Detailed *Methods and Materials* Section

Detailed characteristics of participants

Most of the children came from families whose socio-cultural and socio-economic status was at the middle-high level (mothers: 10.9% had an elementary or middle school degree, 26.6% had a high school degree, 49% had a university degree, 20% were not employed, 8.2% worked in the craft sector, 49% worked in the clerical or technical sector, 14.7% worked as freelancers or managers; fathers: 14.7% had an elementary or middle school degree, 34% had a high school degree, 38.2% had a university degree, 1.9% were not employed, 12.8% worked in the craft sector, 33.8% worked in the technical or clerical sector, 28.3% were freelancers or managers). The average missing rate was 11% for both parents' indicators.

Detailed description of executive control (EC) performance-based tests

Dimensional Change Card Sort (DCCS; FE-PS 2-6; Usai et al., 2017). This task is traditionally used to measure shifting in preschoolers. In this version, the child is shown cards depicting coloured shapes that can be sorted under the first condition according to colour and under the second condition according to shape. Children must sort according to one dimension and then shift to the other. Under the third condition (border phase), the experimenter explains that if there is a black border on a card, the children must sort according to colour; however, if there is no border, they must sort according to shape. Accuracy is recorded by marking the total number of correct classifications (range: 0-24) performed by the children in all three conditions. Previous research suggested good test-retest (rs = .90 - .94) reliability of this task (Beck et al., 2011).

Statue (ST; Nepsy II; Korkman et al., 2011). The task is commonly used to assess motor inhibition and persistence in preschool children. The test has a total duration of 75 seconds, during which the child is required to maintain the posture of a statue in an upright position with eyes closed and mouth shut. During this time, the experimenter attempts to distract the child by making noise.

Errors (i.e., vocalizations, body movements, or eye opening) committed by the children are scored at 5-second intervals (range: 0 – 45). Previous research has found good test-retest reliability ($r = .81$) for this task in preschool children (Brooks et al., 2009).

Forward and Backward Digit Span (FDS and BDS; WISC IV; Wechsler, 2012). The task has two conditions. In the forward condition, children are asked to repeat an incremental list of digits. This condition of the task measures the ability to hold a series of data in mind for a few seconds (short-term memory). In the backward condition, children are asked to repeat incremental lists of digits backwards. This condition measures the ability to manipulate information and to retain it in mind. Each condition has two trials for a total of 8 levels, in which the digits to recall progressively increase from 2 (first level) to 9 (eighth level) in the forward condition and from 2 to 8 in the backward condition. In both conditions, the scores are the maximum list length (0 – 16) at which the two sequences are correctly recalled. The task has acceptable test-retest reliability ($r_{forward} = .70$; $r_{backward} = .71$) in preschoolers (Müller et al., 2012).

Raven's Color Progressive Matrices (CPM, Italian Standardised Version; Belacchi et al., 2008). In this version, the child is asked to identify the missing component in a series of figural patterns by choosing from six alternatives. The final score is the sum of the correct responses given (range 0 – 36) converted to the age-corrected percentile rank (0 – 99). The task has acceptable test-retest reliability ($r = .64 - .83$) in preschoolers (Bildiren, 2017).

Detailed description of the QUVA-p

The QUVA-p items were selected and partly adapted by the second author from a pool of items belonging to BRIEF-P, IPDDAI, and SDQ that address the dimension of cognitive, behavioural and emotional dysregulation (Nigg, 2017). The selection of the items was based on the literature on typical SR developmental milestones (Nigg, 2017) and factorial analysis results (i.e., higher factor loadings) of the tool by which they were inspired (see Marano et al., 2014; Marcotto et al., 2002; Tobia & Marzocchi, 2013). This choice was determined by the good discriminant power

of these tools in identifying children subsequently diagnosed with ADHD (see Mahone & Hoffman, 2007; Re & Cornoldi, 2009).

The items were adapted and modified to address self-regulating behaviours that are relevant in preschool and can be observed every day by teachers (e.g., item 14: "Invece di svolgere un'attività si guarda intorno e non lavora" [Instead of doing a task, they look around and do not work]; item 29: "Incontra difficoltà a rispettare il proprio turno (es. nell'intervenire in una conversazione interrompe gli altri) o la sua posizione pazientemente (es. in fila indiana non sta al suo posto)" [They have trouble respecting their turn (for instance, when intervening in a conversation, they interrupt others) or their position patiently (for instance, in single file, they are not in their place)]).

Once the items were selected and readapted, the fourth author evaluated the items by judging whether they assessed the intended dimension (e.g., cognitive, emotional, behavioural) with regard to self-regulation breakdowns in preschoolers. Next, exploratory factor analysis was performed on the 55 items (see AUTHORS, pd). For item reduction, we used the Marker index (Gallucci & Perugini, 2007). The Marker index suggested that none of the items had to be deleted. Finally, the QUVA-p 55 items addressed the following:

a) Inattention and difficulty remaining engaged in cognitively demanding activities over a reasonable time (cognitive dysregulation), which partly overlap with the inattention scale of the IPDDAI and the working memory and planning/Organisation subscales of the BRIEF-P;

b) Hyperactive, impulsive and reckless behaviours and oppositional conduct with peers and adults (behavioural dysregulation), which partly overlap with the hyperactivity/impulsiveness scale of the IPDDAI and the inhibitory self-control subscale of the BRIEF-p;

c) Reactive and tendentially low mood and marked difficulties in managing emotions and facing new and stressful situations (emotional dysregulation), in line with the emotional symptoms dimension of the SDQ.

The items are grouped into three empirically derived scales (AUTHORS, publication date): cognitive dysregulation (15 items; 5 positive), behavioural dysregulation (14 items; 3 positive), and emotional dysregulation (9 items). According to previous empirical results, for each of these subscales (cognitive, emotional, and behavioural dysregulation), a single score and an overall score (i.e., global self-regulation difficulty) can be obtained. The latter can be obtained by summing the scores of the three subscales of dysregulation (cognitive, emotional, behavioural dysregulation) and range between 0 and 76 (high scores indicate self-regulation difficulties). In addition, there is an index of socio-relational and adaptive difficulties provided by a subscale of 17 items (14 positive) addressing aspects that are frequently compromised in children with self-regulatory deficits, such as the ability to share and consider others and to follow the school routine, motor skills, and autonomy in dressing, eating or using the toilet. The items of this subscale were partly adapted from the SDQ peer relationship problems and prosocial behaviour subscales and inspired by the Child Development Inventory screening scale (CDI; Ireton, 1992).

A description of item contents is provided in Table S1.1. The full text of the questionnaire is available in Italian in the book XXX (AUTHORS, p.d.) together with scoring instructions and preliminary norms for the interpretation of the subscale scores.

Table S1.1

Item contents of QUVA-p subscales.

QUVA-p Subscale	QUVA-p Item	Item Content
Cognitive Dysregulation	Item 11	Gets distracted
Cognitive Dysregulation	Item 12	Follows instructions
Cognitive Dysregulation	Item 13	Stay focused on activities
Cognitive Dysregulation	Item 14	Looks around and does not work
Cognitive Dysregulation	Item 16	Troubles with multi-step tasks
Cognitive Dysregulation	Item 17	Troubles completing tasks
Cognitive Dysregulation	Item 18	Not focused on details
Cognitive Dysregulation	Item 19	Gets easily tired

Cognitive Dysregulation	Item 20	Gives up on hard tasks
Cognitive Dysregulation	Item 25	Begins a task without having to be repeated several times
Cognitive Dysregulation	Item 39	Change activities without difficulty
Cognitive Dysregulation	Item 41	Goes from one game to another without concentrating
Cognitive Dysregulation	Item 42	Forgetful
Cognitive Dysregulation	Item 43	Troubles remembering
Cognitive Dysregulation	Item 46	Autonomous on tasks
Behavioral Dysregulation	Item 1	On the go
Behavioral Dysregulation	Item 2	Cannot stay seated
Behavioral Dysregulation	Item 3	Agitated
Behavioral Dysregulation	Item 7	Express anger without beating or biting
Behavioral Dysregulation	Item 15	Rushed
Behavioral Dysregulation	Item 26	Needs more supervision than others
Behavioral Dysregulation	Item 27	Reckless
Behavioral Dysregulation	Item 29	Troubles waiting for their turn
Behavioral Dysregulation	Item 30	Reflexive
Behavioral Dysregulation	Item 31	Obedient
Behavioral Dysregulation	Item 32	Bully
Behavioral Dysregulation	Item 33	Quarrels with others
Behavioral Dysregulation	Item 35	Troubles in cooperation activity
Behavioral Dysregulation	Item 40	Tidies badly
Emotional Dysregulation	Item 4	Has sudden mood swings
Emotional Dysregulation	Item 5	Overeacts
Emotional Dysregulation	Item 6	In bad mood
Emotional Dysregulation	Item 8	Often worried
Emotional Dysregulation	Item 9	Often upset
Emotional Dysregulation	Item 10	Gets easily scared
Emotional Dysregulation	Item 37	Unfazed by changes
Emotional Dysregulation	Item 44	Feels separation anxiety
Emotional Dysregulation	Item 45	Struggles with separation
Socio-relational and Adaptive Dysfunctioning	Item 21	Cares about the other children
Socio-relational and Adaptive Dysfunctioning	Item 22	Chat with other children

Socio-relational and Adaptive Dysfunctioning	Item 23	Has at least one friend
Socio-relational and Adaptive Dysfunctioning	Item 24	Gets picked on by others
Socio-relational and Adaptive Dysfunctioning	Item 28	Shares their things with the others
Socio-relational and Adaptive Dysfunctioning	Item 34	Lonely
Socio-relational and Adaptive Dysfunctioning	Item 36	Communicative and sociable with unfamiliar people
Socio-relational and Adaptive Dysfunctioning	Item 38	Troubles with routines
Socio-relational and Adaptive Dysfunctioning	Item 47	Is able to use toilet
Socio-relational and Adaptive Dysfunctioning	Item 48	Is able to get undress by themself
Socio-relational and Adaptive Dysfunctioning	Item 49	Is able to eat by themself
Socio-relational and Adaptive Dysfunctioning	Item 50	Is able to wash themself
Socio-relational and Adaptive Dysfunctioning	Item 51	Takes care of their belongings
Socio-relational and Adaptive Dysfunctioning	Item 52	Is able to draw a cross
Socio-relational and Adaptive Dysfunctioning	Item 53	Is able to do puzzle
Socio-relational and Adaptive Dysfunctioning	Item 54	Is able to cut paper with scissors
Socio-relational and Adaptive Dysfunctioning	Item 55	Is able to draw a circle

QUVA-p Norms

The norms were empirically derived from a sample of 327 typically developing preschoolers (M_{age} = 55.44 months; SD = 9.07 months; 52% girls) attending four different preschools in Milan (Italy). All children had a score on Raven's Color Progressive Matrices higher than the 15th percentile, spoke Italian as their mother tongue, or resided in Italy for more than two years.

Normative scores were derived for each of the 4 subscales of the questionnaire. Due to significant differences in the SR breakdown means by the age and sex of the sample, normative scores were computed separately by the age and sex of the children (3-, 4-, and 5-year-old girls; 3-, 4-, and 5-year-old boys). Normative scores follow a percentile rank distribution. Scores below the 85th percentile rank indicate no risk; scores between the 85th and 89th percentiles indicate a low risk; scores between the 90th and 94th percentiles indicate medium risk; and scores between the

95th and 100th percentiles indicate a high risk of behavioural disorders (F90-F92, ICD-10).

QUVA-p application

QUVA-p is a teacher-completed screening questionnaire. It has been created to support clinical and school psychologists, but also those who work with children, as teachers, in their daily work to identify children with potentially relevant SR breakdown.

Teachers who filled out the questionnaire must know the child for a minimum of 6 months. The questionnaire takes from 5 to 8 minutes and should be completed in a quiet environment: teacher has to think and report the frequency (0 = not at all/never; 1 = sometimes; 2= often/always) they observed certain behaviours in their students. Scoring can be done by clinicians or teachers with psychometric skills. The scoring consists of summing the items' responses to one of the four subscales, paying attention to reverse positive item scores. The total sum of each subscale has to be converted into the percentile corrected by age and sex. Positive screening results (above 85th percentile) can support the clinician in deciding for a more in-depth clinical investigation or support teacher or pedagogist decision to suggest a more-in-depth investigation to the family.

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