Communicative-pragmatic assessment in telepractice: e-ABaCo in autistic individuals

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Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in social interaction, restricted interests, and repetitive behaviors[1]. Social communication may be particularly challenging and not necessarily determined by difficulties in language processing but regarding more sophisticated communicative skills, i.e. pragmatic ability[2-4]. Weakness in the autistic spectrum has been proven to affect the context-specific communicative use of humor and figurative language[5]. Even if the nature of their relation is still not completely clear, pragmatic ability is closely linked to Theory of Mind (ToM)[6-9], a domain which results to be challenging in ASD[10-12].

Difficulties in pragmatic communication are not limited to pre-school and school age[13-15], but may persist along adolescence and adulthood, leading to difficulties in daily living[16]. During the COVID-19 pandemic time social life was particularly compromised in ASD and the use of communication technologies (i.e. videoconferences and internet) for healthcare delivery[17] showed its potential and proved to be an effective and low-cost tool to reach a larger pool of users[18]. Nevertheless, not many tools[19] to assess pragmatics ability are available in telepractice, and some ToM assessment tools have been used in online versions (i.e. False Belief Task[20] and RME[21]), but none has been validated yet.

This study aims to fill this gap by providing data on the efficacy of the Assessment Battery for Communication[22-23] in telepractice (e-ABaCo), a tool that has already proven its efficacy in assessing pragmatic ability in ASD in face-to-face modality[13-14].
We expect to find no difference in the performance obtained by a group of autistic adolescents assessed in telepractice compared to a comparable group assessed in face-to-face modality, whereas we expect both the ASD groups (i.e. telepractice and face-to-face) to have lower performance scores than the non autistic group.

Materials & Methods

Participants

Two groups of autistic adolescents were recruited based on the following inclusion criteria: (a) native-Italian speaker; (b) age between 12-18 years; (c) diagnosis of verbally fluent ASD,

certified by qualified clinicians using DSM-5 guidelines[1]; (d) basic linguistic ability, evaluated by the language comprehension subtask from the BVN 12-18[24], namely the Token test[25]. Exclusion criteria were: (e) history of brain injury or neurological disorders; (f) concurrent participation in Applied Behavior Analysis or other communication rehabilitation programs.

One group (N=10; 1 female) was assigned to telepractice assessment (ASD Tp; age: M=14.20, SD=2.15; education: M=9.00, SD=2.00; IQ: M=96.30, SD=17.05) as experimental group, and a comparable group in term of age and gender (N=10; 1 female) was assigned to clinical control group (CG) for face-to-face assessment (ASD FtF; age: M=14.63, SD=2.24; education: M=9.30, SD=2.36; IQ: M=90.40, SD=10.89).
Finally, a third group (N=10; 1 female) of comparable group for age and gender of non autistic adolescents acted as non clinical CG in face to face modality (CG FtF) and was assessed in face-to-face modality (age: M=14.70, SD=2.45; education M=9.30, SD=2.71; IQ: M=98.30, SD=9.10), according to (a), (b) and (e) criteria. The three groups were comparable for age (F=.306; p=.739; η^2_p=.022), education (F=.119; p=.888; η^2p=.009) and IQ (F=.221; p=.803; η2p=.016), assessed through the Italian Version of Raven's Standard Progressive Matrices[26].

Materials

Pragmatic assessment was conducted with the equivalent form A[27] of ABaCo[22-23] or e-ABaCo. This battery consents to evaluate pragmatic skills both in comprehension and production. It is composed of 68 items, divided in 4 scales: linguistic, extralinguistic, paralinguistic, contextual. For each task, a score of 0 (incorrect answer) or 1 (correct answer) can be assigned. For the digitalized version (e-ABaCo) some items were adapted ecologically to the telepractice context.
ToM ability was assessed through the administration of a selection of 6 items from the Strange Stories task[28]. This task evaluates *advanced* ToM, namely the ability to recognize and understand more subtle aspects of social interaction (i.e. double bluff, mistakes, white lies, pretense, misunderstanding). For each story, a score of 0 (incorrect answer) or 1 (correct answer) can be assigned. This task was not yet validated for telepractice modality but it was easily adaptable for an online version.

Procedures

All procedures were carried out according to the instructions provided in the standardized manual for each task. Recruitment was held in collaboration with the Centro Riabilitazione Ferrero (Alba, Italy) and Centro Autismo e Sindrome di Asperger (Mondovì, Italy). The assessment for the ASD Tp have been conducted via videoconferencing and for the face-to-face modality groups in a quiet room. The sessions were video recorded to allow offline coding by blind raters. Administration and coding procedures have been conducted by an independent rater.

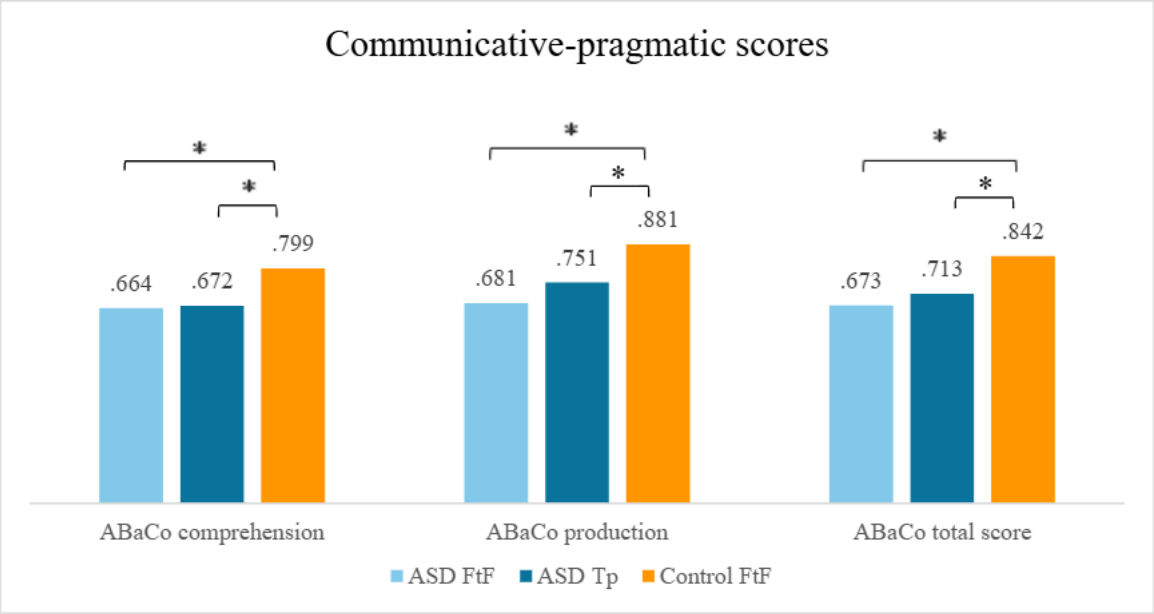
Results

The ABaCo scores were compared in a 3x3 repeated measure analysis of variance (ANOVA RM), with *Group* (ASD FtF vs. ASD Tp vs. Control FtF) as between-subjects factor and *Scale* as within-subjects factor (three levels: ABaCo comprehension, ABaCo production and total

ABaCo). Pairwise comparisons with Bonferroni correction were used to investigate the score difference between groups and scales. The analysis showed no difference for each level of communicative-pragmatic performance between ASD Tp and ASD FtF (comprehension: F=.008; p=1.000, production: F=.070; p=.363, total: F=.040; p=.654). By contrast, a significant difference appeared between the ASD groups and the Control FtF, in both the ASD FtF (comprehension: F=.136; p=.004, production: F=.200; p<.001, total: F=.169; p<.001) and the ASD Tp (comprehension: F=.128; p=.007, production: F=.130; p=.020, total: F=.129; p=.001). The scores obtained by each group on the communicative-pragmatic ability are summarized in Figure 1.

The ToM performance was examined by a 3x1 ANOVA with *Group* (ASD FtF; ASD Tp and Control FtF) as between subject factor and Strange Stories score as dependent variable. Similar to the previous results, Bonferroni pairwise comparisons indicated statistically significant differences between Control FtF and ASD FtF (F=30.08; p=.019) and ASD Tp (F=31.73; p=.013), whether no difference was found between ASD FtF and ASD Tp (F=1.65; p=1.0).

Figure 1. ABaCo scores for each group examined (ASD FtF, ASD Tp and Control FtF group).



Discussion

As expected, the results showed no difference in the communicative-pragmatic performance assessed in the telepractice and face-to-face modality, whereas a significative difference were found between ASD (FtF and Tp) and Control FtF, for each pragmatic aspect examined, thus showing the effectiveness of e-ABaCo. These data prove telepractice to be a reliable modality for conducting an effective pragmatic assessment. In a wider perspective, the results are in line with the data in the literature[13] indicating lower performance of autistic adolescents when compared to non autistic participants, both at pragmatic and ToM tasks[12].

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