

A reply to Rachel Cohen-Rottenberg's (July 7th 2009) Critique of the Empathizing-Systemizing (E-S) Theory of Autism

Simon Baron-Cohen

I thank Rachel for taking the time to respond to the E-S theory on her blog at <http://www.journeyswithautism.com/2009/07/07/a-critique-of-the-empathizing-systemizing-e-s-theory/>

Equally, I am grateful to Kim Wombles at Science 2.0 http://www.science20.com/countering_tackling_woo/interview_simon_baroncohen_zeroempathy_autism_and_accountability-79669

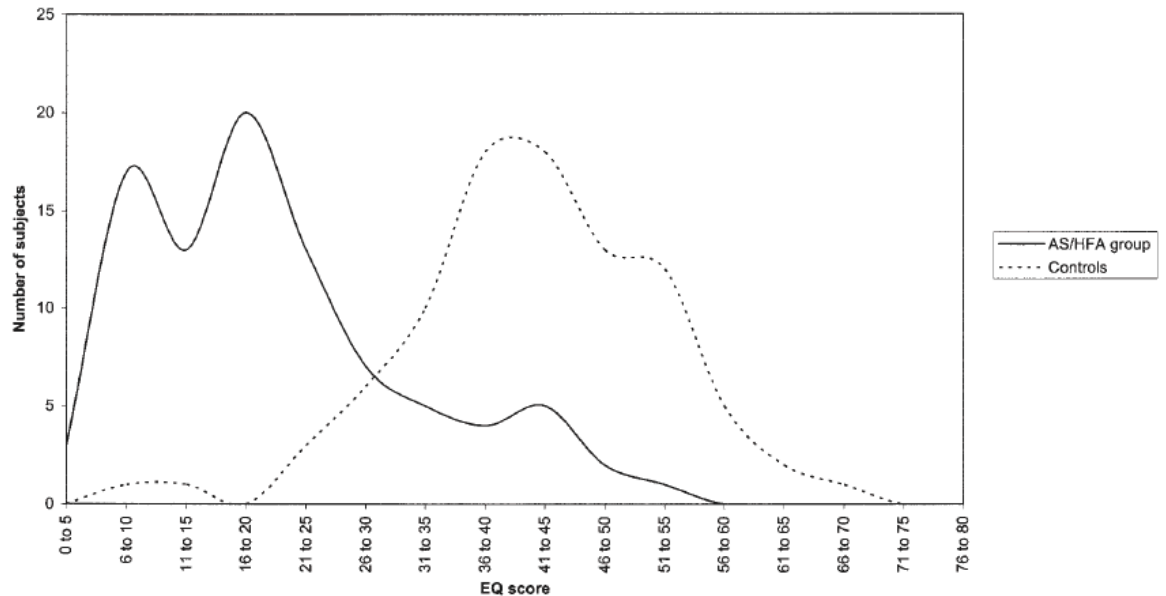
for inviting me to reply to Rachel's critique. I will do this point by point:

1. *Rachel challenges whether people with autism have 'theory of mind' difficulties and instead argues that people with autism have high degrees of empathy.*

This is however hard to reconcile with the scientific evidence. Literally dozens of studies from around the world have documented the theory of mind difficulties in autism. And the empathy difficulties are also well documented and widely replicated, both on performance tests (e.g., emotion-recognition tests from the face and voice) and on self-report measures (such as the Empathy Quotient or EQ).

Consider the latter, where 81% of people with autism score less than 30/80 on the EQ, by their own self-report, whilst only 12% of people without autism score at this low level. These results are mirrored when parents complete the EQ about their children, in many independent samples. So, whilst some people believe that theory of mind and empathy difficulties in autism are mythical, the results of many independent scientific studies suggests otherwise.

This difference in viewpoint may arise because science looks at groups of individuals (with and without autism) and tests for differences on average between the groups. It says nothing about individuals. The autism group is significantly shifted leftwards along the scale, but even with the autism group there will be a range of scores, some overlapping with the typical group. Indeed, you can see the overlap here:



2. *Rachel challenges whether people with autism have difficulty knowing when they have hurt others, and wishes I had not stated that children with Asperger Syndrome (AS) are delayed in being able to figure out what might hurt another person. Indeed, she finds my statement hurtful.*

As a working scientist, all I can do is summarize the empirical evidence. An example is the Faux Pas Test, where children are asked to identify if anyone said anything that they shouldn't have said, whilst listening to short audio recorded stories. Children with AS as a group on average scored significantly lower than children without AS, despite being older than the comparison group. Indeed, the design of this experiment allowed us to estimate the size of the developmental delay in AS, since the 12 year old children with AS performed more like typical 9 year olds. So, although Rachel may not like hearing these results, this is what the science finds.

However, she raises an important point: if the conclusions of the science highlight an area of disability, should we not mention it, because of the risk that this might upset people with AS?

The last thing I want to do is upset anyone, least of all people with autism or AS. But scientists also have a duty to report what they find, openly, since science is conducted in the pursuit of truth (or at the very least, in the pursuit of falsification). Theory of mind and empathy 'deficits' have been consistently reported in autism for at least 30 years, and the social difficulties were documented in the original reports by the clinicians Kanner and Asperger themselves, now more than 60 years ago. Indeed, a cursory look at the program of research presentations at the International Meetings for Autism Research (IMFAR) over the years shows dozens and dozens of studies documenting these difficulties.

We could sweep them under the carpet because it is upsetting to hear about them, or we could study them in order to understand how to help. My colleagues in psychology have opted for the latter course of action. I fully recognize that the idea that autism and AS involve 'deficits' is not nice to hear, and wish that there was some way to present this information in a more palatable way or that science had simply not found this. I would be interested in what advice people with AS might give scientists working in this ethically sensitive area.

3. *Rachel challenges the idea that people with autism don't know how to respond empathically to someone else's distress.*

In particular, Rachel says "once someone tells me how he or she feels, I don't usually have a problem with an empathic response". This is exactly the point. For most people, they don't need to be told by the other person "I am upset". They can just read this information in the other person's facial expression, vocal intonation, or 'body language', and they can make inferences about what the other person might be thinking, in the absence of being directly told. For many people with autism these non-verbal cues may be hard to read and instead they may only know how someone feels if they are told explicitly. The evidence for this again comes from many scientific studies documenting difficulties by people with autism in reading the mind in the eyes, the face, the voice, or in action (e.g., film). Rachel's own self-description seems consistent with this: "Now, I will readily admit that I cannot infer a person's mental state by reading nonverbal cues."

But I completely agree that once it is explicitly pointed out, people with autism are very capable of an empathic response. Rachel may be surprised to hear that I agree with her on this one, but it hinges on the distinction between 'cognitive' and 'affective' empathy. Cognitive empathy is the ability to *identify* another person's state of mind (not just through language) and affective empathy is the drive to *respond with an appropriate emotion* to another person's state of mind. A growing number of studies suggest that the empathy difficulties in autism are largely restricted to the cognitive component, whilst the affective component is often intact. For this reason, people with autism are often highly motivated not to upset others or hurt others, and are themselves upset to hear that they may have done this if it is pointed out. And once they know that someone else is upset or suffering, they are often very motivated to want to help or offer comfort.

In my recent book *Zero Degrees of Empathy* I contrast people with autism to psychopaths who show the mirror opposite profile. Psychopaths have intact cognitive empathy (they can tell that their victim is in pain, know what might cause this particular person pain, and can deceive people easily) but they have impaired affective empathy (they just don't care). People with autism in contrast find it hard to read other people, tend not to deceive others, and are upset by others being upset. The summary

below may be a helpful snapshot of this “double dissociation” between autism and psychopaths:

Empathy	Psychopath	Autism
Cognitive	✓	✗
Affective	✗	✓

4. *Rachel argues that “stimming” is not a reflection of a strong drive to ‘systemize’ in people with autism, but is a reflection of the need to make a chaotic world more soothing, and she cites Virginia Woolf’s phrase “Life stands still here”.*

I am indebted to Rachel and other people with autism (here I am using the term autism in an umbrella sense, to include AS) for talking about what goes on during stimming, since for people without autism it can be hard to understand. We rely on what you tell us.

That said, I am not so sure our two different views of stimming are that far apart, or are mutually incompatible. I regard systemizing as the search for repeating patterns in the world, as a way of rendering an otherwise chaotic world more predictable and consistent, and in my recent book I talk about strong systemizing as “stepping out of time”, since the repeatable patterns are by definition not one-off instances but are seen again and again and again. I used mathematical examples of systemizing (e.g., that the number Pi of 3.1418... was perceived by Archimedes and by Einstein, 2000 years apart) because these are enduring patterns in an otherwise constantly changing world.

My suggestion was that whether someone is letting sand run through their fingers, or watching the wheel of a toy car spinning, or listening to their favourite video, or lining things up in a particular order, such actions are carried out because of the soothing effects of seeing, hearing or touching the same patterns, over and over again.

My guess – and I think this area needs a lot more research – is that the term ‘stimming’ refers to the *experience* of performing the action (the soothing feeling that flows from repetition, for example) whilst the term ‘systemizing’ refers to the kind of *information* that is being processed (repeating patterns). They may describe the same behaviour at slightly different levels. But the goal of the behavior is one that both views converge on: reducing unpredictability in a constantly changing world.

Systemizing has as an additional goal the understanding that emerges from understanding how things work. I am however the first to agree that we need a lot more research into 'stimming' since doubtless there is much more to understand.

5. *Rachel asks if efforts to teach emotions in an autism-friendly format do this "quietly, slowly, and respectfully".*

DVDs such as 'Mindreading' (www.jkp.com/mindreading) or 'The Transporters' (www.thetransporters.com) do indeed take emotions out of the fast-changing, noisy and unrepeating real social world and put them on to a computer or in a controlled animated environment so that the information (facial expression, vocal intonation) can be studied at a slower pace, quietly, repetitively, and hopefully respectfully. Studies evaluating the benefits of such teaching methods suggest that this helps people with autism improve in emotion recognition, again relative to people with autism who have not used these teaching methods.

6. *Rachel questions whether the E-S theory really does destigmatize autism.*

In particular, she worries that if people with autism are seen as showing an extreme of the typical male profile (extreme Type S), surely this is stigmatizing? My answer is that I would hope not. All the 5 different profiles that emerge from the E-S framework (Type E (E>S), Type S (S>E), Type B (E=S), and extreme Type E and Type S) have different profiles of strengths and weaknesses, and none can be seen as better or worse than any other, just different. Stigmatizing any one of these would be wrong. The point is simply that the population contains diversity: we are not all the same. It is the cornerstone of the new 'neurodiversity' movement. Making space for and accepting that diversity is important in promoting social inclusion.

7. *Rachel argues that autism is categorically different to everyone else.*

She argues that people with autism are not just variations of the norm but fundamentally different. She is probably aware that within the scientific community, this is a live issue of debate. The E-S framework allows for a convenient parcellation of the spectrum of individual differences into the 5 'brain types' above, but whether at a neurological level there are clean breaks between these, or whether these are simply different points on an otherwise seamless continuum is still unknown.

8. *Rachel argues that I have not replaced the word "disease" with anything better.*

In fact I have for a decade been quietly using the term ASC (Autism Spectrum Conditions) rather than the more widely used term ASD (Autism Spectrum Disorder) precisely to get away from the purely medical disease model. 'Condition' acknowledges that autism has

biomedical causes, leads to disability in certain environments, and is a diagnosis that should facilitate access to support and services, but acknowledges that autism is not just a disability. It is also a difference, and in some individuals it confers talent. 'Disorder' in contrast implies something is broken and like the term 'disease' is wholly negative. However, I am not dogmatic about terminology, simply expressing my own preference, and different writers and scientists opt for different language. I am grateful that the editors of scientific journals have also not been dogmatic in insisting only on using the terms ASD.

9. *Rachel questions whether the recognition of good systemizing skills in autism is really a big leap forward.*

My own view is that this is a big step, because previously the repetitive behaviour in autism was viewed as 'purposeless' and that the 'obsessions' should be discouraged. I think the value of the concept of systemizing turns the old views on their head: that repetitive behaviour has purpose, to soothe (see point 4 above) and to understand the world (at least, those parts of the world that have structure and can be systemized). Moreover, it recognizes that the learning style in autism is tipped towards searching for patterns in information and towards understanding how things work, and this has important educational implications. Imaginative teaching can build on the child's 'obsessions' and desire for repetition, rather than discouraging these.

10. *Rachel suggests that if someone flunked calculus or can't disassemble or reassemble gadgets, isn't this evidence against people with autism being good at systemizing?*

This is a common misunderstanding (no offence intended, and the misunderstanding may have arisen due to the theory not been sufficiently well explained). Someone who is good at systemizing typically latches onto *one* domain (*one* system) in order to try to understand all the tiny variables within it (e.g., astrology, or botany) but that doesn't mean they are equally focused on *all* or *any* system (e.g., mathematics, or mechanical engineering).

There are likely to be some general attributes of a good systemizer, which the Systemizing Quotient (SQ) picks up, such as excellent attention to and memory for detail, making lists of information, and spotting patterns. But by definition, good systemizers latch onto one system and try to understand it until there is nothing more to understand. That involves going deeply into it (so-called 'obsessions'), the preference being depth over breadth.

The upshot is that just because a person with autism can't do mathematics (and many can, to a precocious level) doesn't mean they are not good at sytemizing. It simply reflects you may be looking in the wrong

place and that a wider search for their good systemizing would reveal this.

11. *Rachel argues that women with autism may show a different profile to men with autism.*

I completely agree with her on this point and would point out how few scientific studies have focused on females with autism, since there are many reasons to expect them to show differences to males with autism. Our recent study (Lai et al (2011, June 13th, *PLOS One*) begins to fill this gap but we need many more studies in this area.

I hope I have adhered to Rachel's blog policy:

This blog is a safe space for autistic and non-autistic people alike. Passionate, respectful debate is welcome. Demeaning and inflammatory remarks are not. Please adhere to the following guidelines:

Stay on point

Respond with civility

Criticize ideas, not people

I hope that dialogue between researchers and people with autism will lead to greater mutual understanding.

With thanks and with respect,

Simon Baron-Cohen