Background
- Clarification of phenotypic variability in ASD is crucial for improvement of diagnostic assessments and development of effective interventions.
- However: usefulness of the DSM-IV categories as a differentiation of individuals with ASD and a guideline for interventions remains debatable.
- Wing and Gould (1979) differentiated three social subtypes: aloof, passive and active-but-odd.

<table>
<thead>
<tr>
<th>Table 1. Social subtypes</th>
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<tbody>
<tr>
<td>Aloof</td>
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<tr>
<td>Responds to social interaction</td>
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<tr>
<td>Initiates social interaction</td>
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</tbody>
</table>

- Prior research with low-functioning children with ASD (IQ < 70) found active-but-odd children to be more intelligent and less autistic than aloof and passive children. However: intelligence could be a confounding factor in these studies.

Objective
Examination of the different social interaction styles of children with high-functioning ASD (IQ > 70) and exploring meaningful associations with several domains of functioning while controlling for level of intelligence.

Research questions
How is the social interaction style of a child with high-functioning ASD (HFASD) associated with:
1. Its severity of autistic symptoms and disruptive behavior problems?
2. Its psycho-social health?
3. Its perspective taking and executive functioning?

Participants
The sample was recruited through specialized education and included 156 participants with HFASD:
- 134 boys (86%), 22 girls (14%)
- Clinical diagnosis: autism (n = 29), Asperger’s Syndrome (n = 22), PDD-NOS (n = 105)
- Age: M = 13.4 years (SD = 3.0; range = 7.2-18.9)
- Verbal IQ: M = 105 (SD = 12.8; range = 72-152).

Measures
- Informants: P = parent; T = teacher; C = child.
- Social interaction style: Wing Subgroups Questionnaire (WSQ; Castelloe & Dawson, 1993). The WSQ (P) generates four scores for an aloof, passive, active-but-odd and typical social interaction style.
- Autism severity: Autism Diagnostic Observation Schedule (ADOS) and Social Responsiveness Scale (SRS: P)
- Disruptive problem behaviors: Disruptive Behaviors Disorders rating scale (DBD: P&T) and Strengths and Difficulties Questionnaire (SDQ: T)
- Psycho-social health: Pediatric Quality of Life Inventory (PedsQL: P&C)
- Perspective taking: advanced Theory of Mind task (C) and Interpersonal Reactivity Index (IRI: C)
- Executive functioning: Behavior Rating Inventory of Executive Function (BRIEF: P)

Analyses
- Series of multiple regression analyses
  - Step 1: control variables: age, verbal IQ and gender
  - Step 2: three social interaction styles (WSQ)
  - Step 3: fourth social interaction style (WSQ)

Results
- Active-but-odd social interaction style was positively associated with autism severity (SRS), hyperactivity (DBD), and executive functioning problems in daily life (BRIEF), and negatively associated with psycho-social health of the child (PedsQL) as reported by parents (see Table 2).

| Table 2. Active-but-odd social style predicts: β AR² Total R² |
|-----------------|---------|-------|
| SRS Total (P)   | .35 *** | .09  | .67  |
| DBD – hyperactivity (P) | .58 *** | .24  | .30  |
| DBD – hyperactivity (T) | .32 **  | .07  | .11  |
| PedsQL Total (P) | .34 *** | .08  | .19  |
| BRIEF Total (P)  | .51 *** | .19  | .28  |

β = standardized beta for the full model; AR² = unique explained variance by active-but-odd score over and above control variables and other WSQ-scores; Total R² = total explained variance by all WSQ-scores over and above control variables

Conclusions
1. In children with HFASD social interaction styles, and active-but-odd social behavior in particular, explain a significant amount of variance in autism severity, hyperactivity, executive functioning problems and psycho-social health as reported by parents.
2. Yet, social interaction styles within HFASD are unrelated to perspective taking skills and psycho-social health as reported by the children themselves.

Discussion
1. The social interaction styles of children with HFASD offer insight into the heterogeneity of ASD and appear to be a clinically relevant distinction.
2. Active-but-odd social behavior may be a potential marker in children with HFASD for increased autistic symptoms and ADHD-characteristics. Alternatively, ADHD-characteristics may moderate the expression of ASD.
3. The peculiarity of active-but-odd social behavior may lead to peer rejection, explaining parent reports of increased psycho-social problems.
4. A difficulty to inhibit impulses and regulate behavior might explain the active-but-odd social behaviors seen in some children with HFASD.

This study was funded by Nuts OHRA. Conflict of interest: None.