



An Official Journal of the American College of Sports Medicine

ACSM's HEALTH & FITNESS JOURNAL

Volume 25 • Number 3 • May/June 2021

EXERCISE IS A LIFE-CHANGER FOR THOSE WITH AUTISM

Exercising to Improve Movement Quality: Why and How?

Adapting Fitness and Neuromotor Self-tracking Over the Life Span

An Oral Myofunctional Exercise Prescription for Obstructive Sleep Apnea



#hfjonline
www.acsm-healthfitness.org



Earn up to 8 CECs in this issue!

Exercise is a Life-Changer for Those with Autism

by David S. Geslak, B.S., ACSM-CEP, CSCS and Benjamin D. Boudreaux, M.S.

Apply It!

- Make a profound impact. Because of limited resources, most school systems are leaving those with autism wandering and wondering in physical education classes. This is a squandered opportunity because autism parents have rated exercise as the no. 1 treatment as it has been shown to extend beyond the health-related benefits. Those with autism need to be able to access fitness centers and trainers to benefit from exercise programming.
- Understanding autism and exercise. Teaching exercise to those with autism is 75% understanding autism and 25% understanding exercise. This community learns differently and to create successful exercise programs requires embedding evidence-based teaching practices, structured routines, and setting individualized goals. The goal may simply start with just being in the facility for 30 minutes.

Key words: Autism, Autism Spectrum Disorders, Exercise, Fitness, Special Education

Fitness professionals share a common goal of using exercise to help people improve their lives. Unfortunately, one group that stands to gain significant benefits from exercise is regularly left out — the autism community. Research studies continue to reveal that exercise may positively affect both health and other challenges of those with autism (1–3). As further evidence, it was noted in a conference presentation on the National Survey of Autism Treatment Effectiveness that surveyed parents of children with autism rated exercise as the no. 1 treatment for their children (4). Thus, the fitness industry has a tremendous opportunity to help this community improve, succeed, and ultimately become productive members of society. Yet many fitness professionals and facility leaders are not familiar with or comfortable working with the autism community, and as a result, many individuals with autism have not become facility members or program participants.

ACSM has recognized this opportunity and has worked with David to offer an Autism Exercise Specialist Certificate and associated training program for exercise professionals.



David with 25 participants who successfully earned their Autism Exercise Specialist Certificate through the Virtual Workshop. Photo courtesy of David Geslak.

Training people with autism requires using the same tools and protocols that have been successfully implemented in the classroom but rarely make it to the gym. To do this effectively, fitness professionals must be educated on how to implement these evidence-based practices. Not adapting to the learning differences of those with autism will result in abject failure — I've lived it (Ben). Developing an exercise session that is 90% correct will most likely result in 100% failure — I've learned it (David).

Autism spectrum disorder (ASD) is the fastest-growing developmental disability in the world, with 1 in 54 children diagnosed in the United States (5). Supporting research for the autism community shows that exercise can improve focus, on-task behavior, develop language, and reduce maladaptive or stereotypical behaviors (1–3,5–8). Although the Every Student Succeeds Act (9) and the Individuals with Disabilities Education Act (2004) (10) support participation in school-based physical education (PE), many students with autism do not receive appropriate PE services nor realize the full benefits from PE classes.

A population-based study indicates that U.S. adolescents with learning and behavioral developmental disabilities are 60% more likely to become obese (11). Although the study did not address PE's role in obesity, the U.S. Government Accountability Office identified key PE challenges for students with disabilities that include lack of clarity regarding schools' responsibility in PE, limited teacher preparation, and budget constraints (12). These key challenges could be contributing factors to the likelihood of those with disabilities becoming obese.

Educators and exercise professionals also should take note of a research study demonstrating that 10 minutes of low- to moderate-intensity exercise produced significant and large reductions in stereotypical behavior (*i.e.*, echolalia and hand flapping) in those with ASD (8). Reducing behaviors like these can help children be less disruptive, more on-task, and more focused on classroom activities. For the professional who is starting to work with this community, 10 minutes of exercise is an achievable starting goal that can be set for new clients.

(Ben) As a Kinesiology Ph.D. student at the University of Georgia and an individual with autism, I want to share my story, which will provide insight into what many on the autism spectrum are experiencing. However, “many” is the operative word. Autism is a spectrum disorder, and not every person's experience and response to exercise will be the same as mine. I hope my story will provide a greater understanding of my peers' challenges with autism and the opportunities that exist for individuals with autism and their families.

(David) As an ACSM Certified Exercise Physiologist who has worked with individuals with autism for more than 15 years, it is my passion to see exercise professionals properly educated and trained to help and inspire the person with autism and their entire family. From personal experience, I can tell you that it is a major victory for both the individual and their family when they progress and achieve their goals.

Together (Ben and David), we want to change people's perceptions regarding the capabilities of those with autism. It's not

about disability; it's about the possibility. Our goal is to empower fitness professionals to use exercise to enhance the lives of individuals with autism and their families.

THE BEGINNING OF MY JOURNEY (BEN)

As an eighth grade student, my academic progress was above average, but my social and motor skills were below average. I could not ride a bike or catch a ball in my PE class. Even if the PE teachers recognized that not catching a ball was a developmental motor skill issue, they did not have the education or the time to give me the help I needed. Making matters worse, my peers bullied me because of this, which resulted in severe anxiety and depression.

Luckily, my mother recognized the seriousness of my emotional state and hired a psychiatrist who suggested a psychological evaluation. My father opposed the idea as he believed it was a waste of time. I was evaluated and diagnosed with ASD and mood dysregulation. My doctors recommended taking medication as well as



Roan is able to independently identify all his body parts, which began by using the Visual Exercise System. Photo courtesy of David Geslak.

EXERCISE AND AUTISM



Using a white-board, as a visual support to communicate instruction, helps Brody to stay focused on his exercise routine. Photo courtesy of David Geslak.

exercising regularly because of the known health benefits. Initially, I refused to take the prescribed medication for personal reasons but later was convinced to take the medication because I avoided physical activity because of my motor skill challenges, frequent bullying, and feelings of being a failure. I was prescribed Lexapro and Clonazepam rather than Risperidone, which is an antidepressant widely used for those with autism (13). Risperidone effectively treats the explosive and aggressive behavior and reduces hyperactivity and the repetitive behaviors that accompany autism (14,15). Worrisome, however, are side effects that include weight gain from an increased appetite and other metabolic effects. Children taking Risperidone have been shown to gain an average of 6 pounds within 8 weeks of taking the medication (15,16). In addition, after 6 weeks of taking a standard dose of Risperidone, children had greater insulin levels and insulin resistance than children taking a placebo. Weight gain and the resulting metabolic problems are side effects of nearly all antipsychotic drugs, but rapid weight gain can be especially worrisome in children.

It's important to understand that repetitive behaviors are just one characteristic of a person with autism. Autism is a spectrum disorder that varies greatly in communication, social and cognitive abilities, and sensory and behavioral challenges. Autism characteristics are not physically noticeable like those associated with Down syndrome. Most individuals with autism look like everyone else of their respective age. However, those with autism behave oddly at times and sometimes inappropriately. Some examples include repeating actions over and over (*e.g.*, hand flapping, rocking, and staring at spinning objects), repeating or echoing words or phrases heard earlier, and becoming aggressive toward others or engaging in self-injurious behaviors (*e.g.*, biting, hitting, and pinching themselves). Although the reasons for these behaviors are not fully understood, they may be related to associated communication and sensory challenges.

Because of these varying characteristics, teaching a person with autism requires simple strategies to help them process information,

such as understanding requests and following directions. Commonly used evidence-based tools include visual supports, video modeling, and technology-aided instruction (*e.g.*, tablet and computer) (17,18). Understanding and incorporating these teaching strategies into an exercise plan is an important success factor when teaching exercise to my peers. Thankfully, David and ACSM created the Autism Exercise Specialist Certificate (www.autismexercispecialist.com). I'm excited that a commitment has been made to train exercise professionals how to work with individuals on the spectrum. I'm happy and relieved that the next generation of those with autism will have an easier path to experience the proven benefits of exercise.

DELIVERING EXERCISE REQUIRES A VISUAL PROGRAM (DAVID)

With the side effects of some medication combined with the lack of PE, it should not come as a surprise that a study found 31.8% of adolescents with autism were obese (19). As fitness professionals working with this community, you will have no control over what medications are prescribed or even the foods they choose to eat. However, you can develop strategies to help them make exercise a part of their daily routine.

Soon after I started working with my first client with autism in 2004, I read the study "Use of Physical Activity to Improve Behaviors of Children with Autism — Two for One Benefits." The study stated, "a physical activity-based program is easy to implement and is effective in controlling many types of inappropriate behaviors associated with autism" (20,21). Although this is a highly promising study, the fitness professional unfamiliar with autism will find teaching individuals with autism is easier said than done. Successfully engaging a person with autism in any new activity — especially exercise — takes patience, creativity, and the use of evidence-based teaching practices. One effective method for teaching individuals with autism is visual supports (*e.g.*, photos, visual schedules, video models, social narratives, and modeling). Visual supports add structure, routine, and sequence that many children with autism require to carry out their



The Visual Exercise System is color-coded which utilizes the therapeutic benefits of color to better gain the attention of those with autism. Photo courtesy of David Geslak.

daily activities (22). When implemented correctly, visual supports allow students with autism the freedom to engage in life, regardless of their impairment (11).

Visual supports and many other evidence-based practices (*e.g.*, technology-aided instruction, reinforcement, and peer-mediated instruction) are successfully used in special education classrooms to teach reading, writing, and life skills. These same teaching strategies are applicable to exercise instruction and increase its effectiveness. Thus, it is important that exercise professionals become familiar with these evidence-based techniques. A study of the ACSM/Exercise Connection Autism Exercise Specialist Certificate's online modules found that the frequency at which participants reported using evidence-based practices increased significantly from pretest to posttest (3.26 ± 0.59 to 3.40 ± 0.59 ; Cohen's $d = 0.15$; $P = 0.031$). Moreover, participants perceived self-efficacy in using evidence-based practices significantly improved from pretest to posttest (2.78 ± 0.76 to 3.20 ± 0.76 ; Cohen's $d = 0.40$; $P < 0.001$) (23).

Just as you create an exercise plan for a high school athlete, someone who is obese, or a senior citizen, the same must be done for individuals with autism. However, instead of simply asking them to perform an exercise, a good starting point would be to add visual supports. For example, you can show them a picture of the exercise. In this case, a picture is worth more than a thousand words. Adding visuals to support verbal instruction can be the catalyst for engaging individuals with autism in exercise. By using evidence-based strategies, the individuals and their families will appreciate that you have taken the time to understand how they and their children best learn. This is the first and most critical step toward building your relationship with this clientele. When a typical client does not connect with their trainer, they will likely try someone else. When someone on the spectrum has this experience, they will see this as yet one more failure and probably never exercise again — just like Ben. With the right approach and understanding, you have the power to break this cycle of failure.

MY DISCOVERY AND BREAKTHROUGH WITH EXERCISE (BEN)

Getting the diagnosis of autism was both terrifying and, on some level, liberating for my family and me as my mother and grandparents finally had some guidance for the journey that has gotten me to where I am today. With their love and support, I not only survived grade school and high school but also eventually developed confidence and self-esteem. This led me to go on to college, although my undergraduate experience also came with challenges. I have always liked football, so I became the football team's equipment manager in high school. I often talked with the athletic trainer and became fascinated with this field, so this was the major I chose for my undergraduate degree.

During undergrad, I shared my diagnosis with few professors because I wanted to be seen for my capabilities, not my disabilities. The professors I did share my diagnosis with told me that they had not heard of autism or were unsure how to help

me succeed. I was having difficulties with the course work in my junior year, and I asked my department head for help. He said, "Maybe this is not the program for you." I was struggling, and frankly, this professor's answer was for me to succumb to, instead of overcome, my autism. I just needed a little help, as did the underinformed professor. I felt like I was back in high school and relapsed into depression. Thankfully, once again, my mother was there for support, and this time, she finally convinced me to exercise.

I started exercising independently by running and lifting weights. I realized that exercise was not the problem; it was the group dynamics of a PE class that was the real problem. As for many of my peers with autism, staying to ourselves is usually preferred because of our struggles with communication and social skills. In agreement with Harvey et al. (24), I soon noticed immediate improvements to my depression and mental health. I quickly found that lifting weights was more like a "weight lifted" from my body and mind. After exercise, I felt less anxious, the tension in my body was reduced, I was able to focus better on my schoolwork, and my depression lightened. I also noticed that my sleep got better. Before I started exercising, I took Benadryl to put me to sleep because I would wake every few hours. After



Ben at his Master's graduation hooding Ceremony (Southeastern Louisiana University) in 2017 with his parents and grandparents. Photo courtesy of Benjamin Boudreaux.

EXERCISE AND AUTISM



Ben running the Bolder Boulder 10K on Memorial Day (2017). Photo courtesy of Benjamin Boudreaux.

exercise became a part of my daily routine, I was able to sleep well without Benadryl.

In a study published in *Psychology in the Schools*, the authors examined the effect of antecedent physical activity on academic engagement time among third grade boys with autism. The authors concluded, “Participation in a physical activity intervention contributed to overall increased academic engagement for high-functioning students with an ASD” (7). Furthermore, a meta-analysis of 16 studies suggested that, on average, exercise interventions led to a 37% improvement in symptoms of autism, specifically behavioral and academic improvement (3).

Because of my department head’s lack of support and indifference, I changed my major to something I wasn’t excited about and subsequently graduated with a degree in interdisciplinary studies. After graduation, I realized that exercise had gone from being one of my childhood nightmares to being an invaluable tool that would help me achieve my dreams.

AWARENESS RAISES MORE QUESTIONS, EDUCATION PROVIDES THE ANSWERS (DAVID)

When Ben first shared his story with me about his department head not understanding autism, I was not surprised.

Ben’s department head thought he was giving him good instruction given the limited understanding of the potential of those with autism. The misunderstanding of autism exists in communities worldwide, in our schools, and unfortunately, in PE. Only 14 states in the United States require an advanced certification for physical educators teaching students with disabilities. That leaves the other 36 states not requiring any specialized training in their undergraduate PE teacher education preparation.

Undergraduate PE curriculums meet the Society of Health and Physical Educators (SHAPE America) state standards for PE licensure by requiring students to take one class in adapted PE (APE) (25). When that class is passed, the student is deemed “certified” to instruct all students with disabilities. With only one course in APE, new PE/APE teachers are woefully unprepared to lead a classroom of students with a variety of disabilities. It’s no wonder why many of those with autism are left wandering and wondering in PE, if they get PE at all. Although the education system may not be giving PE and APE teachers the education they need, the ACSM/Exercise Connection Autism Exercise Specialist Certificate may serve as an excellent educational adjunct. A recent study of the certificate’s online modules found that 20.9% of participants were adapted physical educators, and 26.7% were general physical educators (23).

PE teachers are challenged by the large numbers of students in each class and their widely varying abilities. Also, curriculums frequently focus on teaching sports. Although sport is one way to get physical activity, it requires two difficult things for those with autism — communication and social skills. In addition, the gymnasium is probably the most unsensory friendly environment in the entire school. Thus, PE in its current state can be a recipe for failure for those with autism, ultimately driving this community away from becoming physically active. This is what happened with Ben.



Ben working with students on a research project examining the accuracy of the Apple Watch’s EKG sensor pre, during, and post exercise (Spring 2019). Photo courtesy of Benjamin Boudreaux.



Ben presenting at the 2020 SEACSM Annual Meeting with his first undergraduate research assistant Julie Schenck. Photo courtesy of Benjamin Boudreaux.

Fitness professionals need to educate autism parents that exercise should not be exclusively lumped in with PE/APE, or even physical therapy (PT) and occupational therapy (OT). As previously noted, physical activity requirements are not always met in PE/APE (12). Although PT and OT have an important focus on improving gross motor activity, these services end when goals are met or children “age out” and generally are not designed to meet daily physical activity requirements. Exercise can deliver a lifetime of benefits for those with autism, and their families need to understand that exercise has its own purpose. A personal trainer or exercise professional can be the solution to the exercise need in the community. Furthermore, a personal trainer is a natural fit for many with autism because they provide individualized instruction, which is already familiar and promotes a better opportunity for success.

In addition to the Autism Exercise Specialist Certificate, the recently published 11th edition of *ACSM’s Guidelines for Exercise Testing and Prescription* has a new section focused on ASD. The section discusses the current research, the exercise prescription and training considerations, and the future directions of the field. This excellent addition provides fitness professionals with more foundational knowledge toward helping the autism community make the exercise connection!

AN OPPORTUNITY FOR EVERYONE TO WIN (BEN AND DAVID)

(Ben) After graduating from Nicholls State University, I found the courage to pursue my master’s degree in Kinesiology and Health and completed a thesis at Southeastern Louisiana University. Completing my degree and successfully publishing my thesis in *Medicine & Science in Sports & Exercise*® led me to pursue a Doctor of Philosophy in Kinesiology at the University of Georgia. During my master’s and doctoral degrees, my advisors and professors were very knowledgeable about autism and created an accommodating atmosphere to aid my success. I am

no longer depressed and have gained confidence and self-esteem. I attribute much of this to my family, mentors, and exercise, and I have developed true friendships.

Regarding my future and career, I am optimistic about what lies ahead. It would be naive of me to think the future would come without challenges, but I have gained the confidence to overcome them. My current research focuses on 1) physical activity measurement, 2) assessing different behaviors (e.g., light physical activity, moderate to vigorous physical activity, sedentary behavior, and sleep) that occur during the day, and 3) using consumer wearable devices to assess different health or physical activity behaviors. The observations and findings of my research and personal use of a consumer wearable device have led me to sit less, swim, and run for longer durations, all of which continues to reduce my anxiety and improve my sleep. Like all of us, adults with autism will always have the daily stress of life, making it even more important to use exercise as a stress reducer. Although I have not conducted any scientific research on autism and exercise, I hope to be part of its expansion. I am interested in physical



Ben with two of his best friends, Paige (left) and Kelly (right). Paige is a clinical researcher at Freenova Institute with a Bachelors of Science in Nutrition Bachelors of Science in nutrition. Kelly is in her first year at LSU’s psychiatry residency program. Photo courtesy of Benjamin Boudreaux.

EXERCISE AND AUTISM

activity behaviors in autism and providing insight into researchers and practitioners who will find this valuable.

I am thankful that Editor-in-Chief Brad Roy, Ph.D., FACSM, allowed me to share my life experiences and the life-changing effect exercise has had on me. Many of my peers do not have a platform to share their story, and even if they did, many would not. They do not want to be judged or discriminated against. I hope that by sharing my story, my peers with autism will feel empowered to express themselves and share their often-hidden talents. I also hope to give parents newfound hope and envision that exercise professionals will grasp the opportunity to prepare themselves to help us achieve our greatest potential. Autism is not an excuse; it is an explanation.

(David) My career started with a father who wanted his son with autism to skip when I barely knew what autism was. In four sessions, I helped his child achieve that goal after trying for years. This started me on a journey that has profoundly affected my students and many professionals who do the same for their students and clients. I am grateful for the opportunity to work with ACSM to bring this education to professionals worldwide.

Side Bar: Practical Tips

Creating an *Autism Ready*[®] Gym Experience

1. Start with building a relationship

Fitness professionals frequently share their knowledge of human anatomy, etc., when talking with new clients. When you are talking with an individual with autism or their family, you should focus on building rapport, not their exercise knowledge. For example, ask, “What do you like to do for fun? Do you like exercising? Do you want to be here?” Give them a compliment and find a way to make a connection.

2. Prepare for the facility tour

When you know a person with autism is going to tour, let the entire facility staff know. Autism characteristics (e.g., spinning, rocking, and hand flapping) could present themselves during the tour. Seeing these out-of-the-ordinary behaviors could cause staff (or their clients) to stare, making it uncomfortable. And to be an *inclusive* fitness center, ALL staff should take a course on disability education, and/or earn the Autism Exercise Specialist Certificate, so you don't have to notify staff every time. Also, have a quiet room ready to talk and answer questions during or after the tour.

3. Adjust the physical assessment

With many clients, prepare yourself that they will not complete a full physical assessment in one session. This will depend on both their age and ability level. Think of the assessment as another opportunity for you to build a positive relationship and embed exercises when possible. Moreover, if the individual comes dressed in jeans, a polo shirt, and wearing penny loafers, just assess what you can.

Knowing that because of your efforts, a person will be able to make his or her way in this difficult world with more strength, confidence, and physical abilities is just the beginning. What it does for the families is equally rewarding. As fitness professionals, we all aspire to change people's lives, and there is no greater opportunity to do so than working with the autism community. Helping this deserving and appreciative community has become my mission. By teaming up with ACSM, we cannot just help hundreds, but hundreds of thousands worldwide. Using the power of exercise to help this community is long overdue. As it has been said, “If not us, then who? If not now, then when?”

HOW TO EARN THE AUTISM EXERCISE SPECIALIST CERTIFICATE

Earning the certificate is a two-step process for qualifying professionals: NCCA-accredited fitness professionals, PE and APE teachers, licensed physical, occupational, recreational therapists, speech-language pathologists, nurses, and licensed special education teachers.

Step 1: Complete the Online Modules

This Autism Exercise Specialist CEC Course consists of watching five webinars and reading two research articles. You must successfully complete a 15-question exam after each webinar and article. This course is valued at 6 ACSM CECs, and the registration fee is \$120. To sign up, go to acsm.org. This course is the prerequisite to attending the virtual/in-person workshop.

Step 2: Register for the Virtual or in-Person Workshop

Because of COVID-19, the 1-day 6-hour in-person workshop was adapted to a three-part (average of 2 hours each) series of virtual workshops. You will view videos of a diverse group of individuals and learn strategies to successfully teach them various exercises. You also will review case studies of those with autism to design both individual and group exercise programs. You must successfully complete a 20-question exam (80% is a pass) to earn the full certificate. This workshop is valued at 6 ACSM CECs, and the registration fee is \$350. To sign up or for more information on upcoming workshops, go to www.autismexercispecialist.com.

1. Lang R, Koegel LK, Ashbaugh K, Regester A, Ence W, Smith W. Physical exercise and individuals with autism spectrum disorders: a systematic review. *Res Autism Spectr Disord*. 2010;4(4):565–76. doi:10.1016/j.rasd.2010.01.006.
2. Ruggeri A, Dancel A, Johnson R, Sargent B. The effect of motor and physical activity intervention on motor outcomes of children with autism spectrum disorder: a systematic review. *Autism*. 2020;24(3):544–68. doi:10.1177/1362361319885215.
3. Sowa M, Meulenbroek R. Effects of physical exercise on autism spectrum disorders: a meta-analysis. *Res Autism Spectr Disord*. 2012;6(1):46–57. doi:10.1016/j.rasd.2011.09.001.
4. Adams J. *National Survey of Autism Treatment Effectiveness*. US Autism/Asperger's Conference. Tucson, AZ; 2016.
5. Tse ACY, Venus HL, Lee Paul H. Investigating the matching relationship between physical exercise and stereotypic behavior in children with autism. *Med Sci Sports Exerc*. 2021 Apr 1;53(4):770–5. doi:10.1249/MSS.0000000000002525.

6. Elliott RO Jr., Dobbin AR, Rose GD, Soper HV. Vigorous, aerobic exercise versus general motor training activities: effects on maladaptive and stereotypic behaviors of adults with both autism and mental retardation. *J Autism Dev Disord*. 1994;24(5):565–76. Epub 1994/10/01. doi:10.1007/BF02172138.
7. Nicholson H, Kehle TJ, Bray MA, Heest JV. The effects of antecedent physical activity on the academic engagement of children with autism spectrum disorder. *Psychol School*. 2011;48(2):198–213. doi:10.1002/pits.20537.
8. Schmitz Olin S, McFadden BA, Golem DL, et al. The effects of exercise dose on stereotypical behavior in children with autism. *Med Sci Sports Exerc*. 2017;49(5):983–90. Epub 2017/01/07. doi:10.1249/MSS.0000000000001197.
9. Education USD0. Every Student Succeeds Act (ESSA). [cited 2021 January 27]. Available from: <https://www.ed.gov/essa?src=rm>.
10. Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).
11. Hodgen LA. Cram101 textbook outlines to accompany: *Visual Strategies for Improving Communication Practical Supports for School and Home*. Academic Internet Publishers. 2007.
12. Office US Government Accountability Office. Students with Disabilities: More Information and Guidance Could Improve Opportunities in Physical Education and Athletics. 2010. [cited 2021 January 26]. Available from: <https://www.gao.gov/products/GAO-10-519>.
13. Atnthes E. Risperidone use in children with autism carries heavy risks. *Spectrum News*. 2014. Available from: <https://www.spectrumnews.org/news/risperidone-use-in-children-with-autism-carries-heavy-risks/>.
14. McDougle CJ, Scahill L, Aman MG, et al. Risperidone for the core symptom domains of autism: results from the study by the Autism Network of the Research Units on Pediatric Psychopharmacology. *Am J Psychiatry*. 2005;162(6):1142–8. doi:10.1176/appi.ajp.162.6.1142.
15. Shea S. Risperidone in the treatment of disruptive behavioral symptoms in children with autistic and other pervasive developmental disorders. *Pediatrics*. 2004;114(5):e634–e41. doi:10.1542/peds.2003-0264-f.
16. McCracken JT, McGough J, Shah B, et al. Risperidone in children with autism and serious behavioral problems. *N Engl J Med*. 2002;347(5):314–21. doi:10.1056/nejmoa013171.
17. Dillon SR, Adams D, Goudy L, Bittner M, McNamara S. Evaluating exercise as evidence-based practice for individuals with autism spectrum disorder. *Front Public Health*. 2017;4. doi:10.3389/fpubh.2016.00290.
18. Wong C, Odom SL, Hume KA, et al. Evidence-based practices for children, youth, and young adults with autism spectrum disorder: a comprehensive review. *J Autism Developmental Disorders*. 2015;45(7):1951–66. doi:10.1007/s10803-014-2351-z.
19. Phillips KL, Schieve LA, Visser S, et al. Prevalence and impact of unhealthy weight in a national sample of US adolescents with autism and other learning and behavioral disabilities. *Matern Child Health J*. 2014;18(8):1964–75. doi:10.1007/s10995-014-1442-y.
20. Allison DB, Basile VC, MacDonald RB. Brief report: comparative effects of antecedent exercise and lorazepam on the aggressive behavior of an autistic man. *J Autism Dev Disord*. 1991;21(1):89–94. Epub 1991/03/01. doi:10.1007/BF02207001.
21. O'Connor JF, Hester RH. Use of physical activity to improve behavior of children with autism-two for one benefits. *Palaestra*. 2000;22–9.
22. Rao SM, Gagie B. Learning through seeing and doing. *Teach Except Child*. 2006;38(6):26–33. doi:10.1177/004005990603800604.
23. McNamara SB, Bittner M, Healey S. Online training for physical activity practitioners on evidence-based practices for clients with autism. *Adv Autism*. 2020; ahead-of-print; <https://doi.org/10.1108/AIA-04-2020-0026>.
24. Harvey SB, Øverland S, Hatch SL, Wessely S, Mykletun A, Hotopf M. Exercise and the prevention of depression: results of the HUNT cohort study. *Am J Psychiatry*. 2018;175(1):28–36. doi:10.1176/appi.ajp.2017.16111223.
25. SHAPE America. Grade-level outcomes for K-12 physical education. 2012. Available from: <https://www.shapeamerica.org/standards/pe/upload/Grade-Level-Outcomes-for-K-12-Physical-Education.pdf>.



David S. Geslak, B.S., ACSM-CEP, CSCS, the founder of *Exercise Connection*, has pioneered exercise tools and programs to engage and improve the lives of those with autism. David also created the *Autism Exercise Specialist Certificate (AESC)* in partnership with ACSM. He has trained professionals around the world on the AESC.

His commitment and methodology to bringing exercise to those with autism has been enthusiastically embraced by professionals, higher education, and the autism community.



Benjamin D. Boudreaux, M.S., is a graduate research and teaching assistant at the University of Georgia pursuing a Ph.D. in kinesiology. He has previous clinical experience working in cardiology and orthopedics. His research focus includes objectively measuring physical activity, sedentary behavior, and sleep as well as using consumer wearable technology in different research settings. He is a member of the American College of Sports Medicine and International Society for the Measurement of Physical Behaviour.

BRIDGING THE GAP

Benjamin D. Boudreaux, a Ph.D. student and person with autism, shares the journey of his struggles with autism. He explains how exercise went from being a source of frustration and failure to becoming the gateway to improved confidence and, ultimately, success. David Geslak has seen firsthand that most of his clients on the autism spectrum share similar experiences with Ben. For more than 15 years, David has been developing and fine tuning exercise protocols to effectively bring exercise to the autism community. Ben and David want to empower fitness professionals to have a life-changing effect on individuals with autism and their families through exercise training and physical activity.