

Debate: How far can we modify the expression of autism by modifying the environment?

Laurent Mottron^{1,2}  & David Gagnon^{2,3}

¹CIUSSS du Nord-de-l'Île-de-Montréal, Hôpital Rivière-des-Prairies, Montréal, QC, Canada

²Département de psychiatrie et d'addictologie, Université de Montréal, Montréal, QC, Canada

³Centre de Recherche du CIUSSS-NIM, Hôpital Rivière-des-Prairies, Université de Montréal, Montréal, QC, Canada

Following Green (*Child and Adolescent Mental Health*, 2023, 28, 438) the emergence of a manifest autistic phenotype, during preschool years, represents a discontinuity from preclinical or subclinical states. We propose that this discontinuity suggests that autistic children experience superior interest for, and processing of non-social information, whereas children without autism favor social information processing. This is produced by perceptual over-functioning, still allowing self-taught non-social language learning in a substantial fraction of prototypical autistic children. A new set of rigorous intervention studies using Pediatric Autism Communication Therapy (PACT), based on the synchrony principle, brought autistic children below the ADOS diagnostic threshold (Whitehouse et al., *JAMA Pediatrics*, 2021, 175, e213298). We now know that adaptation of the child's social environment can produce changes in the manifestations of autism in the pre-school period and later. However, the limitation of these changes, combine with evidence of non-social learning of language suggests that clinicians should combine *lateral tutorship* (the parallel, unsynchronous exposure of information) with the *synchrony* (early dyadic communication and engagement) principle to create a new generation of strength-based interventions.

Keywords: Autism; developmental divergence; emergence; transactional; language development; enhanced perceptual functioning

In his piece, Green (2023) offers us an authoritative critique on the conceptual drift of autism and related clinical practices in the last decade. In combination with his critique, he includes a tentative reconceptualization of autism. This reconceptualization dismantles arguments that negate the value of diagnosis. In this, Green joins voices coming from epidemiology (Fombonne, 2023), autistic researchers (Rødgaard, Jensen, Vergnes, Soulières, & Mottron, 2019), and our own reflections (Mottron, 2021).

Like us, Green deplores the accelerated expansion of the autism diagnosis. He outlines that the resorption of autism into 'individual differences' misses the uniqueness of this diagnosis' objective. The term autism is progressively drifting apart in definition across administrative, clinical, scientific, and identity contexts, resulting in a weakened understanding of autism. Precisely, 'profound autism' appears to define the concept by what does not belong to it.

The emergent/transactional model requires specifying to whom these models may apply: for us, 'prototypical' autistic children (Rabot et al., 2023). In all cases, we need a clean break with the current status of the spectrum, which confuses genetic predisposition, subjective experience, clinical judgment, and individual rights. The autistic identity imposes itself on the clinician with the same force as it imposes itself on autistic individuals when they compare themselves to other individuals: there is therefore reason to bring them together. It justifies promoting the delineation of autism as a natural category – whatever its variations of the prototype, spontaneous or resulting from intervention.

The perfunctory acceptance of the notion of 'autistic traits' and 'clinical specifiers', together, deny the reality that clinicians and parents perceive. As such, we should also reconsider the place of intellectual disability in autism, while dissociating it from language delay: intellectual disability predicts present and future language impairment but is not synonymous with it (Courchesne, Meilleur, Poulin-Lord, Dawson, & Soulières, 2015). Thus, the canonical language trajectory of autism (Gagnon et al., 2021) a regression followed by a plateau, then a resumption of language, must be reintegrated into the unified characterization of prototypical autism. Within this language acquisition profile, prototypical autism can present a 'false' intellectual disability where the lack of communicative language coexists with ease in non-verbal fluid intelligence tasks.

However, our overall agreement with Green on these questions and the resulting theoretical and intervention decisions led us to further push his positions, as well as remark on their limitations.

Emergence and transactionality

Green's (2022) two conceptual innovations, *emergence*, which we will call divergence (or bifurcation), and *transactionality*, which we will call information processing bias, oppose this contemporary drift in autism. The term emergence implies a threshold in change of state, as opposed to the dimensional assumptions of 'autistic traits'. It involves re-establishing a clear discontinuity

between autistic traits and autism itself, as well as between ‘at risk for autism’ and autistic.

Beyond a difference in terms, we propose to integrate autistic emergence into the class of *asymmetric developmental divergences* (Mottron & Gagnon, 2023). Those, like breech presentation and delivery, twin pregnancy, and left-handedness, are virtually contained in human genetic programming. This epistemological break allows us to import into the science of autism, and the definition of its status as a natural human variant, biological bases that go beyond the ethical and descriptive foundations of neurodiversity, while maintaining their ethical consequences.

The term *emergence* implies a phase transition, a change in the state of equilibrium, while the term *transactional* refers to the relationship with the child’s human environment. Green’s (2023) conceptual addition suggests that the environment retains the possibility of influencing this new balance, rather than supposing that change can be entirely contained within the individual experiencing this emergence. Moreover, in the scientific literature, the term *transactional* refers to exchanges between *people*. In our opinion, it only covers half of the question; what emerges is a combination of atypicalities in social, perceptual (misnamed repetitive), and linguistic information processing. In this, the term *transactional* remains prisoner of the ‘social first’ approach which dominates thinking within autism. It conceptualizes the relational nature of autism while remaining subject to the very social biases inherent in neurotypical thinking.

We support Green’s (2023) emphasis of the central role of divergent perception in autistic difference. We see prototypical autism as a developmental divergence reversing the typical social bias, or interest, in favor of the entire range of perceptual information available to which the child is exposed. We argue that the manifestations of preschool autism result from the progressive, then accelerated, loss of the relative weight of social information carried by the human beings surrounding him. For an autistic child, after an almost invisible prodromal period, a preferential interest in other human beings around them may be subverted by an enhanced role, autonomy, and performance of unbiased perception. Language analyzing faculties, the very ones that allow the typical child to recognize and master language, appear to be solicited by non-socially mediated language like written material, or even spread across non-linguistic structures. What triggers autistic emotions would, at a preschool age, follow the same trend and become equally redistributed across the social and non-social universe. In short, the relevant transaction would rather extend to homeostasis between the child and all the information surrounding them.

How far can we destabilize autism information processing priorities?

The comparison of autism with a stable dynamic system, resistant to disturbance, enlightens us: pushing a pendulum, whatever the movement, does not cancel its return to equilibrium. To understand this concept, let us compare autism with other developmental divergences such as breech presentation. Breech presentation, like

autism, is a divergent developmental recurrence with a familial predisposition under familial influence (Toijonen, Heinonen, Gissler, & Macharey, 2020). Like autism, breech can only be defined as a relationship with the environment: here, the uterine wall. When the fetus moves towards a breech position, but is still unstable, around the 25th of pregnancy (corresponding to the ‘at risk’ state of autism in our analogy), small disruptions, or interventions, could momentarily reverse its position, without however, modifying the outcome of the final breech presentation. In the same way of thinking, how far would Green predict that the ideal intervention can or should go in terms of destabilizing autistic balance? Once the fetus is presenting as breech, it is necessary to perform external cephalic version if you want to bypass the risk of breech delivery. Does the modification of autistic equilibrium resulting from Pediatric Autism Communication Therapy (PACT, Whitehouse et al., 2021) correspond to the quasi-random fluctuations of the ‘at-risk’ period, or rather to those modifications addressing the final, stabilized, period of the breech position? Does the Cesarean-section solution, a radical adaptation of the environment to the bifurcation, to breech represent a decent, neurodiversity compatible, analogy for our target of intervention, as opposed to the risk of external reversal maneuvers?

Phenomenology and neurodiversity

Where Green (2023) sees in the phenomenology of autistic adults the means of curing the weaknesses presented in a checklist diagnosis, we instead see the limit of access to lived experience as reported to us by autistic adults, despite its richness and truth value. The reintroduction of autism into humanity carried by great autistic voices, like our colleague, Michelle Dawson, at the beginning of our century, represents an ethical-political leap in the advancement of what science was saying at that time. But this does not imply that an autistic adult has an intrinsically truthful access to the source of their psychological life before the age of 3, any more than neurotypical adults have access to the way in which they learned language.

The developmental variations of autism between childhood and adulthood, both of its presentation and of its phenomenology, modulate the contribution of the discourse of autistic people in adulthood to the understanding of the autistic phenomenon. The adult autistic individual has moved away over time from the condition it experienced at its maximum prototypicality (or, if diagnosed at later age, may never have been close to it). Neither we nor those who proclaimed it 20 years ago, had foreseen that ‘nothing on us without us’ would open the door for the risk of misrepresentation. Therefore, another phenomenology, the clinician’s experience or clinical certainty, as well as parent’s experience, must be associated with the lived experience of autistic adults.

Beyond pediatric autism communication therapy

We support Green’s (2023) reorientation of intervention toward optimizing the environment around the

child. However, the divergence at 18 months of age signaling the cessation of social bias in favor of non-socially biased information, particularly linguistic information, suggests adding a second principle to PACT. We have demonstrated that progress in complex language acquisition is independent of joint attention in autism (Kissine, Saint-Denis, & Mottron, 2023). Once autism emerges, social bias no longer constrains the typical selection of pre-linguistic targets, potentially leading to language acquisition through unconventional means, such as hyperlexic language acquired through written code. Could not this intervention, based on the unprecedented successes and strengths of evidence demonstrated by Whitehouse et al. (2021), be enriched by the addition of the exposure to non-socially oriented language, which autistic individuals are particularly adept at processing in a self-taught manner?

In conclusion, we agree with Green (2023) that prototypical autism represents the emergence of a new state of equilibrium in the transactional relationship between the child and its human context. This model may remain however limited by the dominant, 'social first' approach. The term *transactional* for example does not account for language acquisition profiles in autism, nor for the relevance and specificity of perception-based behaviors observed during the period where autism appears in its prototypical form. We argue that social, perceptual, and linguistic manifestations of preschool autism result from a developmental divergence, that is, social information may be less relevant to an autistic child, and they may pay selectively more attention to non-social material. This may explain the non-social acquisition of language, recently demonstrated, as well as the preservation of non-verbal intelligence, or 'false' intellectual disability, characterizing prototypical autism. It questions how far we can, or should, destabilize the autistic equilibrium through social-based intervention, and suggests enriching PACT by adding exposures to non-socially oriented language.

Acknowledgement

The authors have declared that they have no competing or potential conflicts of interest.

Ethical information

No ethical approval was required for this article.

Correspondence

Laurent Mottron, CIUSSS du Nord-de-l'Île-de-Montréal, Hôpital Rivière des-Prairies, 7070 Bvd Perras, Montréal, QC H1E1A4, Canada; Email: laurent.mottron@gmail.com

References

- Courchesne, V., Meilleur, A.A., Poulin-Lord, M.P., Dawson, M., & Soulières, I. (2015). Autistic children at risk of being underestimated: School-based pilot study of a strength-informed assessment. *Molecular Autism*, 6, 12.
- Fombonne, E. (2023). Editorial: Is autism overdiagnosed? *Journal of Child Psychology and Psychiatry*, 64, 711–714.
- Gagnon, D., Zeribi, A., Douard, É., Courchesne, V., Rodríguez-Herreros, B., Huguet, G., ... Mottron, L. (2021). Bayonet-shaped language development in autism with regression: A retrospective study. *Molecular Autism*, 12, 35.
- Green, J. (2022). Autism as emergent and transactional. *Frontiers in Psychiatry*, 7, 988755.
- Green, J. (2023). Debate: Neurodiversity, autism and health-care. *Child and Adolescent Mental Health*, 28, 438–442.
- Kissine, M., Saint-Denis, A., & Mottron, L. (2023). Language acquisition can be truly atypical in autism: Beyond joint attention. *Neuroscience and Biobehavioral Reviews*, 153, 105384.
- Mottron, L. (2021). A radical change in our autism research strategy is needed: Back to prototypes. *Autism Research*, 14, 2213–2220.
- Mottron, L., & Gagnon, D. (2023). Prototypical autism: New diagnostic criteria and asymmetrical bifurcation model. *Acta Psychologica*, 237, 103938.
- Rabot, J., Rødgaard, E.M., Joobar, R., Dumas, G., Bzdok, D., Bernhardt, B., ... Mottron, L. (2023). Genesis, modelling and methodological remedies to autism heterogeneity. *Neuroscience and Biobehavioral Reviews*, 150, 105201.
- Rødgaard, E.M., Jensen, K., Vergnes, J.N., Soulières, I., & Mottron, L. (2019). Temporal changes in effect sizes of studies comparing individuals with and without autism: A meta-analysis. *JAMA Psychiatry*, 76, 1124–1132.
- Toijonen, A.E., Heinonen, S.T., Gissler, M.V.M., & Macharey, G. (2020). A comparison of risk factors for breech presentation in preterm and term labor: A nationwide, population-based case-control study. *Archives of Gynecology and Obstetrics*, 301(2), 393–403.
- Whitehouse, A.J.O., Varcin, K.J., Pillar, S., Billingham, W., Alvares, G.A., Barbaro, J., ... Hudry, K. (2021). Effect of pre-emptive intervention on developmental outcomes among infants showing early signs of autism: A randomized clinical trial of outcomes to diagnosis. *JAMA Pediatrics*, 175, e213298.

Accepted for publication: 1 November 2023