Students' task-solving about ecosystem services – a comparison between students with and without Autism Spectrum Disorders

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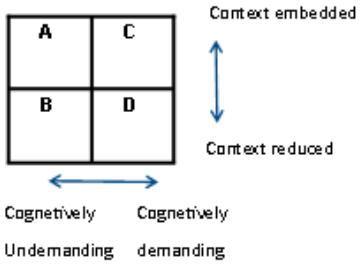
Background

There has been an increasing interest for ecosystem services in society recently, and this interest has also influenced education. In this study, the aim is to develop knowledge about how this new school-phenomenon can be understood by students in grades 7 to 9, with and without Autism Spectrum Disorder (ASD). Ecosystem services literacy aims to help inform decision-makers for a sustainable environment in the future, and by that developing students' knowledge in the field becomes crucial as the students are tomorrow's decision makers.

Aim

The aim of this study is to analyze what strategies in answering different task types (Cummins, 1984) the students use when solving four different types of tasks, from a perspective of the field-dependent-independent (FD/FI) approach (Witkin & Asch, 1948). Two different groups of students' were participating; controls and students' with ASD in grades 7 to 9.

The figure below show the categorization of task difficulties based on Cummins (1983).



Method

Four different kinds of items were designed in a test taken by the participants about eco-systems. The design of the tasks in the A and C quadrants (Cummins, 1983) requires a field independent answering strategy, while tasks in the B and D quadrants requires a field dependent approach. The use of test questions of four different types, based on Cummins' quadrat with four different categories, taken by students in two different groups has been used as a method.

The participating 16 adolescents from grades 7 to 9 (5 female and 11 male) aged 13-16 years (*M*=15, 18 years, IQ> 70) met DSM-IV criteria for HFA/AS and were in a special class included in a regular secondary school. Two control groups (*n*=23 grade 9 and 27 grade 9) with students of the same ages answered the same test.

The research questions were; (1) what kinds of strategies in the answers can be found related to the FDI approach, and (2) how do differences in strategies used in students' answers relate to the type of tasks to be solved?

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Result

The results show that the students with ASD mainly use a FI answering style regardless of task category, while students in the control groups mainly use a FI style answering context embedded tasks, but a FD style answering decontextualized tasks. The ASD group mainly uses one argument or fact to answer the questions, while the controls merge several different facts within or outside the text presented. The reported impairments in executive functions decrease the ASD students' ability to answer the more complex tasks.

Conclusions

- The results point out how students, which seem to have a field dependent (FD) learning style, tend to answer the question based not only on information given in the task, but also by contextualizing information or beliefs they have.
- Students from the ASD group on the other hand, seem to have difficulties in relating several different kinds of information in the argument.
- The findings point at a pattern of strategies used when answering the tasks. First of all, students with ASD mainly use a field independent (FI) answering style regardless of task category, which the students in the control groups also did answering context embedded tasks.
- Students in the control groups mainly used a FD style answering decontextualized tasks and some of them mix information in the text with their own assumptions, which leads to an incorrect answer.
- The ASD students' ability to answer the complex tasks, no matter which answering style is used, is decreased . They tend to answer the task by only one argument even though it ought to be a chain of arguments or different parts building up a more complex argument.

Differences in discernments between students with and without ASD result in different possibilities to understand and answer written tests.

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