



# Paralinguistic abilities of adults with intellectual disability



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## ARTICLE INFO

### Article history:

Received 23 July 2015

Received in revised form 1 November 2015

Accepted 2 November 2015

Available online 7 December 2015

### Keywords:

Paralinguistic production

Paralinguistic comprehension

Dual diagnoses

## ABSTRACT

The aim of this research was to determine the ability level of paralinguistic production and comprehension in adults with intellectual disability (ID) with regard to the level of their intellectual functioning and presence of co-morbid psychiatric conditions or dual diagnosis (DD).

The sample consisted of 120 participants of both genders, ranging in age between 20 and 56 years ( $M = 31.82$ ,  $SD = 8.702$ ). Approximately 50% of the sample comprised participants with a co-existing psychiatric condition. Each of these two sub-samples (those with ID only and those with DD) consisted of 25 participants with mild ID and 35 participants with moderate ID. The paralinguistic scale from *The Assessment Battery for Communication* (ABaCo; Sacco et al., 2008) was used to assess the abilities of comprehension and production of paralinguistic elements.

The results showed that the participants with mild ID are more successful than the participants with moderate ID both in paralinguistic comprehension tasks ( $p = .000$ ) and in paralinguistic production tasks ( $p = .001$ ). Additionally, the results indicated the presence of separate influences of both ID levels on all of the paralinguistic abilities ( $F [1\ 1\ 6] = 42.549$ ,  $p = .000$ ) and the existence of DD ( $F [1\ 1\ 6] = 18.215$ ,  $p = .000$ ).

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## 1. Introduction

Persons with intellectual disability (ID) often exhibit inappropriate types of socio-communicative behaviour that can, to some extent, be explained by a wrong perception of social situations, problems in detecting and understanding contextual characteristics, as well as problems in identifying emotional signals (Sukumaran, 2012). Paralinguistic communicative abilities are non-verbal abilities based on the ability to comprehend and produce the elements that accompany communication. Facial expression and prosody, as basic paralinguistic elements, can be defined as accompanying communicative signals that answer the question: “How has something been said?” (Angeleri, Bosco, Gabbatore, Bara, & Sacco, 2012; Gil, Aguert, Le Bigot, Lacroix, & Laval, 2014). Paralinguistic segments contribute to the variability of the speech flow and the additional undertone of the spoken message (Ward, 2004; Wilson & Wharton, 2006) as well as predict the behaviour of other people, recognizing emotions and understanding communicative intentions (Sacco et al., 2008; Wittfoth et al., 2010), and thus correlate with the pragmatic aspects of communication (Adell, Bonafonte, & Escudero, 2005).

Many research papers have assessed several elements of paralinguistic abilities of persons with autistic spectrum disorders (Castelli, 2005; Grossman, Bemis, Skwerer, & Tager-Flusberg, 2010; Lindner & Rosén, 2006; McCann, Peppé, Gibbon, O'Hare, & Rutherford, 2007; Peppé, McCann, Gibbon, O'Hare, & Rutherford, 2006; Tanaka, Kashioka, & Campbell,

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2011; Wang, Lee, Sigman, & Dapretto, 2006; Wang & Tsao, 2015; Yirmiya, Kasari, Sigman, & Mundy, 1989). This issue has frequently been studied in adults with ID and syndrome specifics (Carvajal, Fernández-Alcaraz, Rueda, & Sarrión, 2012; Fernández-Alcaraz, Extremera, García-Andres, & Molina, 2010; Hippolyte, Barisnikov, Van der Linden, & Detraux, 2009; Pinheiro et al., 2011; Plesa-Skwerer, Faja, Schofield, Verbalis, & Tager-Flusberg, 2006; Plesa-Skwerer, Schofield, Verbalis, Faja, & Tager-Flusberg, 2007). Only certain segments of paralinguistic abilities in persons with Williams syndrome (Hargrove, Pittelko, Fillingane, Rustman, & Lund, 2013; Rosner, Hodapp, Fidler, Sagun, & Dykens, 2004) and Down syndrome (Bellugi, Lichtenberger, Jones, Lai, & St George, 2000; Dykens, Shah, Sagun, Beck, & King, 2002; Järvinen-Pasley et al., 2008) have been assessed.

By reviewing the literature, we observe that the ability to recognize, comprehend, and produce paralinguistic elements of communication has infrequently been assessed in adults with ID. Although the paralinguistic segments of communication have numerous functions, only the ability to recognize emotional reactions using facial and prosodic expressions has frequently been assessed in adults with ID. The results of the studies have shown that adults with ID have demonstrated significantly lower achievement than typically developing participants in the tasks that demand recognizing emotions using facial expression (Owen, Browning, & Jones, 2001), and that these individuals express difficulties in recognizing negative emotions in the tasks of facial and vocal expressions, especially fear (Plesa-Skwerer et al., 2006) and disgust (Owen et al., 2001).

Paralinguistic production was not assessed in the above-mentioned papers nor was the assessment of all of the paralinguistic abilities conducted. We are not familiar with any research on all of the paralinguistic abilities in persons with ID with regard to the level of their intellectual functioning or the appearance of co-existing psychiatric conditions (this co-morbidity will be referred to as “dual diagnosis” – DD in the text). There are indications that the severity of cognitive deficit correlates with the ability to recognize emotional facial expression (McAlpine, Kendall, & Singh, 1991; McAlpine, Singh, Kendall, & Ellis, 1992; Rojahn, Lederer, & Tassé, 1995); however, there are no data on how cognitive deficit influences other paralinguistic abilities. Additionally, the findings in the literature have shown that the presence of psychiatric disorders in a typical population influences the processing of social and emotional stimuli from the environment (Cusi, Nazarov, Holshausen, MacQueen, & McKinnon, 2012), recognizing and producing both paralinguistic affective and non-affective segments in communication (Colle et al., 2013); however, there is no information on paralinguistic abilities in persons with DD. We believe that it is important to extend this type of research to persons with ID because the incidence of psychiatric disorders is higher in this population than in typically developing persons (Deb, Thomas, & Bright, 2001).

The present research was conducted with aims of determining the ability level of paralinguistic production and paralinguistic comprehension in adults with intellectual disability and assessing the influence of ID level and the presence of DD on paralinguistic abilities.

## 2. Method

### 2.1. Sample

The sample consisted of 120 participants of both genders, ranging in age between 20 and 56 years ( $M = 31.82$ ,  $SD = 8.70$ ). The complete sample was divided into two subsamples, i.e., participants with ID and participants with DD ( $n = 60$  participants in each subsample). The participants with DD belong to the category of schizophrenia spectrum disorders according to DSM-5 classification, displaying symptoms in at least one of the following areas – delusion, hallucinations, abnormal motor behaviour, negative symptoms and disorganized speech and thoughts. All participants with DD used antipsychotics and their medical charts included information on occasional hospitalization in psychiatric institutions, and their lower intellectual functioning did not have a known cause. On the other hand, the participants with ID neither had co-morbid psychiatric disorders nor used medical therapy, and 50 participants from this group had ID of unknown aetiology, while 10 participants had Down syndrome. There were no participants with autism spectrum disorders in the complete sample (ID and DD).

Both subsamples consisted of 25 (41.7%) participants with mild ID (IQ range, 50–69) and 35 (58.3%) participants with moderate ID (IQ range, 35–49). Four groups of participants were formed as follows: participants with mild ID ( $ID_{mild}$ ); participants with moderate ID ( $ID_{moderate}$ ); participants with DD whose IQ is within mild ID ( $DD_{mild}$ ); and participants with DD who function at the level of moderate ID ( $DD_{moderate}$ ). Bearing in mind that the information on IQ and medical documentation of the participants indicated that different assessment tests were used, and that the assessments were conducted at different time, and that the information on IQ did not exist for some of the participants, but only the category of disability was known, we used Raven's progressive matrices (Raven & Raven, 1998) as a control variable, which confirmed that all the participants from our sample had under-average intellectual abilities. The results of the Mann–Whitney  $U$  test showed that there are no statistically significant differences between the participants with  $ID_{mild}$  and  $DD_{mild}$  with regard to their achievements on Raven's progressive matrices ( $U = 277.50$ ;  $Z = -.682$ ;  $p > .05$ ), or between the participants with  $ID_{moderate}$  and  $DD_{moderate}$  ( $U = 556.50$ ;  $Z = -.661$ ;  $p > .05$ ). Table 1 presents age and achievements on Raven's progressive matrices for the subsamples.

With regard to the place of living, half of the participants with ID lived with their families ( $N = 30$ ), while the others ( $N = 30$ ) were in larger institutions (the institution in which our participants lived has 300 users over the age of 10). In the sample of the participants with DD, 31 participants lived with their families, while 29 were in larger institutions.

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