



**HAL**  
open science

## Thinking in pictures in autism spectrum disorder

Clara Bled, Isabelle Soulieres, Lucie Bouvet

► **To cite this version:**

Clara Bled, Isabelle Soulieres, Lucie Bouvet. Thinking in pictures in autism spectrum disorder. International Society for Autism Research, May 2019, Montréal, Canada. hal-03130527

**HAL Id: hal-03130527**

**<https://hal.science/hal-03130527v1>**

Submitted on 3 Feb 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Thinking in pictures in autism spectrum disorder



C. BLED\*, I. SOULIERES\*\*, L. BOUVET\*

\*Université Toulouse Jean Jaurès, Laboratoire CERPPS-E.A. 7411, Toulouse, France.  
\*\* Psychology Department, Université du Québec à Montréal, C.P. 8888 succursale Centre-ville, Montreal, H3C 3P8, Canada.

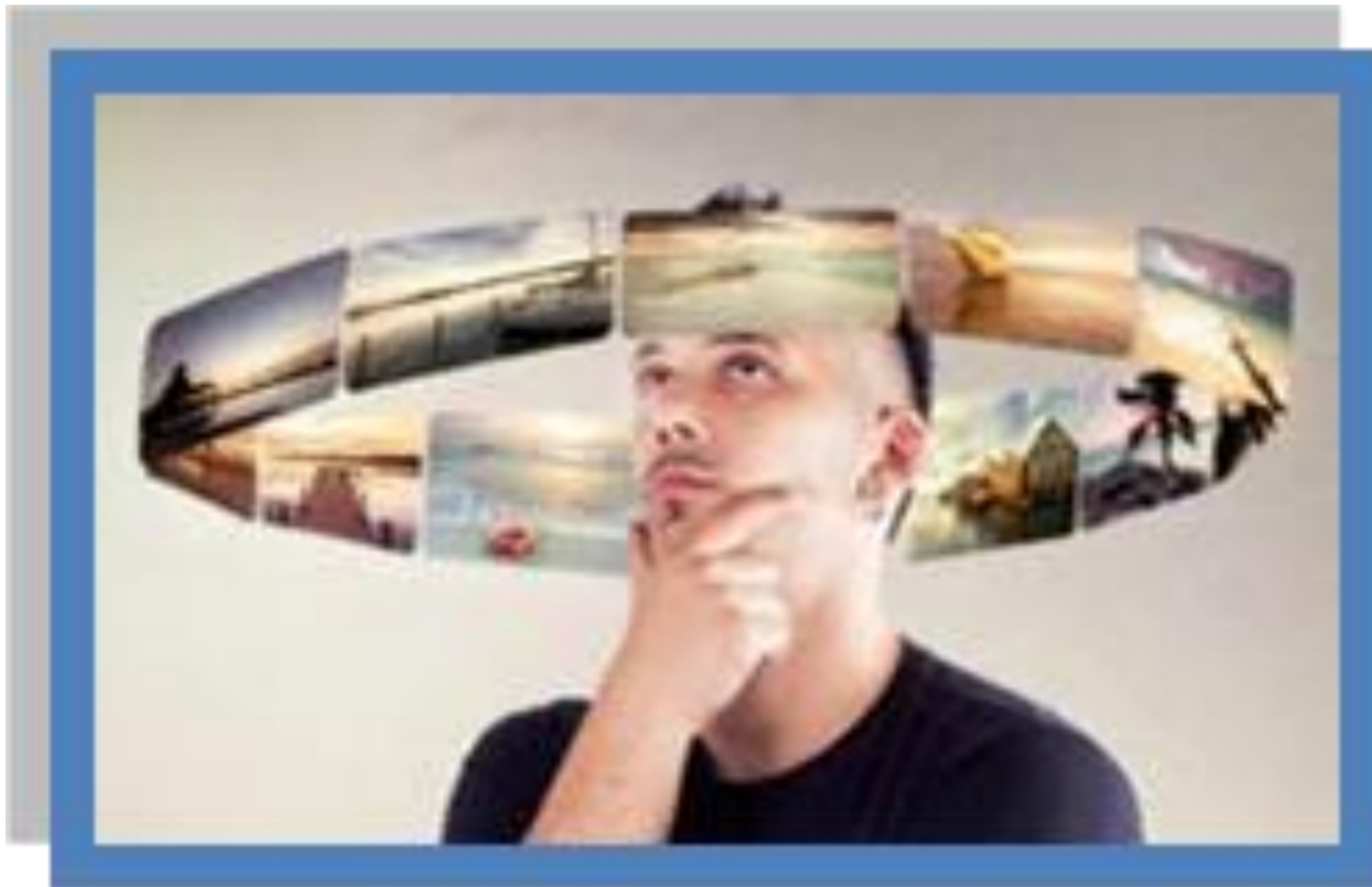


CONTACT: lucie.bouvet@univ-tlse2.fr

## BACKGROUND

Individuals with Autism Spectrum Disorder (ASD) show **abilities in tasks requiring mental imagery (e.g., mental rotation task ; Soulières et al., 2011)**. Furthermore, according to personal reports, some of them would possess a specific visual cognitive style (Grandin, 2010)

→ **Objectives:** Assess the presence of a **visual cognitive style** in autistic individuals and verify whether this visual cognitive style is related to the **sensory atypicalities** present in ASD.



## METHOD

### Participants

- **39 adults with ASD** (age range 18 to 62, mean = 33.5, SD = 10.6)
- **104 comparison participants** (age range 18 to 69, mean = 37.0, SD = 12.7)

Groups are matched on age ( $p = .184$ ), education levels ( $p = .089$ ) and gender (73.1 % of women in the control group, 71.8 % in the ASD group,  $p = .878$ ).

### Protocol

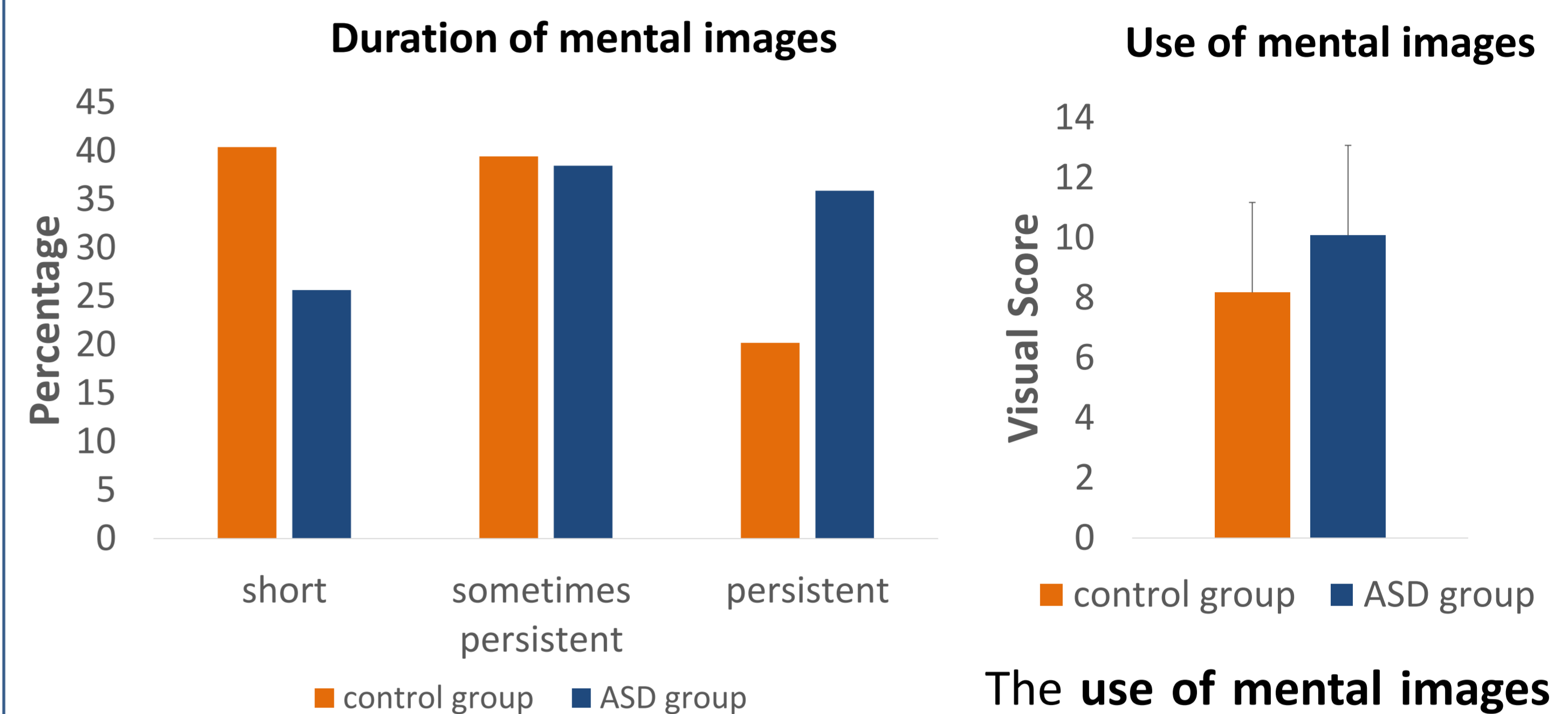
An online questionnaire containing 66 items:

- ✓ **Attention to details:** 6 items from the Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001).
- ✓ **Adolescent/Adult Sensory Profile** (AASP; Brown & Dunn, 2002): 42 items including sensory sensitivity.
- ✓ **Mental imagery quality:** 6 items concerning the colors, level of details, duration, level of abstraction, movements and manipulation of mental images.
- ✓ **Mental imagery use in daily situation:**
  - **Questionnaire :** Participants indicated whether they use images only, words only or both images and words in seven different situations: recollection, problem solving, anticipation, decision making, planning, comprehension and memorization. The **visual score** corresponds to the importance of use of mental images among these different situations.
  - **Two open questions :** "Describe what comes to your mind when you hear the name of a city you've already been to".

## RESULTS

The **attention to details score** and the **sensory sensitivity score** are significantly more important in participants with ASD than in controls ( $p < .005$ ).

### Mental imagery quality and use



**Mental images** appear to be more **persistent** in participants with ASD than in controls ( $p = .052$ ).

The **use of mental images is reported more frequently** in participants with ASD than in controls ( $p < .001$ ).

### Qualitative analysis

A **hierarchical descending classification** of lexical classes was performed on the open question's responses.

When describing their experiences :

⇒ **Control participants** tend to use the lexical field of **MEMORIES** "the cities will stand out more for the encounters and experiences in these cities, so the memories and sensations more than the city itself"

⇒ **Participants with ASD** tend to use the **VISUAL** lexical field "An overall plan of an emblematic place (the Capitol Square), the overall architecture and the shape of the buildings. An often impersonal point of view, a bit like a postcard's image".

### Correlations

There are correlations between the **use of images, sensory sensitivity** and **attention to details** only in participants with ASD.

Matrix of correlations among visual scores and attention to detail and sensory sensitivity in autistic and non-autistics participants.

	1	2	3
<b>Control group (n = 104)</b>			
1. Attention to detail		.17	.45**
2. Visual score			.18
3. Sensory sensitivity			
<b>ASD group (n = 39)</b>			
1. Attention to detail		.35*	.67**
2. Visual score			.37*
3. Sensory sensitivity			

\* .01 <  $p$  < .05

\*\*  $p < .01$

## CONCLUSION

Our results support the existence of a **visual cognitive style** in ASD individuals with the frequent and persistent use of **mental images**. This visual cognitive style is related to the **sensory atypicalities** present in individuals with ASD. These results question the impact of this particular cognitive style on the daily life of these individuals, especially in terms of learning and attention.

### REFERENCES:

- Baron-Cohen, S. et al. (2001). The autism-spectrum quotient (AQ): Evidence from Asperger syndrome/high-functioning autism, males and females, scientists and mathematicians. *Journal of autism and developmental disorders*, 31(1), 5-17.
- Brown, C., & Dunn, W. (2002). *Adolescent-adult sensory profile: user's manual*. San Antonio: Therapy Skill Builders.
- Grandin, T. (2010). How does visual thinking work in the mind of a person with autism? A personal account. *Autism and talent*, 141-149.
- Soulières, I., Zeffiro, T. A., Girard, M. L., & Mottron, L. (2011). Enhanced mental image mapping in autism. *Neuropsychologia*, 49(5), 848-857.