THE TRANSPORTERS: TEACHING CHILDREN WITH AUTISM TO RECOGNIZE EMOTIONS

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Introduction by Elizabeth Laugeson, PsyD

Emotion recognition is a key social skill that is impaired in many children with autism spectrum disorders (ASD). The inability to recognize and adapt to various human emotions, such as happiness, sadness and anger, can make it hard for children and adults with ASD to socialize in meaningful ways. Researchers have begun to address the issue of emotion recognition by using empirical data about preferences and cognitive styles of children with ASD in order to explore and develop potential therapeutic interventions. One such innovative intervention developed by researchers at Cambridge University is The Transporters, a DVD that teaches children with ASD how to recognize emotions in others though the use of engaging animated characters.

Our research group had already developed a DVD for teaching emotion recognition to people age 8 and above on the autistic spectrum, called Mind Reading: The Interactive Guide to Emotion. Research has shown that using that DVD for two hours a week over a 10-week period leads to significant improvement in emotion recognition among people with autism spectrum conditions. Our experience on that earlier project persuaded us that there are methods that can make a difference to people with this disability. Just as children with dyslexia can be helped significantly by using tailored educational software to ease them into reading words, so too, children with autism can be helped significantly by using tailored educational software to ease them into understanding emotions and reading these emotions on faces. Despite dyslexia's being a form of word-blindness and autism's being a form of mind-blindness, neither of these conditions is beyond remediation.

We recently took up the challenge of trying to teach empathy to very young children with autism spectrum conditions by making an animated series called The Transporters (www.thetransporters.com). Whereas Mind Reading required children to be able to play a computer game by clicking a mouse, or to be supervised by a teacher or adult who could help them to do this, The Transporters was aimed at relatively neglected ("excluded") people on the autistic spectrum: those with significant learning difficulties and preschoolers. Neither of these two groups may be able to use or even be interested in using computers, but both of these two groups enjoy watching animated films about vehicles.

The reason they love watching films about vehicles is simple. According to one theory, children and adults with autism spectrum conditions are strong 'systemizers'. They are drawn to predictable, rule-based systems, whether these are repeating mathematical patterns, repeating electrical patterns (e.g., turning light switches on and off) or repeating patterns in films. They love lawful repetition. As an aside, it is of interest that the two other major theories of autism that try to explain the non-social factors in autism — the weak central coherence theory and the executive dysfunction theory — have no simple way of explaining this love of lawful repetition, which is a hallmark of the condition. It is ironic, too, that Kanner, who first described autism in 1943, also drew attention to this feature of autism (what he called their "need for sameness" and their "resistance to change"), and yet it has been the social difficulties exhibited by individuals with autism that have been the main focus of psychological research. We believe that at the core of autism is an ability to deal effortlessly with systems because they do not change and hence remain the same. On the other hand, there is disabling difficulty in dealing with the social world because it is always changing unpredictably and is different every time.

According to the hyper-systemizing theory, vehicles whose motion is determined only by physical rules (such as vehicles that can only go back and forth along linear tracks) would be much preferred by children with autism over vehicles like planes or cars whose motion could be highly variable, moving at the whim of the human driver operating them. So we proposed to make a children's animation series based around eight characters that are all vehicles with rule-based motion. Such vehicles would grab the attention of both preschoolers with autism and those so-called 'low-functioning' children with autism who have significant learning difficulties. Onto these vehicles we would graft real-life faces of actors showing emotions, and contextualize them in entertaining social interactions between the toy vehicles.

Together with a leading production company, Catalyst, we created a whole family of different toy vehicles running on tracks or cables, that have limited

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freedom of motion: two trams (Charlie and Jennie), two cable cars (Sally and Dan), a chain ferry (William), a coach (Nigel), a funicular railway (Oliver) and a tractor (Barney). Since all of the characters were depicted as toys in a child's bedroom, motion of the latter two was constrained to a track, in a Scalextric-like manner.

Each of the 15 episodes lasts five minutes and opens with a catchy tune and a sequence panning around the boy's bedroom, where he plays with his toy vehicles. We then see the boy going off to school, the vehicles then 'come to life' and become caught up in dramatic stories that enable the child watching to see different key emotions on the faces of the vehicles. The Transporters aims to teach not just basic emotions (happy, sad, angry, disgust, fear, surprise) but also more complex ones (ashamed, joking, jealous, proud, tired, sorry, kind, excited, worried, unfriendly and grumpy). Each short story is entertaining and narrated, but the program works even for a child without language, because the actions speak for themselves.

The hope is that through hours of repetitive TV watching, children with autism — instead of turning away from faces as they usually do because they find them so unpredictable (thus missing out on crucial experience in learning about emotional expressions) – will tune into faces without even realizing that they are doing so. Why? Because unlike faces on the people in their own homes, which are attached to human bodies that move unpredictably and are therefore stressful and confusing, the faces on the vehicles in The Transporters are attached to mechanical bodies that move with beautiful predictability. The wheels turn — round and round and round. The gears on the wheels lift up and down and up and down. The vehicles move back and forth and back and forth. All of these predictable movements are soothing for a child with autism who has a "need for sameness." Such systems, far from being confusing, are easy to understand because they are 100 percent lawful, following the laws of mechanics and "Does this work?" cause and effect. All you need to understand such mechanical motions are concepts like causality, temporal sequence and contingency (If A, then B). The movements are unvaryingly the same, over and over and over again. And if you are a child who has difficulties with 'theory of mind' or 'empathy', such that you are puzzled why a person's facial expression has suddenly changed, the hope is that you could become familiar with how people look when they are surprised or afraid or proud through massive exposure to these patterns.

Our team has conducted an evaluation of The Transporters as an intervention. One group of 25 children with high-functioning autism, ages four to seven years old, was given copies of the animated series to use over a four-week period, for 20 minutes per day. They were assessed prior to the intervention and at the end of it. A typically-developing control group (matched on age, sex, IQ, handedness, language and parental educational level) were simply assessed at two time-points with the same four-week interval in between. Results indicate that while the children in the intervention group began at below-average levels on four tests of emotion-recognition in time period one, by the second time period they achieved equivalent levels to the typically developing controls. The tests included using character's faces that had not appeared in the films themselves, thereby showing some degree of generalization, as well. This suggests that even with a relatively short intervention period, gains are possible. Future research will need to evaluate if the series is also of benefit to less-able children on the autistic spectrum.

In conclusion, we don't wish to claim for a moment that teaching emotion recognition is tantamount to teaching the whole of empathy, but it is at least one component of empathy that can be enhanced. And unlike medical treatments, we assume that this psychological intervention has no unwanted side-effects and potentially has many benefits, both for the child, in finding faces less confusing, and for his or her family, in being able to talk about feelings and making that special connection.

For more information, please visit our website at www.thetransporters.com.

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