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# **Profiles of Social(Pragmatic) Communication Disorder among children with special needs: A study with the Assessment Battery for Communication**

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## **Short Summary:**

Social Pragmatic Communication Disorder (SPCD) is characterised by an impairment in pragmatics and it may lead to difficulties in school readiness. These difficulties apply also to children with Special Needs, i.e., Italian "Bisogni Educativi Speciali" (BES). The aim of this study is investigating the pragmatic ability of children with BES, compared to a control group of children with Typical Development (TD) using the Assessment Battery for Communication (ABaCo).

Preliminary results show that children with BES perform significantly worse than the control group and suggest the possibility of identifying children with undiagnosed SPCD among those with BES.

## **Introduction:**

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5;[1]), introduced the Social Pragmatic Communication Disorder (SPCD), characterised by a pragmatic impairment. Several authors [2,3] pointed out the difficulty of identifying this disorder, also considering the lack of sensitive assessment tools.

SPCD could be related to difficulties in school readiness [4,5], sometimes observed also in children with Bisogni Educativi Speciali (BES) [6]. The Italian category BES is similar to the "Special Educational Needs" (SEN) introduced in the United Kingdom [7]. BES is not a nosographic classification, but includes children with a wide range of permanent or temporary difficulties in school activities due to different causes. The Italian legislator has distinguished three subcategories of BES [6]: 1) children with certified disabilities; 2) children with specific developmental disorders, e.g. Specific Learning Disorder (SLD); 3) children with not otherwise specified BES (BES-NOS).

In recent years, some studies in the English cultural context, have attempted to distinguish children with SPCD from those on SEN using different assessment tools [8,9], but no studies, have been published for the Italian population that would be able to identify children with SPCD within the BES-NOS category.

The aim of this study is to investigate the pragmatic performance of Italian children with BES-NOS, compared to TD; more in detail, our expectation is that BES-NOS perform worse than children with TD. Furthermore, for exploratory purposes, we investigate whether it is possible to identify a subgroup of children with undiagnosed SPCD in the BES-NOS group.

## **Methods:**

### **Participants**

The experimental group consisted of 14 children (7 males) with BES-NOS, aged 7 to 16 years ( $M=10.93$ ;  $SD=2.30$ ), recruited from an Italian screening centre for SLD, matched to 14 TD children, recruited through personal contacts and social media (mean age= $10.71$ ;  $SD=1.44$ ).

Inclusion criteria were the following: Italian native speakers, intelligence quotient (IQ) above 80 as measured by the Standard Progressive Matrices [10], and basic language skills as demonstrated by scores in the normative range on subtests of the Battery NEPSY II [11]. Children in the BES-NOS group also received a comprehensive assessment of their learning skills to rule out an undetected diagnosis of SLD.

The Mann-Whitney U-test confirmed that the BES-NOS and control groups were similar in age ( $U=98.00$ ;  $p=1.000$ ), IQ ( $U=94.00$ ;  $p=.874$ ), SEX ( $U=98.00$ ;  $p=1.000$ ), education ( $U=116.50$ ;  $p=.401$ ) and Socio Economic Status (SES), as for an Italian adaptation of the Four-Factor Index of Social Status [12] ( $U=85.50$ ;  $p=.571$ ).

### Materials and procedures

ABaCo is a comprehensive pragmatic assessment instrument that has also been validated for children [13]. It consists of vis-à-vis interactions and short videos, for a total of 172 items, organized in five scales for both comprehension and production: linguistic, extralinguistic, paralinguistic, contextual, conversational. ABaCo responses are coded 0 or 1 offline, based on the sessions' video-recordings.

The assessment was conducted in 2 individual sessions of approximately one and a half hours each.

### **Results:**

The distributions of ABaCo total scores of the two groups were not normal based on both Kolmogorov-Smirnov ( $p<.006$ ) and Shapiro-Wilk tests ( $p<.001$ ). Thus, we performed an arcsine transformation of the children's scores on the ABaCo.

The independent-samples t-test showed a significant statistical difference between the experimental group ( $M=.85 \pm .07$ ) and the control group ( $M=.90 \pm .16$ ), on the ABaCo total score, with the BES-NOS group performing worse than the control group ( $t_{(26)}=2.320$ ;  $p=.028$ ).

Repeated-measures ANOVA with a between-subjects factor (type of group, 2 levels: BES-NOS/TD) and a within-subjects factor (ABaCo scale, 5 levels: linguistic, paralinguistic, extralinguistic, contextual, conversational), showed an effect of group type,  $F_{(4,104)}=13.084$ ;  $p<.001$ ;  $\eta^2=.335$ ) and scale type,  $F_{(1,26)}=1888.799$ ;  $p<.001$ ;  $\eta^2=.986$ ), with BES-NOS performing worse than TD. Pairwise comparisons revealed a statistically significant difference between the two groups in linguistic ( $p=.045$ ) [BES-NOS:  $M=.85 \pm .71$ ; TD:  $M=.90 \pm .07$ ], paralinguistic ( $p=.007$ ) [BES-NOS:  $M=.83 \pm .09$ ; TD:  $M=.91 \pm .06$ ], and conversational scales ( $p=.040$ ) [BES-NOS:  $M=.92 \pm .07$ ; TD:  $M=.97 \pm .05$ ], but not in the extralinguistic ( $p=.204$ ) [BES-NOS:  $M=.84 \pm .13$ ; TD:  $M=.91 \pm .09$ ] and contextual scale ( $p=.434$ ) [BES-NOS:  $M=.87 \pm .12$ ; TD:  $M=.91 \pm .09$ ].

To test whether it is possible to find a subgroup of children with specific pragmatic difficulty in the ABaCo total score within the experimental group BES-NOS, we performed a hierarchical cluster analysis applying Ward's method (Figure 1).

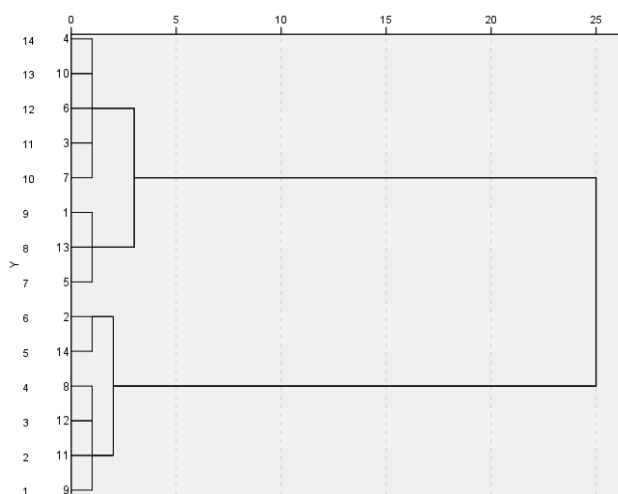
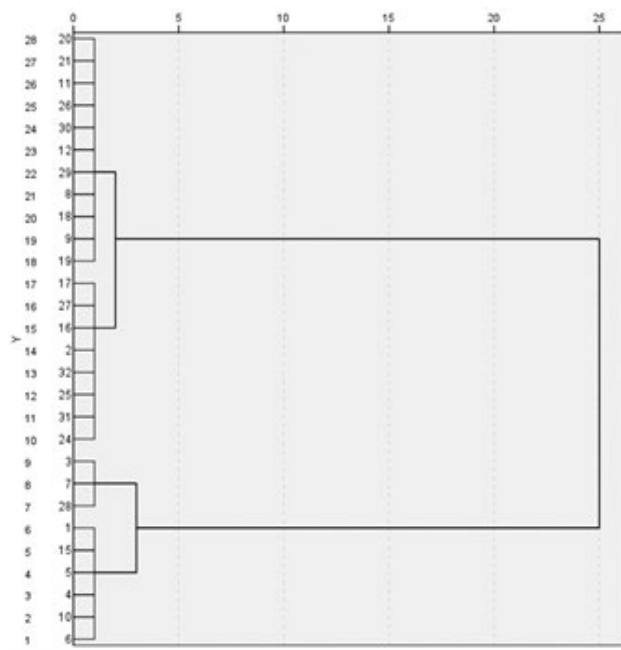


Figure 1. Hierarchical cluster analysis of the BES group using the ABaCo total score.

The analysis revealed two clusters, with one cluster (BES-NOS with Specific Pragmatic Difficulty - BES-NOS-PD) scoring worse on ABaCo than the other (BES-NOS without pragmatic difficulty - BES-NOS-nPD). To verify that there were no differences in group composition between these two new clusters of participants (BES-NOS-PD and BES-NOS-nPD), we conducted a Mann-Whitney U-test, which revealed no significant differences for age ( $U=31.00$ ;  $p=.414$ ), IQ ( $U=30.50$ ;  $p=.662$ ), and SES ( $U=27.50$ ;  $p=.414$ ).

Looking at the raw scores of BES-NOS-nPD in the ABaCo total score ( $M=.92 \pm .02$ ), we found that their performances were more similar to those of the control group ( $M=.91 \pm .06$ ) than to those of the BES-NOS-PD cluster ( $M=.79 \pm .38$ ). To further investigate which cluster of children actually exhibited pragmatic difficulty, we conducted another hierarchical cluster analysis that included all participants (BES-NOS-PD, BES-NOS-nPD and controls, see Figure 2).



*Figure 2. Hierarchical cluster analysis of all participants for the ABaCo total score.*

This analysis again identified two new clusters: one including the TD controls and participants in the BES-NOS-nPD cluster; the other including participants in the previously identified cluster BES-NOS-PD. Again, a Mann-Whitney U-test showed that the clusters did not differ with respect to age ( $U=96.00$ ;  $p=.438$ ), IQ ( $U=92.00$ ;  $p=.901$ ), and SES ( $U=77.50$ ;  $p=.566$ ).

### **Discussion:**

Participants' performance on the ABaCo total score showed a statistically significant difference between BES-NOS and the control group. These results were consistent with the experimental hypothesis. Analysis of the ABaCo subscales revealed a statistically significant difference between the two groups on the linguistic, paralinguistic, and contextual scales, but not on the extralinguistic and conversational scales.

Cluster analysis allowed the identification of two clusters within the group BES-NOS, similar in terms of age, IQ and SES, but not in terms of pragmatic performance, with one cluster (BES-NOS-PD) scoring lower than the other cluster (BES-NOS-nPD) on the ABaCo total score.

Given the similarities in pragmatic performance between TD and BES-NOS-nPD participants, we conducted another cluster analysis, which yielded two new clusters: one cluster consisted of BES-NOS-PD participants and another of BES-NOS-nPD with TD

controls. Again, these two groups are similar in terms of age, IQ, and SES, but not in terms of pragmatic performance in ABaCo.

In line with other studies identifying children with SPCD among English children with SEN [4], [8], [9], these preliminary results suggest that it is possible to detect children with undetected SPCD among children with BES-NOS also in the Italian context.

Although a larger sample is needed to ensure better generalizability of the results, these preliminary results suggest that ABaCo seems to be an effective assessment tool to identify children with SPCD.

**Keywords:** *Social Pragmatic Communication Disorder, Special Educational Needs, Pragmatics*

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