



Sur le

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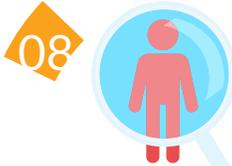
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The Montreal Cognitive Neuroscience Autism Research Group



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of autism:
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of multiple genes



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RÉSEAU NATIONAL
D'EXPERTISE
EN TROUBLE
DU SPECTRE DE
L'AUTISME

Université 
de Montréal

CHAIRE DE RECHERCHE MARCEL ET ROLANDE GOSSELIN
EN NEUROSCIENCES COGNITIVES FONDAMENTALES
ET APPLIQUÉES DU SPECTRE AUTISTIQUE



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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 :

The effect of science on the COVID-19 crisis.

This new issue of Sur le Spectre is brought to you in very peculiar times. I am therefore exceptionally joined by Laurent Mottron, in order to comment briefly on the effect of the COVID-19 crisis on science, but also the effect of science on this crisis.

Firstly, this crisis has caused most autism research projects to come to a halt, whilst propelling COVID-19 research to the forefront at unprecedented speed. Many administrative barriers have been abandoned, all coronavirus research initiatives have found financial support, and recruitment for studies has been supported by government publications urging those affected by the crisis to participate in research. Though it will not be possible to maintain all of these adjustments following the crisis, we nevertheless hope they will bring about some serious reflection on the utility of certain procedures in research.

It is also extremely interesting to think about the central role science plays in this crisis. More specifically, how effective science communication to politicians and the general population has been a key element in managing the pandemic. Scientists have done a phenomenal job in providing the government with clear data and recommendations to limit transmission, whilst illustrating this information in an accessible way for the public. The now-viral "Flatten the curve" initiative comes to mind. Let us hope that this general interest in science will persist and that researchers will continue to come up with innovative ways to communicate their results effectively.

Another important lesson to be learned from this situation is that in cases where decisions have to be made around public health issues that affect us all, it is crucial that we unanimously follow evidence-based guidelines. Diversity of ideas and academic freedom to make and contradict hypotheses must temporarily adjust, so that coherent measures can be taken by an entire group. This same reasoning applies to mandatory vaccinations, and may one day be relevant once more as the planet decides how to address climate change.

In these extreme times, we are reminded of the importance of scientific communication for all of our health and well-being. *Sur le Spectre* will therefore continue in its mission to communicate results from the latest research in autism, with renewed support from the Fondation les Petits Trésors, Réseau National pour l'expertise en TSA, chaire de recherche Marcel et Rolande Gosselin en neurosciences cognitives fondamentales et appliquées du spectre de l'autisme, and all collaborators who contribute to writing or editing articles.

Happy reading! 



Valérie Courchesne
Ph.D.

Chief editor



Laurent Mottron
MD, Ph.D.

It is also extremely interesting to think about the central role science plays in this crisis.

beyond this group of clearly identified genes, most other mutations are only observed in a very small number of individuals.





The genetics of autism:

contributions of multiple genes

By ÉLISE DOUARD & GUILLAUME HUGUET

Although the causes of autism are still not well understood, we do know that genetics play a large role. Indeed, research shows that if you had an identical twin who was autistic, you would have a 70 to 90% chance of also being autistic. This would indicate that genetics contribute 70 to 90% of causality in autism.

Picture your DNA as an encyclopedia made up of 46 volumes : your chromosomes. Then, within these 46 volumes, over 27,000 paragraphs : your genes. One or more of these paragraphs or genes may be partially or completely modified, and in such cases we refer to a *mutation* of the gene(s).

The simplest scenario involves a mutation of a single gene which explains a person's autism symptoms. This is the case in a mutation of the FMR1 gene on the X chromosome, which causes Fragile X Syndrome. This mutation is associated with intellectual disability and atypical facial features, and also with autistic signs in about 50% of cases. Therefore, there are some cases in which autism can be explained by a mutation in a single gene, such as FMR1, making the cause very clear. However, this is only the case for a small portion of the autistic population.

In most autistic people, we tend to find mutations of many genes at the same time. This combination of altered genes contribute to an autism diagnosis. We see this on alterations of a small portion of chromosome 16, in the 16p11.2 region, which affects 31 different genes. Almost as though a page containing 31 paragraphs was torn out or duplicated in one of our encyclopedia volumes! This mutation is associated with autism in 20% of cases, but has also been linked to intellectual disability and schizophrenia.

Studies have currently identified only about a hundred genes which can contribute to an autism diagnosis. This

isn't much when you consider our total of 27,000 genes! However, as previously mentioned, modifying these genes does not always lead to autism. People with the same mutation could develop psychiatric disorders and/or autism, but not always.

It is also important to consider that, beyond this group of clearly identified genes, most other mutations are only observed in a very small number of individuals. Despite the scientific community's efforts, the precise effect of these mutations remains unknown.

A team led by Dr. Sébastien Jacquemont, physician and geneticist at Sainte-Justine Pediatric University Hospital Center (Montreal, Canada), has recently published studies interested in developing new tools to estimate the effects of these mutations. In other terms, they produced a technique allowing them to estimate the overall contribution of a mutation on autism diagnosis. They estimated that, of our 27,000 genes, around 40% can increase risk for autism when presenting with a mutation. This would support the hypothesis that a large proportion of genes are involved in autism and that a complex combination of several genetic mutations would explain the condition. From these results, an online clinical tool (<https://cnvprediction.urca.ca/>) was developed to assist clinicians in giving a probability estimate for autism given a certain mutation.

In conclusion, though it is clear that autism is largely explained by genetics, in the majority of cases we do not find any mutations to the hundred or so genes which have been clearly identified. Mutations to a single gene, as is the case in Fragile X, are even rarer. Autism is therefore due to a combination of mutations to several genes, but we cannot yet precisely define what effect this has. New tools are necessary to study this phenomenon. 🌸

Autism is therefore due to a combination of mutations to several genes

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Those without intellectual disabilities seem particularly prone to falling through the cracks of service provision.

Transitioning to adulthood : challenges and first steps

By AUDREY MURRAY and ALEXA MEILLEUR

For many young adults, transitioning to adulthood is a difficult task. This transition can be even more complex and involve additional difficulties for young adults on the autism spectrum. Whether one wishes to undertake postsecondary education, find work or move into an apartment, transitioning to adulthood requires higher levels of autonomy. Unfortunately, few services currently exist to support young autistic adults during this transition. Those without intellectual disabilities seem particularly prone to falling through the cracks of service provision. Although these young adults have high potential, they are more likely to drop out of school and find themselves in unstable professional situations. What can we do to better

support young autistic adults as they gain their independence?

This is the question a McGill University research team, led by Aparna Nadig and Tara Flanagan, had in mind when developing a transition support program for autistic people on their way to autonomy (*McGill Transition Support Program*). In 2018, they published a promising study evaluating the program's efficacy. The program's sessions targeted three key domains: social communication, **self-determination** and collaboration. The team was also interested in whether the program had any effect on quality of life, self-determination, and social problem-solving skills in their participants.



An Innovative Program

Participants in the program took part in one 2-hour session a week, for a total of 10 weeks. Two graduate students facilitated these sessions, each made up of 4 to 6 people.

The novel aspect of the *McGill support program* is that content is largely determined based on the needs expressed by participants during the first session. Of 15 available modules, each group was able to pick 9 modules from the curriculum depending on their interests (see table).

Table: The 15 curriculum modules of the McGill Transition Support Program

Social Communication	Self-Determination	Working with Others
Initiating	Preferences, Interests, and Strengths	Knowing your Context
Listening	Problem-Solving	What makes Good Partners
Making an Impression	Self-Advocacy	Preventing and Resolving Conflict
Perspective Taking	Self-Regulation	Getting the Bigger Picture
Non-Verbal Communication	Choice-Making	Teamwork

“Guiding principles of the McGill Transition Support Program sessions : encourage self-assertion, value each individual’s strengths and interests, create a safe space for sharing, etc...”

A rigorous study

In order to evaluate the program’s efficacy, 34 autistic adults (aged 18 to 32) with no intellectual disability participated in a **Randomised Controlled Trial (RCT)**. An RCT involves randomly splitting the group of participants, with half of the group participating in the 10-week intervention program (“active” participants). Meanwhile, the other half of participants were put on a waiting list to receive the program (“passive” participants). This allowed researchers to compare program effects between “active” and “passive” participants. The waiting list condition meant that the “passive” participants were also able to take part in the 10-week program, following the first cohort.

The team measured quality of life, self-determination skills and social problem-solving skills before and after the program’s 10 sessions. Researchers administered self-reported questionnaires to participants, meaning

that participants reported their own impressions following the program. Contrary to other similar studies, this research took into account autistic participants’ opinions in evaluating the program. Whilst family members were able to report their observations, autistic adults were considered the experts on their own impressions and learning. Finally, in order to measure social problem-solving skills, participants completed a task, which consisted of reading social situation scenarios representing daily life, and having to answer questions on these vignettes.

Promising Results

The results of this study revealed that “active” participants having taken part in the 10 sessions of the *McGill Transition Support Program* reported improved self-determination skills and higher perceived quality of life following program participation, when compared to “passive” participants. These results were also reported by family members who evaluated the program’s efficacy.

Contrary to other similar studies, this research took into account autistic participants’ opinions in evaluating the program.

Self-determination

Being self-determined involves feeling in control of one’s life, and able to undertake concrete actions to improve one’s quality of life. A self-determined person can make decisions according to his or her own interests and personal values.

Original article:

Nadig, A., Flanagan, T., White, K., & Bhatnagar, S. (2018). Results of a RCT on a Transition Support Program for Adults with ASD: Effects on Self-Determination and Quality of Life. *Autism Research*, 11(12), 1712-1728.

Another interesting finding was that, one year after participating in the program, positive effects were still present in some of the participants.

Randomised Controlled Trial (RCT)

An RCT is a type of study used to determine whether an intervention is effective. In these studies, two groups of participants are randomly formed. One of these groups receives the intervention (intervention group) and one does not (control group). These two groups are then compared in order to determine if the intervention was effective.

It is notable that, contrary to what the research team expected, no improvement was found for the social problem solving task. Researchers mention that the absence of results in this case could be explained by the fact that the program did not specifically address social problem solving, for example through role-play.

Another interesting finding was that, one year after participating in the program, positive effects were

still present in some of the participants. Of six participants having filled out the follow-up questionnaires, two reported increased/maintained self-determination, and three reported maintained quality of life. Although this study recruited a small number of participants, it is encouraging to see that a short training program targeting the needs of young autistic adults can improve factors considered essential in transitioning into adulthood, whilst respecting their autonomy and independence. 🌱



Audrey-Ann Cholette

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Siblings Wanted

We are recruiting siblings of autistic people aged 14+ to participate in a study!

This project aims to better understand the experience of growing up with an autistic sibling. This research will provide recommendations to improve current services in order to better meet the specific needs of siblings of autistic people.

WHAT? Fill out an anonymous online questionnaire.

COMPENSATION: We will be drawing 10 \$25 gift cards amongst participants

DURATION: 15 minutes

To participate, here is the link to the questionnaire!
<https://sondages.uqo.ca/index.php/611792?lang=fr>



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Research currently suggests that clinical expertise is more reliable in recognizing autism than diagnostic tools.

Heterogeneity Dissected

By LAURENT MOTTRON

Scientists and the general public now accept that autism is heterogenous, hence the notion of an *autism spectrum*. A person's language level, intelligence, severity of disability when present and medical and psychiatric conditions can all vary almost infinitely. Is this heterogeneity scientific fact, or does it simply speak to our inability to precisely identify the boundaries of autism?

In an article accepted in *Molecular Psychiatry*, we undertook an extensive investigation into the mechanisms that led to the very idea of an autism spectrum, which led us to favor the second interpretation. The criteria which currently define autism allows for the diagnosis of people who no longer resemble each other. This has important consequences where research is concerned (see: Autism Research : are we losing the signal? in our previous issue), but also in terms of service provision. For example, it is not beneficial to place a child into an autism classroom, if that child will not benefit from accommodations that are helpful to autistic pupils.

It is important to mention that some "good" heterogeneity probably exists in autism. For instance, consider the difference between a young autistic child who is non-verbal, and that same child as an adult who is now verbal. There are also real differences in severity, given that some autistic people have relatively good quality of life whilst others do not, despite the same level of autism symptoms. Another source of heterogeneity exists between autistic people who speak very early, those who speak very late and those who never become verbal. These 3 groups of people can, however, be very alike in many other ways.

However, our article largely emphasizes what we consider to be "bad" heterogeneity, which results from widening diagnostic criteria. If we find certain signs which may look like autism in a neurological or

psychiatric condition, present criteria would effectively allow us to consider that the person presenting these signs is autistic. There is also an issue with clinicians diagnosing solely based on criteria and "checking boxes" such as : has few friends, follows routines etc., thereby diagnosing many more people as autistic than clinicians who *recognize* that the person before him *resembles* other autistic people they have previously met.

How can we address this situation in a way which continues to deepen our understand of autism? By considerably restricting the notion of an autism spectrum. For this, it will be necessary to reconstruct diagnostic criteria based on autistic people who present similarly and have autistic signs as recognized 70 years ago. Then, we will need to trust the expertise of clinicians who have met many autistic people. Indeed, research currently suggests that clinical expertise is more reliable in recognizing autism than diagnostic tools. Research will also have to shift its focus to autistic people as we have redefined them. We will also need to reintroduce differential diagnostic in autism criteria. For example, if a person with hyperactivity presents with social difficulties, it will first be necessary to determine whether the hyperactivity may be causing these problems, instead of diagnosing autism on top of hyperactivity. Lastly, we will maybe need to abandon the idea that "we are all a little autistic". Though there are some cases in which the line between autistic and non-autistic appears blurry, an autistic child in early life is fundamentally different from a child who is not autistic. Lastly, it would be wrong to assume that the consequence of such a movement would be a loss of services for people who lose their autism diagnosis. They will have access to services better adapted to their condition. 🌻

Article original :
Mottron, L., Bzdok, D. Autism spectrum heterogeneity: fact or artifact?. *Molecular Psychiatry* (2020). <https://doi.org/10.1038/s41380-020-0748-y>



Anxiety on the spectrum in adulthood

By KIRSTY AINSWORTH and CHLOÉE PAQUETTE-HOUDE

Mental health issues are experienced by a large proportion of autistic individuals. Research suggests that around 80% of those on the spectrum meet criteria for at least one psychiatric condition at some point in their life. Anxiety, in particular, has been highlighted as one of the most common co-occurring mental health conditions in the autistic population, with 50% of adults with autism meeting criteria for an anxiety disorder diagnosis. These figures are striking given that only 18% of the general population will meet criteria for anxiety.

Anxiety in autism is complex, and likely affected by differences in social cognition. This link is bidirectional, meaning that differences with social cognition can impact anxiety levels in autistic people, and in turn anxiety levels can have an effect on social cognition. Research suggests that although anxiety is not a fundamental part of autism, the anxiety symptoms present in autistic individuals may be different from non-autistic individuals. Hence, there is not only an unusually high *prevalence* but also an unusual *presentation* of anxiety in the autistic population. If the

manifestation of anxiety itself presents differently on the spectrum, how can we ensure that autistic individuals are being sufficiently supported to help reduce feelings of anxiety? In order to address this, it is important that we explore the way in which anxiety is treated. The research project reported here gathered information from mental health practitioners on their experiences of treating anxiety in their autistic clients.

We interviewed eight general mental health practitioners currently working with adults with autism and anxiety. The interviews explored the barriers that may prevent anxiety treatment from being as effective when working with autistic clients. Using what is called a *thematic analysis*, researchers were able to identify several key themes from the interviews.

Practitioners consistently mentioned adapting their 'usual' practice for anxiety to better suit autistic individuals. These modifications took many forms, including a greater focus on emotional learning, greater emphasis on concrete behavioural aspects of standardized therapy, and altering the structure of

There is not only an unusually high prevalence but also an unusual presentation of anxiety in the autistic population.

Original Paper:

Ainsworth, K., Robertson, A. E., Welsh, H., Day, M., Watt, J., Barry, F., Stanfield, A. & Melville, C. (2020). Anxiety in adults with autism: Perspectives from practitioners. *Research in Autism Spectrum Disorders*, 69, 101457.

Another major theme present in the data was: difficulty with the use of standardized anxiety measures in autistic clients.

sessions. Despite this, practitioners noted that modifications were developed in a somewhat independent, spontaneous fashion that generally required instinctive thinking. However, these instincts depended largely on the practitioner's experiences and thus could vary widely from one practitioner to another. In addition to this, these interviews reflected the experiences of *general* mental health professionals (not autism experts), thus, adaptations lead by intuition may be largely based on experiences with non-autistics.

Another major theme present in the data was: difficulty with the use of standardized anxiety measures in autistic clients. Practitioners recognized that current anxiety measures did not accurately reflect anxiety

levels in their autistic clients, especially when their clients had developed ways to compensate for their difficulties. These compensatory strategies could outwardly make an autistic person look more functional than they actually are. Overall, practitioners described either using the measures, but finding them unsuitable for autistic adults, or not using them at all. Hence, the ability to measure the efficacy of psychological therapy for anxiety in autistic individuals may be compromised. To conclude, further research is needed regarding anxiety in autism, both for its better characterization and measure, but also to develop treatments and guidelines for clinicians that would be specific to autism. 



Sylvie Lauzon
Executive director
Fondation les petits trésors

Research in healing



Though research may at times seem abstract to us, it has consistently managed to answer questions which seemed impossible just moments before. Research ultimately leads to better care, and sometimes cure. This knowledge allows the scientific and medical community to develop new treatments, new therapies and new tools. For example, thanks to research, the vast majority of children with leukemia recover, whereas just over 50 years ago, more than half of them would die.

The Petits Trésors Foundation is very proud to support the publication of Sur le Spectre magazine. The magazine discusses current projects and trends in autism research, but above all it makes this accessible. Valérie Courchesne and her team turn their research into fascinating stories!

Over the years, the Montreal Cognitive Neuroscience of Autism Research Group, which Valérie is a part of, has developed an approach that focuses on developing the strengths of autistic children and adolescents. This difference in perspective and new understanding of how the brain works is very positive because it allows us, parents of young people with autism, to see beyond the barriers inherent in autism. We contemplate possibilities rather than walls.

Of course, walls we have encountered and walls there will be more of. But to better understand the minds of our autistic children, focussing not only what is difficult, but what can be developed, makes all the difference.

This difference feels like a breath of fresh air during difficult moments.

Wishing you all the best with this new issue!



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INTERVIEW SUR LE SPECTRE

ANNE-MARIE NADER, occupational therapist, neuropsychologist and postdoctoral trainee.
Interviewed by **CAMILLE LETENDRE**.



The many faces of autism research

Over the magazine's following issues, we will be profiling members and collaborators of the Montreal Autism and Cognitive Neuroscience research group. These brief interviews will shed some light on the many researchers, professionals and students who contribute to autism research, and highlight their unique career paths, projects and commitment to the field.

Biography

Anne-Marie originally trained as an occupational therapist at the University of Montreal, and has extensive clinical experience practicing occupational therapy. For many years, she led a practice within the CISSS Montérégie-Ouest's Complex Developmental Disorders Clinic, specifically working with autistic teenagers and children. She also practiced at the Douglas Institute, in the field of youth mental health.

Anne-Marie's fascination with the brain and cognitive functioning in autistic people then led her to a doctoral

program in neuropsychology at the Université du Québec à Montréal, supervised by Isabelle Soulières, PhD, and Armando Bertone, PhD. Her doctoral thesis, which she defended this January, explored learning and categorization processes in autistic children. Anne-Marie's work revealed that autistic children do not benefit from the same type of help as non-autistic children do when learning new information. During her doctoral program, Anne-Marie welcomed two daughters. She still combines her clinical practice with research and teaching. Anne-Marie's passions include travelling and the outdoors!



Anne-Marie Nader
occupational therapist,
neuropsychologist
and postdoctoral trainee



What I find interesting with the autistic population is that we are moving away from focusing on weaknesses, and moving towards strengths and how these can be used as springboards to optimize functioning in different individuals.

Anne-Marie, what drew you to autism research?

My doctoral thesis project actually came to me within the context of my clinical work as an occupational therapist. The time I spent observing how autistic children react in different situations made me want to better understand how they learn. I was finding that our tendency to simplify all information and environments as much as possible did not always seem helpful for autistic children. On the contrary, many of these children appeared to prefer being given wider access to learning material. I wanted to support learning in autistic children, while exploring strength-based ways of doing this.

What do you think are the important clinical takeaways from your work?

My thesis results suggested that autistic children are more sensitive than typical children to the way in which learning material is presented and how they receive feedback during learning. This can have an important impact on how we implement interventions. Autistic children seem to benefit from being presented with all necessary information in an organized way, and from having access to a wide range of information (for example, many items from the same category presented together). Children also seem to benefit from being able to manipulate, categorize and organize their learning material.

Therefore, it may be interesting if in certain contexts we moved away from focusing on very specific elements, and tried off the bat to demonstrate different ways of learning the concept in question (for example, different versions of the same emotion, different breeds of dogs to understand the concept of dog), and applied this to different types of learning (social, language, sensory, academic etc.). The main takeaway is that there are many ways to reach the same goal, and I think it then becomes of the utmost importance to understand how autistic children function if we want to provide them with optimal learning environments.

Which aspects of being a researcher do you enjoy most?

Research careers offer a wide range of possibilities and a variety of activities, which I enjoy. In research, we apply rigorous standards, innovation and creativity to a topic we are passionate about. I also appreciate the teamwork involved and this has always been at the center of my practice. Research allows me to work closely with other colleagues to achieve a common goal, whilst sharing in the expertise and experience of every member of the team. I also have a particular interest in clinical research, where I promote regular communication between autistic people, families, clinical practice and research. The projects I work on are always influenced by my clinical practice. What I find interesting with the autistic population is that we are moving away from focusing on weaknesses, and moving towards strengths and how these can be used as springboards to optimize functioning in different individuals.

Which autism research projects are you currently working on?

I have started a postdoctoral placement within Université de Montréal's Psychiatry Department, with the goal of bridging the gap between developmental differences in autism and their functional use. I am therefore investigating the well-being and quality of life of autistic adults living in residential services (supervisors: Dr. Roger Godbout, Ph. D. and Baudouin Forgeot D'Arc, M.D., Ph. D.). My role involves developing and implementing a research project to evaluate the impact of a novel housing model on quality of life in autistic adults, in collaboration with the Véro & Louis Foundation and the CISSS Montérégie Ouest. The idea behind this project is to use what we know about the characteristics of autism to build a living environment which corresponds to residents' needs (e.g. architecture and adapted spaces, activities corresponding to different profiles etc.). I am also working on a longitudinal project seeking to better understand the emergence of mental health problems in autistic youths. Lastly, I am working with the Côte-du-Sud School Board to develop tools for autistic children to manage their emotions and anxiety within a school context. All in all, lots to feel motivated about! 



Five Frequent Myths about Autism

By NOÉMIE CUSSON and DOMINIQUE GIRARD

1. Autistic people are unable to identify and express their emotions.

A first myth about autism is that autistic people have difficulties in identifying and expressing their emotions. Having difficulties to identify, express and recognise one's own emotions or others' is a condition named alexithymia. A recent meta-analysis¹ on alexithymia in autism showed that 50% of autistic people are alexithymic as compared to only 5% of neurotypical people. Although half of autistic people are alexithymic, this study also shows that about 50% of them have no problem processing their emotions. Moreover, alexithymia is not only linked to autism. It is indeed associated with other conditions, such as eating disorders and schizophrenia and even people without any diagnosis can be alexithymic.

2. Autistic people have exceptional skills in a specific field.

Several movies and TV series staging an autistic person link autism to outstanding skills. Such a belief is well illustrated in the movie « Rain Man », where an autistic man, Raymond Babbitt, has an exceptional memory. However, exceptional skills among autistic people are not always as impressive. In fact, autistic people skills are generally defined as a difference between a person's performance in a specific field

and his/her overall level of functioning. Moreover, not all autistic people have exceptional skills. A study with 254 autistic participants² showed that 63% of them had at least one skill, most often related to memory, significantly above their level of ability in other fields. Also, exceptional skills can be found among people with conditions other than autism and among neurotypical people. In short, all autistic people do not have exceptional skills and all those who have exceptional skills are not necessarily autistic. Furthermore, although having a skill in a specific field is frequently found in autism, that skill is not always « exceptional ».

3. Autistic people have no interest in developing relationships with other people and in making friends.

Since social and communication difficulties are associated with autism, it is commonly believed that autistic people are not interested in developing relationships with other people. This is usually not the case. A meta-analysis³ focusing on friendship among school-age children published in 2016 showed that there are more similarities than differences between autistic and neurotypical children regarding friendship. Contrary to the common belief that autistic children have no friends, this study shows that most

although having a skill in a specific field is frequently found in autism, that skill is not always « exceptional ».



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of them have at least one friend. It also shows that autistic people are willing to make friends and that they have the capacity to develop mutual friendships. However, autistic people seem to have fewer friends than neurotypical people and what they expect from a friendship, as well as the way they express it, may differ from neurotypical people.

4. All autistic people want to work in the field of computer sciences.

Autistic people's minds are often compared to a computer. Like computers, autistic people are often described as having an "all or nothing" way of thinking. Moreover, two abilities often linked to autism, paying close attention to details and the capacity to recognise patterns, are widely sought for in programming. Thus, some people may think that autistic people naturally have an interest in computer sciences. But this is not the case. A study on autistic university students' career interests⁴ showed that their career goals were similar to those of neurotypical students. In order to analyse the participants' career interests, an adapted version of the Holland career interests' inventory was used. That tool classifies a person's career interests according to six main categories. While that study showed that fewer autistic people were interested in enterprising careers, which are associated with jobs linked to entrepreneurship and politics, no other significant difference between autistic people and neurotypical people was found. Thereby, autistic students show as much interest in social or artistic jobs as non-autistic students. Thus, the career goals and interests of autistic people are far from being limited to computer sciences.

5. Autistic people are unable to look into other people's eyes.

In fact, autistic people can make eye contact with other people, but usually don't do it on their own initiative. Several theories were proposed to explain that behaviour. One is the hyperarousal model. According to this theory, eyes are unpleasant stimuli for autistic people, which leads them to avoid eye contact. Eye contact would therefore be perceived negatively by autistic people because they link it to a feeling of stress. Another theory is the hypoarousal model. According to this theory, autistic people do

not look into other people's eyes because they do not attach a positive value to eye contact. Therefore, autistic people would not seek to avoid eye contact; their attention is simply not drawn spontaneously towards other people's eyes. In comparison, neurotypical people's attention would be attracted by faces and they would experience eye contact in a positive way. In 2017, a study⁵ investigated how autistic people experience eye contact. For some autistic people, eye contact was linked to negative emotional and physiological reactions or was felt as intrusive and uncomfortable. It was also described by some as being unnatural and awkward. Besides, several autistic people felt it was difficult to maintain eye contact while listening to what the other person was telling them. Thus, it is not because an autistic person does not look into the speaker's eyes that he/she is not listening. Finally, nonverbal communication was also examined. Several autistic people had difficulty understanding the emotional information conveyed by the eyes. Therefore, autistic people can look into someone's eyes, but do not do it systematically, contrary to neurotypical people.

In conclusion, several myths about autism are conveyed within our society in different areas such as emotions, exceptional skills, friendship, career interests and eye contact. All these myths can have a real impact on the way people perceive autism and interact with autistic people. For example, if people believe that autistic people have no interest in making friends, this may lead neurotypical people to offer them fewer opportunities to develop new social relationships or to consider that their friendly relationships are not « true » friendly relationships. Similarly, believing that all autistic people want to have a job in computer sciences can make it such that companies promoting autistic people's employment may exclusively offer job opportunities in that field. Therefore, although we hear more and more about autism in our society, it is still important to continue fighting the stigmatization associated with this condition through education and by raising awareness about autism! 🌸