



University of HUDDERSFIELD

University of Huddersfield Repository

Sanford, Emma and Horner, Louisa

Teaching pupils with Autism Spectrum Disorder

Original Citation

Sanford, Emma and Horner, Louisa (2017) Teaching pupils with Autism Spectrum Disorder. *Physical Education Matters*, Spring. pp. 46-48. ISSN 1751-0988

This version is available at <http://eprints.hud.ac.uk/31693/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>

Teaching Pupils with AUTISTIC SPECTRUM DISORDER

Emma Sanford and Louisa Horner

Autistic spectrum disorder (ASD) is prevalent in approximately 1.1 per cent of the UK population (The National Autistic Society, 2015) and diagnosed in one in 152 children within mainstream schools (Barnard, Broach, Potter and Prior, 2002). ASD is a neuro-developmental condition, characterised by a range of stereotypical behaviours and difficulties with social communication, interaction and imagination (The National Autistic Society, 2015a). Current physical activity guidelines for ASD and neuro-typical children aged 5-18 years of age suggest that 60 minutes of moderate to vigorous intensity physical activity per day should be undertaken (Department of Health, 2011). However, Pan and Frey (2006) recorded that ASD children had no consistent pattern in physical activity and were less active than neuro-typical children. It is essential, therefore, that physical education (PE) teachers and, in particular, newly qualified PE teachers who, due to limited experience, often report feeling unprepared to teach children with special educational needs (SEN), fully understand the condition and how they can engage such pupils in PE.

In order to successfully achieve an inclusive environment within extra-curricular sport and National Curriculum PE, promoted by policies such as *Removing Barriers to Achievement* (Department for Education and Skills, 2004) and the *Equality Act* (Government Equality Office, 2013), PE teachers need to be able to recognise the barriers and facilitators to physical activity for ASD children. This article identifies these, as well as putting forward practical suggestions and strategies.

Although the causes of ASD are ambiguous, neuro-pathological alterations are one proposed explanation for the characteristics of ASD children which can potentially

impact upon sporting involvement. For example, abnormalities in the cerebellum relate to poor motor coordination (Fatemi, 2013) and cognitive functioning (Gordon, 2007), resulting in issues in developing and retaining specific motor skills (Mari, Castiello, Marks, Marraffa and Prior, 2003), which negatively impact upon fundamental movements such as balance (Meneer and Neumeier, 2015).

Pupils who lack motor skills are also strongly correlated with being victims of bullying. ASD children may be more at risk of social isolation (Bejerot, Edgar and Humble, 2011) and may have intra-personal barriers to PE, such as perceived lack of skill (Obrusnikova and Cavalier, 2011). However, interventions looking at fundamental movements have shown to increase physical proficiency, which, in turn, may reduce the likelihood of victimisation. For example, Pan (2011) undertook a 14-week swimming programme for ASD children and their siblings and found an increase in fitness test scores, aquatic ability and self-confidence. Similarly, a ten-week swimming programme by Yilmaz, Yanardag, Birkan and Bumin (2004) showed increased fitness test scores and water orientation. Therefore, a greater emphasis on fundamental movement patterns and sports, such as swimming, that require little cognitive instruction may facilitate the participation of an ASD child and subsequently improve their motor capabilities.

The likelihood of social isolation is also arguably more prevalent in ASD children due to complications in processing and retaining information, resulting in reductions in social understanding and communication complications (Youth Sport Trust, 2008). Neurologically, this may be influenced by abnormalities within the hippocampus which affect “establishing and maintaining social bonds” (Rubin, Watson, Duff and Cohen,

2014, p.1), further supporting the use of simple movements patterns or, alternatively, small group/individual activities which reduce social demands within the PE environment. The use of small groups or solo activities is also promoted by Schenkelberg, Rosenkrnaz, Milliken and Dzewaltowski (2015), who found higher motivation levels for ASD children when exercising alone (13.2 per cent) compared to with a peer (1.5 per cent) or peer group (1.2 per cent).

Repetitive, stereotypical and inappropriate behaviours, caused by abnormalities in the cerebral hemisphere, (Fatemi, Merz and Realmuto, 2003) are a feature of children with ASD and are often manifested during PE lessons, triggered by an unclear routine or sensory integration deficits (Youth Sport Trust, 2008). These behaviours often manifest themselves quickly due to the inability of ASD children to state their emotions (Griffin *et al.*, 2006) and can result in classroom disruption, disruption that may be exacerbated by PE teachers struggling to maintain inclusivity (Smith and Thomas, 2006).

Potential stigmatisation from peers may also contribute to classroom disruption (Cunningham and Schreiberman, 2008) and may further increase the likelihood of social isolation for ASD children. However, some forms of physical activity have been associated with declines in stereotypical symptoms, which may have a facilitating effect on inclusion. For example, research by Levinson and Reid, (1993, cited in Oriel, Cheryl, George, Peckus and Semon, 2011, p188) concluded that “stereotypical behaviours decreased after 15 minutes of continuous jogging but only for 90 minutes post-exercise”. Additionally, Bahrami, Movahedi, Marandi and Abedi (2012) found declines in stereotypical behaviours which remained significantly low 30 days post-intervention by using kata training techniques.



Regardless of the length of effect, the reduction in stereotypy may have occurred due to repetitive body movements that have similarities to stereotypical movements (Bahrami *et al.*, 2012) exhibited in ASD children. Therefore, curriculum activities that promote repetitive action, for example, dance, may reduce stereotypical symptoms and facilitate engagement. Alternatively, defining a space for ASD children to withdraw to temporarily – when they are over-stimulated – may prevent classroom disruption (Youth Sport Trust, 2008).

Children with developmental disorders have also been found to have a 60 per cent risk of obesity compared to neuro-typical children (Phillips *et al.*, 2014), potentially due to a more sedentary lifestyle, which may be influenced by a lack of physical ability. For example, Pan, Tsai, Chu and Hsieh (2011) reported that ASD children only spent 33 per cent of their PE lessons in moderate to vigorous physical activity (MVPA), compared to 45 per cent spent by typically developing children. However, other studies reported no real time difference between ASD children and typically developing children undertaking MVPA within PE (Sandt and Frey, 2005; Bandini *et al.*, 2013). Nevertheless, in an obesogenic society any child at risk should be the focus of PE teachers. Interestingly, both of these studies indicate that motivation for PE from ASD children can decline with age.

Due to lower levels of motivation to participate in physical activity, ASD children potentially possess lower levels

of cardiovascular fitness and muscular endurance than their peers (Murphy and Carbone, 2008), which is more evident in male pupils after the age of 12 when maximal aerobic power begins to differ between the genders (Bar-Or and Rowland, 2004). As a consequence of this lack of motivation and potential poor physical capabilities, exclusion from PE and school sport may be intensified and further affect their ability to develop motor skills. For example, Pan (2014) found that variables such as motivation are needed for the development and refinement of motor capabilities. PE teachers therefore need to focus on motivating and engaging ASD children to take part in all aspects of school sport. Engaging ASD children, for example, by allowing them to work at their own physical capabilities – by modifying lesson plans (Smith and Thomas, 2006), or by facilitating their interests (Zhang and Griffin, 2007), may increase inclusion and success in PE and extra-curricular activities, as well as preventing obesity and its associated co-morbidities.

Initial teacher training programmes do not seem to provide adequate training in regards to SEN: 84 per cent of recently qualified PE teachers felt they were not prepared sufficiently to teach SEN children (Vickerman and Coates, 2009) and, therefore, are arguably unable to meet the aims of policies such as the Salamanca Statement on Education (UNESCO, 1994). When fully included, SEN children have found PE to be empowering (Huzler, Fliess, Chacham and Auweele, 2002, cited in

Coates and Vickerman, 2008) compared to non-inclusive environments, which have contributed towards “isolation, questioned competence and restricted participation” (Goodwin and Watkinson, 2000, p.144).

Positive relations and inclusion within a physical activity setting have been found to contribute towards enjoyment of sport and positive participation (Coates and Vickerman, 2010). For example, Pan (2010, p.25) found “individualised instruction and positive feedback” as the main facilitators accounting for behaviour change following a ten-week swimming intervention for ASD children. Conversely, if exclusion from a physical activity occurs for an ASD child, sport may be remembered as an unfavourable experience, resulting in lifelong withdrawal from sport and exercise (Lavalle *et al.*, 2004, cited in Coates and Vickerman, 2008). Therefore, to facilitate inclusion, a parallel activity within a mainstream class could be considered (Youth Sport Trust, 2008) enabling ASD children to continue to access a mainstream PE setting but also work on an activity that matches their developmental and physical age (Training and Development Agency for Schools, 2009).

Inappropriate or poor behaviour has also been found to act as a barrier to participation in community sport (Jones, 2003), which is normally facilitated by school-club links; this may reduce the likelihood of an active life, which is an aim of the PE National Curriculum (Department for Education, 2013; Department for Education, 2013a).

Additional barriers, such as lack of self-esteem and a heavy emphasis on competitive games, have also been noted as preventing the participation of SEN children, especially within after-school programmes, as they are often performance-oriented and therefore selective of high ability pupils (Smith, 2004). These factors potentially contribute towards higher levels of physical activity within school hours compared to after-school hours for ASD children (Rosser and Frey, 2005 cited in Pan and Frey, 2006) and, as a consequence, greater pressure on PE teachers to ensure participation.

As physical activity behaviours during childhood are positively correlated with physical activity behaviours in adulthood (Curtin *et al.*, 2010, cited in Sorensen and Zarrett, 2014), exclusion from after-school settings may result in a lack of physical activity post-school for ASD children. Therefore, alternative initiatives such as the School Games programme or Project Ability (Youth Sport Trust, 2013), which promote inclusive sport competitions for those with disabilities, should be encouraged to promote physical activity rather than segregated physical activity. Potentially, segregated physical activity could reinforce “negative differences between disabled and non-disabled students” (Fitzgerald and Kirk, 2009 cited in Haycock and Smith, p.523) and result in further social isolation. As the social aspects of physical activity can contribute towards positive development (Perkins and Noam, 2007), involvement in extra-curricular activities may give ASD children self-confidence and adequate behavioural skills to access community sport.

The benefits of physical activity for ASD children have been identified with improvements in fitness levels and motor skills (Pan, 2011; Yilmaz *et al.*, 2004), stereotypical behaviour (Levinson and Reid, 1993; Bahrami *et al.*, 2012) and communication (Bahrami *et al.*, 2016). Using simplified instructions that match a child’s developmental age, within a fully inclusive environment, and implementing physical activity that meets the physical capabilities of an ASD pupil, should allow ASD children to participate fully in National Curriculum PE and extra-curricular opportunities. However, if the PE National Curriculum continues to emphasise “performance, excellence and skills” (Smith and Thomas, 2006, p.76) ASD children will continue to be excluded. Additionally, if skills are not simplified to match an ASD child’s capabilities, they will continue to be disengaged from PE due to the inability to perform or understand the required task and will continue to be socially isolated from their peers in PE or extra-curricular environments. ■

REFERENCES

- Bahrami, F., Movahedi, A., Marandi, S.M., & Abedi, A. 2012. Kata techniques training consistently decreases stereotypy in children with autism spectrum disorder. *Research in Developmental Disabilities*, 33(4), 1183-1193. doi:10.1016/j.ridd.2012.01.018
- Bahrami, F., Movahedi, A., Marandi, S.M., & Sorensen, C. 2016. The effect of karate techniques training on communication deficit of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 46(3), 978-986. doi:10.1007/s10803-015-2643-y
- Bandini, L.G., Gleason, J., Curtin, C., Iivindini, K., Anderson, S.E., Cernak, S., Maslin, M., & Must, A. 2013. Comparison of physical activity between children with autism spectrum disorders and typically developing children. *Autism*, 17(1), 44-54. doi:10.1177/1362361312437416
- Barnard, J., Brooch, S., Patter, D., & Prior, A. (2002). *Autism in Schools: Crisis or Challenge?* [Online] file:///C:/Users/sanfb/Downloads/Autism%20in%20Schools%20%20Crisis%20or%20Challenge%20hull%20report.pdf [Accessed 7 March 2016]
- Bar-Or, O., & Rowland, T.W. 2004. *Pediatric Exercise Medicine: From Physiologic Principles to Health Care Application*. Champaign: Human Kinetics.
- Bejerot, S., Edgar, J., & Humble, M.B. 2011. Poor performance in physical education – a risk factor for bully victimization. A case-control study. *Acta Paediatrica*, 100(3), 413-419. doi:10.1111/j.1651-2227.2010.02016.x
- Coates, J., & Vickerman, P. 2008. Let the children have their say: children with special educational needs and their experiences of Physical Education – a review. *Support for Learning*, 23(4), 168-175. doi: 10.1111/j.1467-9604.2008.00390.x
- Coates, J., & Vickerman, P. 2010. Empowering children with special education needs to speak up: experiences of inclusive physical education. *Disability and Rehabilitation*, 32(18), 1517-1526. doi: 10.3109/09638288.2010.497037
- Cunningham, A.B., & Schriebman, L. 2008. Stereotypy in Autism: The Importance of Function. *Research in Autism Spectrum Disorder*, 2(3), 469-479. doi:10.1016/j.rasd.2007.09.006
- Department for Education and Skills. 2004. *Removing Barriers to Achievement: The Government's Strategy for SEN*. [Online] Available at: <http://www.bxkey.gov.uk/CHtppandler.ashx?id=683&p=0> [Accessed 10 April 2016]
- Department for Education. 2013. *Physical education programmes of study: key stages 1 and 2: National curriculum in England*. [Online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239040/PRIMARY_national_curriculum_-_Physical_education.pdf [Accessed 9 March 2016]
- Department for Education. 2013a. *Physical education programmes of study: key stages 3 and 4 National curriculum in England*. [Online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239086/SECONDARY_national_curriculum_-_Physical_education.pdf [Accessed 9 March 2016]
- Department of Health. 2011. *Physical activity guidelines for CHILDREN AND YOUNG PEOPLE (5-18 YEARS)*. [Online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213739/dh_128144.pdf [Accessed 11 April 2016]
- Fatemi, S.H. (2002). The role of reelin in pathology of autism. *Molecular Psychiatry*, 7(9), 919-920. Doi:10.1038/sj.mp.4001248
- Fatemi, S.H. 2013. Cerebellum and Autism. *Cerebellum*, 12(5), 778-779. doi: 10.1007/s12311-013-0484-9
- Fatemi, S.H., Merz, A., & Realuto, G.R. 2003. The Roles of Reelin, Bcl2, and Serotonin in Cerebellar Pathology in Autism. *Journal of Developmental and Physical Disabilities*, 15(1), 1-22. doi:10.1023/A:1021457519382
- Goodwin, D.L. & Watkinson, E.J. 2000. Inclusive Physical Education from the Perspective of Children with Physical Disabilities. *Adapted Physical Activity Quarterly*, 17(2), 144-160 [Online] Available at: <http://journals.human Kinetics.com/AcuCustom/Sitenome/Documents/DocumentItem/11125.pdf> [Accessed 3 March 2016]
- Gordon, N. 2007. The cerebellum and cognition. *European Journal of Paediatric Neurology*, 11(4), 232-234. doi:10.1016/j.ejpn.2007.02.003
- Government Equalities Office. 2013. *Equality Act 2010: guidance*. [Online] available at: <https://www.gov.uk/guidance/equality-act-2010-guidance> [Accessed 21 March 2016]
- Griffin, H.C., Griffin, L.W., Fitch, C.W., Albera, V., & Gingras, H. 2006. Educational interventions for individuals with Asperger syndrome. *Intervention in School and Clinic*, 41(3), 150-155. doi: 10.1177/10534512060410030401
- Haycock, D., & Smith, A. 2011. Still 'more of the same for the more able?' including young disabled people and pupils with special educational needs in extra-curricular physical education. *Sport, Education and Society*, 16(4), 507-526. doi:10.1080/13573322.2011.589647
- Jones, D.B. 2003. "Denied from a lot of places" barriers to participation in community recreation programs encountered by children with disabilities in Maine: Perspectives of parents. *Leisure/Loisir*, 28(1), 49-69. doi:10.1080/14927713.2003.9649939
- Levinson, L.J., & Reid, G. 1993. The effects of exercise intensity on the stereotypical behaviours of individuals with autism. *Adapted Physical Activity Quarterly*, 10(3), 255-268. doi:10.1123/apaq.10.3.255
- Mari, M., Castiello, U., Marks, D., Maraffa, C., & Prior, M. 2003. The reach-to-grasp movement in children with autism spectrum disorder. *Philosophical Transactions of the Royal Society of London Series B: Biological Sciences*, 358(1430), 393-403. doi:10.1098/rsb.2002.1205
- Meneer, K.S., & Neumeier, W.H. 2015. Promoting physical activity for students with autism spectrum disorder: Barriers, benefits, and strategies for success. *Journal of Physical Education, Recreation and Dance*, 86(3), 43-48. doi:10.1080/07303084.2014.998395
- Murphy, N.A., & Carbone, P.S. 2008. Promoting the Participation of Children with Disabilities in Sports, Recreation and Physical Activities. *Pediatrics*, 121(5), 1057-1061. doi:10.1542/peds.2008-0566
- Obrusnikova, J., & Cavalier, A. R. 2011. Perceived barriers and facilitators of participation in after-school physical activity by children with autism spectrum disorders. *Journal of Developmental and Physical Disabilities*, 23(3), 195-211. doi:10.1007/s10882-010-9215-z
- Oriol, K.N., George, C.L., Peckus, R., & Semon, A. 2011. The Effects of Aerobic Exercise on Academic Engagement in Young Children with Autism Spectrum Disorder. *Pediatric Physical Therapy*, 23(2), 187-193. doi: 10.1097/PEP.0b013e318218f149
- Pan, C. 2011. The efficacy of an aquatic program on physical fitness and aquatic skills in children with and without autism spectrum disorders. *Research in Autism Spectrum Disorders*, 5(1), 657-665. doi:10.1016/j.rasd.2010.08.001
- Pan, C. 2014. Motor proficiency and physical fitness in adolescent males with and without autism spectrum disorders. *Autism*, 18(2), 156-165. doi:10.1177/1362361312458597
- Pan, C-Y. 2010. Effects of water swimming program on aquatic skills and social behaviours in children with autistic spectrum disorder. *Autism*, 14(1), 9-28. doi: 19.1177/1362361309339496
- Pan, C-Y, Frey, G.C. 2006. Physical Activity Patterns in Youth with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 36(5), 597-606. doi: 10.1007/s10803-006-0101-6
- Pan, C-Y, Tsai, C-L, Chu, C-H, Hsieh, K-W. 2011. Physical activity and self-determined motivation of adolescents with and without autism spectrum disorders in inclusive physical education. *Research in Autism Spectrum Disorders*, 5(2), 733-741. doi:10.1016/j.rasd.2010.08.007
- Perkins, D.F., & Noam, G.G. 2007. Characteristics of sports-based youth development programs. *New Directions for Youth Development*, 2007(115), 75-849. doi: 10.1002/yn.224
- Phillips, K.L., Schieve, L.A., Visser, S., Boulet, S., Sharma, A.J., Kogan, M.D., & Yeargin-Allsopp, M. 2014. Prevalence and impact of unhealthy weight in a national sample of US adolescents with autism and other learning and behavioral disabilities. *Maternal and Child Health Journal*, 18(8), 1964-1975. doi:10.1007/s10995-014-1442-y
- Rubin, R.D., Watson, P.D., Buff, M.C., & Cohen, N.J. 2014. The role of the hippocampus in flexible cognition and social behaviour. *Frontiers in Human Neuroscience*, 742(8), 1-15. doi:10.3389/fnhum.2014.00742
- Sandt, R., & Frey, G. 2005. Comparison of Physical Activity Levels between Children with and Without Autistic Spectrum Disorder. *Adapted Physical Activity Quarterly*, 22(2), 146-159. doi: <http://journals.human Kinetics.com/AcuCustom/Sitenome/Documents/DocumentItem/4740.pdf>
- Schenkelberg, M.A., Rosenkranz, R.R., Milliken, A. 2011. Social environmental influences on physical activity of children with autism spectrum disorders. *Journal of Physical Activity & Health*, 12(5), 636-641. doi:10.1123/jpah.2013-0312
- Smith, A. 2004. The inclusion of pupils with special educational needs in secondary school physical education. *Physical Education and Sport Pedagogy*, 9(1), 37-54. doi:10.1080/174089804200208115
- Smith, A., & Thomas, N. 2006. Including pupils with special educational needs and disabilities in National Curriculum Physical Education: a brief review. *European Journal of Special Needs Education*, 21(1), 69-83. doi: 10.1080/08856250500491849
- Sorensen, C., & Zarrett, N. 2014. Benefits of physical activity for adolescents with autism spectrum disorders: A comprehensive review. *Review Journal of Autism and Developmental Disorders*, 1(4), 344-353. doi:10.1007/s40489-014-0027-4
- The National Autistic Society. 2015. *Autism*. [Online] Available at: <http://www.autism.org.uk/about/what-is/asd.aspx> [Accessed 3 April 2016]
- The National Autistic Society. 2015a. *Myths, facts and statistics*. [Online] Available at: <http://www.autism.org.uk/About/What-is/Myths-facts-stats> [Accessed 26 March 2016]
- Training and Development Agency for Schools. 2009. *For secondary PGCE tutors and trainees: Including students with SEN and/or disabilities in secondary physical education*. [Online] Available at: <http://dera.ioc.ac.uk/13805/1/physicaleducation.pdf> [Accessed 5 March 2016]
- UNESCO. 1994. *The Salamanca Statement and Framework For Action on Special Education Needs*. [online] Available at: <http://unesdoc.unesco.org/images/0009/000984/098427eo.pdf> [Accessed 3 April 2016]
- Vickerman, P., & Coates, J.K. 2009. Trainee and recently qualified physical education teachers' perspectives on including children with special educational needs. *Physical Education and Sport Pedagogy*, 14(2), 137-153. doi: 10.1080/17408980803400502
- Yilmaz, I., Yanardag, M., Birkan, B., & Bumin, G. 2004. Effects of swimming training on physical fitness and water orientation in autism. *Paediatrics International*, 46(5), 624-626. doi:10.1111/j.1442-200x.2004.01938.x
- Youth Sport Trust. 2008. *High Quality Physical Education for Pupils with Autism*. [Online] Available at: http://www.autism.org.uk/resources_files/AUTISM%20PE%20BOOKLET_v5.pdf [Accessed 18 March 2016]
- Youth Sport Trust. 2013. *School Games: Inclusive Sport Formats*. [Online] Available at: <http://www.youthschoolgames.com/about-the-games/inclusive-competition/inclusive-sports-formats> [Accessed 18 March 2016]
- Zhang, J., & Griffin, A. J. 2007. Including children with autism in general physical education: Eight possible solutions. *Journal of Physical Education, Recreation and Dance*, 78(3), 33-50. doi: 10.1080/07303084.2007.10597987

Emma Sanford is a Graduate in Sport, Exercise and Nutrition Sciences/trainee PE teacher and Louisa Horner is Senior Lecturer in Sport, Exercise and Nutrition Sciences at Huddersfield University.