Abstract

The construct of emotional intelligence was first defined by Salovey and Mayer (1990) as people's ability to monitor their emotions and the emotions of others, the ability to differentiate between different emotions and to use this information for directing their thoughts and actions. Three main models for defining and measuring emotional intelligence were developed over the years: the Abilities Model (Mayer & Salovey, 1997), which is cognitive in nature, the Personality Traits Model (Petrides & Furnham, 2003), which is emotional in nature, and the Mixed Model (Bar-On, 1997), which includes both dimensions. Today there is great awareness that use of emotional intelligence in everyday life influences learning achievements and academic success (MacCann et al., 2020), career and employment (Chernis & Adler, 2023), family life and interpersonal relations (Martinez et al., 2020), well-being (Salavera et al., 2020), happiness, optimism, and social support (Lopez-Zafra et al., 2019).

The considering of emotional abilities and emotional intelligence implies a humanistic worldview that can aid in improving the quality of life of people with disabilities. A limited number of studies tested emotional intelligence in the population with developmental intellectual disability (ID) (Adibsereshki et al., 2016; Robles-Bello et al., 2020; Sheydaei et al., 2015). Other studies investigated concepts related to emotional intelligence, including emotional, behavioral and social difficulties, social cognition, emotional perception (Bermejo et al., 2014) at young ages, as well as emotional motives for being religious and reasons for singlehood among adults with ID (Haguel & Lifshitz, 2019; Vahav et al., 2015).

The objective of the present study was to test the developmental trajectories of emotional intelligence among adolescents (CA = 16-21) and adults (CA = 22-40) with non-specific intellectual disability (ID) (IQ = 40-70) compared to adolescents and adults with typical development with an identical chronological age. The emotional intelligence development trajectories were tested according to three possible trajectories for the development of intelligence and cognitive ability among the population with ID and other disabilities, such as autism, compared to the population with typical development (Bathelt et al., 2020; Fisher & Zeaman, 1970; Lifshitz, 2020): the Impaired Trajectory (IT) according to which emotional intelligence, may reach a peak at age 13-14, and a decline may already begin at age 20-30; the Stable Trajectory (ST) according to which emotional intelligence reaches its peak at age 20, similarly to the population with typical development, after which there is a plateau, with a decline beginning at age 50-60; the Continuous (Compensatory) Trajectory (CT) according to which the intelligence continues to develop during adulthood. A series of studies tested the development of intelligence and cognitive abilities (Chen et al., 2017; Lifshitz et al., 2021), language (Freundlich, 2020) and memory (Kilberg, 2019) in the population with ID from adolescence (16-21) to adulthood (22-40), and support the Compensation Age Theory which posits that the intelligence of adults with ID reaches its peak at age 40-45 (Lifshitz, 2020; Lifshitz-Vahav, 2015). **The present study was the first to test whether a continuous-compensatory trajectory also exists for emotional intelligence among this population.**

The research innovations:

A. Other studies generally tested emotional intelligence among people with ID using one model, or by testing related concepts such as social cognition, emotional perceptions, etc. (Channell et al., 2014; Harkins, 2014; Sheydaei et al., 2015). The present study is the first to examine emotional intelligence in the population with ID from adolescence to adulthood according to the three models (Abilities, Traits, Mixed). It can be said that this is a pilot study in the field of emotional intelligence in the population with ID.

B. The trajectories of emotional intelligence were tested for the first time using a cross-sectional design among adolescents and adults with ID, with reference to the three trajectories of the development of intelligence in populations with disability (Bathelt et al., 2020; Fisher & Zeaman, 1970; Lifshitz, 2020): Impaired, Stable or Continuous.

C. For the first time, a comparison was made between the emotional intelligence of the population with ID and the population with typical development matched by chronological age. To date, researchers compared between the two groups based on a similar mental age (Channell et al., 2014).

D. The contribution of endogenous variables (age and gender) and the level of crystallized and fluid intelligence to predicting emotional intelligence was tested.

E. In addition to the quantitative method, qualitative interviews were held via social situations describing conflicts presented to 10 adolescents and 10 adults with ID, whose emotional intelligence was measured and analyzed according to the three stages of analysis in qualitative research (Shkedi, 2003; Tracy, 2019) as well as quantitative analyses (mixed method design).

The participants: The study participants included adolescents and adults with non-specific ID (*N* = 55, IQ = 40-50) and participants with typical development (*N* = 54, IQ = 85-115) in two age cohorts: adolescence (16-21), adulthood (22-40).

The research instruments: Nine instruments were used. Crystallized and fluid intelligence were tested using three subtests of the Wechsler Abbreviated Scale of Intelligence (WASI™; Wechsler, 1999) and the Raven Matrices (Raven, 1958). The were used for assessing crystallized intelligence Vocabulary and Similarities subtests and Block Design and the Raven Matrices (Raven, 1958) served for evaluating fluid intelligence. Emotional intelligence was tested using five instruments that represent the three models of emotional intelligence. The **Abilities Model** was tested using the Self-Report Emotional Intelligence Scale (SSEIS; Schutte et al., 1998) and the Trait Meta Mood Scale (TMMS; Salovey et al., 1995). The **Traits Model** was tested using the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF; Petrides, 2009) and the Trait Emotional Intelligence Questionnaire–Short Form for peer (TEIQue 360°-SF; Petrides, 2009). The **Mixed Model** was tested using the Bar-On Emotional Quotient Inventory (EQ-I; Bar-On, 1997). A demographic questionnaire was also used. For testing the emotional measures using the qualitative method, we used situations extracted from the study of Gillis (1992) who processed Brophy and Rohrkemper's (1981) situations. Reliability was tested between three raters by calculating the Intra-Class Correlation (ICC) for each sub-measure of the study. The three situations were adapted, and their language was simplified to enable accessibility to the population with

ID according to Inclusion Europe (2022) and easy-to-read principles (Miller & Burstow, 2010) such as clear and accessible language, frequent words, short sentence structure. The research results will be presented with reference to the research objectives.

Objective 1: Differences in emotional intelligence between the research groups according to the three models, with reference to research group and age (adolescents/adults)

First, it was found that the mean score in both research groups was very high (between 3 and 4). Thus, both groups report on having high emotional intelligence. We interpreted the high scores in the two groups using two approaches: **A critical approach,** according to which theses scores are not realistic, and stem from the fact that these are questionnaires that are based on the participants' self-report which, created higher emotional profiles (O'Connor et al., 2019) and on the social desirability bias, according to which respondents desire to placate the researchers and report on positive attitudes (Paulhus, 2017). **A realistic approach**, according to which the scores are indeed realistic and can be explained by the Ecological Model (Bronfenbrenner, 1979; Guy-Evans, 2020) which focuses on the person developing in his environment and on the reciprocal relations between the person and his environment through different systems that influence him. The two research groups benefit from activities whose goal is to improve their self-image and self-efficacy within the different education frameworks, in the community and in the family. It appears that these messages were assimilated and internalized by the participants and were expressed in higher emotional intelligence scores. The high scores are also related to the time of data collection during the COVID pandemic, where there was heightened awareness of emotional issues (Bhatnagar & Many, 2022). The participants were aware of their emotions, such that relatively high answers were obtained among both groups.

Differences in emotional intelligence between the two research groups: The research hypothesis was that in **the Abilities Model and in the Mixed Model**, which are cognitive in nature (Bar-On, 1997; Mayer & Salovey, 1997), the emotional intelligence scores of the population with typical development will be higher than that of the population with ID, whereas no differences between the research groups will be found in **the Personality Traits Model**, which is emotional in nature (Petrides & Furnham, 2003) and refers to the individual's emotional tendencies and self-perceptions. The hypothesis was partially confirmed.

Two-way analyses of variance (2x2) yielded differences between the two research populations in the **Abilities Model as well as in the Mixed Model**. In the Abilities Model a main effect of research group was found. In the Mixed Model there was no such effect, but a research group x age cohort interaction was found. Post-hoc analyses indicated that in these two models, the Abilities Model (Mayer & Salovey, 1997) and the Mixed Model (Bar-On, 1997), the source for the differences in scores between the two research populations is the group of adults with ID whose scores were significantly higher than those of the adolescents with ID. Thus, **the differences in the emotional intelligence scores between the two research groups cannot be disengaged from differences in the age cohorts**.

We also interpreted the high scores of the **adults with ID** according to the two above approaches, similarly to the previous question. According to the **critical approach**, the high scores stem from idealization of reality among people with ID, which creates the desired reality around them, of their desired "self" (Kohut, 2009) and from the Disability Paradox Theory (Fellinghauer et al., 2013) according to which people with disabilities may report higher levels of quality of life even though their objective health is not such. According to the **realistic approach**, the high scores of the adults with ID are realistic and in line with the claim of the Compensation Age Theory (Lifshitz, 2020; Lifshitz-Vahav, 2015) which posits that life experience and maturity of adults with ID contribute to their emotional intelligence, in addition to contributing to their cognitive abilities. Empowerment actions and self-advocacy that take place among people with ID at adult ages contribute to their well-being and to their high self-assessment in the emotional intelligence questionnaires (Mineur et al., 2017). The high scores can also be attributed to the self-image and self-perception of adults with ID that takes shape as they age (Douma et al., 2022).

It is not possible to unequivocally determine which approach is more suitable with reference to the higher scores of the adults with ID, but we tend to support the realistic approach, according to which the high scores of the adults with ID are realistic and are in line with the Compensation Age Theory (Lifshitz, 2020; Lifshitz-Vahav, 2015). In our opinion, the fact that the differences between the age cohorts were found only for the Abilities Model and the Mixed Model, and not for the Traits Model, indicates that the high scores of the adults with ID are realistic and that the realistic approach can be

used. Additionally, support for the realistic approach was also found in the analysis of the qualitative interviews (objective 4).

Contrary to the population with ID, no differences between adults and adolescents were found in **the research population with typical development**. This can be explained in that in this population, emotion develops during the period from childhood through adolescence, after which it remains stable (Bailen et al., 2019; Cracco et al., 2017; Nook et al., 2020).

In contradistinction, **no differences were found** between the two groups, or with reference to age cohorts, according to the Traits Model, which is emotional in nature (Petrides & Furnham, 2003). This finding is in line with the results of studies in which parallels were found in emotional abilities and emotional intelligence of adults with ID and adults with typical development (Lifshitz & Katz, 2009; Lifshitz-Vahav et al., 2015; Neuman et al., 2020), for example in motives for being religious, in the ability for intimacy and in reasons for singlehood, which indicate that in certain measures of emotional intelligence, there is no difference between the population with ID and the population with typical intelligence, at least during adolescence and adulthood.

Objective 2: Correlations between and across the five measures of emotional intelligence

The second research hypothesis that claimed correlations between the measures of emotional intelligence of the Abilities Model and the measures of the Mixed Model in the two research populations was partially supported. Pearson correlations indicated a correlation between measures of the Abilities Model and measures of the Mixed Model, which are both based on cognition (Bar-On, 1997; Mayer et al., 1999). A correlation was also found in the two research populations between the Abilities Model and the Mixed Model (which are cognitive in nature) and the Traits (self) Model which is, as mentioned, emotional in nature. The higher the emotional intelligence according to the Traits Model, the higher the level of emotional intelligence reported according to the Traits Model and the level of emotional intelligence according to the Mixed Model. Our findings support the claim that an association exists between the emotional components and the cognitive components of emotional intelligence, and that the two cannot be separated (Joormann et al., 2010; Nook et al., 2020; Pessoa et al., 2019) also in the population with ID.

Objective 3: Contribution of endogenous variables (age and gender), IQ level and crystallized and fluid intelligence to predicting in participants' emotional intelligence

Regression analyses indicated partial confirmation of the research hypotheses regarding age and gender. In the **population with ID**, a contribution of chronological age of 10.9-14.99% to the explained variance of the emotional intelligence was found using the Compensation Age Theory (Lifshitz, 2020; Lifshitz-Vahav, 2015) (see above). **The findings regarding gender** (contributed 10.6%) agree with the results in the population with typical development according to which women manage their emotions better than men and have greater emotional knowledge (Fernández-Berrocal et al., 2012; Schutte et al., 2002).

Achievements in Similarities (crystallized intelligence) contributed to explaining 28% of the variance in emotional intelligence **in the population with ID**, compared to a contribution of 5.7% on the Raven Test. In contradistinction, **in the population with typical development**, the Raven Test (fluid intelligence) contributed 11.7-36.7% to the explained variance in emotional intelligence. Thus, the population with ID relies more on crystallized verbal intelligence that includes semantic conceptualization, differentiation between concepts, finding a "top concept", analysis and synthesis of emotions (Similarities), whereas the population with typical development relies more on fluid intelligence that includes understanding abstract problems that are not dependent on experience, learning and culture, understanding relations and making inferences (Hicks et al., 2015).

Objective 4: Qualitative interviews – analysis of emotion measures in social situations a **reflection of emotional intelligence among adolescents (16-21) and adults (22-40) with ID using the mixed method**

To test the emotional intelligence level of the participants not via questionnaires, semi-structured interviews were held, only for participants with ID: 10 adolescents and 10 adults, combined with statistical analyses (mixed method). The participants were presented with three conflictual social situations (Gillis, 1992) and were asked to analyze them according to leading questions. The emotional items were analyzed according to the three stages of qualitative research (Shkedi, 2003; Tracy, 2019). In the first analysis stage, the answers were catalogued into 12 main categories and in the mapping stage they were grouped into three major categories: ability to analyze and

define concepts (emotional intelligence, self-regulation, and control); understanding representation of emotions in the self and in the other; cognitive-emotional-behavioral ability for recognizing and explaining emotions. In the themes stage, three main themes were produced, which in our opinion represent the **Abilities Model, the Traits Model and the Mixed Model of emotional intelligence**.

Regarding differences between adolescents and adults, independent samples t-tests showed higher scores in the emotional measures among adults with ID than among adolescents. They exhibited a higher ability to solve conflicts and a higher linguistic register than the adolescents.

The results of the quantitative and qualitative research, allowed us to better support the realistic approach, according to which adults with ID have higher emotional abilities than adolescents with ID.

The theoretical contribution of the research is expressed in the actual discussion of the emotional intelligence findings in the population with ID, both from a critical and from a realistic perspective.

A critical approach toward emotional intelligence tests has been presented in the scientific literature (O'Connor et al., 2019), since contrary to different types of intelligence tests, the measurement instruments for emotional intelligence tests do not meet the standards of psychometric tests. Most of the questionnaires are self-report questionnaires that are given to the participants' subjective viewpoint. Considering the difficulties in measuring emotional intelligence in the population with ID, it is recommended to develop instruments that are suitable for testing the emotional intelligence of this population.

With reference to the realistic approach, we identified a continuous trajectory from adolescence to adulthood also in the emotional intelligence of the population with ID. Indeed, our research is a cross-sectional study, but in line with the Compensation Age Theory, which posits a continuous trajectory for intellectual intelligence (Chen et al., 2017; Freundlich, 2020; Kilberg, 2019; Lifshitz, 2020; Lifshitz et al., 2021; Lifshitz-Vahav, 2015). Maturity and life experience also influence emotional intelligence, contribute to recognition and distinction between different emotions, help in assessing and expressing emotions and in effective use of emotions for direction of thoughts and actions.

Regarding the clinical contribution, it is important to instruct the educational/caregiving team and the family with the aim of increasing awareness of the importance of emotional intelligence and its uses, and to impartation of suitable and more effective coping and adjustment methods for people with ID in the emotional domain in different life environments. It is recommended to add a section to the definition of intellectual disability that refers to the emotional abilities of the participants and which also refers to the level of emotional intelligence which will lead to a meaningful educational contribution in the education system.

In the conclusion section of this research, the following question is discussed: **why the emotional component and emotional intelligence are absent from the traditional, new and *DSM-5-TR* definitions of intellectual disability,** with association to the present study.

Keywords

Emotional intelligence, Abilities Model, Traits Model, Mixed Model, Intellectual disability, Continuous (compensatory) Trajectory.

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