

Utilizing Self-Determination Theory to Promote Physical Activity in Individuals with Autism Spectrum Disorder

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Abstract

Individuals with autism spectrum disorder (ASD) often experience an array of challenges when it comes to participation in physical activity (PA). As studies have shown children and adolescents to be less active than their typically developing peers, it is necessary for future research to explore innovative ideas and instructional strategies to help increase levels of participation in PA to this population. This article provides an overview of the self-determination theory (SDT) and explores practical strategies for parents, practitioners, and related-service providers to support participation in PA to individuals with ASD.

Keywords: ASD, autism spectrum disorder, self-determination theory, physical activity

According to The Centers for Disease Control and Prevention (CDC), one in 54 children and adolescents are diagnosed with ASD (CDC, 2020). Those on the spectrum share a common cluster of impairments, including deficits in communication and social interactions and restricted, repetitive patterns of behavior, interests, or activities (*Diagnostic and Statistical Manual of Mental Disorders*, 5th ed. [DSM-5]; American Psychiatric Association [APA], 2013). While not part of the formal diagnosis of ASD, studies have shown individuals with ASD to be less active than their typically developing peers (Bandini et al., 2013; Pan, 2008; Pan et al., 2011). It has been suggested that lower levels of motor

abilities and fitness and/or impairments in socialization and emotional regulation contribute to limited PA in this population (Buchanan et al., 2017; Obrusnikova & Cavalier, 2011; Obrusnikova & Miccinello, 2012; Srinivasan et al., 2014). Relatedly, research has shown that adolescents with ASD spend more time in sedentary pursuits such as watching television, movies, and playing video games compared to peers without ASD (Chonchaiya et al., 2011; Mazurek & Wenstrup, 2013; Must et al., 2015).

Low levels of PA contribute to many major health risk factors, including the development of metabolic syndrome, chronic health conditions, and obesity-related comorbidities (Chastin et al., 2016; Owen et al., 2010). Lack of PA coupled with sedentary behavior has led to an increase in overweight and associated health issues in children with disabilities. In a 2016 review of medical records from 48,762 children with ASD in the United States showed significantly higher rates of obesity and obesity-related conditions in children with ASD such as hypertension, high cholesterol, and nonalcoholic fatty liver disease (Karpur et al., 2019). Thus, helping individuals with ASD to establish a regular PA routine to meet the minimum PA recommendations are needed to maintain health and function.

The challenge is how to help individuals with ASD start and maintain a physical activity program. It is difficult to motivate those without disabilities to regularly participate in physical activity. Getting someone with ASD to regularly participate in physical activity has added challenges related to the unique characteristics of those with ASD, including but not limited to the following (Cheak-Zamora et al., 2020; Chou et al., 2017; Lang et al., 2010):

- difficulty starting a new routine and breaking old routines
- difficulty interpreting environments and knowing what is expected in specific environments (e.g., what to do at the gym if your piece of equipment is being used)
- social anxiety (i.e., uncomfortable in settings with lots of people or how to interact with others)
- sensory issues (i.e., difficulty with loud environments)
- safety (i.e., elopement and running away)
- having strong interests that may be unrelated and even in direct opposition to being physically active (i.e., preference to watch YouTube videos).

The purpose of this article is to present self-determination theory (SDT) as an approach to motivate individuals with ASD to start and adhere to physical activity programs. The article begins with an introduction to SDT with examples of how key components can be applied to physical activity and those with ASD. The article concludes with practical strategies using SDT to create individualized physical activity programs that are motivating for those with ASD.

Self-Determination Theory (SDT)

Self-determination theory (SDT) focuses on what motivates individuals to take part in a particular activity. Motivation can be divided into two types, extrinsic and intrinsic. Extrinsic motivation refers to behaviors controlled by external rewards or incentives such as money, grades, praise, or perceived value. Extrinsic motives exist on a continuum from least self-determined (e.g., doing something to avoid punishment) to highly self-determined (e.g., doing something because it is seen as valuable and relevant). In contrast, intrinsic motivation refers to behaviors controlled exclusively by internal rewards such as interest, the natural pleasure and enjoyment of participating in an activity or fulfilling a need such as gaining knowledge or improving oneself (Cherry, 2021; Deci & Ryan, 1985, 2012; Ryan & Moller, 2017). It is important to note that most people are driven by a mix of intrinsic and extrinsic motivation (Ryan & Deci, 2017). For example, someone may workout at the gym for extrinsic reasons and to seek approval from others (e.g., my doctor told me to exercise to lose a little weight) or because they see exercise as a way to stay healthy, but this person also finds that working out regularly provides inherent (i.e., intrinsic) enjoyment (e.g., I feel good about myself after I work out). Duncan et al. (2010) noted that, in an exercise context, research shows that people who regularly exercise are more self-determined in their motivation. Thus, the goal is to help individuals see their exercise in terms of more self-determined forms of motivation and optimally, to have intrinsic reasons for being active.

According to SDT, individuals become “self-determined,” and in turn more internally motivated when their needs for *autonomy*, *competence*, and *relatedness* are fulfilled (Cherry, 2021; Deci & Ryan, 1985; Ryan & Deci, 2017). Modified from the original work of Deci and Ryan (1985), the following section summarizes the three key components to SDT:

Autonomy: People need to feel in control over what they choose to do, and participation in activities needs to be viewed as voluntary and by choice. With regard to exercise, one has autonomy by choosing to go to the gym and walk on a treadmill. While there are many options to be physically active, there is the option to remain sedentary. Autonomy is reflected in a person choosing to be physically active and then choosing to walk on a treadmill at the gym as a means of being physically active. The person has made these choices not because someone told them to do it (i.e., controlled environment), and not because someone is paying them to do it (i.e., external reinforcer). In contrast, *autonomy frustration* represents the feelings when one is not in control of their choices or is controlled by external pressures/rewards to take part in an activity. For example, an adult with ASD living in a group home may encounter a lack of autonomy, if the local YMCA is the only option to engage in physical activity. The adult with ASD may be limited to riding a stationary bike because it is more conducive for the group home staff to provide supervision while all clients are riding stationary bikes.

Competence: When people feel that they have the skills needed for success, they are more likely to participate and continue to engage in a particular activity. Competence comes with practice, mastering key skills related to the activity, and understanding and feeling comfortable with the rules and nuances of the environment where the activity takes place. Someone who feels competent while participating in a particular activity will experience enjoyment and feelings of self-worth. In turn, this person will likely choose to participate in that activity. For example, a person who is competent in a yoga class at a local studio, playing golf at a favorite course, or swimming at a local swim club is more likely to participate in these activities on a regular basis. The person has the physical skills to be successful, but also knows and feels comfortable with the social expectations and etiquette of the environment. In contrast, *competence frustration* leads to feelings of failure and doubts about one’s ability and self-efficacy. For example, a father takes his young adult son with ASD to the fitness club to shoot some basketball. The young adult with ASD becomes frustrated because he is not skilled at shooting baskets. In addition, the environment presents sensory confusion, since there are people coming and going, balls bouncing into personal space, and an array of background noise (i.e., balls bouncing, music playing, and people talking). This young adult thus experiences competence frustration in this environment. Without an intervention to support the development of fundamental basketball skills in a comfortable learning environment, this young adult will likely display behaviors that communicate he does not want to go to the gym to play basketball.

Relatedness: People who experience a sense of belonging and connection with others when participating in activities are more likely to continue. Activities that provide relatedness often include a social component such as weekly dinners with friends or being a member of a monthly book club. Relatedness also could be staff welcoming members when they come to the gym to work out or recognizing regular walkers on the hiking trail. One does not necessarily have to interact with others to feel relatedness. Individuals can feel a connection with others just by being in the same environment and participating in the same activity. In the context of physical activity, relatedness could result from participating in a weekly paddle ball or tennis match with friends, joining a hiking club, taking part in a group exercise class, or simply waving to neighbors when walking the dog. In contrast, those who feel disconnected or socially excluded while participating in an activity are more likely to experience *relatedness frustration* and stop participating in the activity. For example, exercising at the gym may not be enjoyable if a person is not greeted by staff or recognized by other members; and hiking is not as fun when done alone. It should be noted that many people enjoy the solidarity of working out at the gym, going for a walk, or playing golf on their own. However, relatedness also can be viewed as a *feeling of belonging* to a group of people who share similar interests. For example, someone who enjoys playing solitary games of golf, may feel

a kinship and consider themselves to be a member of the golf community. Similarly, someone who enjoys going to the gym and works out alone, may still consider themselves a member of a group that values regular participation in physical activity.

Interestingly, Hamm and Yun (2018) found that only autonomy and competence were significantly associated with motivation to exercise with their sample of participants with ASD. Perhaps relatedness as a psychological need is not as critical in those with ASD when it comes to physical activity. However, research specifically targeting relatedness is more limited, so that component should not be ruled out.

Environments that Support Self-Determination

SDT suggests that the best way to foster self-determined forms of motivation is to provide a competence-enhancing and autonomy-supportive environment, where individuals also feel a sense of connection (i.e., relatedness) with others. A competence-enhancing environment values effort and improvement over a focus on outcome. In such an environment, providing *mastery challenges* (i.e., something difficult but achievable), combined with specific feedback that gives the individual key information needed to improve will enable the individual to build competence (Ryan & Moller, 2017). An autonomy-supportive environment is one in which the person of authority (i.e., teacher, parents, trainers) would (a) take the perspective of individuals into consideration, (b) consider the person's need for relatedness and enhances a sense of belonging, (c) provide opportunity for choice, and (d) explain in a meaningful way why participation in a particular activity might be important (Chatzisarantis & Hagger, 2009; Deci & Ryan, 2012). In other words, an environment that supports autonomy, relatedness, and competence will help participants become energized about initiating and maintaining action and achieving goals (Wehmeyer, 2019). In contrast, an environment is said to be controlling when people in positions of authority do not provide most of the critical factors that comprise autonomous environments, such as perspective-taking, enhancing a sense of belonging, opportunities for choice, and providing a rationale for participating.

This is true for physical activity as well. Rodrigues and Macedo (2021) noted that health care providers should create physical activity settings that are autonomy-supportive, which could lead to self-determined forms of motivation to exercise and to start and adhere to an exercise routine. Chatzisarantis and Hagger (2009) operationalized how people close to participants can foster competence-enhancing and autonomy-supportive environments and enhance self-determination and intrinsic motivation. For example, an environment in which people in authority provide encouragement and feedback on a participant's performance can increase intrinsic motivation. This type of feedback helps enhance competence and encourage continued participa-

tion in an activity. Similarly, leaders can create an environment in which participants believe they have control and take responsibility for their behaviors, which will positively influence feelings of competence and autonomy. Highly self-determined people take credit for their success, but they also accept the blame for their failures. In turn, when facing challenges, participants who feel they have control are more likely to overcome these challenges through persistence and hard work. Lastly, leaders can enhance self-determination by limiting external rewards and creating an environment in which goal setting and hard work are promoted to achieve personal goals. The leader can also help participants understand the importance of regular participation in physical activity to help them achieve a targeted goal.

Self-Determination and Individuals with ASD

Higher levels of self-determination are associated with better employment, independent living, and financial outcomes for young adults with physical, developmental, and intellectual disabilities (Carter et al., 2009; Shogren et al., 2015; Wehmeyer & Palmer, 2003). However, developing self-determination with those on the autism spectrum can be difficult. Cheak-Zamora et al. (2020), as well as Chou et al. (2017), noted that characteristics associated with ASD such as problems with executive function and adaptive behavior can fundamentally undermine self-determination. For example, young adults with ASD struggle with key components of self-determination (i.e., self-monitoring, social relationships, self-regulating, goal setting, and planning) due to these deficits in executive dysfunction and adaptive abilities. In addition, some individuals with ASD may adhere to strict routines and feel discomfort in unfamiliar situations. This could result in those with ASD to rely on caregivers, which could limit choice-making and control, and hinder the development of self-determination skills.

Using SDT to Create the Physical Activity Program

Parents, practitioners, and related-service providers could use SDT to assist individuals with ASD in the development of a personalized physical activity program. The following sections provide strategies to promote autonomy, competence, and relatedness within a physical activity context.

Promoting Autonomy through Choice

Autonomy revolves around the feeling of control and can be realized by having choices. This process begins with the selection of a preferred physical activity. Allowing the participant to choose the physical activity immediately moves control *to the participant* and *away from the caregiver*. However, too many choices could frustrate and confuse those on the autism spectrum, so providing only two or three choices is suggested. Paired choices can be presented multiple times to help a participant with ASD to select a preferred physi-

cal activity. For example, choices may begin by asking the participant if they want to do something outside or at the fitness center. If the participant chooses the fitness center, the choices could be walking on a treadmill or riding a stationary bike, two activities this participant knows and has done successfully in the past. If the participant chooses outside, the choices could be walking in the neighborhood or playing paddleball. Visual supports (i.e., clip art, images, and photos) could also be used to assist this population in the selection of their preferred physical activity.

Additional choices can be offered once the participant selects an activity. First, *when* does the participant want to do the activity, (i.e., before lunch or after lunch) and *how long* does the participant want to engage in the physical activity (i.e., thirty minutes or forty-five minutes). Another choice is whether the participant wants to do the physical activity alone or with a peer or caregiver. If the participant wants to be with a partner, then more choices could be offered such as going with mom or dad to the fitness center to work out, or to go for a walk with one of two group home staff members or another group home friend. Participant could also choose what they want to wear during physical activity. While individuals with ASD can select their own clothes and shoes, some may need a caregiver to layout two shirts, two shorts and two pairs of athletic shoes and allow the participant to choose what they want to wear. Lastly, the participant could choose to watch videos on a tablet, look through a magazine or listen to music while walking on the treadmill or riding the stationary bike. However, some choices may not always be available. For example, outdoor activity may be limited due to inclement weather, the preferred parent may be at work, or the fitness facility may be closed for a holiday. While these situations can present some challenges, providing choices can create an autonomy-supportive environment and strengthen the feeling of control and autonomy. A greater sense of autonomy, could increase levels of self-determined motivation to participate in the activity.

Promoting Competence

It is critical that participants feel they can be successful and competent when participating in physical activity. This is particularly important during early sessions when participants may experience limited success. How many people have taken up golf only to quit after a few frustrating sessions on the driving range, and feel that mastery of the game will never happen? Therefore, to enhance feelings of competence, it is important to teach participants how to do the activity, set small and realistic goals, and document and re-

inforce the individual's progress. Teaching individuals how to complete a specific skill begins with a task analysis. The task analysis begins by breaking down a skill into key components, assessing the participant on these components, and then creating a teaching plan based on the assessment. Figure 1 presents an assessment created based on the steps one would need to walk on a treadmill at a fitness center.

In the following example, the instructor has task analyzed the steps to operating a treadmill, preassess what the participant can already do, and targets steps the participant still needs to master. From a competence standpoint, the instructor should begin by reinforcing the participant for the components mastered with *informational feedback*. For example, "Wow, you already know a lot about operating a treadmill!" Then the instructor can focus on teaching the missing components. Components can be taught in the correct sequence all at once to help the participant understand the steps of the task. Then individual steps can be targeted and practiced to mastery before moving on to another component. The instructor should reinforce the participant as they master a

Figure 1
Components for Walking on a Treadmill at a Fitness Club.

Name: _____			Date: _____
Components for Walking on a Treadmill at a Fitness Club			
<u>Pre</u>	<u>Mid</u>	<u>Post</u>	
✓	—	—	Finds an empty treadmill
✓	—	—	Steps onto the treadmill
—	—	—	Places tablet, phone, or magazine on the rack on the treadmill
✓	—	—	Turns tablet to desired show or to the desired page of the magazine
—	—	—	Stands with both feet on the treadmill facing forward, hands on handrails
—	—	—	Releases one hand and presses the "quick start" button
—	—	—	When the treadmill belt starts, finds the speed button
—	—	—	Continues to press the speed button until you reach a desired speed
✓	—	—	As the belt begins to move, continuously walks in a forward motion
—	—	—	Keeps hands on the handrail
✓	—	—	Walks on the treadmill for 1 minute
—	—	—	Walks on the treadmill for 3 minute
—	—	—	Walks on the treadmill for 5 minutes
—	—	—	Walks on the treadmill for 10 minutes
—	—	—	Walks on the treadmill for 15 minutes
—	—	—	Walks on the treadmill for 20 minutes
—	—	—	Walks on the treadmill for 25 minutes
—	—	—	Walks on the treadmill for 30 minutes
<u>5</u>	—	—	Total Number of Components Completed

new step. For example, “Great job, Katie, you now know how to find the speed button and set it to 3 miles per hour. Way to go!” The key is that the instructor is defining competence for the participant, and competence is defined as mastering components and slowly building up to 30 minutes or more of walking on the treadmill. The participant is reinforced for achieving small goals, whether that means mastering specific components of using the treadmill or walking for longer periods of time. This helps give the participant confidence and a feeling of competence.

Promoting Relatedness

Relatedness could be as simple as explaining to the individual that they are now part of a special group of bike riders, dog walkers, tennis players or “gym rats” who love to ride, walk, play tennis, or go to the gym. Pointing out others who are doing the activity helps build this bond of relatedness (e.g., “Look at all the people walking their dogs today”; “Look at all the people playing tennis today”). The idea of being a member of a group of people with similar interests is particularly important for those with ASD who want to feel a connection with others without necessarily doing the activity with others. Many people without ASD enjoy the solitude of a run, a long walk, or hitting golf balls at the driving range. However, these people also feel a bond with others who share the same passions.

Participating in an activity with a friend or caregiver is another way to promote relatedness. This could be as simple as walking the dog together with another person at the group home, hitting tennis balls with mom, or going to the gym and taking turns weightlifting with a friend. Exercising or playing a game with others may be a way to help those with ASD become more comfortable in group settings. For example, some with ASD might enjoy being part of a group exercise class or joining a hiking or biking club allows for some interaction with others, but the focus is more on the physical activity. A person with ASD can interact as much or as little as he or she wants in these settings, but simply being in the group setting and around others builds relatedness. Caregivers and instructors can help by providing some simple scripts to participants on what to say upon arrival to the activity (i.e., *Hello Mary, how are you today?*); during the activity (i.e., *I really enjoy walking on the treadmill.*), and when it is time to leave the activity (i.e., *Have a nice day, see you next week.*). Social stories are another way that caregivers can ease a participant’s anxiety and prepare them for the typical social interactions that are part of the activity. Below is a social story for a group yoga class:

Maggie (the participant’s name) is going to yoga today at the Yogaville Exercise Club. Everyone will be dressed in tights and a comfortable t-shirt, but no one will be wearing shoes or socks. Maggie will bring her own mat from home. Before class starts, people will be finding their personal space and setting down

their mats. Some may look at Maggie and say hi, and it would be appropriate for Maggie to smile and say hi back. When the class begins, everyone will be quiet and listen to the instructor. Only the instructor talks during class and Maggie will try real hard not to talk or make sounds. During class, Maggie tries her best to do the different body movements called poses. Every person may have their own version of a pose and it’s OK! At the end of class, everyone will roll up their mat. Some participants may talk to each other and say, “Good job today” or “That was a good workout.” Some may look at Maggie and say these things, and Maggie can respond by saying the same thing back to these people; “You did a good job today, too,” “Yes, that was a good workout.” Finally, some people might say goodbye to Maggie, in which case Maggie will say goodbye back to them.

Another way to build relatedness is to follow college and professional athletes and teams that are involved in the same physical activity as the participant with ASD. If the participant is learning to play tennis, then watching tennis on TV, attending a local high school tennis match, and following a favorite college tennis team online is a great way to feel related to others who enjoy tennis. The participant could also wear athletic attire endorsed by professional athletes or collegiate teams. Developing a connection between a specific sport or activity, could motivate the participant to engage in regular physical activity, improve fitness, and to meet others who share similar interests.

Summary

While it is important for everyone to be physically active, it is especially important for those with ASD who tend to be less fit and more sedentary than the general population. Motivating individuals with ASD to engage and maintain regular participation in a physical activity program can be quite challenging. One model shown to promote physical activity in those without disabilities is SDT (Teixeira et al., 2012). With the support and guidance of parents, practitioners, and professionals in the field of sport and PA, the implementation of SDT could help fulfill the needs for autonomy, competence, and relatedness for this population. With continued practice, SDT could lead to more self-determined forms of motivation, enjoyment, and adherence to physical activity programs. It is suggested for future research to explore SDT in hope that it could become a viable means to increase participation in physical activity to individuals with ASD.

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