FACTORIAL STRUCTURE OF TIME KNOWLEDGE AND MANAGEMENT QUESTIONNAIRES IN PRIMARY SCHOOL CHILDREN, AND THEIR RELATIONS WITH AGE AND ADHD TRAITS

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Finanziato dall'Unione europea NextGenerationEU | Ministero dell'Università e della Ricerca | Italiadomani

Theoretical Background

Time processing skills are becoming increasingly significant in the etiology of neurodevelopmental disorders, including attention deficit hyperactivity disorder (**ADHD**; Ptacek et al., 2019). Deficits in temporal processing affect various aspects of time management and orientation, which greatly impact in daily life (Grondin, 2010). To effectively investigate these complex and multifaceted constructs, especially in the primary school population, it is essential to have **standardized multi-informant tools** available to assess time perception.

Aim of the study

The aim of the present study was to investigate the **factorial structure** of a comprehensive set of time knowledge and management items in Italian primary school children, adapted from an existing questionnaire for children in Italy (**Sense of Time Questionnaire (STQ)**; Porcelli et al., 2018). Additionally, the relationship between the emerged STQ factors and the attention and hyperactivity/impulsivity scores reported by parents and teachers was investigated.

Methods

961 children (mean age = 8.35±1.41 y, 51% F), their parents, and teachers filled in the Sense of Time Questionnaire (STQ; Porcelli et al., 2018). The STQ is composed of 34 items for the children and 24 items for parents and teachers. The responses are all given on a Likert scale ranging from "never or rarely" (0) to "very often" (3). *Table 1* presents some example items from the STQ. **For a subset of 263 children**, ADHD observative scale scores (attention difficulties and hyperactivity scales) from both parents (**SDAG**) and teachers (**SDAI**) were also available (Marzocchi et al., 2021).

Table 1: Factors emerged, internal reliability of the factors and example items

Factor	Name of the factor	Cronbach's α	Example item
Child 1	General semantic knowledge about time	α = 0.662	"Can you tell me the seasons in the correct order?"
Child 2	Self-related knowledge about time	α = 0.652	"How long does it take you to brush your teeth?"
Parent 1	General and self-related knowledge about time	α = 0.891	"He/she asks about something that will happen in the future."
Parent 2	Effective management of own time	α = 0.764	"He/she has difficulty finishing activities within the given time."
Teacher 1	Effective management of own time	α = 0.928	"He/she needs extra time to finish school assignments."
Teacher 2	Self-related knowledge about time	α = 0.755	"He/she asks how much time is left to finish a task."

Results

The results from the CFA highlight **six factors (two for each informant)**, concerning **general semantic knowledge** about time and/or self-related knowledge about time (factor 1), as well as effective **management of own time** (factor 2) (*Table 1*) The fit indices of the STQ were adequate (RMSEA= 0.075; SRMR=0.094; CFI=0.930; NNFI= 0.929). *Table 2* shows correlations between latent factors measuring the same construct across different informants and with age, gender, and ADHD scores. The emerged factors correlate among informants, except for "Teacher 2" Factor. Relationships between scores and age were modest, except for children-informed factors. Hyperactivity scores were weakly related to time knowledge factors, but attention deficit scores were substantially related to effective management of own time as reported by parents and teachers (correlations between 0.50 and 0.60). Gender was virtually unrelated to any of the above-mentioned factors except hyperactivity (higher in males than in females by about half an SD).

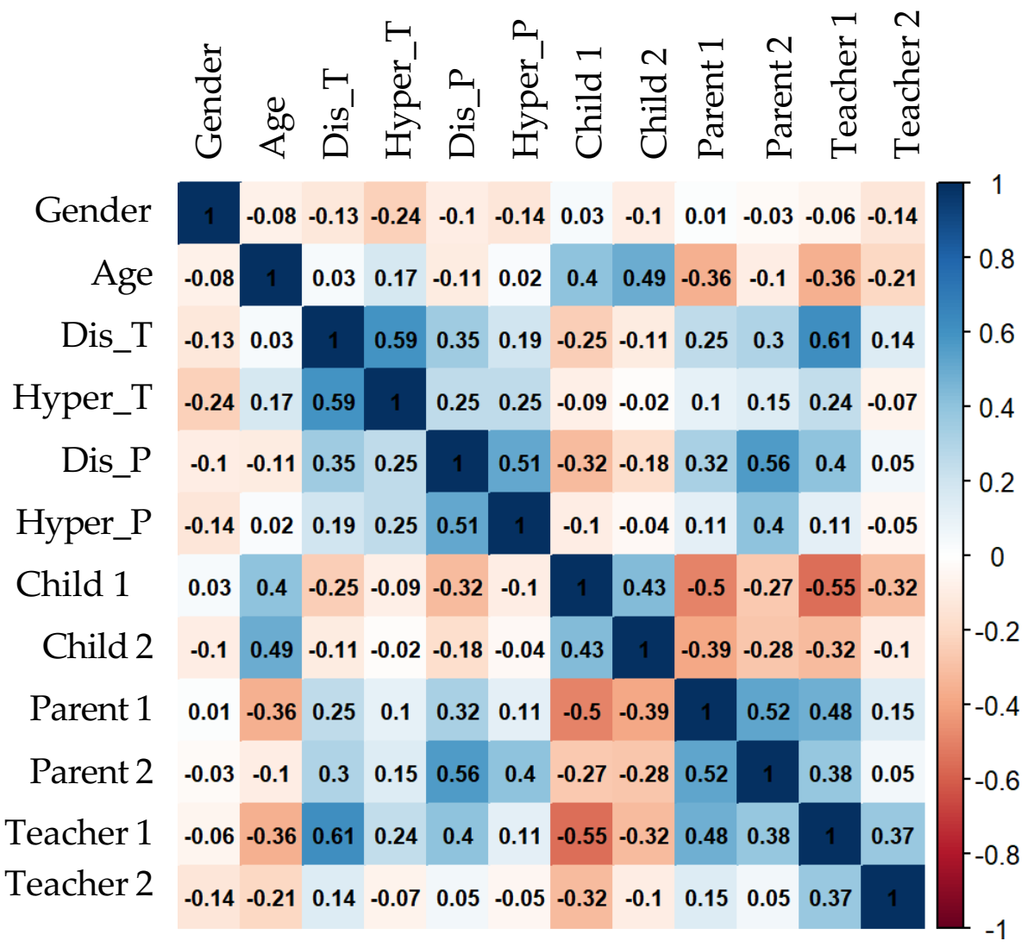

Table 2: Correlations between latent factors, age, gender and ADHD scores

Discussion and conclusions

The **STQ** shows **adequate psychometric properties** (Hu & Bentler, 1999). The **emerged factors correlate across informants**, suggesting good validity of the instrument. Relationships between time processing and age suggest a **natural improvement in general and self-related knowledge about time**, according to self-reports (Droit-Volet et al., 2013). The presence of a relationship between management of one's own time and attention deficit scores confirms the **importance of time-processing deficits in the ADHD population**. In the future, it would be beneficial to develop and enhance time management strategies to improve relationship and daily life management in children with attentional difficulties.

References

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