sensory-Integration.pdf>
- Porter, R., & Lemon, R. (1993). *Corticospinal function and voluntary movement* (No. 45). Oxford University Press, USA.
- Provost, B., Lopez, B. R., & Heimerl, S. (2007). A comparison of motor delays in young children: autism spectrum disorder, developmental delay, and developmental concerns. *Journal of autism and developmental disorders*, 37(2), 321-328.
- Pusponegoro, H. D., Efar, P., Soebadi, A., Firmansyah, A., Chen, H. J., & Hung, K. L. (2016). Gross motor profile and its association with socialization skills in children with autism spectrum disorders. *Pediatrics & Neonatology*, 57(6), 501-507. Ανακτήθηκε από: <https://www.sciencedirect.com/science/article/pii/S1875957216300225>
- Riquelme, I., Hatem, S. M., & Montoya, P. (2016). Abnormal pressure pain, touch sensitivity, proprioception, and manual dexterity in children with autism spectrum disorders. *Neural plasticity*, 2016. Ανακτήθηκε από: <https://www.hindawi.com/journals/np/2016/1723401/abs/>
- Ritvo, E. R., Freeman, B. J., Scheibel, A. B., Duong, T., Robinson, H., Guthrie, D., & Ritvo, A. (1986). Lower Purkinje cell counts in the cerebella of four autistic subjects: Initial findings of the UCLA-NSAC research report. *The American journal of psychiatry*.
- Rutter, M. (1990). *Νηπιακός Αυτισμός. Ελληνικά Γράμματα*.
- Sacrey, L. A. R., Germani, T., Bryson, S. E., & Zwaigenbaum, L. (2014). Reaching and grasping in autism spectrum disorder: a review of recent literature. *Frontiers*

in Neurology, 5, 6. Ανακτήθηκε από:

<https://www.frontiersin.org/articles/10.3389/fneur.2014.00006/full>

- Sandin, S., Lichtenstein, P., Kuja-Halkola, R., Larsson, H., Hultman, C. M., & Reichenberg, A. (2014). The familial risk of autism. *Jama*, 311(17), 1770-1777.
- Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., Van Hooydonk, E., ... & Kelly, D. (2014). An intervention for sensory difficulties in children with autism: A randomized trial. *Journal of autism and developmental disorders*, 44(7), 1493-1506. Ανακτήθηκε από:
<https://link.springer.com/article/10.1007/s10803-013-1983-8?sf20668529=1?body=http://link.springer.com/article/10.1007/s10803-013-1983-8?sf20668529=1>
- Schmahmann, J. D., & Sherman, J. C. (1998). The cerebellar cognitive affective syndrome. *Brain: a journal of neurology*, 121(4), 561-579. Ανακτήθηκε από:
<https://academic.oup.com/brain/article/121/4/561/260849>
- Scott, J. A., Schumann, C. M., Goodlin-Jones, B. L., & Amaral, D. G. (2009). A comprehensive volumetric analysis of the cerebellum in children and adolescents with autism spectrum disorder. *Autism Research*, 2(5), 246-257.
- Σηφάκη, Μ.(2002). *Εργοθεραπεία σε παιδιά και εφήβους I*. Θεωρητικό μέρος. Αθήνα. Τεχνολογικό Εκπαιδευτικό Ίδρυμα Αθήνας, Σχολή Επαγγελμάτων Υγείας και Πρόνοιας, Τμήμα Εργοθεραπείας.
- Σηφάκη, Μ.(1998). *Δραστηριότητες καθημερινής ζωής II*. Ένας τομέας λειτουργικής ενασχόλησης. Αθήνα. Τεχνολογικό Εκπαιδευτικό Ίδρυμα Αθήνας, Σχολή Επαγγελμάτων Υγείας και Πρόνοιας, Τμήμα Εργοθεραπείας.
- Sharer, E. A., Mostofsky, S. H., Pascual-Leone, A., & Oberman, L. M. (2016). Isolating visual and proprioceptive components of motor sequence learning in ASD. *Autism Research*, 9(5), 563-569.
- Shetreat-Klein, M., Shinnar, S., & Rapin, I. (2014). Abnormalities of joint mobility and gait in children with autism spectrum disorders. *Brain and Development*, 36(2), 91-96.
- Sipes, M., Matson, J. L., & Horovitz, M. (2011). Autism spectrum disorders and motor skills: The effect on socialization as measured by the Baby and Infant Screen

for Children with aUtlsm Traits (BISCUIT). *Developmental neurorehabilitation*, 14(5), 290-296.

Σκαπινάκης, Π.(2000), Συστηματικές ανασκοπήσεις και συστηματικά σφάλματα.

Αρχεία Ελληνικής Ιατρικής, 17, 440–445. Ανακτήθηκε από:

<http://www.mednet.gr/archives/2000-5/pdf/440.pdf>

Smith, M. A., & Shadmehr, R. (2005). Intact ability to learn internal models of arm dynamics in Huntington's disease but not cerebellar degeneration. *Journal of neurophysiology*, 93(5), 2809-2821. Ανακτήθηκε από:

<https://www.physiology.org/doi/full/10.1152/jn.00943.2004>

Smith, M., Spence, M. A., & Flodman, P. (2009). Nuclear and mitochondrial genome defects in autisms. *Annals of the New York Academy of Sciences*, 1151(1), 102-132.

Smith Roley, S., Mailloux, Z., Miller-Kuhaneck, H., & Glennon, T. (2007).

Understanding Ayres' Sensory. Ανακτήθηκε από:

Integration.https://digitalcommons.sacredheart.edu/cgi/viewcontent.cgi?referrer=https://scholar.google.gr/&httpsredir=1&article=1017&context=ot_fac

Sparks, B. F., Friedman, S. D., Shaw, D. W., Aylward, E. H., Echelard, D., Artru, A. A., ... & Dager, S. R. (2002). Brain structural abnormalities in young children with autism spectrum disorder. *Neurology*, 59(2), 184-192.

Stanfield, A. C., McIntosh, A. M., Spencer, M. D., Philip, R., Gaur, S., & Lawrie, S. M. (2008). Towards a neuroanatomy of autism: a systematic review and meta-analysis of structural magnetic resonance imaging studies. *European psychiatry*, 23(4), 289-299.

Steyaert, J. G., & De La Marche, W. (2008). What's new in autism?. *European Journal of Pediatrics*, 167(10), 1091-1101.

Συριοπούλου, Χ. & Κασίμος, Δ. (2009). Ζητήματα Διάγνωσης και Αξιολόγησης παιδιών με διάχυτες αναπτυξιακές διαταραχές. *Νέα Παιδιατρικά Χρονικά*, 9(1), 42-50.

Συριοπούλου, Χ., Κασίμος, Δ., & Ζαφειριού, Δ. (2010). Αναπτυξιακά Διαγνωστικά κριτήρια και μέσα αξιολόγησης του Αυτισμού και άλλων Διάχυτων Αναπτυξιακών Διαταραχών. *Παιδιατρική Βορείου Ελλάδος*, 22(4), 357-363.

- Szatmari, P., Maziade, M., Zwaigenbaum, L., Mérette, C., Roy, M. A., Joober, R., & Palmour, R. (2007). Informative phenotypes for genetic studies of psychiatric disorders. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 144(5), 581-588.
- Thompson, A., Murphy, D., Dell'Acqua, F., Ecker, C., McAlonan, G., Howells, H., ... & MRC AIMS Consortium. (2017). Impaired communication between the motor and somatosensory homunculus is associated with poor manual dexterity in autism spectrum disorder. *Biological psychiatry*, 81(3), 211-219. Ανακτήθηκε από:
<https://www.sciencedirect.com/science/article/pii/S0006322316325331>
- Tomchek, S. D., & Case-Smith, J. (2009). *Occupational therapy practice guidelines for children and adolescents with autism*. American Occupational Therapy Association.
- Torres, E. B. (2015). Commentary on: An exploration of sensory and movement differences from the perspective of individuals with autism. *Frontiers in integrative neuroscience*, 9.
- Τραυλός, Α. (1998). *Ψυχοκινητική ανάπτυξη παιδιών ηλικίας 2-7 χρόνων*. Αθήνα: Σαββάλας.
- Travers, B. G., Mason, A. H., Mrotek, L. A., Ellertson, A., Dean, D. C., Engel, C., ... & McLaughlin, K. (2018). Biofeedback-Based, Videogame Balance Training in Autism. *Journal of autism and developmental disorders*, 48(1), 163-175.
- Travers, B. G., Bigler, E. D., Tromp, D. P., Adluru, N., Destiche, D., Samsin, D., ... & Alexander, A. L. (2015). Brainstem white matter predicts individual differences in manual motor difficulties and symptom severity in autism. *Journal of autism and developmental disorders*, 45(9), 3030-3040.
- Υπουργείο Παιδείας, Δια Βίου Μάθησης και Θρησκευμάτων (ΥΠΕΠΘ) (2003). *Χαρτογράφηση-Αναλογικά Προγράμματα Ειδικής Αγωγής (2003ΣΕ04530072)*. Αθήνα: ΥΠΔΒΜΘ.
- Vernazza-Martin, S., Martin, N., Vernazza, A., Lepellec-Muller, A., Rufo, M., Massion, J., & Assaiante, C. (2005). Goal directed locomotion and balance control in autistic children. *Journal of autism and developmental disorders*, 35(1), 91-102.

- Wall, A. E., Bouffard, M., McClements, J., Findlay, H., & Taylor, M. J. (1985). A knowledge-based approach to motor development: Implications for the physically awkward. *Adapted Physical Activity Quarterly*, 2(1), 21-42.
- Whitney, E. R., Kemper, T. L., Bauman, M. L., Rosene, D. L., & Blatt, G. J. (2008). Cerebellar Purkinje cells are reduced in a subpopulation of autistic brains: a stereological experiment using calbindin-D28k. *The Cerebellum*, 7(3), 406-416.
- World Health Organization. (WHO, 2017). Autism spectrum disorders. Ανακτήθηκε από: <https://www.who.int/en/news-room/fact-sheets/detail/autism-spectrum-disorders>
- World Health Organization. (1992). *The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines*. Geneva: World Health Organization.
- Wright, R. W., Brand, R. A., Dunn, W., & Spindler, K. P. (2007). How to write a systematic review. *Clinical Orthopaedics and Related Research* (1976-2007), 455, 23-29. Ανακτήθηκε από:
https://journals.lww.com/corr/Fulltext/2007/02000/How_to_Write_a_Systematic_Review_.7.aspx
- Xu-Wilson, M., Chen-Harris, H., Zee, D. S., & Shadmehr, R. (2009). Cerebellar contributions to adaptive control of saccades in humans. *Journal of Neuroscience*, 29(41), 12930-12939. Ανακτήθηκε από:
<http://www.jneurosci.org/content/jneuro/29/41/12930.full.pdf>
- Yanardağ, M., Birkan, B., Yılmaz, İ., Konukman, F., Ağbuğa, B., & Lieberman, L. J. (2011). The effects of least to most prompting procedure on teaching basic tennis skills for children with autism. *Kinesiology*, 43(1), 44-55. Ανακτήθηκε από: https://digitalcommons.brockport.edu/pes_facpub/70/