“Is there an autistic way to learn language?”

Laurent Mottron

David Gagnon, Alexia Ostrolenk

Université de Montréal

SCERT Conference

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OBJECTIVES

Know :

- the “bayonet” language acquisition in prototypical autism
- the profiles of strengths and challenges at different times of autistic language development
- Autism and autodidact learning of printed characters
- The role of electronic tools in autistic language learning

(1) A significant proportion of prototypical autistic children develop speech with a considerable delay

Autism spectrum

Phenocopy
Copy of autism by other pedopsychiatric syndromes

Non syndromic autism

Syndromic autism

Autism with initial language onset delay **with normal non-verbal intelligence**

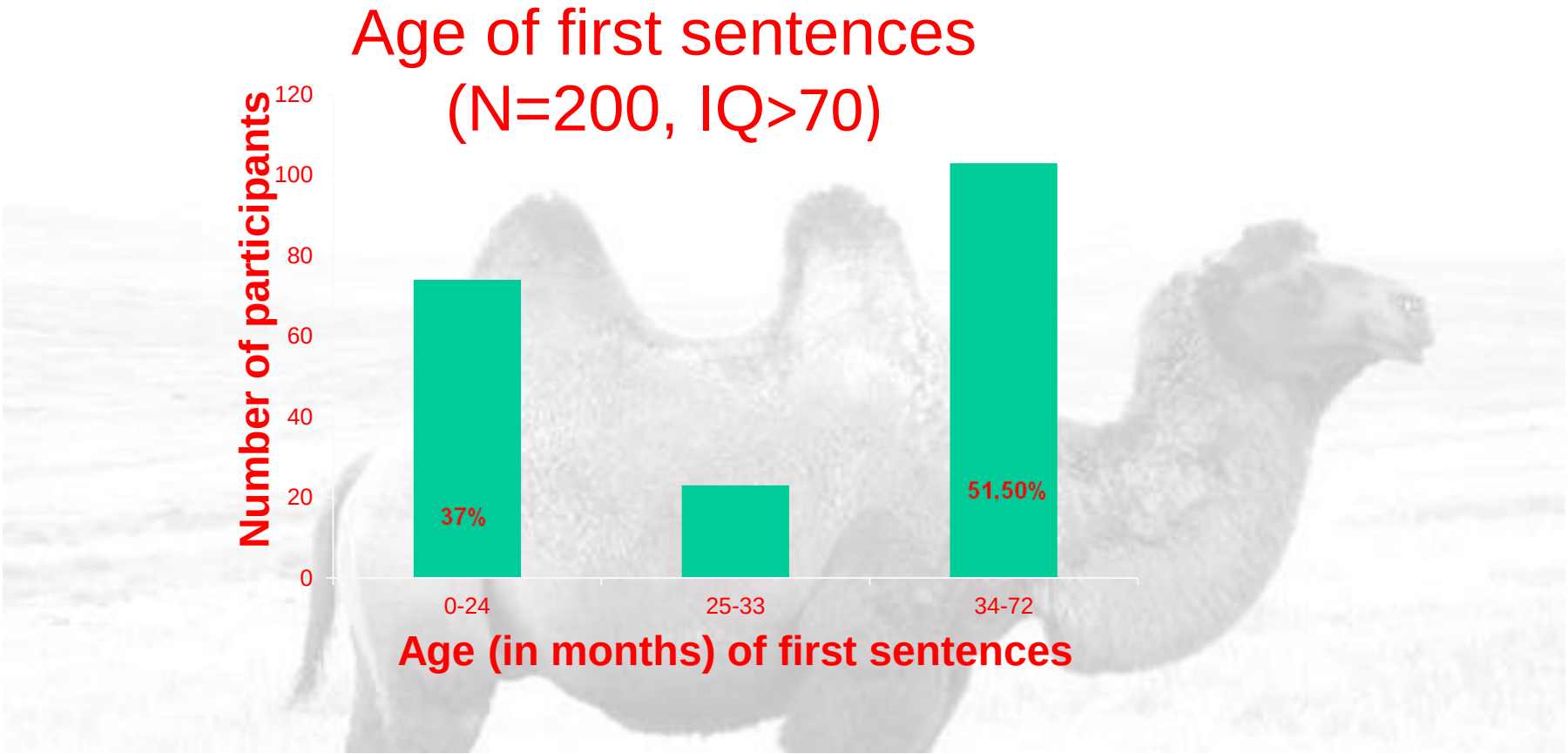
Autism without language onset delay **Normal verbal and non-verbal intelligence**

Multiple syndromes **Dominant intellectual disability**

Multiple conditions partially resembling autism

Variable intelligence depending on condition

Bimodal distribution of speech onset in non-syndromic autism (from our database)



Within *non-syndromic* autism: Two distinct (?) profiles

Autism = AS-SOD

- Speech-Onset Delay (SOD)
- Strength in non-verbal reasoning
- Perceptively defined interests

Asperger = AS-NoSOD

- Early speech
- Strength in verbal reasoning
- Verbally defined interests

DSM-5 biggest error

- Considering Autism as a spectrum, and using language as a specifier masks a profound difference between Autism with and without speech-onset delay whatever commonalities exist between them at the genetic level.
- It has damaging effects on research and clinical practice:
  - Merging two types of support
  - Missing Specific signs
  - Missing the informative value for science of specific trajectories

Lombardo, 2022

- ‘’The impact of the change regarding the non-essential nature of early language issues cannot be understated. This change substantially reshaped how the autism population could be conceptualized – from once being a large majority of individuals with substantial intellectual and early language issues, to nowadays reflecting a large majority of autistic individuals without such issues’’.

A quasi pathognomonic language regression

- 25-35%: loss of words around 20 months together with loss of socially oriented initiative and response (Tan et al 2021)
- Not incompatible with secondary, late catch-up of language
- May be quasi pathognomonic to autism

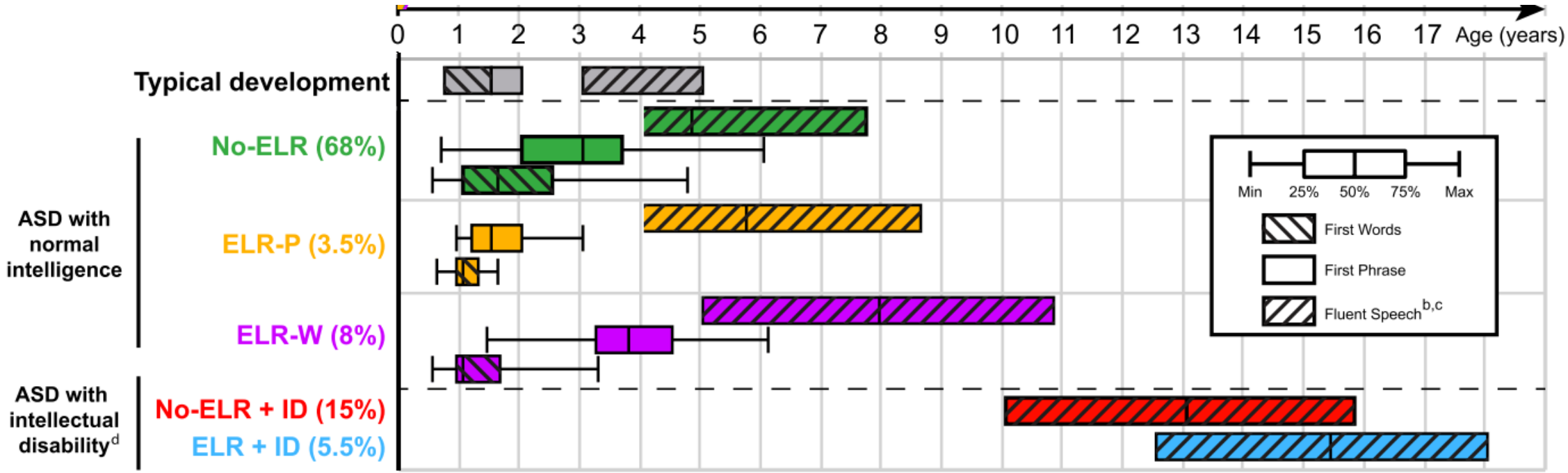
Gagnon *et al. Molecular Autism* _####################_
https://doi.org/10.1186/s13229-021-00444-8

Molecular Autism

RESEARCH Open Access

Bayonet-shaped language development in autism with regression: a retrospective study

David Gagnon[1,2†], Abderrahim Zeribi[3,4,5†], Élise Douard[3,5], Valérie Courchesne[6], Borja Rodríguez-Herreros[7], Guillaume Huguet[3,5], Sébastien Jacquemont[3,5], Mor Absa Loum[3,5†] and Laurent Mottron[1,2*†]



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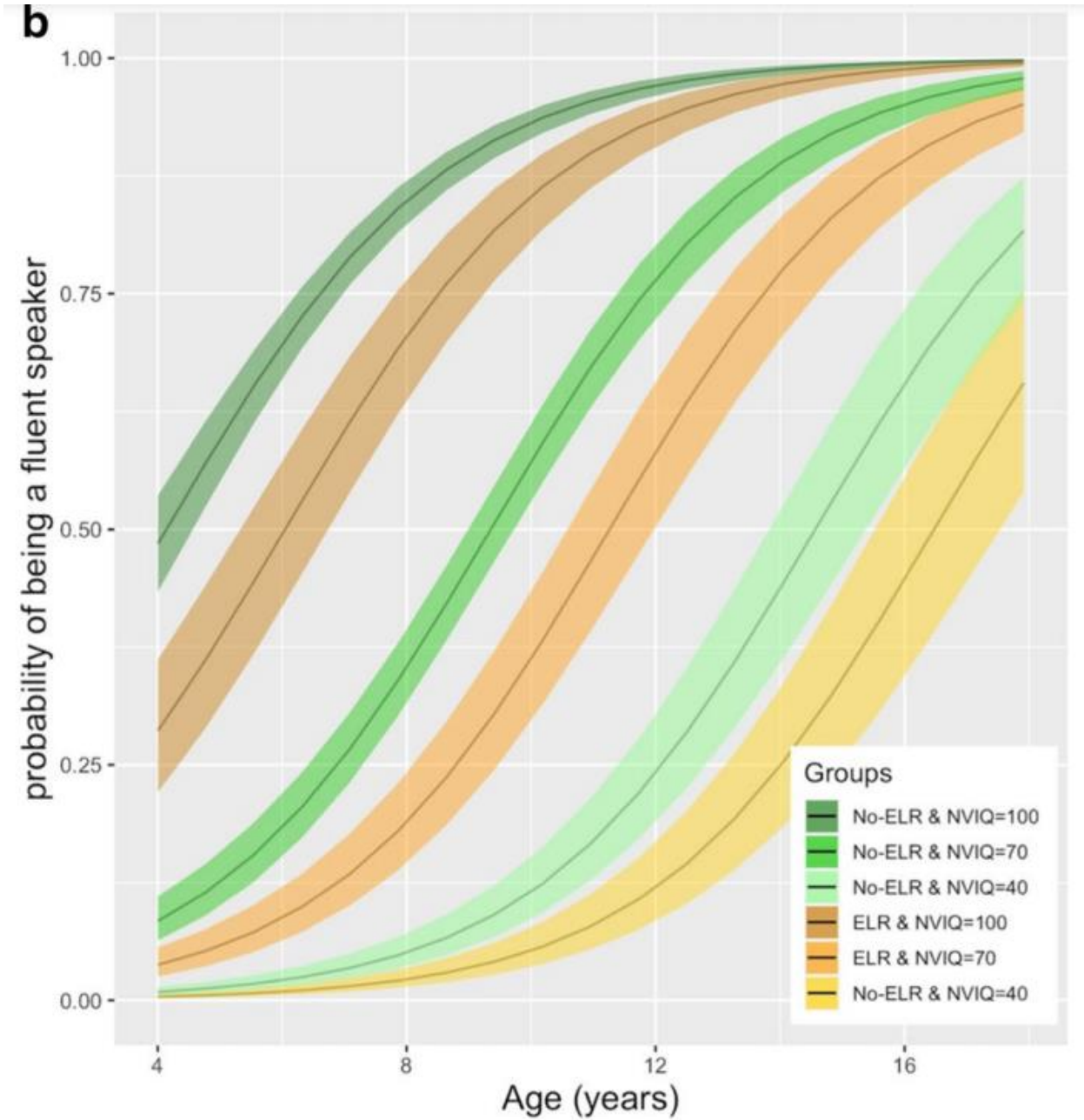

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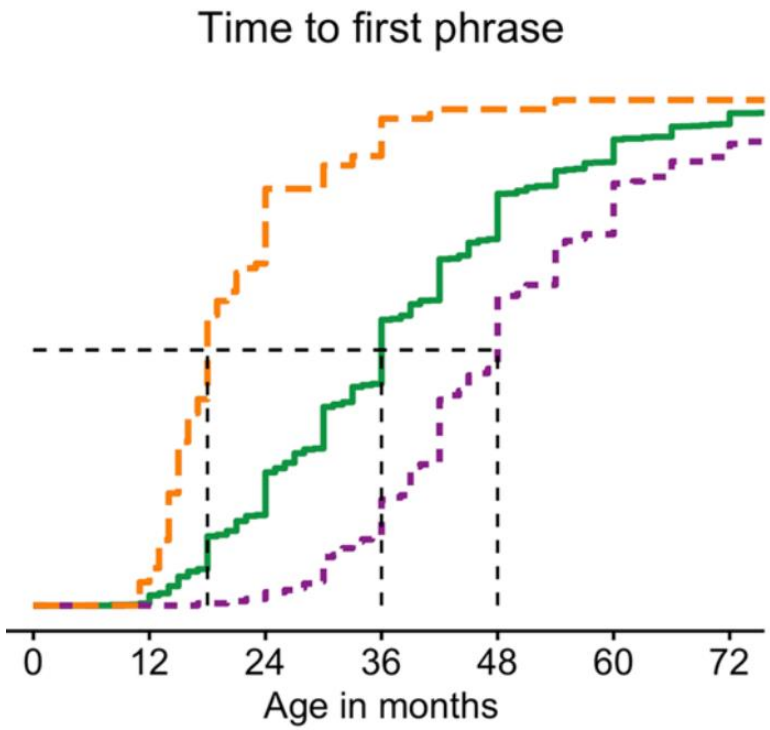
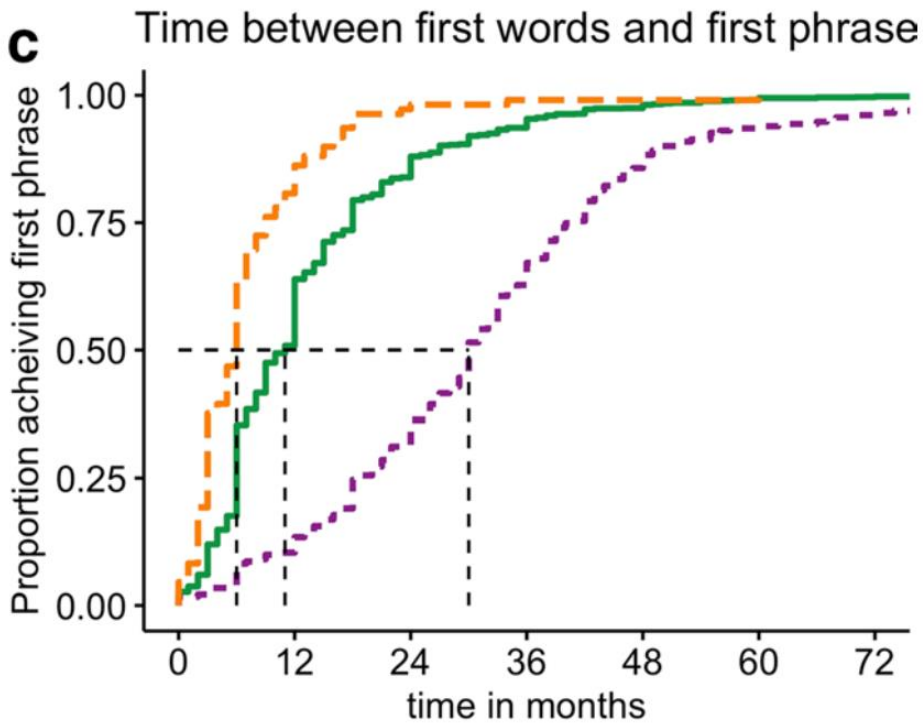
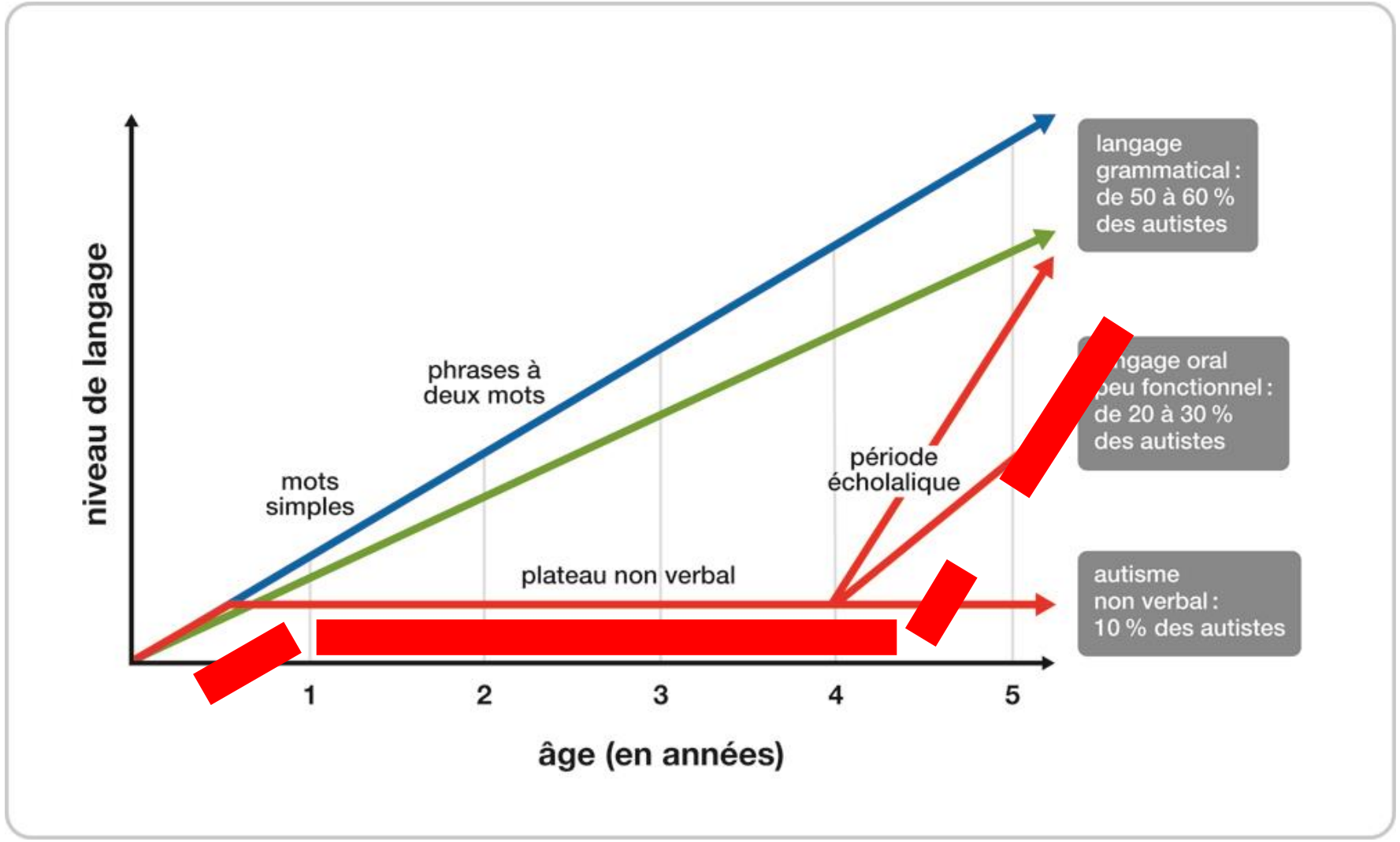




The “bayonet-shaped” language development



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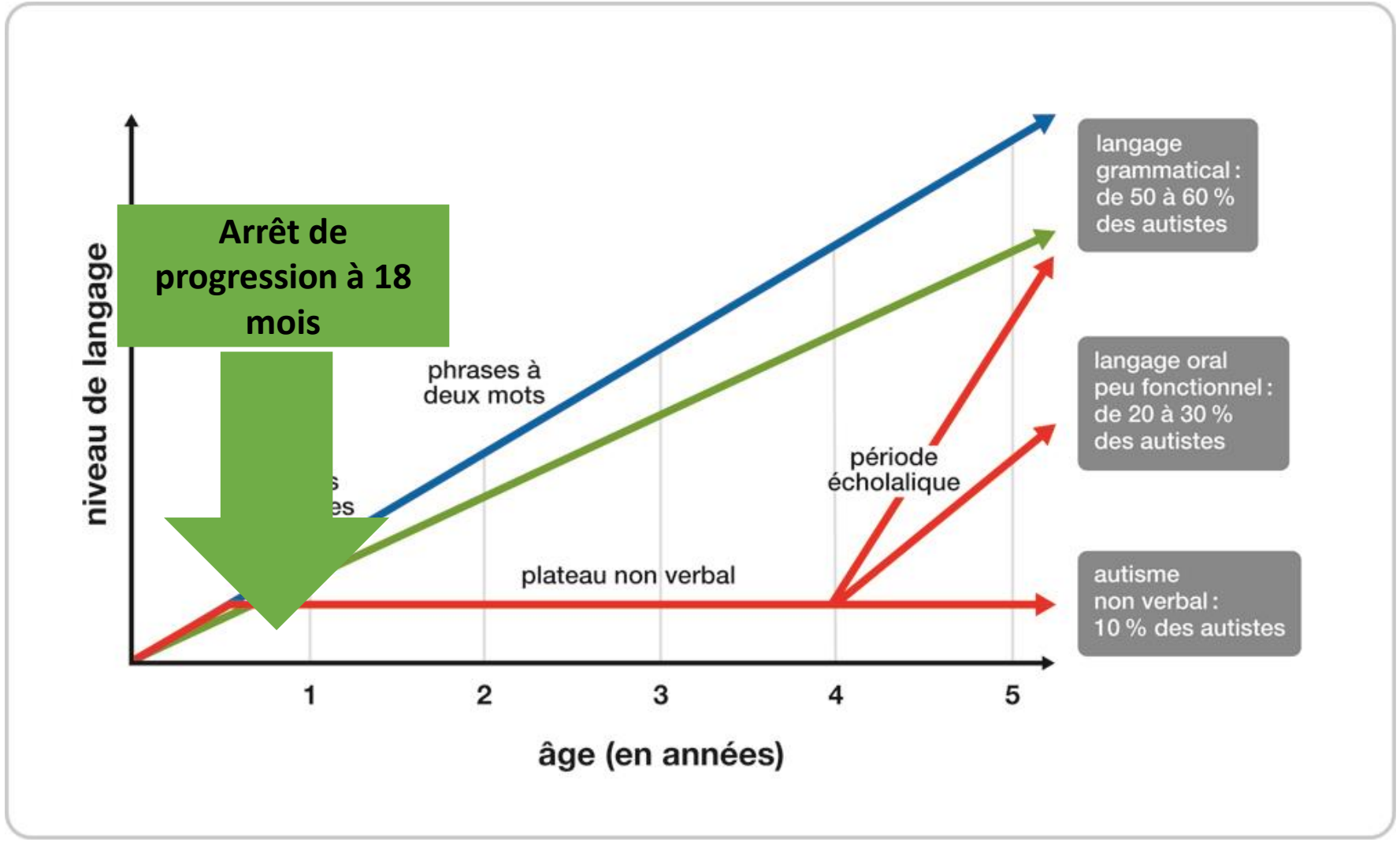

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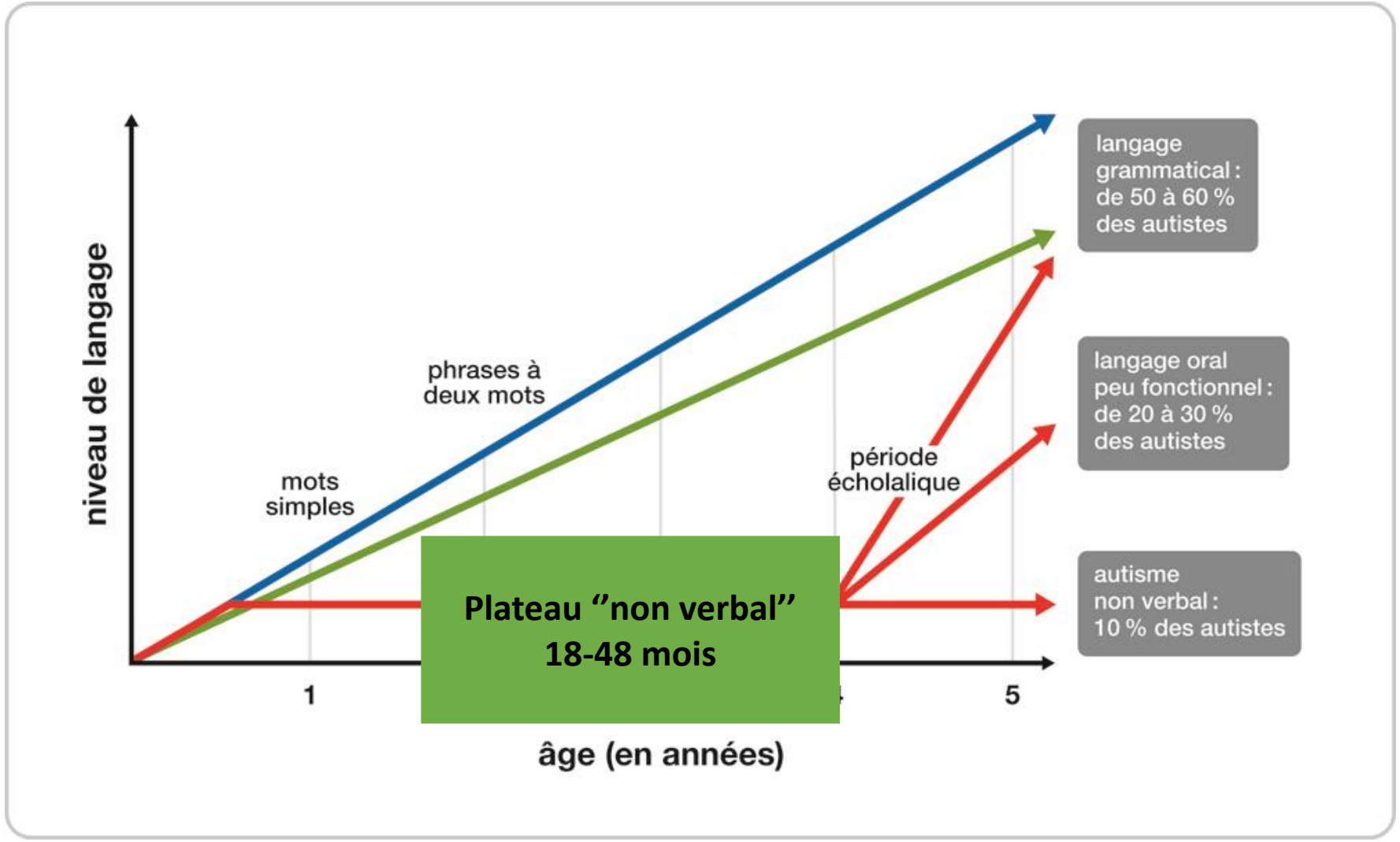

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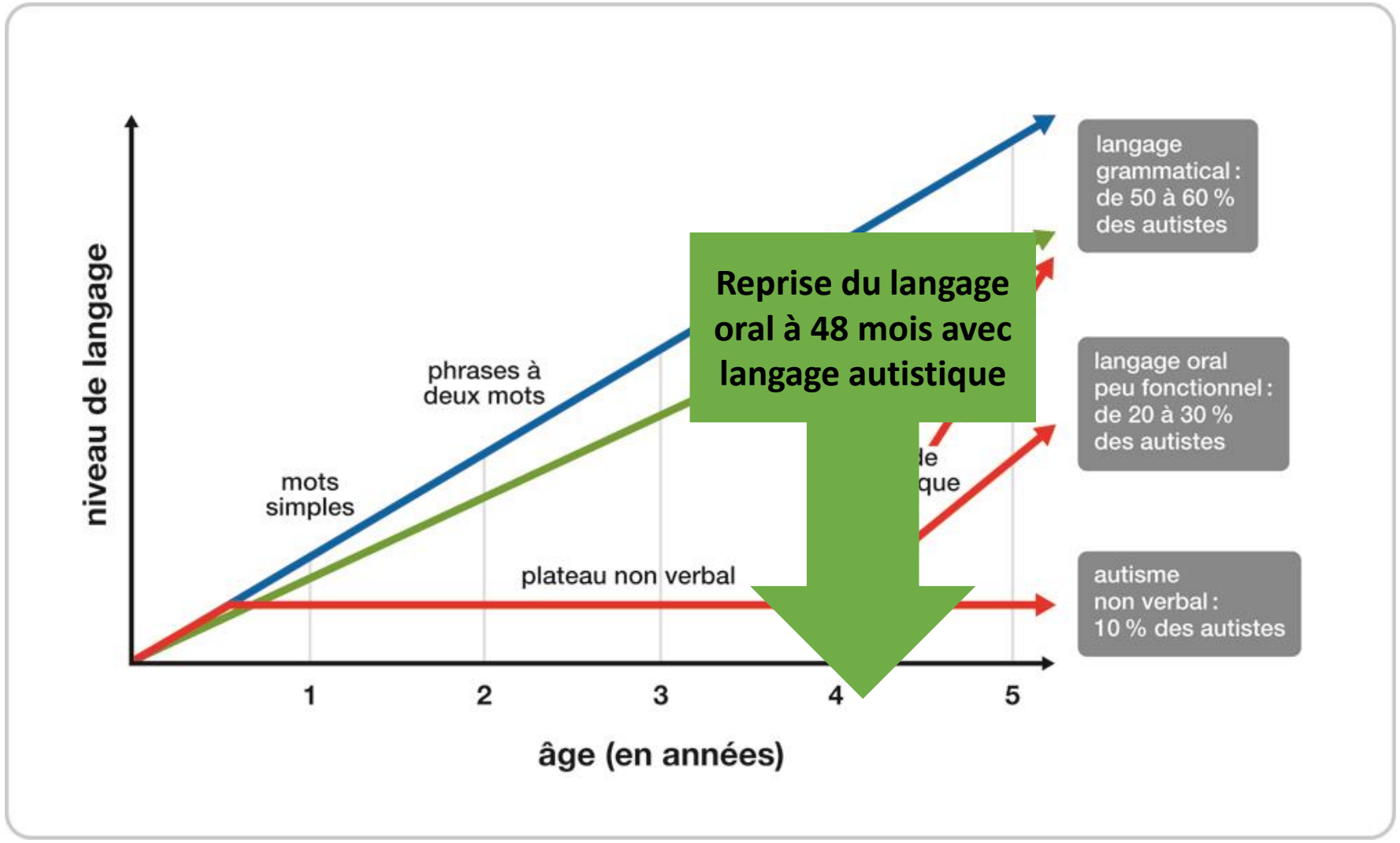
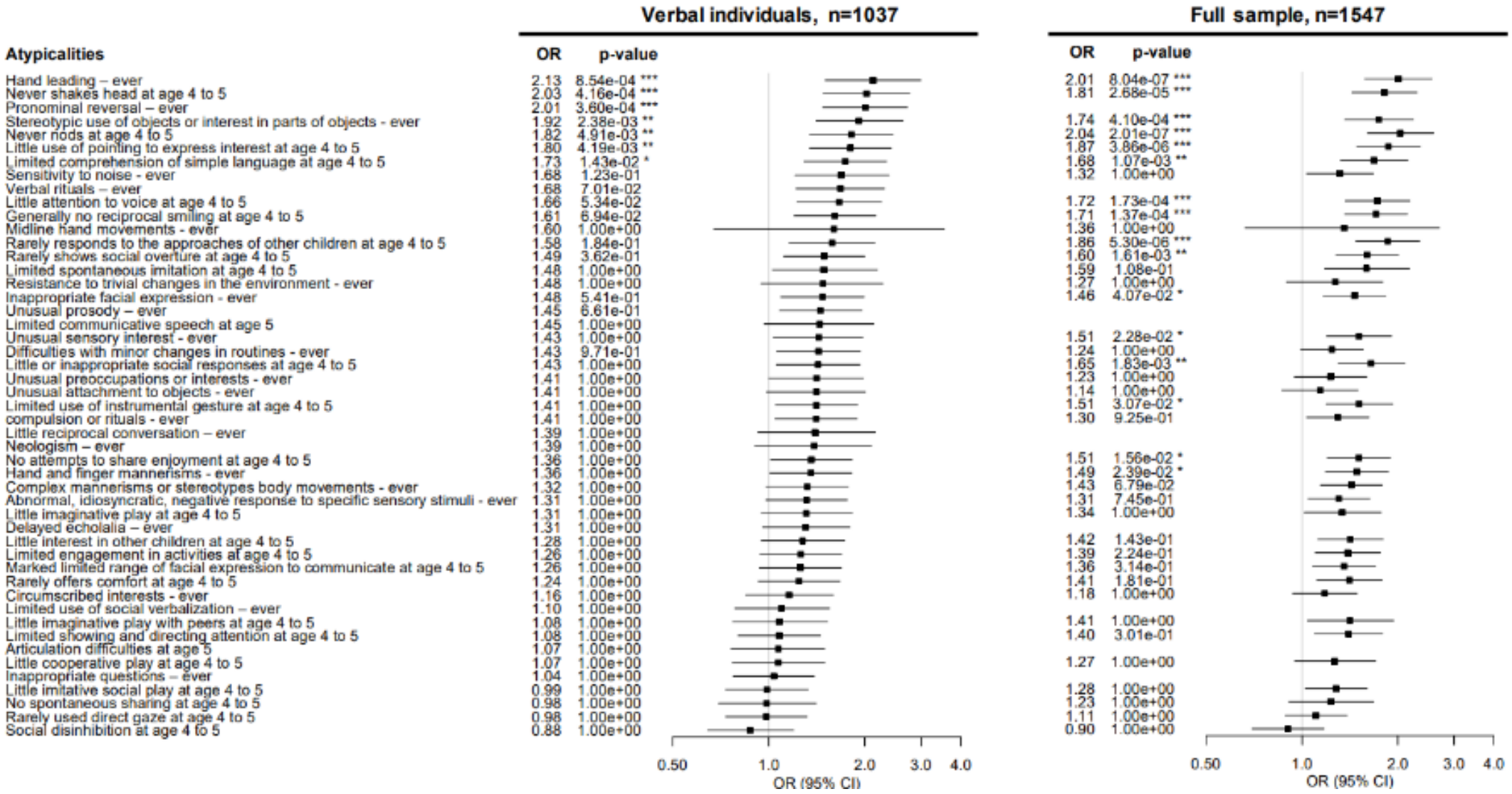


To which signs language regression are the most associated with? (Gagnon et al, sub)

- “**hand leading – ever**”,
- “**pronominal reversal – ever**”,
- “**never shakes head at age 4 to 5**”
- “**stereotypic use of objects or interest in parts of objects – ever**”), when grouped together, **best characterized the phenotype of verbal autistic children with ER**.
- **higher summary scores on a diagnostic scale for autism**
- **and greater odds of receiving an “autistic disorder” diagnosis instead of another PDD diagnosis.**



Logistic regression analyses, which were Bonferroni corrected, estimated the association of each atypicality with a history of ER .

Regression and plateau form a clinical pattern together with core symptoms of autism, which we can idenitfy as "prototypical"

An instructive observation on how science misses autistic language and communication

Hand leading & autism : 1 paper (saying that it is not specific to autism)

Joint attention & autism: 609 papers

(2) Autistic language developement is more than a specifier

The core autistic atypicalities of language developement

- Non verbal or minimally verbal plateau?
- Dissociation between overtly communicative language (verbs and requests) and non communicative self-taught labelling of language-related “familial” objects (letters, numbers, shapes, colors and animals)
- Non linguistic requests (4 types: hand-leading, body-pushing, head-turning, bringing object)
- At catch-up: Echolalia/stereotyped utterances/pronoun reversal
- Atypical vocalisations
- Unexpected bilinguism

Spontaneous interest for letters at preschool age

- Behavioral coding of 49 autistic (x=47.1 mths) & 43 age-matched (x=42.8 mths) non-autistic children in Jacques' Montréal situation
- "Only one object, books, was more explored (…)by one group, and this was the autistic children.
- compared to typical children, autistic children showed similar or greater exploration of other literacy-related objects (e.g. picture dictionary, regular dictionary, magnetic letters and numbers)."

PLOS ONE

RESEARCH ARTICLE

What interests young autistic children? An exploratory study of object exploration and repetitive behavior

Claudine Jacques[1,2*], Valérie Courchesne[2], Andrée-Anne S. Meilleur[2], Suzanne Mineau[2], Stéphanie Ferguson[2], Dominique Cousineau[3], Aurélie Labbe[4], Michelle Dawson[2], Laurent Mottron[2,5]

1 Psychoeducation and Psychology Department, Université du Québec en Outaouais, Gatineau, Québec, Canada, 2 Autism Research Group, CIUSSS du Nord-de-l'île-de-Montréal, Montréal, Québec, Canada, 3 Development Center, Centre Hospitalier Universitaire Ste-Justine, Montréal, Québec, Canada, 4 HEC Montréal, Montréal, Québec, Canada, 5 Psychiatry Department, Université de Montréal, Montréal, Québec, Canada

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Check for updates

hyperlexia in autism

autism in hyperlexia

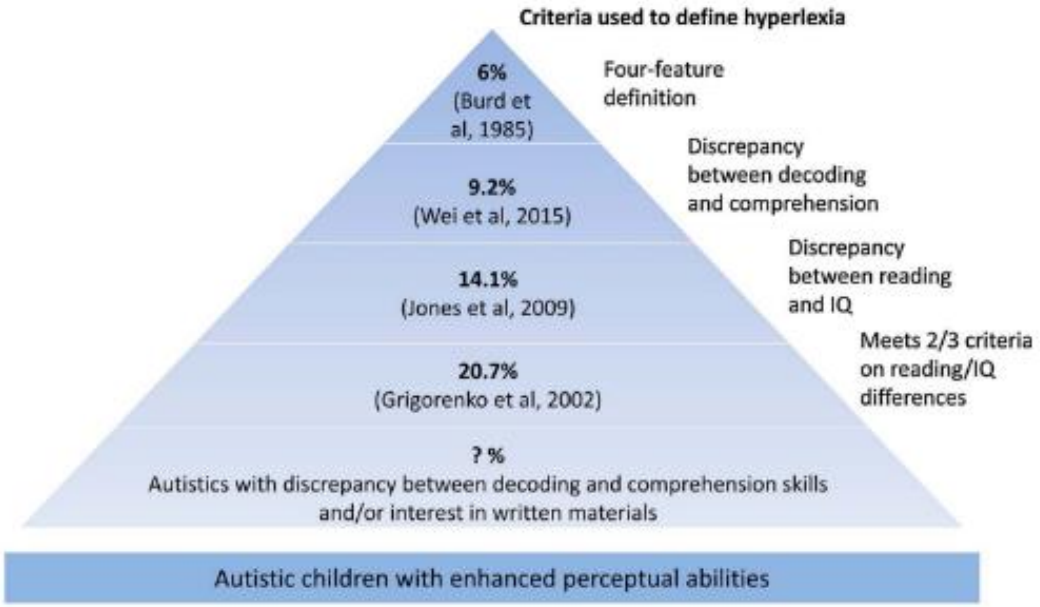


Fig. 3. Prevalence of hyperlexia and enhanced perceptual abilities – The reported prevalence changes with the stringency of the criteria employed. Less pronounced hyperlexic profiles may be much more frequent. Autistic children have strong perceptual skills from which hyperlexia could emerge.

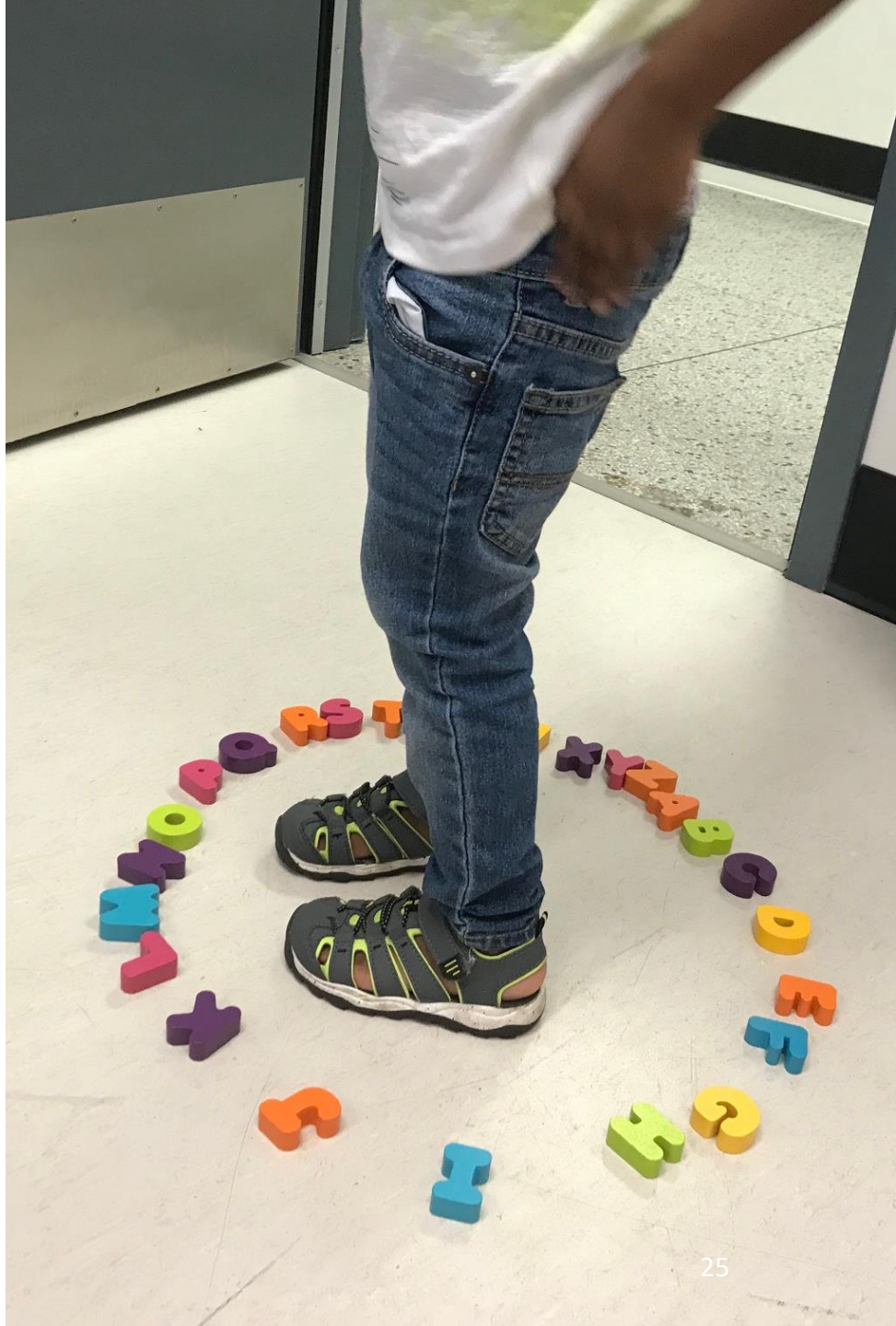
69 of the 82 (84.15%) hyperlexic cases had either autism or several autistic features

strong association between autism and hyperlexia.

Ostrolenk' letters and numbers study

Objectives:

- To documents the prevalence and development of the interest in written material in a representative population referred for an autism diagnosis assessment and a neurotypical group
- to collect information on other manifestations of early literacy and the parallel development of oral language



Two parallel studies

Study 1: Medical files

All the eligible children who were assessed at the clinic between 2018 and 2021 were anonymously examined using a rating grid investigating the child's interest in letters and numbers.

Study 2: Phone questionnaire

The families who consented to be contacted answered a 45-minute phone questionnaire on the same topic.

Participants

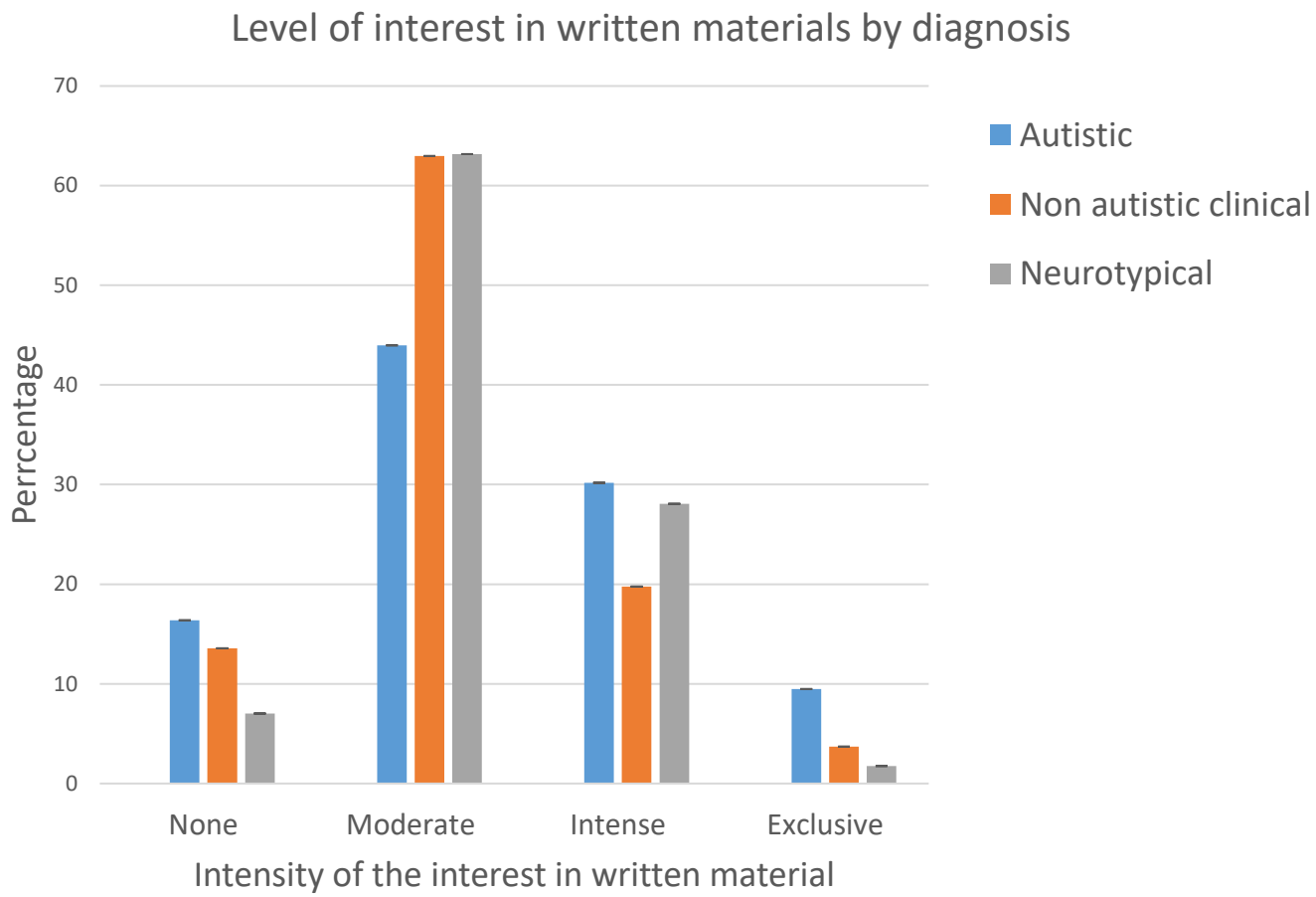
All the children who were assessed the clinic between 2018 and 2021 up to 6 years old, whatever their outcome diagnosis + a neurotypical control group (population representative of the geographical area)

			Autistic	Non-autistic clinical	Neurotypical
Study 1	N (M:F)		116 (93:23)	81 (65:16)	58 (29:29)
N = 255	Age in months	M	51.04	61.32	45.95
		SD	11.30	13.03	15.45
		Range	24 - 80	32 - 83	24 - 78
Study 2	N (M:F)		393 (297:96)	306 (254:51)	N.A.
N = 698	Age in months	M	47.97	57.48	N.A.
		SD	11.49	13.94	N.A.
		Range	24 - 82	18 - 83	N.A.

Participants' language level

			Autistic	Non-autistic clinical
Study 1 N = 255	ADOS module	1	72,5%	34,1%
		2	17%	34,1%
		3	0,5%	7,9%
		Toddler	3,8%	2,3%
Study 2 N = 698	ADOS module	1	80,9%	33,3%
		2	15,5%	56,7%
		3	0%	10%
		Toddler	3,6%	0%

Prevalence of interest in written material



Intense or **Exclusive** interest:

- 39,7% of autistics
- 23,5% of non autistic clinicals
- 29,8% of neurotypicals

Letters and language

Children who sing the alphabet

in two languages or more

Autistic	Non-autistic clinical	Neurotypical
63,2%	34,5%	28,3%

in three languages or more

Autistic	Non-autistic clinical	Neurotypical
10,6%	8,6%	2,3%

Letters and language

Children who name letters

in two languages or more

Autistic	Non-autistic clinical	Neurotypical
64%	37,3%	20%

in three languages or more

Autistic	Non-autistic clinical	Neurotypical
6,7%	11,8%	0%

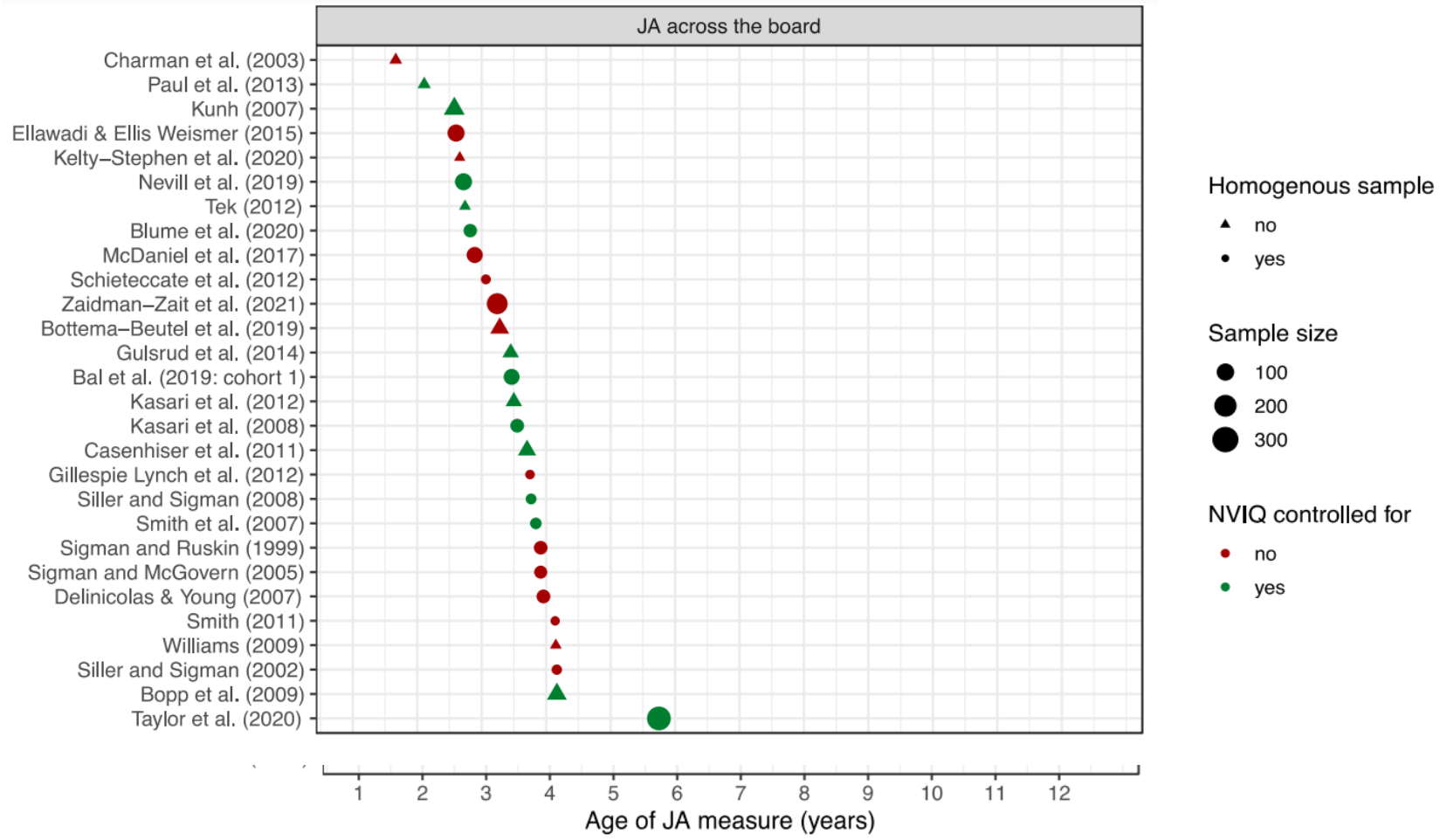
(3) Consequences on intervention

Dominant conceptions of language in autism, and intervention programs, presuppose that enriching early joint attention and communicative skills is crucial to improving an autistic child's language outcomes.

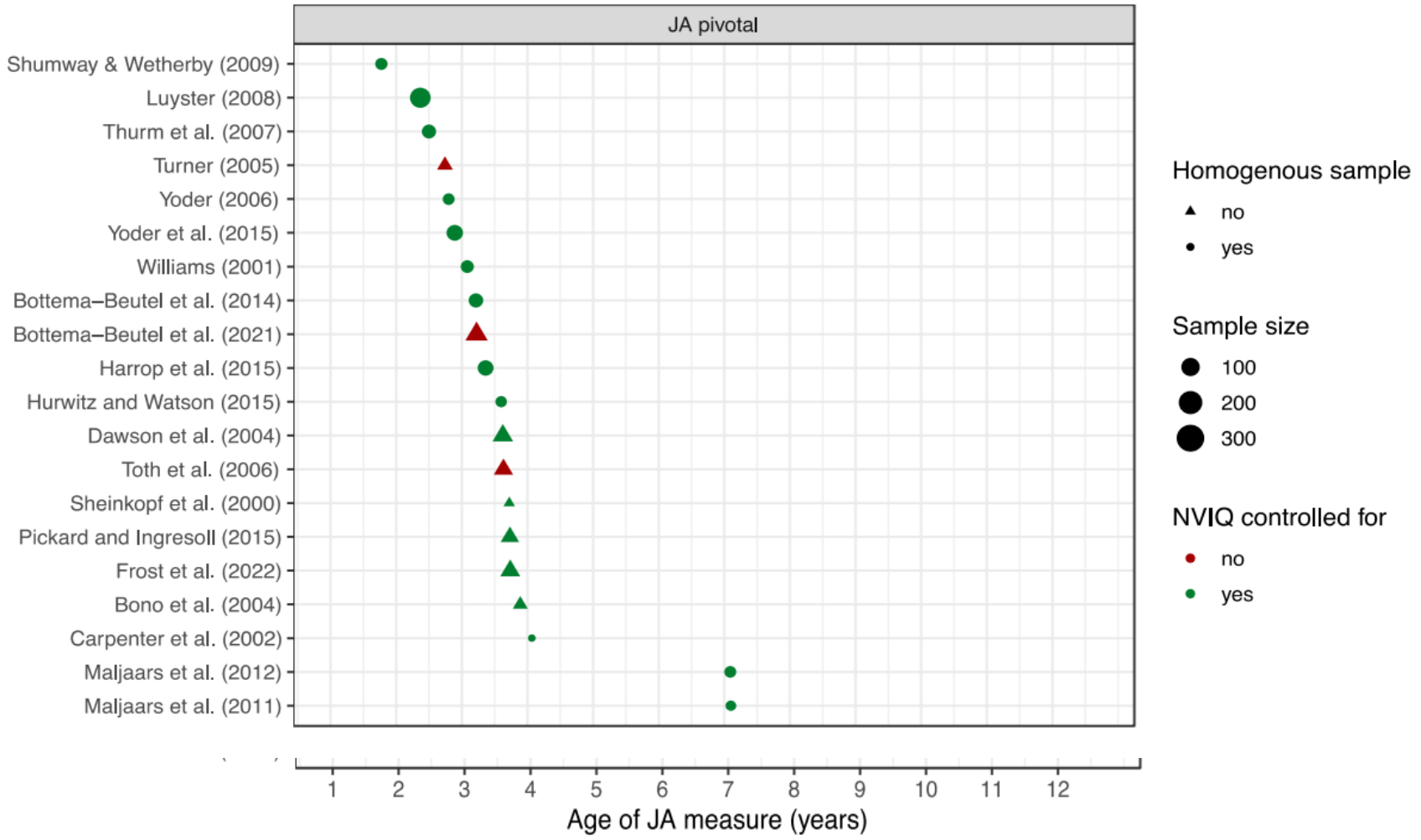
How true is that, when closely examined? (Kissine, St Denis, Mottron Sub)

- A systematic narrative review of 71 studies, on the influence of joint attention on the language outcome.

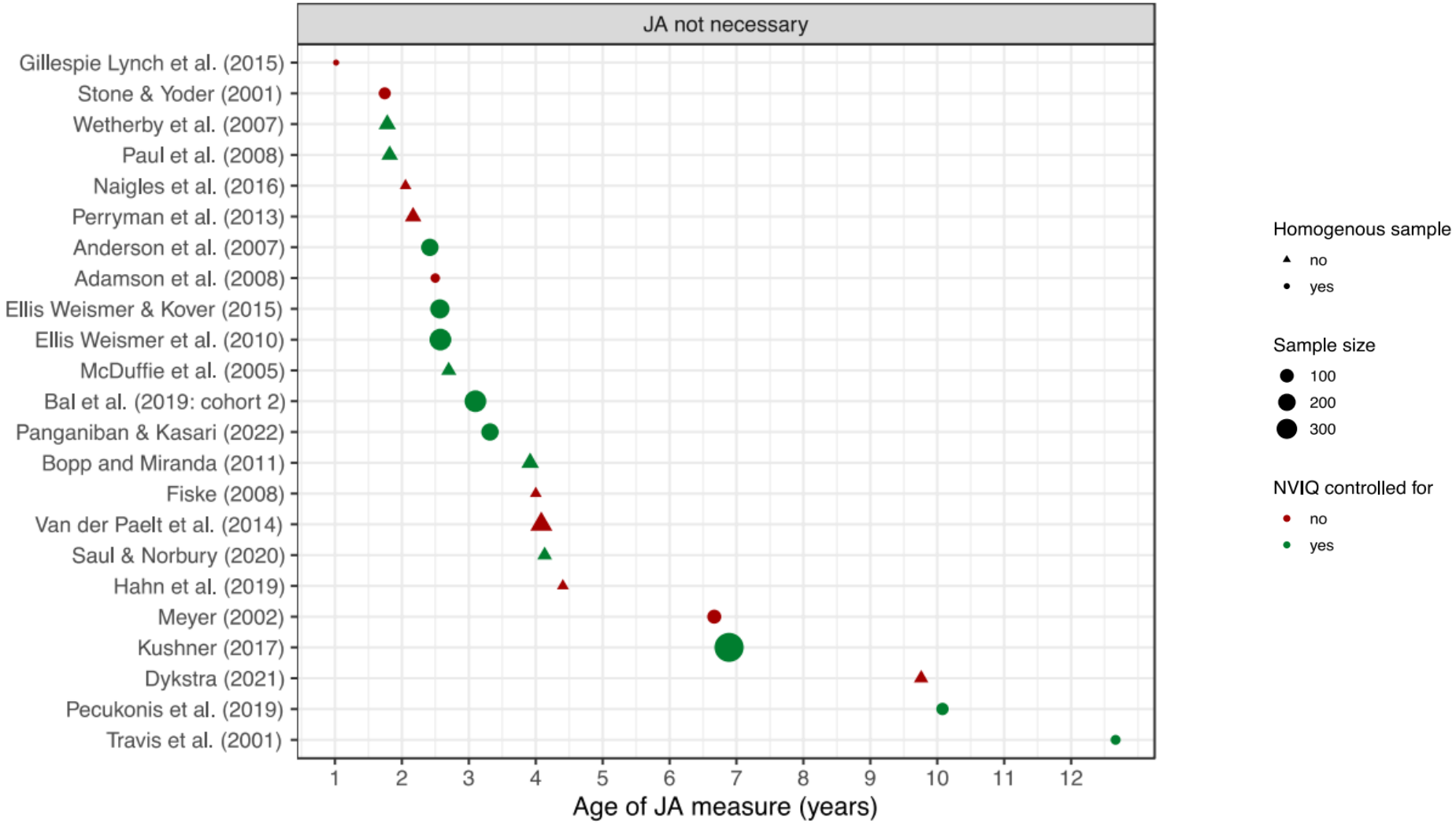
28 studies report the correlation of joint attention with advanced language skills. However, all but one do not control for non-verbal cognition or comprise children who do not meet the strict definition of autism.



In 20 studies, joint attention skills predicted early linguistic milestones. Joint attention plays a pivotal role for the *emergence* of language –but non on the level ultimately reached.



Crucially, 23 studies report that language outcomes can be independent of joint attention skills.



Our conclusion:

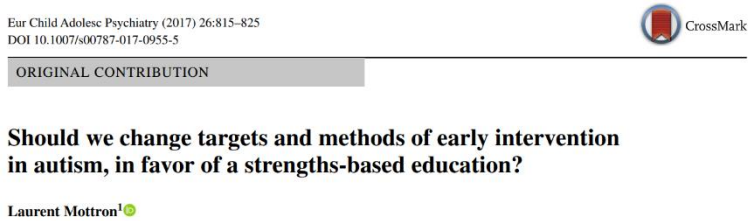
“There is little evidence that improvement in language levels in autism would be predicted by fading difficulties in processing social stimuli.”

Summary of the intervention targeting socio-communicative indices

- No data relating intensity and precocity of intervention (ABA or other) with the outcome. (NICE, 2013)
- The enrichment in synchrony through parental guidance lowers (a little) some autistic signs in the long-term. (Green & Garg, 2018)

language interest and learning in prototypical autism

- Autistic preschoolers are mostly interested in non-communicative language
- "Precursors of communication" do not predict language outcome
- Written modality is preferred to on oral modality
- Oral labelling may follow interest for written language


Eur Child Adolesc Psychiatry (2017) 26:815–825
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ORIGINAL CONTRIBUTION

Should we change targets and methods of early intervention in autism, in favor of a strengths-based education?

Laurent Mottron[1]


Neuroscience and Biobehavioral Reviews 37 (2013) 209–228

Contents lists available at SciVerse ScienceDirect

Neuroscience and Biobehavioral Reviews

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Review

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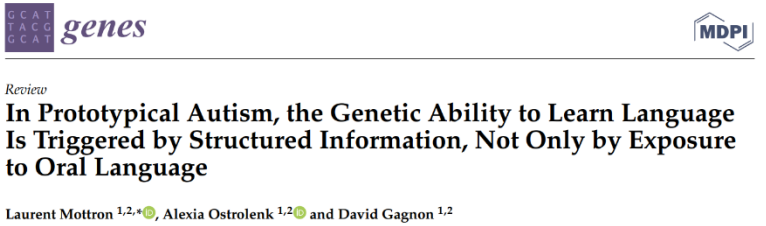
Laurent Mottron[a,*], Lucie Bouvet[c], Anna Bonnel[a,b], Fabienne Samson[a], Jacob A. Burack[a,b], Michelle Dawson[a], Pamela Heaton[d]


genes

MDPI

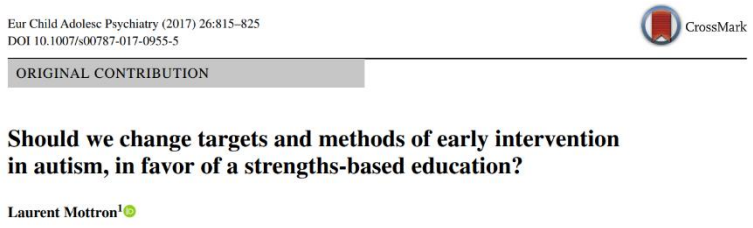
Review

In Prototypical Autism, the Genetic Ability to Learn Language Is Triggered by Structured Information, Not Only by Exposure to Oral Language

Laurent Mottron [1,2,*], Alexia Ostrolenk [1,2] and David Gagnon [1,2]

Veridical mapping between letters and their names

- Autistic people orients toward series of information with "familial" perceptual resemblance (eg: written code)
- Semantic system is built through **veridical mapping** between these series (e.g.: letter/its name).
- Learning language syntax may follow this process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CrossMark

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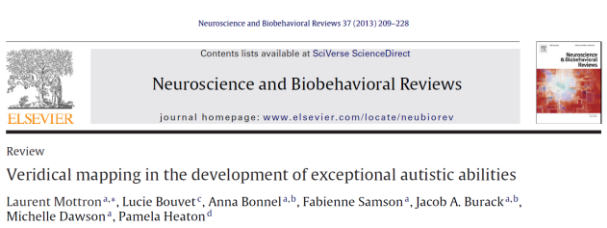
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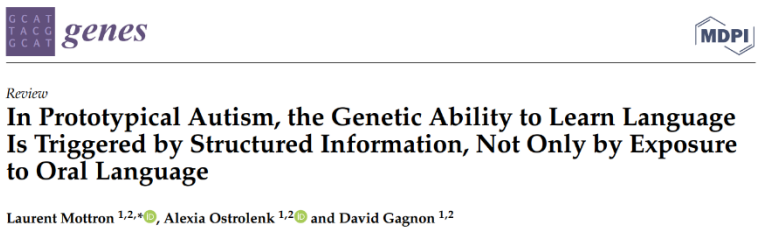
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Laurent Mottron [1,2,*], Alexia Ostrolenk [1,2] and David Gagnon [1,2]

Lateral tutorship hypothesis

- Language rules are learnt through **exposure to their recurrence** prior to their meaning or the advantages they provide.
- Manipulate complex information (eg: letters and numbers) close to an autistic child may trigger or enrich interest for a **non-communicative** language-related material
- Autonomous access to written code (eg tablets, letters, books) is a prerequisite to the development of an interest in the written code.
- Some repetitive behaviours and interests are “heuristic”, and distinct from behaviours of captivity or impoverishment.

Wittkopf et al., 2022

- As concepts such as “masking”, “compensation”, and “camouflaging” have become increasingly popular, the value of standardized behavioral observations and interviews with caregivers has decreased, the criterion of an early onset of ASD has been undermined and heterogeneity has increased. Like a vicious circle, the hope of finding valid biomarkers is additionally hampered by the dramatic increase of heterogeneity and comorbidity in ASD. Currently, we note a trend towards the inclusion of individuals with autistic traits as a basis for research on autism whereas considerations of differential diagnoses are rare. Thus, we believe there is a danger of losing touch with what is called “prototypical autism”.

Learning a language not spoken at home

The clinical vs. research drift

- Autism researchers do not work on autism. They work on autism scientific literature. They make papers on papers.
- Scientific literature on autism does not inform on autism. It informs on information that filtered, standardized, and possibly distorted by standardized instruments. It makes papers on data.
- While not measuring what we see cannot create usable knowledge, measuring it may fail to create knowledge too.
- Now, what I see is not what I read.

Our hypotheses on the potential role of intense interests for social bonding