

# Psychological and School Problems in Children and Adolescents: A Multimethod Study

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The study explores the relationship between the performance in two cognitive tests and the emotional and behavioral problems revealed by CBCL/4-18 in a non clinical sample. We administered CPM/SPM and three sub-tests of TOMAL (forward digit span, backward digit span, and visual-sequential memory) to 320 children from 6 to 13 years. Their parents completed CBCL/4-18. This study demonstrates a meaningful relationship between cognitive abilities and some syndromic scales and confirms the utility of CBCL as a screening instrument. Parents ability to register signs of difficulties in their children is an invaluable resource for prevention. However, CBCL provides only indirect information about the child's intellectual resources. Hence, CBCL could be integrated by some cognitive tests, taking into consideration the way in which they would be administered. The collective instruments, which are typically preferred in large scale screenings, could be misleading because they were unable to reveal adequately neither the difficulties of the internalizing children, nor the positive potential of the externalizing children.

Key words: *child behavior, school, psychological adaptation.*

## I

### Introduction

The acknowledged importance of early psychological intervention has increased the practice of large scale screenings. To this end, many professional associations of psychologists, neuropsychiatrists and pediatricians recommend adopting sensitive and appropriate tests (Kline, 2001). However, it is not practical to evaluate large numbers of children with comprehensive batteries of tests. The need for economical, yet efficient assessment instruments explains why most practitioners appreciate the Child Behavior Checklist (CBCL; Achenbach, 1991). In fact, the CBCL capitalizes on daily parents' observations and encompasses a large range of behaviors, potentially indicative of psychological problems in various fields.

With the creation of CBCL, a large body of research was carried out with and about this instrument (Bérubé, Achenbach, 2007). Nevertheless, there are

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relatively few studies comparing the data arising from cognitive tests and CBCL or other germane instruments included in the Achenbach System of Empirically Based Assessment (ASEBA). The correlation between psychopathological syndromes and cognitive disturbances is well documented (Kovacs, Goldston, 1991; Kusché, Cook, Greenberg, 1993; Muris, Meesters, Rompelberg, 2006;) but we don't know precisely the role a screening instrument such as CBCL could play in focussing on those cognitive components of behavioral problems which have not evolved into psychopathology or undiagnosed psychological syndromes.

Indirect evidence about the cognitive difficulties associated with the behavioral problems assessed by the CBCL is provided by the validation study carried out in its version for children from 4 to 18 years of age (Achenbach, 1991). In fact, even in the non-clinical sample, a negative correlation appears between academic achievement and the CBCL syndromic scales (the only exception being *Somatic complaints*); poor school results, in turn, are often linked with a low cognitive performance (Achenbach, 1991).

However, school failure may depend on problems arising at very different levels: a general intellectual insufficiency (Brody, 1997; Neisser *et al.*, 1996) or specific cognitive problems, among which those pertaining to attention and memory are especially important, since these functions are required for a successful learning in every knowledge domain (Engle, Kane, 2004). Moreover, academic achievement can be hindered also by non-cognitive problems, such as relational difficulties, insufficient motivation, etc. (Hoge, Luce, 1979). In short, new data are required to understand the cognitive implications of the correlation between CBCL syndromic scales and school performance.

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### Aims and hypotheses

The present study explores the relationship between the performance in two cognitive tests and the emotional and behavioral problems revealed by CBCL/4-18 syndromic scales in a non clinical sample.

We wanted first to determine if the cognitive tests we selected confirmed the well known link between academic achievement and cognitive skills. Then we wanted to determine which syndromic scales were negatively correlated with cognitive performance. We expected to find a relationship between cognitive abilities and the CBCL syndromic scales, but not necessarily with all of them. More precisely, the cognitive tests scores should correlate negatively with the scales directly involving mental functions (i.e. *Thought* and *Attention problems*) as well as with the *Social problems* scale, which includes numerous behaviors that directly or indirectly reflect cognitive immaturity. Examples of direct indication are items as: (1) Acts too young for his/her age or (11) Clings to

adult or too dependent; examples of indirect indication are items as: (62) Poorly coordinated or clumsy or (64) Prefers being with younger children. Several components of the Internalization (e.g. *anxiety*, *depression* and *withdrawal*) tend to slow down or inhibit intellectual activities (Kaslow, Rehm & Siegler, 1984); however, *Somatic complaints* should not be associated with cognitive difficulties, because somatic problems are not likely to compromise mental activities, and in fact this scale did not correlate with school performance in the validation studies (Achenbach, 1991). Finally, *Externalizing* children typically perform poorly in school, but not necessarily because of cognitive limitations, as much as for insufficient motivation, deviant values or relational maladjustment (Hymel, Rubin, Rowen, LeMare, 1990; McLelland, Morrison, Holmes, 2000).

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## Materials and method

### 3.1. Participants

From a larger sample, we randomly selected 320 children from 6 to 13 years old, balanced for gender and age. Children were recruited in three elementary schools and an equal number of grade schools in small towns in three regions of south-central Italy. The SES was on the average low or medium-low. None of the participants had been diagnosed for psychological problems, nor referred to a consultant for suspected psychological problems.

From the ample selection of cognitive tests (Reynolds, Kamphaus, 2003), we chose two instruments easy to use even with large samples: the Progressive Matrices (SPM for children 11 to 13 years old; CPM for younger children; Raven, 1938, 1947), and some subscales from the Test of Memory and Learning (TOMAL) (Reynolds, Bigler, 1994). The CPM/SPM evaluate logical reasoning, an ability strictly linked with general intelligence; they are widely used to assess children's intellectual level, for both clinical and research purposes, because they can be administered collectively from 8 years of age, are easy to code and are relatively culture-free in that they require only a limited use of language (Raven, 2000). The task, which is generally enjoyed by school-age children, requires finding the appropriate figure (out of six or more) to complete a pattern or a geometrical design. TOMAL is an individual test from which we selected three sub-tests: forward digit span, backward digit span, and visual-sequential memory. Recalling series of digits, in the order in which they were presented or in the reverse order, is considered a valid indication of the attention level, as well as of verbal-sequential memory (Lezak, 1995). The last sub-test (visual-sequential memory) requires that the subject recall the sequence in which a series of non figurative geometrical stimuli was originally

presented, and, according to the test authors, requires cognitive elaboration and integration, besides visual memory.

3.2. Procedure

With the required permissions from school authorities and parents, we administered the CPM or SPM (according to the children’s age) and the three sub-tests of TOMAL described above. The first instrument was administered collectively to all children from the third grade up; the TOMAL sub-tests were always administered individually. The CBCL questionnaire was sent to the parents through their children’s teachers, who also helped to collect the completed questionnaires.

3.3. Data analysis

The three scores deriving from TOMAL were summed to obtain a single memory/attention score (MAS). This score and the total CPM/SPM score were standardized in order to exclude the age effects. For the same reason we calculated the T scores for the syndromic scales. Then we correlated these scores and school performance (as assessed by the CBCL) with Pearson’s *r*.

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Results

As expected, school performance correlated positively with Raven Matrices (CPM/SPM: *r* = 0,181; *p* < 0,01) as well as with the aggregated memory/attention score (MAS: *r* = 0,211; *p* < 0,01).

TABLE I  
Correlations between CBCL syndromic scales, school performance and cognitive tests

	School performance	CPM/SPM	MAS
Internalizing	-0,155***	-0,049	-0,149***
Withdrawn	-0,148***	-0,001	-0,132**
Somatic complaints	-0,128**	-0,035	0,012
Anxious/depressed	-0,160***	-0,086	-0,110**
Social problems	-0,124**	-0,110**	-0,145***
Thought problems	-0,151***	-0,034	-0,078
Attention problems	-0,205***	-0,106*	-0,175***
Externalizing	-0,161***	-0,047	-0,052
Delinquent behavior	-0,153***	-0,116**	-0,027
Aggressive behavior	-0,125**	-0,043	-0,003

Note: \*\*\* *p* < 0,01; \*\* *p* < 0,05; \* *p* = 0,06.

The correlations between school performance and syndromic scales corresponded to those of the normative American sample (Achenbach, 1991), except for *Somatic complaints* which in our group were correlated (negatively) with school performance (TAB. 1).

Finally, as expected, some of the CBCL syndromic scales were correlated with cognitive abilities. As shown in TAB. 1, negative correlations emerged between the following scores: *Internalizing*, *Withdrawn*, *Anxious/depressed* and MAS; *Attention problems* and MAS; *Social problems* and MAS; *Social problems* and CPM/SPM; *Delinquent behavior* and CPM/SPM.

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### Discussion and conclusions

Our results demonstrate a meaningful relationship between cognitive abilities and some syndromic scales, largely confirming our expectations. In particular, the *Attention problems* tendentially affect logical reasoning (as measured by the CPM/SPM) and are clearly linked with poor memory and attention performances (as measured by the TOMAL items), as we hypothesized in the light of the role of attention in cognitive tasks. Also the *Social problems* appear to hinder cognitive performances, confirming our expectation that cognitive immaturity would play a major role in this syndrome; cognitive immaturity, in turn, could create or amplify the children's relational difficulties. Finally, as we hypothesized, *Somatic complaints* are not related to cognitive difficulties, even if in our group they unexpectedly appeared to be related with a poor school performance, possibly because the health of some of the children who score high in this scale is poor, preventing them from coping adequately with school requirements.

Contrary to our hypotheses, *Thought problems* did not correlate with low cognitive performance, probably because of the extremely reduced incidence of these serious problems in a non clinical group. Also the different results between *Internalizing* and *Externalizing* children in the two cognitive tasks were not expected. It is known that internalizing children are more at a disadvantage with respect to specific abilities such as those involved in the TOMAL sub-tests (Muris, Meesters, Rempelberg, 2006); however we think that our results could be explained also by the way in which the tasks were administered. In fact, the procedure required by the TOMAL sub-tests might have been particularly difficult for withdrawn, anxious or depressed children, having had to confront individually an unfamiliar adult and to provide their answers in a short time. This situation can be easily mistaken for an exam if the child is worried or lacks self-confidence, inhibiting the individual intellectual performance. Instead, the collective situations in which the CPM/SPM were administered to the large majority of the participants were more similar to daily school situations (or

even considered as a kind of game), hence arousing fewer worries. Working by themselves while remaining in the classroom, children were free to organize their work as they wanted, feeling less anxious about their performance. An individual testing procedure, however, could have been beneficial for the oppositional / defiant children (i.e. those children who score high in *Delinquent behavior*) who, in fact, performed better in the TOMAL sub-tests than in the collective situation of the CPM/SPM. The playfulness itself of this test might not have been positive for these children, who are unable to self-direct efficiently in the absence of individual supervision. With the data at our disposal, we cannot yet explain why the CPM/SPM scores of aggressive children is not similar to that of their peers with high scores in the *Delinquent behavior* scale.

In conclusion, this study confirms the utility of CBCL as a screening instrument. Parents' ability to register signs of difficulties in their children, even when the behavioral manifestations have not yet evolved into symptoms, is an invaluable resource for prevention. CBCL appears to be a valid and economical way to assess behavioral and emotional disturbances, as well as school problems. However, professionals using CBCL should remember that this instrument provides only indirect information about the child's intellectual capabilities. Hence, CBCL could be conveniently complemented by an assessment of cognitive performances. More specifically, our results show the usefulness to assess both general and specific cognitive abilities, being careful about the way in which the selected tests are administered. The collective instruments, which are typically preferred in large scale screenings, can be misleading in two ways: they are unable to reveal adequately the difficulties of the internalizing children, nor can they fully appreciate the positive potential of the externalizing children.

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## Abstract

La nostra ricerca indaga la relazione tra la prestazione fornita a due test cognitivi e la rilevazione di problemi emotivi e comportamentali attraverso la CBCL/4-18. Abbiamo somministrato le matrici progressive di Raven (forme CPM/SPM) e tre sub-test del TOMAL (memoria di cifre in avanti, memoria di cifre all'indietro, memoria sequenziale-visiva) ad un campione non clinico composto da 320 bambini tra i 6 e i 13 anni. I genitori dei bambini hanno compilato la CBCL/4-18. I risultati mostrano una relazione significativa tra le abilità cognitive e alcune scale sindromiche, confermando nel complesso l'utilità dell'uso della CBCL come strumento di screening nonché la rilevanza delle osservazioni genitoriali. Tuttavia, poiché la CBCL fornisce solo informazioni indirette sulle risorse cognitive infantili, è importante che lo screening preveda un'integrazione con test cognitivi. In tal caso, i nostri risultati suggeriscono di tenere in considerazione anche la modalità di somministrazione (individuale *vs* collettiva) delle varie prove, che potrebbe influire sulla prestazione di bambini con problemi emotivi e comportamentali. Più in particolare, i bambini con difficoltà di tipo internalizzante sembrerebbero ottenere prestazioni peggiori nelle prove somministrate individualmente, mentre i bambini con difficoltà di tipo oppositivo-provocatorio sembrano fornire prestazioni peggiori nei test collettivi, beneficiando al contrario di un contesto in cui il rapporto tra esaminatore ed esaminato è di 1 a 1.

Parole chiave: *comportamento infantile, problemi scolastici, adattamento psicologico.*