



Sur le

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spectre

The Montreal Cognitive Neuroscience Autism Research Group



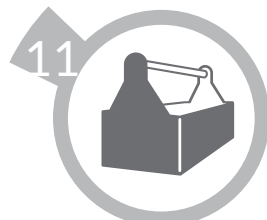
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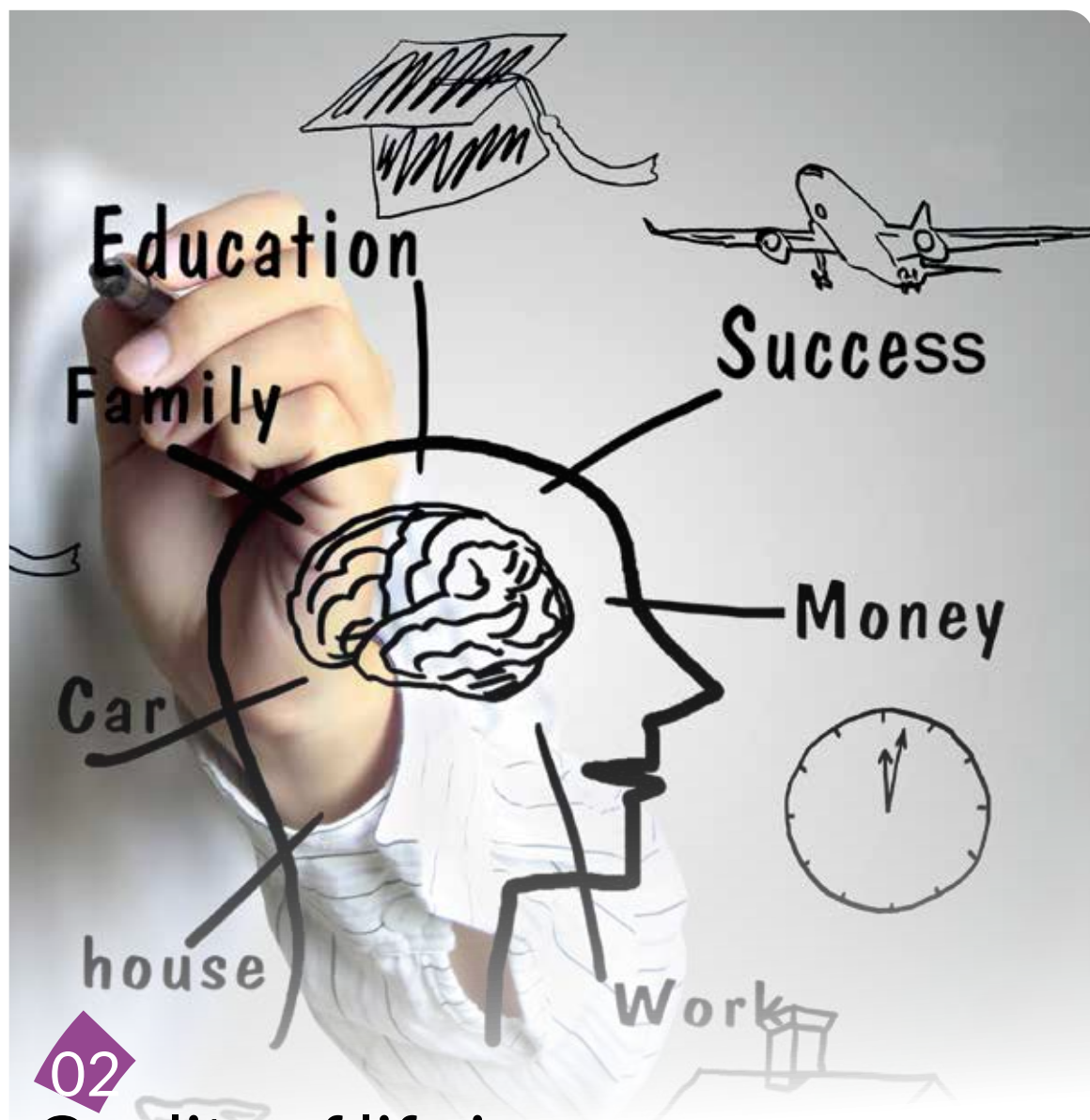
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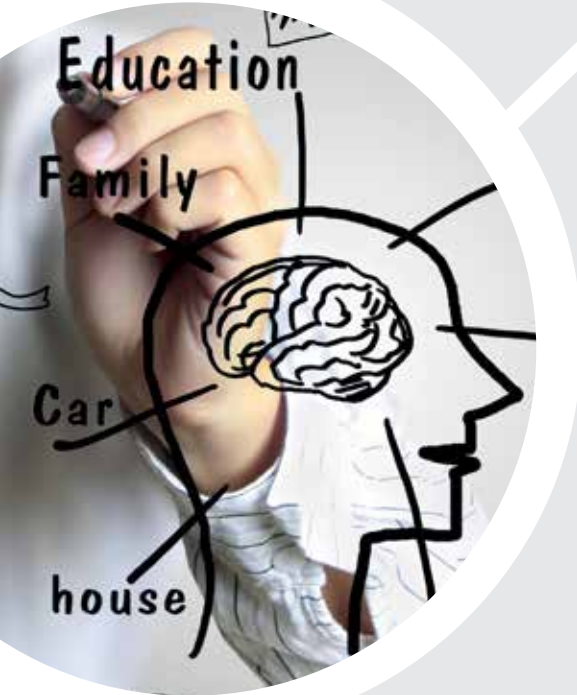
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autistic adults:
searching for what really matters



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**Quality of life
 in autistic adults:
 searching for what
 really matters**

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Official magazine of the The Montreal Cognitive Neuroscience Autism Research Group

The Montreal Cognitive Neuroscience Autism Research Group focuses on brain function, auditory and visual perception, exceptional skills and interventions in autism.

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Sur le spectre:

Happy holidays from Sur le Spectre's team.

It is with great pleasure that we release the sixth issue of "Sur le Spectre", a scientific outreach magazine brought to you by the Montreal Cognitive Neuroscience and Autism Research Group.

We are proud to be able to share this issue with you just in time for the holiday season! Once again, the articles included here were written on a volunteer basis by clinicians, researchers and students, who firmly believe in making autism research more accessible. A usual, you will find full citations of the articles covered in this issue, and authors' main reference lists. Feel free to visit our website and like our Facebook page to stay up to date on our group's activities. Sign up for our newsletter to receive every issue of *Sur le Spectre* upon release.

In this issue, you will find in center page a summary of the research process. Then, articles on quality of life in autistic adults, food selectivity, the role of psychiatry in autism, and finally a summary of a recent article published by the group on gyrification in autistic brains.

We would like to specially thank our new partners, the Réseau National d'expertise en TSA (RNETSA). Thank you also to our research participants, who are essential to the advancement of knowledge, and last but not least thank you to our most loyal partner, the Fondation des Petits Trésors, without whom *Sur le Spectre* would not have launched and continued to be published year after year.

Sur le Spectre continues to grow, with a steadily increasing number of readers. Thanks to you, our authors and our partners, we can pursue our mission of creating content that is both scientific and accessible.

Happy reading! 



Valérie Courchesne
Ph.D.

Chief editor

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and accessible



Quality of life in autistic people is a burgeoning field of research, and is considered particularly important by autistic people and their families

Quality of life in autistic adults:

searching for what really matters

By JÉRÔME LICHTLÉ, PSYCHOLOGIST

Almost all research suggests that autistic adults face significant difficulties in their day-to-day lives, that they struggle with access to autonomous living and healthcare services, and that they may face unemployment and suffer from physical and mental health issues. Despite these findings, we still know relatively little about how to help autistic adults to better reach their full potential. One of the reasons for this is the current lack of agreement on which criteria to use in evaluating the effects of an intervention. For example: is it important for an autistic person to have a lot of friends? Would they rather prioritise a well-paid job, or professional opportunities related to their interests? These questions are extremely complex to address given the amount of heterogeneity encountered across the autistic spectrum. Over the last decade, researchers have begun to take a serious look at this issue, in order to address the needs of three different groups: parents advocating for the

rights of their adult children, autistic adults who have come out in large numbers to express their needs, and professionals who do not always manage to identify these needs and appropriately respond to them.

Quality of life in autistic people is a burgeoning field of research, and is considered particularly important by autistic people and their families. However, though increasingly recognised as an important construct, research on quality of life faces at least 3 major obstacles:

- 1 Researchers do not agree on how to define quality of life! The only consensus researchers have more or less reached is that it is a multidimensional, subjective concept, as described by the WHO's definition: quality of life is "an individual's perception of their individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and

Main references:

Ayres, M., Parr, J. R., Rodgers, J., Ayres, M., Parr, J. R., Rodgers, J., Mason, D., Avery, L. et Flynn, D. (2017). A systematic review of quality of life of adults on the autism spectrum. *Autism*, 1-10.

McConachie, H., Mason, D., Parr, J.R., Garland, D., Wilson, C. & Rodgers, J. (2018). Enhancing the Validity of a Quality of Life Measure for Autistic People. *Journal of Autism and Developmental Disorders*, 48(5), 1596-1611.

Taylor, J. L. When is a good outcome actually good? *Autism*, Prepublished August, 23, 2017, DOI: 10.1177/1362361317728821.



This consensus research cannot be conducted without the active participation of autistic people.

concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment."


- 2 Suppose we manage to agree on a suitable definition of quality of life. The next logical question would be how to assess it: how do we measure quality of life in an individual? This concept does not describe a precise, specific and observable phenomenon, all of which are necessary to develop a "valid" measurement tool using a scientific approach.
- 3 Quality of life measurements in autistic adults are probably different than for typically developing adults. Indeed, autistic people may attribute less value to certain conventional criteria, such as those pertaining to social activities, for which few autistic adults will reach high quality of life levels. It may therefore not be appropriate to use quality of life measures validated within the general population. Researchers have actually attempted to develop a quality of life measurement tool specifically for autistic adults, and this task demonstrated that their quality of life may not be as poor as we think.

However, the problem still remains: we do not have a clear understanding of which specific aspects are important to measure and linked to quality of life in autistic people. A first step would be to better identify

which aspects of quality of life matter most for autistic people and affect daily living. Once a consensus is reached on what constitutes "good" quality of life, we will then be able to seriously tackle the development of measurement tools. This consensus research cannot be conducted without the active participation of autistic people.

Collaborative approaches: the path to a solution

Centering the voices of autistic people is crucial for the purposes of, (1) producing research that autistic people identify with, and (2) better understanding their perspectives and experiences in order to develop relevant ways to improve their quality of life. In order to do this, we must increase their participation in research, and consider them important contributors to scientific knowledge. In practical terms, this approach involves collecting data directly from autistic people, in addition to data collected with families and the rest of the community (namely clinicians).

This trend towards collaborative approaches is increasingly found in research. A prime example of this is the Adults Autism Spectrum Cohort, a large-scale project initiated by an English research team. Amongst other projects, this group has developed and validated a module within a quality of life measure that is specific to autistic adults. 



We want to better understand how autistics perceive the world around them.

Participants wanted

Functional magnetic resonance imaging (fMRI) study on reasoning in 6 to 14 years old autistic children

The research laboratory of Dr. Isabelle Soulières, researcher at Rivière-des-Prairies Mental Health Hospital and professor at the Department of Psychology of UQAM, is looking for autistic and typically developing children between the ages of 6 and 14 for an fMRI study on reasoning development.

- **Location:** Both appointments will take place at the Geriatric university Institute of Montreal.
- **Duration:** First appointment will last 2 hours. Second appointment will last 2 hours and 15 minutes.
- **Compensation:** 100\$

For more information or to participate:

Éliane Danis

psychology student, UQAM

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Psychiatric conditions, on the other hand, are different entities and are defined relative to typical development, which is more difficult to identify in autistic people.



Psychiatric intervention 101

By BAUDOIN FORGEOT D'ARC, MD, PHD and by PASCALE GRÉGOIRE, MD, FRCP (C)

In the last issue of *Sur le Spectre*, we brought you an article explaining the psychiatrist's role in diagnostic assessments. We will now share a few thoughts with you on the psychiatrist's role in autism intervention.

To this day, no medical treatment exists for autism. However, more than half of autistic adolescents have an intervention plan involving some kind of psychotropic medication (psychostimulants and antipsychotics being the most common). What role do psychiatrists therefore play in intervention?

Autistic people do not necessarily require psychiatric treatment. However, as is the case in the general population, they may face mental health issues and it is important that they receive appropriate care. It is within this framework that basic mental health care is provided by professional teams in CLSCs and hospitals. Autistic people can then benefit from general psychiatric assessments, with some teams specialising in this type of intervention.

Autistic people will therefore consult, or be brought in by their families, when they experience difficult situations that could possibly be attributed to psychiatric conditions. In these cases, it is important to accurately analyse the situation, in order to select the appropriate intervention. Every symptom must be well understood, as it could be an amplified autistic trait rather than manifestations of an additional diagnosis.

What we refer to as "aggravating" symptoms is a concept often used in practice, but that does not actually correspond to psychiatric language. Rather, the concept acknowledges autistic symptoms which become very intense and prevent adequate daily functioning. Psychiatric conditions, on the other hand, are different entities and are defined relative to typical development, which is more difficult to identify in autistic people. For example, under the umbrella of repetitive behaviours, it can be difficult to distinguish autistic stereotypies from obsessive-compulsive rituals and tics. And yet therapeutic options, notably in terms of medication, will be different in both of these cases, demonstrating the importance of careful evaluation.

As another example, it is sometimes the case that restlessness will be identified as an additional diagnosis of hyperactivity, but this can also be a type of self-stimulatory behaviour seen in autistic people who lack structure in their activities. The first case will respond to medication, but the second will be better dealt with by planning structured activities and presenting them with visual aids. The same can be said of an apparent lack of concentration, which can prove to be an attention deficit, but could also turn out to be a lack of understanding of what is communicated verbally. The solutions to this symptom would once again not be the same.

Another symptom that people often consult a psychiatrist for is anxiety. Let us not forget that, at its core, this is a normal and common emotion in the general population when faced with unexpected or novel situations. In autism, it is therefore also normal to a large extent, especially given that events are more frequently understood as unforeseen or new. Consequently, solutions are often not based on medication (though it is frequently requested) but rather on a more adaptive communicative system.

It is also important to differentiate anxiety from difficulty coping with frustration. When evaluating the function of aggressive behaviour, we must consider the possibility that this is a means of communication, which, though inadequate, does not always carry aggressive intent. Supportive measures for communication can be very helpful in these cases.

Furthermore, in those situations where psychiatric conditions are truly found in addition to autism, it is necessary to provide appropriate treatment according to usual standards, whilst adapting follow-up to the person's mode of communication and interests.

Pharmacological intervention must be situated within this larger context. Again, there is no medication for autism, but medication can be used to target associated symptoms. Proper explanation of what effects can be expected, and on which symptoms, is therefore needed.



In sum, it is common for psychiatrists to be consulted in the hope that a medication will solve a certain problem, only to find that this is not an option the psychiatrist recommends. On the other hand, the psychiatrist may suggest a medication which is then declined. Indeed, though there is still much to learn, another barrier to reasonable pharmacotherapy is *pharmacomagic*, which is a pattern of widely held beliefs which bias decision making when considering medication. Some of these beliefs will oppose any prescription of medication, whilst others may contribute to overmedication. 🌱

Again, there is no medication for autism, but medication can be used to target associated symptoms.

| | Pharmacomagic... | ... and some critical thoughts |
|---------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| "Anti-pill" beliefs | "I am against medication" | Medicating a child is a serious decision. An informed decision can be made by discussing advantages, disadvantages and areas of uncertainty. |
| | "I would prefer to try something natural instead" | The "natural" label does not guarantee the efficacy or safety of a product. |
| | "Things are better, let's stop the medication" | In certain cases, medication is required to maintain an improvement, and in other cases it is recommended to stop (but this must be discussed because weaning can require added precautions) |
| "Pro-pill" beliefs | "Things aren't going well, we have to add medications or increase dosage" | In many cases, other interventions should be considered first. Medications do not exist for every situation. Furthermore, successful interventions often involve decreasing or ceasing a medication. Lastly, certain symptoms (e.g. aggression, anxiety, restlessness) can be side-effects of medications. |
| | "Everything is going well, there's no need to change anything »" | The effects of certain medications will wear off with time, and the risk of side effects may increase. Certain symptoms may also decrease with time and interventions. Therefore, even if a medication has proved useful, it is necessary to regularly reconsider maintaining or ceasing it. |
| | "In order to change medications, we need to hospitalise »" | Most changes in medications can be done safely as long as they are done progressively, but hospitalization is to be considered on a case-by-case basis. |



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Brain imagery

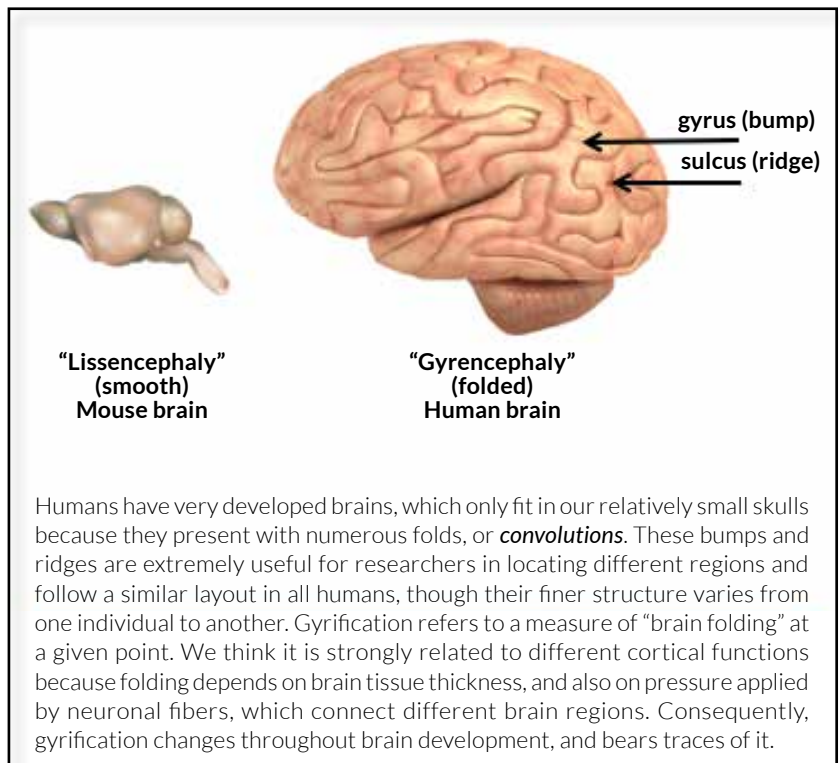
to better understand the wide variability across the autism spectrum

PAULINE DURET

Neuroscience researchers have long attempted to uncover structural brain differences between neurotypical and autistic people. Though research in this seemingly promising field has gradually piled up, no consensus exists so far: different studies report only small differences, which rarely occur in the same brain regions. Over the past few years, the field of brain imaging has moved towards developing large databases (over 1000 brain scans) in order to increase our ability to detect differences. However, these large cohorts' main strength also happens to be their greatest weakness: gathering this many participants means combining age groups, different diagnoses, varied levels of intellectual functioning etc. Too much variety? That is the challenge we are up against! In an article published this summer, we demonstrated that observable brain differences actually depend on the autistic sub-type being studied.

In this study, anatomical brain images of 55 autistic and 37 typically developing adolescents were obtained using magnetic resonance imaging (MRI). A specialized processing software allowed us to reconstruct the surface of each participant's cortex, and to locally measure **gyrification** (see box). We can statistically compare these two groups, and model how gyrification evolves with age. With this last analysis, it becomes possible to take into account brain development that occurs during adolescence.

La gyrification, un indice puissant qui lie structure et fonction:



These structural differences are slight: autistic and typically developing brains are largely similar.

When we directly compared our autistic and typical groups, we did not find any difference in gyrification. In and of itself, this could have been our conclusion, but we chose to go a step further and to separate young autistic participants into two groups: those who had a language acquisition delay in childhood, and those who

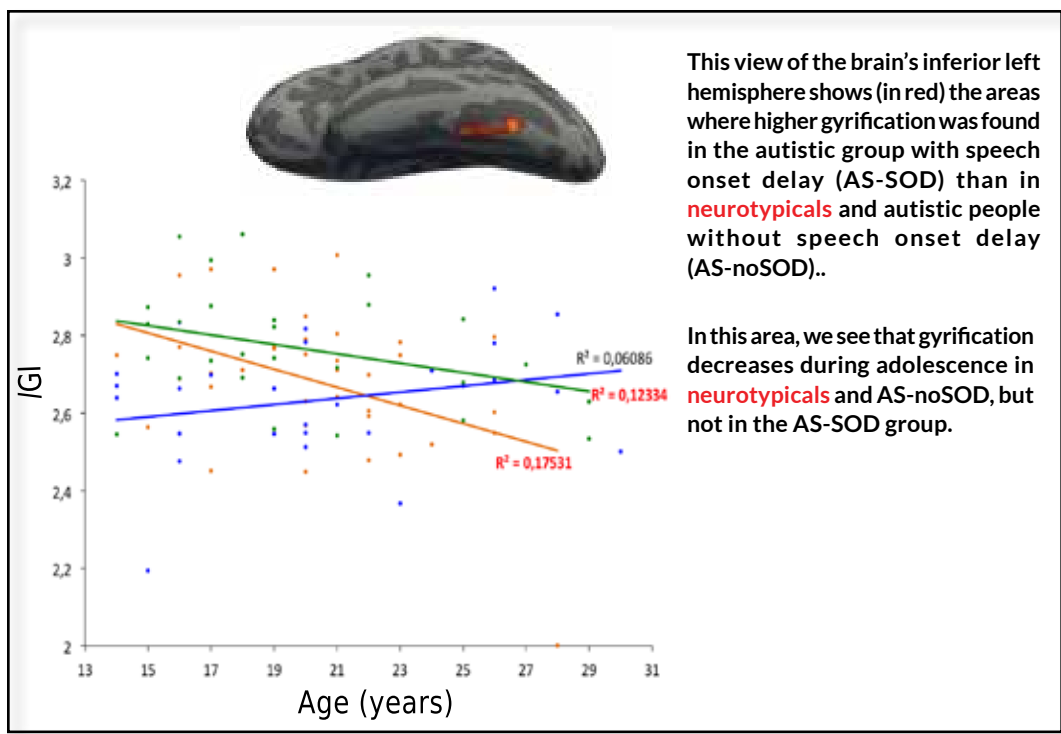
demonstrated typical speech development. Besides from their language development history, there was no difference between these two groups in symptoms or average level of intelligence: when the study was conducted, they seemed positively similar.

Why did we focus on language delays? This distinction was the basis of Asperger's syndrome diagnosis (no language delay), which is no longer used as an official category. However, some specialists continue to think that this noticeable difference in child development, and therefore probably in brain structure, is significant. Our team has evidenced several times that these two groups demonstrate strengths and interests in markedly different areas: language for ex-Aspergers, and perception (namely auditory and visual) for the others. In our study, this is demonstrated by so-called cognitive peaks: the group with speech onset delay performed significantly better than the other group on the "block" test, which is perception-based, whilst the group without language delays performed better on verbal aptitude tests. These results confirm those found in previous studies (see Sur le Spectre, issue 1).

When the autistic group is separated depending on history of speech acquisition, we not only observe direct differences in gyrification between the two autistic groups and the typical group, but also differences in gyrification changes over time. Brain development therefore follows a unique trajectory in each group. These structural differences are slight: autistic and typically developing brains are largely

similar. It is however particularly interesting to notice where these gyrification differences occur: in the group with speech onset delay, it is observed in a region involved in visual perception (the fusiform) and in the group without language delay, it is in an area pertaining to the language network and specifically vocal processing (median temporal).

Example: the left fusiform region



We have therefore found brain regions which correspond to specific peaks of ability (language and perception) in two autistic groups, and which evolve in unique ways. It goes without saying that these results do not allow us to directly link autistic abilities to brain structure and development. They may rather spark further interest in investigating heterogeneity in the autism spectrum, and underlying differences in neurological structure. Research should take into account the distinctive features of these sub-groups and individuals instead of lumping them all together, in order to adapt interventions to developmental differences.



TOOLBOX FOR PARENTS

By CAROLANE TREMBLAY, OCCUPATIONAL THERAPIST and GHITZA THERMIDOR, PSYCHOEDUCATOR



Myth or reality: My child's food selectivity is due to his sensory specificities

Parents often consult seeking to address their child's food selectivity, convinced that their child's sensory needs are the sole cause for their child accepting only a limited number of foods. This belief is not accurate, and here is why.

What is food selectivity?

There is presently no consensus in the literature for a definition of food selectivity. However, we consider in our practice that a child displays selectivity if one or more of the following criteria applies to them: the child (1) eats less than 15 different foods, (2) refuses one or several food groups, (3) will have a tantrum when new foods are presented, and (4) requests for certain foods to always be presented the same way, often during most meals.¹ These difficulties significantly interfere with daily routines and impact the child (e.g. weight issues, anemia), the parents (e.g., stress during meal times) and the parent-child relationship.

It is important to note that transitional food selectivity is also observed in typically developing children between the ages of 2 and 4. Studies have shown that food difficulties are present in 25% of typically developing children, and up to 89% of autistic children.²

Sensory specificities may contribute to food difficulties in your child, but other factors must also be considered.

The link between sensory specificities and food selectivity

Many factors can influence whether a child accepts or refuses certain foods, and sensory specificities are indeed one of them. For example, a child may demonstrate preference or aversion to certain foods depending on their texture, smell or even their temperature. Your child's chewing abilities, and how able they are to move food between their teeth may also influence which food textures they accept. Your child can also develop preferences in food presentation (shapes, separated on the plate, asks for specific cutlery) and may refuse to eat dishes that do not conform to these criteria. Furthermore, certain medical conditions (e.g. constipation, acid reflux) may also impact your child's willingness to eat. We must also consider what we call environmental factors, such as the climate around mealtimes, food preferences in the family, or a lack of meal routine. Therefore, several reasons may explain why your child refuses certain foods. It is important to carefully analyze them in order to properly intervene.

The solution? Expose, expose and expose again

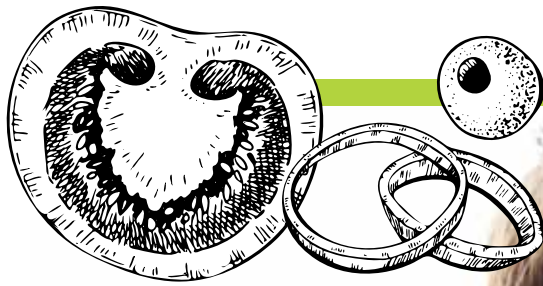
Indeed, it is recommended that you frequently present your child new foods, even if they refuse them the first,



Sensory specificities may contribute to food difficulties in your child, but other factors must also be considered.

¹ Ernsperger, L., and Stegen-Hanson, T., (2004). *Just take a bite: easy, effective answers to food aversions and eating challenges!* Arlington: Future horizons.

² Marshall, J., Ware, R., Ziviani, J., and al. (2014). Efficacy of interventions to improve feeding difficulties in children with autism spectrum disorders: a systematic review and meta-analysis. *Child: care, health and development.* 41 (2), 278-302.



A child must be exposed to a certain food many times and in the same way (at least 20 times) before concluding that they do not like this food.

Main references

Cermak, S. A., Curtin, C., et Bandini, L. G. (2010). Food selectivity and sensory sensitivity in children with autism spectrum disorders. *J am diet assoc*, 110 (2), 238-246.
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 Taylor, C., et al. (2015). Picky/fussy eating in children: Review of definitions, assessment, prevalence and dietary intakes. *Appetite*, 95, 349-359.

second or umpteenth time. It is important however, to ensure that the texture of the foods you present is adapted to your child's oral motor skills. A more thorough assessment will provide specific recommendations depending on your child's profile.

Supplementary toolkit

- A child must be exposed to a certain food many times and in the same way (at least 20 times) before concluding that they do not like this food. Your child may go through several stages before accepting the

food. For example, your child may accept to touch the food, will imitate you and bring the food to touch their mouth, etc.

- Meal and snack schedules are also important. If your child snacks before meal times, he will not be hungry.
- When you present a new or lesser preferred food to your child, it is important to present it alongside a preferred food.

If your child's eating is cause for concern, do not hesitate to speak to your doctor or a healthcare professional. ❄️



Sylvie Lauzon
 Chief Executive Officer

Dear Readers,

The Fondation les petits trésors is extremely pleased with our partnership with Sur Le Spectre magazine, brought to you twice yearly by the Montreal Cognitive Neuroscience and Autism Research Group. Having just reached our 6th issue, we extend our congratulations to all!

This magazine is a real gem for its ability to summarize autism research and raise awareness on key issues. May I remind you that all content is prepared on a volunteer basis by students, and revised by members of the research group. Valerie Courschesne, our editor and herself a researcher, has carried this project from its inception. This is no minor feat given the extraordinarily high demands of a research career.

This magazine speaks directly to parents, and indeed to anyone who interacts with autistic children, teenagers and adults on a day-to-day basis. The Montreal Cognitive Neuroscience and Autism Research Group would like us to consider and understand all aspects of autism. We as a society have the duty to adapt to autistic intelligence in order to benefit from their exceptional abilities.

Striving to better understand others is an important step towards building a more inclusive society which channels the strengths of all individuals, even if they may at first seem atypical.

Thank you to the entire team of Sur le Spectre, and to many more issues!



Myth Busting Scientific Research

A step by step overview of the research process

By CAMILLE LETENDRE

Series Introduction:

For many of us, scientific research seems mysterious and raises plenty of questions. What are the practical purposes of research? How do research projects take place? Which specific issues must researchers consider? Though a far cry from lab rats and the iconic white coat-clad, disheveled scientist, we invite you to come along as we take a closer look into the world of autism neuroscience research.

Article Introduction:

All research aims to further knowledge in a particular field- in our case, autism. In order to reach this final goal, a project must go through a rigorous yet relatively unknown process, involving time, human, intellectual and financial resources. Participating as a subject, or bringing a child in to participate, can provide a glance into this process. We have therefore simplified and summarized the steps which a project follows within the Montreal Cognitive Neuroscience Autism Research Group.

With Sur le Spectre, we try to make results in autism research more accessible.

Le projet de recherche étape par étape (suite) A step by step overview of the research process (continued)



Un projet doit cheminer au travers d'un processus exigeant tant sur les plans temporel, humain, intellectuel que financier et largement méconnu.

A project must go through a rigorous yet relatively unknown process, involving time, human, intellectual and financial resources

Développement/ Development

L'idée



Un projet de recherche naît d'une idée, qui peut découler d'une observation, de problématiques cliniques ou sociales ou de travaux de recherche antérieurs. À partir de cette idée, le chercheur, à l'aide de son équipe de recherche, consulte la littérature scientifique pour recueillir des informations et prendre connaissance des études déjà menées sur le sujet, ce qui lui permettra de formuler le but de son projet de recherche ainsi que sa question et ses hypothèses de recherche. Dans le Groupe, les questions de recherche s'articulent entre autres autour de la perception, la cognition, les interactions sociales ainsi que les forces et les intérêts dans l'autisme et les idées de recherche naissent souvent de discussions qui ont lieu au sein de l'équipe composée de chercheurs, de cliniciens et d'étudiants.

1

The idea

A research project is the direct result of an initial idea, which may be derived from an observation, clinical or social issues, or previous research. With this idea as a starting point, a researcher consults the scientific literature to collect information and familiarize themselves with studies that have already been conducted on the subject. This will help to formulate a clear aim for the research project, as well as a research question or hypothesis. In our research group, research questions center around perception, cognition, social interaction and strengths and interests in autism.

La planification



Le chercheur et son équipe doivent ensuite déterminer avec quelle méthode ils répondront à leur question : Quelles seront les caractéristiques des personnes étudiées ? Quel devis ou plan de recherche sera employé ? Quels instruments de mesure seront utilisés ? Dans les travaux du Groupe, des méthodologies variées sont utilisées. Certains projets se penchent sur les adultes alors que d'autres sont menés auprès d'enfants. Certains sont autistes alors que d'autres présentent un développement typique ou un retard de développement. Certains utilisent comme instruments de mesure des tâches cognitives, de l'observation comportementale, des questionnaires ou même de l'imagerie cérébrale... Il existe autant de méthodologies que de questions de recherche dans le domaine des neurosciences de l'autisme ! L'équipe de recherche doit aussi considérer les enjeux éthiques lors de l'élaboration de son plan de recherche afin d'y faire prévaloir le respect et la dignité des participants. Un article paraîtra à ce sujet dans le prochain volume du magazine.

2

Planning

Researchers must then plan which methods they will use to address their research question or hypothesis : What are the characteristics of the population of interest ? Which research methods will be used ? Which measurement instruments will be administered ? Our group uses a wide array of research methodologies. Some projects will look at adults whilst others are conducted with children. Some subjects are autistic, whilst others may be typically developing or display developmental delays. Some use cognitive tasks as measurement tools, whilst others may rely on behavioral observations, questionnaires or even brain scans... When studying the neuroscience of autism, there are as many methods as there are research questions ! The researcher must also consider ethical issues when developing a research plan, in order to ensure the respect and dignity of all participants. This topic will be addressed in another article as part of our next issue.

La collecte de données.

Enfin, l'équipe de recherche met son plan de recherche à exécution! Les participants sont recrutés pour le projet et participent à différentes tâches, selon les instruments de mesure choisis à l'étape précédente. Les données des projets du Groupe sont souvent collectées à l'Hôpital en santé mentale Rivière-des-Prairies, dans les garderies ou dans les écoles. Les données recueillies pour chacun des participants sont par la suite colligées dans un logiciel: c'est ce qu'on appelle l'entrée de données. La plupart du temps, pour ces tâches, le chercheur est aidé par des étudiants ou des assistants de recherche

Les résultats

Des analyses statistiques sont réalisées à partir des données collectées. Les résultats des analyses permettent au chercheur et à son équipe de répondre à leur question de recherche en vérifiant ou en infirmant leurs hypothèses. Ensuite, le chercheur, toujours avec l'aide de son équipe, interprète ses résultats, c'est-à-dire qu'il tente de donner une signification à ses résultats en se basant sur des études antérieures et connexes à son sujet de recherche. Le chercheur doit aussi tenir compte des limites de son étude. Il propose finalement d'autres idées de projets de recherche futurs.

La diffusion

L'équipe de recherche diffuse les résultats de son étude à la communauté scientifique par diverses méthodes de communication: présentation dans des congrès scientifiques, conférences dans des universités, publication d'un article dans une revue scientifique, etc. L'équipe peut aussi parfois être amenée à communiquer les résultats de son étude à des professionnels, qui pourront appliquer ces connaissances dans leur domaine de pratique afin de l'améliorer. En lisant ce magazine de vulgarisation scientifique, vous faites partie des finalités du processus de recherche! Le but du magazine *Sur le spectre* est de rendre plus accessibles les résultats de la recherche en autisme en dehors de la communauté scientifique.

Étape
Step

3

Data collection

This is the part where researchers put their research plan to action! Participants are recruited for the project and take part in different tasks, depending on which measurement tools the researcher selected in the previous step. Our research group often collects data at Rivière-des-Prairies Mental Health Hospital, in daycares, and in schools. Once data has been collected from all participants, it is then compiled with the help of specialized software. We call this process data entry. Researchers will often seek out help from students or research assistants for these tasks.

4

Results

Statistical analyses are conducted on the collected data. The results of these analyses will help a researcher to answer their research question or verify their hypothesis. Then, researchers interpret their results, meaning they try to attribute meaning to the results by referring to previous and related studies conducted on the topic of interest. Researchers must also take into account any limitations to their study. Finally, they suggest ideas for future research projects.

5

X Vous êtes ici!
You are here!

Dissemination

Statistical analyses are conducted on the collected data. The results of these analyses will help a researcher to answer their research question or verify their hypothesis. Then, researchers interpret their results, meaning they try to attribute meaning to the results by referring to previous and related studies conducted on the topic of interest. Researchers must also take into account any limitations to their study. Finally, they suggest ideas for future research projects.



**Référence principale/
Main references:**
Fortin, Marie-Fabienne. (2010). *Fondements et étapes du processus de recherche: Méthodes quantitatives et qualitatives* (2^e éd.). Montréal, Canada: Chenelière Éducation.