Can technology enhance emotion recognition in kids on the autism spectrum?

Breaking down what technology can and can't do for kids with autism

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The challenge–
learning to identify emotions

As a therapist or educator working with kids on the autism spectrum, one of the biggest challenges can be teaching them to identify and interpret social and emotional cues. No matter where they are on the spectrum, many people with autism struggle to understand facial expressions, tone of voice, and gestures that other people understand intuitively, as well as respond to them appropriately. They may also have difficulty understanding, regulating, and expressing their own emotions. These difficulties impact how people with autism perceive relationships and social situations and hamper their integration into society in the long run. The impaired social competence can impact every element of their lives including education, employment, housing, healthcare, and even their interactions with administration and law enforcement.

For example, Joe, a 9 year old child on the spectrum, approaches Pat, a classmate, during recess. Joe has just read something about his favorite topic, whales, and is eager to share it. Pat has just fallen down, and is crying while grasping his injured hand. One classmate is helping Pat get up, another calls an adult, and yet another offers water and comfort. During all of this commotion, Joe pushes his way through the crowd and exclaims, "Pat, Pat! did you know whales only eat plankton?" Pat continues his crying, while the other kids gaze at Joe in utter disbelief. Joe, unperturbed, continues and says, "Isn't that amazing? The largest animal on earth eats something so tiny we cannot even see it!" The other kids, ignoring Joe, turn around and escort Pat away. Joe is left alone, wondering why plankton would make anyone cry, and why everyone suddenly left him all alone.

These types of interactions are typical for kids on the spectrum, where they are often left alone, or are bullied, as a result. **Without being able to interpret everyday interactions, the overall well-being of people with autism is severely impaired.**

Although they don't understand them intuitively, people with autism can be taught to recognize a variety of emotion indicators such as facial expressions and tone of voice using methods like Applied Behavior Analysis (ABA), a therapy method based on the science of learning and behavior. Therefore,a central goal of therapy and educational intervention for people with autism is teaching them to interpret emotion and non-verbal cues. However, as therapists know, it isn't an easy task. Like learning to speak a foreign language, or playing an instrument, it is a complex skill that improves only through regular practice. Through repetition—exposing the learner to the emotional cues in different contexts—many people with Autism can learn to consistently identify emotions and associate the proper response with them. However, the learning process needs to be explicit, allowing the autistic learner to examine these fleeting, constantly changing emotional cues in a rule-based, systematic way.

Barriers and challenges in teaching about emotions

A major challenge when working with kids with autism is parent-professional coordination. Therapists and educators have a limited amount of time with each child, and it's up to parents to practice and reinforce the skills at home. If parents and professionals work differently with a child, the lack of a coordinated approach may hinder progress. Even with good coordination, if parents don't have the time and resources to regularly reinforce the therapist's work, progress may be slow.

Another problem lies in the generalization difficulties children with autism often face. This means that if a child is exposed to a set of expressions performed by a specific character, they may struggle to associate the emotional cues taught with other characters. Exposing the child to many different types of faces and expressions can help him/her generalize, **but finding, organizing, and curating a wide variety of appropriate examples is extremely time-consuming and onerous for the therapist**. Even if the therapist is able to build a robust database of examples, he/she generally doesn't have a simple, intuitive way to share the material with parents so that they can reinforce the work at home.

Games can be a gamechanger

We often think of them in the context of colorful candies and online battles, but computer games aren't just mindless fun—the market is full of serious games designed for purposes other than pure entertainment. They often use simulations of real-world events to teach users how to solve a problem or do a complex task, such as flight simulators that are used to train pilots.

Serious games are increasingly being used in education, especially during the pandemic and the transition to distance learning. But education is only one field where gaming has been found to be useful. Today, games are also used in the workplace to train workers or to make tedious tasks more enjoyable, and to encourage a variety of healthy behaviors both in the workplace and at home.

Technology-based games are also used in therapy, and with the recent advances in simulation techniques, these technologies can also be used for autism care and education.

> **Two decades of research show that computer/media-assisted teaching of emotions and social understanding for children with Autism is effective, and even short-term interventions yield significant results.**

Even better—technology makes advanced interventions available to people who may not have access to in-person therapy with a trained professional.

How do you choose the right platform?

List of things to look for when choosing a platform

1. Research based
2. Validated examples
3. Use real examples of emotional cues
4. Rich library of examples
5. Use with multiple people - therapist, parent
6. Cloud based - changes are transparent
7. Use with any device

Not all technological platforms for people with Autism are created equal. In order to achieve positive outcomes with people with autism, the platforms should be adapted to their unique needs. For example, learning from cartoon characters may be challenging, since they differ so much from real life faces. Therefore, leading platforms use real people, not cartoons or abstract representations like emojis.

Many game developers do not have the resources, expertise, or commitment to conduct in-depth, long-term research before launching their product. Therefore, many of the products on the market cannot demonstrate evidence of efficacy in promoting positive outcomes in people with autism. Even if a company claims that a product is backed up by research, **it is always recommended that parents, therapists and educators review the research behind any product they use paying attention to who did the research, how rigorous is the research that has been done and what institutions are behind the technology.**

Doesn't technology distance kids with autism from human interaction?

Most kids with autism like technology. Computers and computer games are predictable and rule-based, things that appeal to kids with autism. Whereas the technological environment can be accessible and motivating for kids with autism, generalization of learned skills to real life setting requires practice with other people.

Therefore,

> **technological platforms that have demonstrated positive outcomes in children with Autism use technology to facilitate interpersonal interaction, not replace it.**

In most cases, a child works with an adult mediator, such as a parent, teacher, or therapist, interacting with that person while engaging in tasks related to emotion recognition and understanding them in context. By focusing on learning by doing and including tasks that encourage the adult and child to explore emotions together, the communication between the adult and child may be enhanced and include new ways to communicate effectively. The activity is the means, while the interaction is the goal.

Like in other fields,

> **technology can also be a huge time saver for therapists and educators.**

Rather than spending hours scouring books and the internet to find pictures and videos that demonstrate different emotions, with the right platform, relevant examples are already there, validated and curated to the unique needs of kids on the spectrum.

Emotiplay—a new game

The Emotiplay platform is based on in-depth research and development work conducted through the EU-funded project "Autism-Inclusion", as well as technological infrastructure provided by Compedia. The Emotiplay platform includes lessons and interactive games focused on emotion recognition in others and in one self. It is designed to maintain motivation and to boost the generalization of acquired skills in everyday life.

EmotiPlay

Creating a better future for kids with Autism

Every aspect of life is undergoing a technological revolution, and autism intervention is no exception. Although technology has the potential to be a game-changer for people with Autism, all interventions must be supported by robust and ongoing research. As educators and therapists, you can play a key role in this new frontier. Try out the different platforms, give feedback, and get involved—you can use your expertise to create a better future for the Autism community. Technologies and companies who create tech for kids are thirsty for feedback, so make your voice heard.

About Professor Ofer Golan, PhD.

Ofer Golan is a clinical psychologist, an associate professor and the head of the Autism Research Lab at the Department of Psychology, Bar-Ilan University, Israel. He studies socio-emotional functioning in ASD, including social skills, emotion recognition, expression and regulation, and ways to develop them through parent focused, cognitive-behavioral, and technological interventions. His work has been published in leading research journals and presented in international conferences.

Prof. Golan is the founder and the clinical advisor of two Israeli clinical centres which provide evidence-based diagnosis and intervention services to children, adolescents and adults with ASD and their families, and in addition train clinicians and disseminate evidence-based interventions nationwide.

Prof. Golan is a member of the expert committee, which advises the Israeli Ministry of Health on ASD best practice. He is the chair of the steering committee for the Israeli National Autism Research Center, and an honorary visiting fellow at the Autism Research Centre, University of Cambridge, UK.