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# Emotional Development Questionnaire for Primary Education (CDE\_9-13)

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Abstract: This study presents the construction of the Emotional Development Questionnaire (CDE\_9-13) and examines its psychometric properties. This questionnaire measures the emotional competence and its five dimensions—emotional awareness, emotional regulation, emotional autonomy, social competence, and life and well-being competence—of boys and girls from 9 to 13 years of age. Its construction followed the guidelines of the International Test Commission. The final version consists of 41 items. The total sample is 1905 boys and girls between the ages of 9 and 13, although partial samples have been used for specific analyses. Various studies have been carried out to demonstrate the reliability and validity of the instrument: the calculation of the reliability coefficient, a confirmatory factor analysis (CFA), and the correlational comparison of the CDE\_9-13 with recognized measures of emotional intelligence, personality, adjustment difficulties, and self-esteem. Likewise, a regression study has been carried out to confirm the incremental validity. The CDE\_9-13 is a theoretically well-founded questionnaire with appropriate psychometric characteristics. Therefore, it is considered an optimal tool to assess emotional competence in interventions aimed at promoting mental health and well-being.

Keywords: emotional competence; validity; reliability; factor analysis; questionnaire



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# 1. Introduction

The construct of "emotional intelligence" (EI) has been the subject of debate in the field of psychology over the years and has had different definitions and models [1]. Initially, Salovey and Mayer [2] defined it as the ability to manage feelings and emotions, discriminate between them, and use this knowledge to direct thoughts and actions. More recent contributions [3,4] argue that existing EI models could be grouped into two broad categories: ability and trait models.

The ability model considers EI as the ability to identify, perceive, value, distinguish, and express emotions, to use emotions to facilitate thinking and making decisions; and to understand and regulate emotions [5,6]. However, the trait model [7] views EI as a set of stable personality traits, behavioral tendencies, and self-perceived abilities.

Progressively, the use of the concept of emotional competence has increased compared to that of emotional intelligence [4,8–13]. Emotional intelligence is conceived as a hypothetical construct of psychology, while emotional competence constitutes a set of capacities, knowledge, skills, attitudes, and values necessary to identify, understand, express, and appropriately regulate emotional phenomena [1,14].

The educational applications of emotions and emotional intelligence can be encompassed under the concept of emotional education, understood as an educational process that proposes the development of emotional competencies [15,16], considered as basic competencies necessary to better face challenges that arise in life [14,17].

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Scientific contributions in recent years indicate the need for educational interventions to promote the mental health and well-being of children and young people [16,18–21]. Furthermore, there is sufficient evidence of the benefits of emotional education in improving attitudes towards oneself and towards others, classroom climate, assertiveness, resilience, reduction in disruptive behaviors, and even academic performance, along with other relevant aspects for quality education [3,22,23].

Additionally, any educational program must include an evaluation tool to assess the level of emotional development of the participants and analyze the effects of the intervention. For this reason, social and emotional development programs require assessment tools that provide evidence of changes in the participants' emotional abilities brought about by their emotional experiences. However, although there are various measurement instruments for evaluating emotional intelligence in adults, there are few instruments aimed at children and adolescents [24].

# 1.1. Emotional Competencies Evaluation Models

The assessment of emotional competencies is a topic of current interest in emotional education. The different views on EI models have direct consequences on their measurement. Thus, as seen from a review of various studies [4,25], EI ability is typically measured using performance tests, whereas trait EI is measured mainly by employing self-report questionnaires.

The scientific literature on the instruments for measuring emotional intelligence that emerged in recent years [1,15,25,26] allows us to affirm that (a) there are a greater number of instruments measuring trait EI than ability EI; (b) there are few instruments with sufficient guarantees of reliability and validity; (c) most instruments do not have a solid theoretical model on which to base their results and guide future interventions; (d) there is a scarcity of instruments designed for the assessment of EI in children and adolescents; and (e) there is a scarcity of instruments developed and/or adapted to the Spanish context.

Experts agree on the importance of developing emotional competencies through educational interventions [3,27]. In this sense, there is enormous interest in assessing emotional competencies in the educational setting [28], as well as in the development of optimally validated instruments with proven psycho-technical properties [29,30]. Most of the instruments available for evaluating emotional competencies have been subjected to criticism focused mainly on the lack of a clear theoretical framework and firm empirical foundations [31]. To face this problem and have instruments adapted to the Hispanic context, the Psychopedagogical Guidance Research Group of the University of Barcelona (GROP) has developed various questionnaires [32] that are framed in Bisquerra and Perez's model of emotional competence [14]. These authors define emotional competence as a set of capabilities, knowledge, abilities, aptitudes, attitudes, and values necessary to understand, express, and regulate emotional phenomena appropriately. The GROP model of emotional competence advocates prevention and commitment to personal empowerment. Although it is based on emotional intelligence, it has an inclusive and open character that has incorporated and remains receptive to accepting new advances from different disciplines such as positive psychology, the theory of multiple intelligences, neuroscience, and the concept of flow, among others [8,14]. The scientific bibliography has highlighted how the domain of emotional competences impacts cognition, memory, attention, decision making, behaviors, moral evaluations, health, etc. [1,33–36]. For all these reasons, emotional competences are understood as basic competencies for life and their development extends throughout the entire life cycle, being considered essential during the first stages of life. Other studies have delved into the skills that can be developed in the different educational stages and the content of emotional education that favor said development in accordance with evolutionary requirements [16,37–39].

Table 1 presents a summary of the GROP model, which is structured in five dimensions: emotional awareness, emotional regulation, personal autonomy, social competence, and competence for life and well-being.

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| <b>Table 1.</b> GROP's Pentagonal M | odel of Emotional Competence. |
|-------------------------------------|-------------------------------|
|-------------------------------------|-------------------------------|

| Dimension                            | Description  |
|--------------------------------------|--|
| Emotional awareness                  | Ability to become aware of one's own emotions, including the ability to grasp the emotional climate of a given context.  |
| Emotional regulation                 | Ability to use emotions appropriately. It involves becoming aware of the relationship between emotion, cognition, and behavior; having good "coping" strategies; and self-generating emotions.   |
| Emotional autonomy                   | Ability for emotional self-management, related to a set of characteristics such as self-esteem, positive attitude in life, responsibility, ability to analyze social norms critically and seek help and resources, and personal self-efficacy. |
| Social competence                    | Ability to maintain good relationships with other people. This involves mastering basic social skills, effective communication, respect, prosocial attitudes, and assertiveness.   |
| Life and<br>Well-being<br>competence | Ability to adopt appropriate and responsible behaviors to solve personal, family, professional, and social problems, oriented towards the improvement of personal and social well-being.   |

Based on this model, different evaluation instruments have been developed, one being the CDE\_9–13 questionnaire. The Emotional Development Questionnaire for children aged 9 to 13 years [30] aims to be a tool for the evaluation of emotional education programs to promote mental health and well-being.

# 1.2. Construction of the Instrument

The construction of the CDE\_(9–13) began in 2007–2008 to evaluate the emotional development needs of children in primary education, specifically those aged between 9 and 13 years. It is also a useful tool to evaluate the effects of the emotional education programs applied in the mid and upper cycles of primary education. Diligent work has been carried out to improve the instrument over the years and create the final version presented here.

The construction of this instrument followed the guidelines of the International Test Commission [40]. The procedure followed was based on a review of previously validated instruments for the evaluation of emotional intelligence. This allowed us to make decisions about the wording of the items and the type of response. A bank of items was elaborated from the theoretical Bisquerra and Perez's model of emotional competence, described above. Judges carried out the first validation to guarantee the ascription of each item to the different dimensions of the questionnaire and ensure the relevance and clarity of the items, and their appropriateness for the target population. The group of judges was made up of eight experts in emotional education from different Spanish universities, all of whom were familiar with the instrument's model. With their recommendations, the preliminary design of the instrument was elaborated, which initially had 43 items. We tested different response procedures (qualitative, graphic, numerical). We used various pilot applications to analyze the instrument's technical properties and assess the difficulty for the respondents of each response mode. These applications made it possible to improve the wording of some items. The tests also showed that children could efficiently respond according to an eleven-point Likert-type scale whereby 0 = totally disagree, and 10 = totally agree. Thus, the second version of the scale was established with special attention to quality to increase the efficiency and precision of the tool [41]. Subsequently, a new nationwide pilot application was carried out with a sample of 369 primary school students from third to sixth grade. This test confirmed that 8-year-old students showed difficulties in comprehending some items and sometimes did not have sufficient reading maturity. Therefore, it was considered inappropriate for third-grade students, and we decided that the target audience would be only boys and girls between 9 and 13 years of age, that is, schoolchildren from fourth to sixth grade of primary education. Likewise, we eliminated two of the items, reducing

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the final instrument to 41 items. The questionnaire was computerized so that the students could answer it from an electronic device.

The scale can be divided into five factors. The first, called emotional awareness, contains twelve items referring to knowledge of one's own emotions and the emotions of others (e.g., I easily notice if others are in a good or bad mood). The second factor, called emotional regulation, groups eleven items related to emotional management (e.g., When I am nervous, I know how to calm down). The third factor, called emotional autonomy, groups four items related to self-confidence and self-esteem. (e.g., I think nice things about myself). Social competence is the fourth; it has eight items related to managing interpersonal relationships (e.g., It is easy for me to talk to people I know little). The fifth factor, life and well-being competence, consists of six items related to personal well-being and self-satisfaction (e.g., I feel like a happy person). We detail the technical characteristics of this instrument in the results section.

# 1.3. Purpose of the Study

The purpose of this study is to test the reliability and validity of the CDE\_9–13 using a heterogeneous sample of boys and girls. Specifically, this study has six objectives:

- (1) To assess the internal reliability of the variables of the CDE\_9–13.
- (2) To validate the proposed structure of five factors: emotional awareness, emotional regulation, emotional autonomy, social competence, and life competence and well-being through confirmatory factor analysis (CFA).
- (3) To assess the convergent validity of the CDE\_9–13 testing its association with the Spanish version of Baron and Parker's [42].
- (4) To confirm the correlation of trait emotional intelligence with the five major dimensions of personality. Based on the theory of trait emotional intelligence, emotional competencies should have a strong relationship with neuroticism and extraversion and, to a lesser extent, with responsibility, openness, and agreeableness [7,43,44].
- (5) To test the criterion validity of the CDE\_9–13 in relation to self-esteem, prosocial behavior, and adjustment difficulties. We selected these variables for their theoretical relevance to trait emotional intelligence, which is hypothesized to directly impact cognitive appraisals of one's life circumstances and adjustment behavior [44].
- (6) To explore the incremental validity of the CDE\_9–13 over the five personality dimensions.

# 2. Materials and Methods

# 2.1. Procedures

This study used different sample sizes for different analyses. All participants answered the CDE\_9–13. However, due to time constraints, availability of the instruments, and permissions of the centers, not all students were presented with the entire set of questionnaires. Therefore, partial samples were used for some of the analyses developed in this study. We explain the size of the sample used for each analysis in Section 2.2.

Students answered online versions of the questionnaires, in the presence of their teacher. All students participated voluntarily, and the schools they attended collected the corresponding consent forms signed by one of the parents of each participant.

#### 2.2. Participants

To study the descriptive data, structure, and reliability of the CDE\_9–13, we used a sample of 1905 students from fourth to sixth grade of primary education from different public, subsidized, and private schools in Spain. The participants ranged in age from 9 to 13 years of age (M = 10.43, SD = 0.095). The distribution of the sample (n = 1095; 50.7% male; 49.3% female) is described in Table 2.

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10.43 (DT = 0.97)

10.43 (DT = 0.95)

|      | Sample      | Mean Age          | 4th Grade   | 5th Grade   | 6th Grade   |
|------|-------------|-------------------|-------------|-------------|-------------|
| Boys | 965 (50.7%) | 10.43 (DT = 0.94) | 411 (51.7%) | 239 (48.6%) | 315 (50.1%) |

384 (48.3%)

795 (41.7%)

253 (51.4%)

492 (25.8%)

303 (49.0%)

618 (32.4%)

**Table 2.** Sociodemographic characteristics of the total sample.

n = 1905.

Girls

**Total** 

940 (49.3%)

1905

To study the convergent validity of the CDE\_9–13, 259 of the 1905 students who answered the Emotional Quotient inventory youth version [42] were examined. To study the correlations of the questionnaire's scales with the Big Five personality dimensions of extraversion, agreeableness, openness, conscientiousness, and neuroticism, we examined a sample of 259 students. These Big Five personality dimensions were first proposed in 1949 by Fiske [45] and later confirmed by McCrae and Costa [46] and are nowadays widely used and accepted. To analyze criterion validity of the CDE\_9–13, we examined a sample of 436 students with regard to prosocial behavior and adjustment difficulties. As a second check of the criterion validity of the CDE\_9–13, we examined a sample of 343 students with regard to self-esteem. Finally, to investigate the incremental validity of the CDE\_9–13, we examined a sample of 259 students.

# 2.3. Ethics Statement

We developed this study following the recommendations of the Bioethics Committee of the University of Barcelona and were subject to the ethical standards established by the 1964 Declaration of Helsinki, inclusive of all subsequent modifications. The school administration of each participating child informed all parents or legal guardians of the study objective, procedures, risks and benefits, confidentiality, and the voluntary nature of their participation. The parents or guardians of the children were asked to provide written informed consent to the school administrators. The research group signed a research agreement with each school guaranteeing the confidentiality of the results. Each educational center kept each participating child's informed consent, administered the questionnaires in the classroom, and sent the data anonymously (using passwords) to the research team.

# 2.4. Statistical Analysis

We conducted a descriptive analysis of the Emotional Development Questionnaire (CDE\_9–13). We also conducted analyses of its factor structure, the reliability of its scales, its convergent validity, the correlation with personality dimensions, its criterion validity, and of its incremental validity. We used IBM AMOS 24 to test the theoretical structure of the five-factor CDE\_9–13 through confirmatory factor analysis (CFA). For all other statistical analyses, we used IBM SPSS 27.

Factor structure of the CDE\_9-13. We conducted a second-order confirmatory factor analysis, in which the main construct was Emotional Intelligence and the subconstructs were the five dimensions of emotional intelligence already explained. The analysis used maximum likelihood (ML) estimator. For this analysis, the full sample of 1905 students was used. When using the Structural Equation Modeling (SEM) technique, a sample size of approximately n = 150 is required to perform a confirmatory factor analysis with normally distributed indicator variables and no missing data [47]. Our sample was, therefore, suitable for a CFA using SEM.

Several authors have shown that a confirmatory factor analysis that uses all items in a questionnaire or test is excessively rigorous because individual items have low reliability, low intercorrelations, and limited correlations with other variables. When factor analysis is conducted in such a manner, it becomes complicated to confirm the fit of the model to the data [48,49]. The alternative is the creation of item parcels. This is a technique that consists of using the arithmetic mean of two or more items to replace them. This technique allows increasing reliability, improving communalities, increasing the degree of factor variance,

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and achieving distributions closer to normal [50,51]. Thus, in this study, we proceeded to create item parcels to perform confirmatory factor analysis. To ensure a superior test of the structural model parameters so that the constructs were precisely defined, we followed the recommendation to compose three-item parcels for each variable [52]. The items were randomly assigned to the parcels. For each parcel, the mean of its component items was calculated. The covariance matrix between the parcels was used as input in the factor analysis, and a maximum likelihood estimation was performed [53].

The factor structure was examined using chi-square, the comparative fit index [54], Tucker–Lewis index [55], and the root mean square error of approximation [56]. In Structural Equation Modeling, a model is considered confirmed when several fit indices show a good fit of the model to the data. Specifically, if the CFI and IFI indices are between 0.90 and 0.95, and the RMSEA coefficient is lower than 0.80, the fit is considered acceptable [57–59]. An optimal fit is considered when the indices exceed or are close to the following figures: CFI and IFI > 0.95 [60]; RMSEA < 0.70 [61].

*Reliability analysis.* We used Cronbach's  $\alpha$  coefficient to calculate the reliability of each of the scales and subscales in this study.

Convergent validity. As explained above, we used partial samples to test convergent validity. To investigate the convergent validity of the questionnaire, we analyzed the correlations between the CDE\_9–13 and another measure of emotional intelligence, the Emotional Quotient Inventory: Youth Version [42].

Correlations with personality dimensions. We computed the Pearson zero-order correlations between the CDE\_9–13 scales and the different personality dimensions as measured by the Big Five Questionnaire—Children and Adolescents.

*Criterion validity*. To test the criterion validity of the CDE\_9–13, we performed several hierarchical regression analyses. In the first one, the dependent variable was prosocial behavior measured with the fifth scale of the SDQ questionnaire. In the second one, the dependent variable was adjustment difficulties measured again with the SDQ questionnaire. In the third one, the dependent variable was self-esteem measured with the RSES questionnaire. In the first step, age and gender were entered in the analysis. In the second step, emotional intelligence was entered in the analysis.

Incremental validity. To investigate the incremental validity of the CDE\_9–13 over other already established measures in its ability to predict prosocial behavior and adjustment difficulties, we conducted a hierarchical regression analysis. In the first step, demographic variables were entered into the regression equation. In a second step, the five personality dimensions measured by the BFQ-NA [62] were entered: neuroticism, openness, extraversion, responsibility, and agreeableness. Due to collinearity between the personality traits of conscientiousness, openness, and agreeableness (IVF > 0.40), the three variables were summed. In a third step, emotional intelligence was entered.

#### 2.5. Measurement Instruments

*Emotional Competence.* We used the CDE\_9–13 explained above.

Emotional Intelligence. We used the BarOn Emotional Quotient Inventory: Youth Version (EQi-YV-YV) [42], in the reduced version, translated to Spanish and adapted by Ugarriza and Pajares [63], which showed an overall alpha coefficient of  $\alpha$  = 0.77 in its validation. It has also been used in research with children to evaluate emotional intelligence development programs [63,64]. The reduced BarOn-ICE: NA consists of 30 items answered on a four-point Likert-type scale, according to the following response options: "1 = Very rarely", "2 = Rarely", "3 = Often", and "4 = Very often." It is divided into five scales: intrapersonal (measures self-understanding and assertiveness), interpersonal (empathy, social responsibility, and understanding of others' feelings), adaptability (problem-solving and adaptability to reality), stress management (stress tolerance and impulse control), and general mood (happiness and optimism). In addition, the questionnaire provides a global EI quotient that indicates how one copes in general with daily demands considering the set of scales of the questionnaire. We were able to administer this test to 259 of the

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participants in the study. Cronbach's alpha values of the subscales were: Intrapersonal  $\alpha$  = 0.65, Interpersonal  $\alpha$  = 0.71, Adaptability  $\alpha$  = 0.80, Stress management  $\alpha$  = 0.75, General mood  $\alpha$  = 0.47; Global IE  $\alpha$  = 0.81.

Personality. We used an adapted Spanish version [65,66] of the BFQ-NA (Big Five Questionnaire—Children and Adolescents) [62]. This questionnaire is used to measure the Big Five personality model in adolescents. This model proposes that personality can be encapsulated in five core factors: extraversion, agreeableness, openness, conscientiousness, and neuroticism [46]. This questionnaire is used to measure the Big Five personality model in adolescents. It consists of 65 items to be answered on a five-point Likert-type scale, with values from one point "Completely false for me" to five points "Completely true for me". In Spain, the psychometric characteristics of the BFQ-NA were investigated, obtaining suitable reliability (Cronbach's alpha between 0.78 and 0.88; test/retest between 0.62 and 0.84) [64]. In turn, confirmatory and exploratory factor analysis reported a five-factor structure corresponding to the Big Five [67]. This test was applied to 259 of the study participants. Cronbach's alpha values of the subscales were: Conscientiousness α = 0.83, Agreeableness α = 0.79, Neuroticism α = 0.84, Extraversion α = 0.65, Openness α = 0.75; Total scale  $\alpha = 0.88$ .

Adjustment Difficulties and Prosocial Behavior. We used the Strengths and Difficulties Questionnaire (SDQ) [68], a self-report measure widely used to assess different mental, emotional, and behavioral problems children and adolescents experienced in the previous six months. The SDQ comprises 25 statements, which are distributed among five subscales (with five items each): Emotional Symptoms, Conduct Problems, Hyperactivity, Relationship Problems, and Prosocial Behavior. The first four subscales form a total score of Difficulties, and the fifth subscale provides a measure of Prosocial Behavior. It uses a Likert response format with three response options: 1 = Not true, 2 = Sometimes true, 3 = Definitely true. The psychometric properties of the SDQ have been extensively analyzed. While there is evidence of suitable internal structure and convergent/discriminant and predictive validity [69,70], the reliability of the scales has been found to be generally low. For instance, Kersten et al. [71] examined 34 studies that had investigated the reliability of the SDQ. The average reliability coefficient of each scale computed by these authors were the following: Emotional symptoms = 0.62, Conduct Problems = 0.56, Hyperactivity = 0.69, Peer problems = 0.49, Prosocial behavior = 0.66, and the Total Difficulty Scale = 0.76. One of the reasons for the low reliabilities is the brevity of its scales that have only five items each. The Cronbach coefficient is highly dependent on the number of items in the scale.

Despite the relatively weak reliabilities of several of its scales, the SDQ is widely used in many countries to measure children's emotional and behavioral problems because of its favorable psychometric properties and its predictive power. In this study, we used the Spanish version available on the Internet (http://www.sdqinfo.com, accessed on 22 July 2021) [72]. We were able to administer this test to 436 of the study participants. Cronbach's alpha of the subscales was Emotional Symptoms  $\alpha = 0.63$ , Conduct Problems  $\alpha = 0.57$ , Hyperactivity  $\alpha = 0.62$ , Relationship Problems  $\alpha = 0.48$ , and Prosocial Behavior  $\alpha = 0.59$ ; Total score of Difficulties  $\alpha = 0.63$ . These reliability coefficients are very similar to those reported by Kersten et al. [71].

Our reliabilities may have also been affected by the age of the respondents. The reliabilities reported by Kersten and colleagues were based on adults' responses to the questionnaire, while we used self-reported responses by children between nine and thirteen years of age. It is well established that responses of younger subjects tend to show lower quality compared to more mature respondents [73].

Self-esteem. We measured self-esteem with the Rosenberg Self-Esteem Scale (RSES) [74]. It is a brief test with appropriate psychometric properties. It is the most widely used instrument for the assessment of self-esteem in clinical practice and scientific research. It assesses self-esteem understood as a global evaluation of the positive or negative consideration of oneself. It has been translated into 28 languages and cross-culturally validated in

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53 countries. In this study, we used the translation by Martín Albo [75]. The scale consists of 10 items with a 4-point Likert-type response format, from total disagreement to total agreement. Five of the items provide positive scores of self-esteem, while the other five items are reversed coded. We were able to administer this test to 343 of the participants in the study. Cronbach's alpha of the scale was 0.68.

#### 3. Results

# 3.1. Factor Structure of the CDE\_9-13

The Kaiser–Meyer–Olkin test of sample adequacy was 0.94, and Bartlett's test of sphericity was significant (p < 0.000), indicating that all variables were highly suitable for factor analysis, so we proceeded to perform confirmatory factor analysis.

The fit of this model reached the required acceptance minima:  $\chi^2$  (80, n = 1905) = 643.076, CFI = 0.95, IFI = 0.95, RMSEA = 0.61. Therefore, the CFA confirms the five dimensions of emotional intelligence established by the theoretical frame of reference.

The factor loadings of the different factors in the second-order emotional intelligence construct are high or acceptable in all cases: emotional awareness, emotional regulation, social competence, autonomy, and life competence ( $k=0.84,\,0.70,\,0.84,\,0.80,\,$  and  $0.86,\,$  respectively). The correlations of each of the factors with the emotional intelligence second-order factor are  $r=0.86,\,0.76,\,0.84,\,0.73,\,0.83$ . The intercorrelations between the CDE\_9–13 scales are offered in Table 3. The Average Variance Extracted and calculated from the factor loadings was 60.93%. The descriptive data of these scales can be seen in Table 4. All individual items showed factor loadings in their respective factors over  $0.40,\,$  meeting the cut-off criteria established by Stevens [76].

Table 3. Correlations among emotional intelligence scales.

| Scales                     | 1       | 2       | 3       | 4       | 5       | 6 |
|----------------------------|---------|---------|---------|---------|---------|---|
| Emotional Intelligence     | 1       |         |         |         |         |   |
| <b>Emotional Awareness</b> | 0.86 ** | 1       |         |         |         |   |
| Autonomy                   | 0.73 ** | 0.58 ** | 1       |         |         |   |
| Social competence          | 0.84 ** | 0.73 ** | 0.54 ** | 1       |         |   |
| Life and Well-being com.   | 0.83 ** | 0.62 ** | 0.64 ** | 0.63 ** | 1       |   |
| Emotional Regulation       | 0.76 ** | 0.43 ** | 0.43 ** | 0.47 ** | 0.58 ** | 1 |

Note: n = 1905; \* p < 0.05, \*\* p < 0.01; com. = competence; 1 = Emotional Intelligence, 2 = Emotional Awareness, 3 = Autonomy, 4 = Life and Well-being competence, 5 = Emotional Regulation.

**Table 4.** Descriptives of the Emotional Development Questionnaire (CDE\_9–13) and its five subscales.

| Scales                      | Minimum | Maximum | Mean | SD   |
|-----------------------------|---------|---------|------|------|
| Emotional Awareness         | 0.00    | 10.00   | 7.30 | 1.50 |
| <b>Emotional Regulation</b> | 0.45    | 9.91    | 6.05 | 1.58 |
| Social Competence           | 0.00    | 10.00   | 7.02 | 1.54 |
| Autonomy                    | 0.00    | 10.00   | 7.72 | 1.67 |
| Life and Well-being com.    | 2.00    | 10.00   | 7.61 | 1.53 |
| Emotional Intelligence      | 1.22    | 9.85    | 7.00 | 1.26 |

Note. n = 1905; com. = competence, SD = standard deviation.

# 3.2. Reliability of the CDE\_9–13

The five dimensions of emotional competence of the CDE\_9–13 showed the following reliabilities measured with Cronbach's  $\alpha$ : Emotional Awareness (CE) = 0.80, Emotional Regulation (RE) = 0.75, Social Competence (CS) = 0.72, Emotional Autonomy (AU) = 0.62, Life Competence and Well-Being (CV) = 0.72, and the full scale of emotional intelligence (Total CDE) = 0.91.

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# 3.3. Convergent Validity

The total emotional intelligence coefficient calculated by the CDE\_9–13 correlates with all the EQi-YV scales [42] and especially with the total coefficient (see Table 5). Moreover, as can be seen, all the scales of the CDE\_9–13 correlate significantly with all the EQi-YV scales.

**Table 5.** Correlations between the variables measured by Emotional Development Questionnaire (CDE\_9–13) and the Emotional Quotient Inventory: Youth Version (EQi-YV) variables [42].

|                            | CDE_9–13<br>Total | Emotional<br>Awareness | Autonomy | Social<br>Comp. | Life and<br>Well-Being | Emotional<br>Regulation |
|----------------------------|-------------------|------------------------|----------|-----------------|------------------------|-------------------------|
| Intrapersonal Intelligence | 0.487             | 0.448                  | 0.326    | 0.515           | 0.335                  | 0.338                   |
| Interpersonal Intelligence | 0.586             | 0.621                  | 0.312    | 0.451           | 0.388                  | 0.460                   |
| Adaptability               | 0.430             | 0.428                  | 0.325    | 0.362           | 0.276                  | 0.308                   |
| Coping with Stress         | 0.421             | 0.207                  | 0.217    | 0.270           | 0.320                  | 0.666                   |
| Positive Impression        | 0.280             | 0.212                  | 0.226    | 0.181           | 0.293                  | 0.293                   |
| Total EQi-YV               | 0.717             | 0.629                  | 0.442    | 0.598           | 0.493                  | 0.664                   |

Note. n = 259. All correlations with p < 0.01. Social Comp. = Social Competence.

# 3.4. Correlations with the Personality Dimensions

The correlations between the CDE\_9–13 scales and the five personality traits measured with the BQF-NA [62] can be seen in Table 6. All scales correlate negatively with neuroticism and positively with extroversion, agreeableness, openness, and responsibility.

**Table 6.** Correlations between the variables measured by the Emotional Development Questionnaire (CDE\_9-13) and the Big Five Questionnaire—Children and Adolescents (BFQ-NA) [62].

|                               | RPD   | OPD   | EPD   | APD   | NPD    |
|-------------------------------|-------|-------|-------|-------|--------|
| Emotional Awareness           | 0.482 | 0.425 | 0.341 | 0.597 | -0.247 |
| Autonomy                      | 0.374 | 0.328 | 0.269 | 0.485 | -0.271 |
| Social Competence             | 0.448 | 0.408 | 0.293 | 0.589 | -0.303 |
| Life and Well-being           | 0.491 | 0.358 | 0.300 | 0.517 | -0.380 |
| <b>Emotional Regulation</b>   | 0.469 | 0.416 | 0.193 | 0.514 | -0.613 |
| Total Emotional Intelligence. | 0.599 | 0.489 | 0.399 | 0.700 | -0.490 |

Note. n = 259. All correlations significant, p < 0.01. RPD = Conscientiousness, OPD = Openness, EPD = Extraversion, APD = Agreeableness, NPD = Neuroticism.

# 3.5. Criterion Validity

The results show that beyond the demographic variables of age and gender, emotional intelligence predicted prosocial behavior ( $\beta = 0.51$ , p < 0.000). It also predicted children's adjustment difficulties 354 ( $\beta = -0.54$ , p < 0.000) and self-esteem ( $\beta = 0.41$ , p < 0.000). The total explained variance of prosocial behavior was 1% when only demographic variables were considered and 27% when emotional intelligence was added. In relation to adjustment difficulties, the demographic variables explained 1% of the variance, while adding emotional intelligence increased the explained variance to 29%, and for self-esteem, it rose from 0% to 16%. In a third step, the emotional intelligence variable was replaced by its scales. Thus, we found that only emotional awareness and social competence predict prosocial behavior. Emotional regulation, autonomy, and life competence predict adjustment difficulties. Finally, emotional regulation and autonomy predict self-esteem (see Tables 7–9). Collinearity was controlled for, but no IVF coefficient exceeded 3.1 points, well below the limits of 4 or even 5 proposed by various experts [77,78].

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Table 7. Regression analysis. Prediction of prosocial behavior from dimensions of emotional intelligence.

| 36.11                         | Non-Standar | dized Coefficients | Standardized Coefficients |        | C:::::       |
|-------------------------------|-------------|--------------------|---------------------------|--------|--------------|
| Model -                       | В           | Standard Error     | Beta                      | t      | Significance |
| (Constant)                    | 3.150       | 0.552              |                           | 5.710  | 0.000        |
| Age                           | 0.012       | 0.013              | 0.043                     | 0.868  | 0.386        |
| Gender                        | 0.322       | 0.169              | 0.096                     | 0.908  | 0.057        |
| <b>Emotional Intelligence</b> | 0.441       | 0.082              | 0.445                     | 0.408  | 0.000        |
| (Constant)                    | 3.167       | 0.461              |                           | 6.864  | 0.000        |
| Age                           | 0.009       | 0.014              | 0.027                     | 0.654  | 0.513        |
| Gender                        | 0.115       | 0.133              | 0.035                     | 0.864  | 0.388        |
| <b>Emotional Awareness</b>    | 0.352       | 0.068              | 0.333                     | 5.178  | 0.000        |
| <b>Emotional Regulation</b>   | 0.099       | 0.053              | 0.091                     | 1.857  | 0.064        |
| Autonomy                      | -0.034      | 0.056              | -0.033                    | -0.602 | 0.547        |
| Social Competence             | 0.213       | 0.070              | 0.206                     | 3.051  | 0.002        |
| Life and Well-being Comp.     | 0.002       | 0.071              | 0.002                     | 0.033  | 0.974        |

Note. n = 436. Dependent Variable: Prosocial Behavior. Explained variance = 2% and 26%.

Table 8. Regression analysis. Prediction of adjustment difficulties from dimensions of emotional intelligence.

| Model -                    | Non-Standar | rdized Coefficients | <b>Standardized Coefficients</b> |        | C::C         |
|----------------------------|-------------|---------------------|----------------------------------|--------|--------------|
|                            | В           | Standard Error      | Beta                             | t      | Significance |
| (Constant)                 | 34.064      | 2.336               |                                  | 14.584 | 0.000        |
| Age                        | 0.040       | 0.048               | 0.054                            | 0.838  | 0.403        |
| Gender                     | -0.881      | 0.532               | -0.107                           | -1.655 | 0.100        |
| Emotional Intelligence     | -3.139      | 0.333               | -0.611                           | -9.434 | 0.000        |
| (Constant)                 | 32.290      | 10.674              |                                  | 19.294 | 0.000        |
| Age                        | -0.013      | 0.050               | -0.010                           | -0.259 | 0.796        |
| Gender                     | -0.678      | 0.482               | -0.056                           | -1.406 | 0.160        |
| <b>Emotional Awareness</b> | 0.291       | 0.247               | 0.060                            | 0.950  | 0.342        |
| Emotional Regulation       | -1.453      | 0.194               | -0.390                           | -8.269 | 0.000        |
| Autonomy                   | -0.423      | 0.203               | -0.115                           | -1.473 | 0.039        |
| Social Competence          | -0.484      | 0.253               | -0.129                           | -1.910 | 0.058        |
| Life and Well-Being C.     | -0.581      | 0.259               | -0.146                           | -1.769 | 0.025        |

Note. n = 436. Dependent Variable: Adjustment Difficulties. Explained variance = 0% and 25%.

Table 9. Regression analysis. Prediction of self-esteem from dimensions of emotional intelligence.

| Model                         |        | andardized<br>fficients | Standardized Coefficients | t      | Significance |
|-------------------------------|--------|-------------------------|---------------------------|--------|--------------|
| _                             | В      | Standard Error          | Beta                      |        |              |
| (Constant)                    | 30.134 | 1.066                   |                           | 28.279 | 0.000        |
| Age                           | -0.046 | 0.053                   | -0.048                    | -0.881 | 0.379        |
| Gender                        | 0.576  | 0.563                   | 0.055                     | 1.024  | 0.306        |
| (Constant)                    | 18.812 | 1.683                   |                           | 11.179 | 0.000        |
| Age                           | -0.041 | 0.048                   | -0.042                    | -0.845 | 0.399        |
| Gender                        | 0.290  | 0.515                   | 0.028                     | 0.563  | 0.574        |
| <b>Emotional Intelligence</b> | 1.653  | 0.200                   | 0.408                     | 8.251  | 0.000        |
| (Constant)                    | 17.377 | 1.698                   |                           | 10.235 | 0.000        |
| Age                           | -0.049 | 0.047                   | -0.050                    | -1.041 | 0.299        |
| Gender                        | 0.367  | 0.505                   | 0.035                     | 0.726  | 0.468        |
| <b>Emotional Awareness</b>    | -0.362 | 0.259                   | -0.110                    | -1.398 | 0.163        |
| <b>Emotional Regulation</b>   | 0.515  | 0.191                   | 0.158                     | 2.691  | 0.007        |
| Autonomy                      | 0.847  | 0.208                   | 0.264                     | 4.069  | 0.000        |
| Social Competence             | 0.306  | 0.264                   | 0.094                     | 1.159  | 0.247        |
| Life and Well—Being C.        | 0.497  | 0.268                   | 0.141                     | 1.851  | 0.065        |

Note. n = 343. Dependent Variable: Self-esteem. Explained variance = 0% and 16%.

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# 3.6. Incremental Validity

We analyzed the results obtained with the 259 participants who answered the three questionnaires. In the first step, we found that age and gender did not predict prosocial behavior. In the second step, we found that only two variables predicted prosocial behavior: neuroticism and the variable obtained by the sum of conscientiousness, openness, and agreeableness. In the third step of the analysis, when EI was measured with CDE\_9–13, an additional 8% predictive power was accrued. In the fourth step, the emotional intelligence variable was replaced by its five dimensions. We observed that social competence was the variable that provides predictive value above the "Big Five" dimensions of the individual's personality.

The same steps were repeated for the prediction of adjustment difficulties. In the second step, we again found that only two variables predicted prosocial behavior: neuroticism and the variable obtained by the sum of conscientiousness, openness, and agreeableness. In step 3, emotional intelligence contributed an additional predictive power of 3%. In the fourth step, social competence and autonomy are the variables that provide additional predictive power over personality traits (see Tables 10 and 11).

Table 10. Regression analysis. Prediction of prosocial behavior from personality and emotional intelligence dimensions.

| Model                             | Non-Standa | rdized Coefficients | Standardized<br>Coefficients | t      | Significance |
|-----------------------------------|------------|---------------------|------------------------------|--------|--------------|
|                                   | В          | Standard Error      | Beta                         |        |              |
| (Constant)                        | 7.470      | 0.305               |                              | 24.47  | 0.000        |
| Gender                            | 0.007      | 0.018               | 0.031                        | 0.37   | 0.712        |
| Age                               | 0.291      | 0.196               | 0.125                        | 1.487  | 0.139        |
| (Constant)                        | 1.344      | 1.319               |                              | 1.019  | 0.310        |
| Gender                            | 0.012      | 0.016               | 0.054                        | 0.731  | 0.466        |
| Age                               | 0.156      | 0.179               | 0.067                        | 0.869  | 0.386        |
| Neuroticism                       | 0.002      | 0.024               | 0.012                        | 0.078  | 0.938        |
| Extraversion                      | 0.010      | 0.038               | 0.032                        | 0.272  | 0.786        |
| Openness                          | 0.021      | 0.034               | 0.066                        | 0.614  | 0.540        |
| Agreeableness                     | 0.132      | 0.035               | 0.455                        | 3.777  | 0.000        |
| Conscientiousness                 | 0.001      | 0.019               | 0.004                        | 0.047  | 0.962        |
| (Constant)                        | -0.487     | 1.040               |                              | -0.469 | 0.640        |
| Gender                            | 0.011      | 0.014               | 0.041                        | 0.772  | 0.441        |
| Age                               | 0.232      | 0.179               | 0.069                        | 1.298  | 0.196        |
| RESAPAM                           | 0.019      | 0.007               | 0.231                        | 2.974  | 0.003        |
| Extraversion                      | 0.019      | 0.021               | 0.059                        | 0.916  | 0.361        |
| Neuroticism                       | 0.027      | 0.013               | 0.120                        | 1.992  | 0.048        |
| Emotional Intelligence            | 0.523      | 0.096               | 0.403                        | 5.431  | 0.000        |
| (Constant)                        | 0.155      | 1.118               |                              | 0.138  | 0.89         |
| Gender                            | 0.013      | 0.014               | 0.049                        | 0.927  | 0.355        |
| Age                               | 0.209      | 0.180               | 0.062                        | 1.163  | 0.246        |
| RESAPAM                           | 0.019      | 0.007               | 0.230                        | 2.941  | 0.004        |
| Extraversion                      | 0.021      | 0.021               | 0.066                        | 1.01   | 0.313        |
| Neuroticism                       | 0.019      | 0.015               | 0.087                        | 1.269  | 0.206        |
| <b>Emotional Awareness</b>        | 0.184      | 0.096               | 0.176                        | 1.915  | 0.057        |
| Autonomy                          | 0.011      | 0.073               | 0.011                        | 0.152  | 0.879        |
| Social Competence                 | 0.246      | 0.094               | 0.239                        | 2.622  | 0.009        |
| Life and Well-being<br>Competence | -0.077     | 0.091               | -0.069                       | -0.844 | 0.399        |
| Emotional Regulation              | 0.094      | 0.086               | 0.088                        | 1.094  | 0.275        |

Note. n = 259. Dependent variable: Prosocial behavior. RESAPAM = Conscientiousness + Openness + Agreeableness. Explained variance  $R^2$  for steps 1 through 4 = 0.03, 0.59, 0.60, and 0.63, respectively.

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Table 11. Regression analysis. Prediction of adjustment difficulties from personality and emotional intelligence dimensions.

| Model                      | Non-Standa | rdized Coefficients | Standardized<br>Coefficients | t      | Significance |
|----------------------------|------------|---------------------|------------------------------|--------|--------------|
|                            | В          | Standard Error      | Beta                         | •      |              |
| (Constant)                 | 13.420     | 1.058               |                              | 12.679 | 0.000        |
| Gender                     | 0.056      | 0.061               | 0.076                        | 0.910  | 0.364        |
| Age                        | -1.391     | 0.680               | -0.170                       | -2.046 | 0.043        |
| (Constant)                 | 14.803     | 3.528               |                              | 4.196  | 0.000        |
| Gender                     | 0.041      | 0.042               | 0.055                        | 0.963  | 0.337        |
| Age                        | -1.360     | 0.480               | -0.166                       | -2.834 | 0.005        |
| Neuroticism                | -0.049     | 0.065               | -0.089                       | -0.750 | 0.455        |
| Extraversion               | -0.322     | 0.102               | -0.280                       | -3.147 | 0.002        |
| Openness                   | 0.163      | 0.092               | 0.147                        | 1.783  | 0.077        |
| Agreeableness              | -0.143     | 0.093               | -0.142                       | -1.539 | 0.126        |
| Conscientiousness          | 0.410      | 0.050               | 0.500                        | 8.176  | 0.000        |
| (Constant)                 | 18.090     | 3.002               |                              | 6.025  | 0.000        |
| Gender                     | 0.021      | 0.041               | 0.022                        | 0.510  | 0.611        |
| Age                        | -1.503     | 0.517               | -0.126                       | -2.906 | 0.004        |
| RESAPAM                    | -0.059     | 0.019               | -0.198                       | -3.119 | 0.002        |
| Extraversion               | 0.073      | 0.060               | 0.064                        | 1.221  | 0.223        |
| Neuroticism                | 0.375      | 0.038               | 0.478                        | 9.756  | 0.000        |
| Emotional Intelligence     | -1.071     | 0.278               | -0.233                       | -3.851 | 0.000        |
| (Constant)                 | 18.401     | 3.190               |                              | 5.768  | 0.000        |
| Gender                     | 0.034      | 0.041               | 0.035                        | 0.824  | 0.410        |
| Age                        | -1.588     | 0.512               | -0.133                       | -3.101 | 0.002        |
| RESAPAM                    | -0.065     | 0.019               | -0.217                       | -3.447 | 0.001        |
| Extraversion               | 0.075      | 0.060               | 0.066                        | 1.265  | 0.207        |
| Neuroticism                | 0.386      | 0.043               | 0.493                        | 8.900  | 0.000        |
| <b>Emotional Awareness</b> | 0.334      | 0.274               | 0.090                        | 1.218  | 0.224        |
| Autonomy                   | -0.414     | 0.207               | -0.114                       | -1.996 | 0.047        |
| Social Competence          | -0.620     | 0.267               | -0.170                       | -2.321 | 0.021        |
| Life and Well-being        | -0.406     | 0.260               | -0.103                       | -1.560 | 0.120        |
| Emotional Reg.             | 0.109      | 0.246               | 0.029                        | 0.441  | 0.659        |

Note. n = 259. Reg. = Regulation. Dependent variable: Adjustment Difficulties. RESAPAM = Conscientiousness + Openness + Agreeableness. Explained variance  $R^2$  for steps 1 through 4 = 0.03, 0.59, 0.60, and 0.63, respectively.

# 4. Discussion

The aim of the present study was to evaluate the psychometric properties of the CDE\_9–13 in response to six specific objectives, which we analyze below.

The first of these was the evaluation of its internal reliability. The findings show that the scale presents high reliability of 0.91 measured by Cronbach's alpha and that the reliabilities for each factor are also adequate.

The second objective was to study the factorial structure of the instrument. The results of the CFA indicate that the five-factor structure coincides with the theoretical dimensions of the pentagonal model of the GROP: emotional awareness, emotional regulation, emotional autonomy, social competence, and life competence. Likewise, the different goodness-of-fit indices also report the correct adequacy of the questionnaire to the theoretical model.

For the study of convergent validity, as we proposed in the third objective, the correlation analysis between the CDE\_9–13 and the EQi-YV test [42] (a widely recognized measure of trait emotional intelligence) confirms that at a global level, both questionnaires correlate strongly and positively with one another. Furthermore, all scales of the CDE\_9–13 correlate significantly with all EQi-YV scales. These results support the hypothesis that both the CDE\_9–13 and the EQi-YV test assess trait emotional intelligence (TEI). The presented results demonstrate support for research on trait EI compiled by Pérez-González, Saklofske and Mavroveli [79].

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At the same time, the correlations between the CDE\_9-13 and the five major personality factors measured with the BQF-NA [62] were confirmed, as hypothesized in our fourth objective. The results show that all scales correlate negatively with neuroticism and positively with extroversion, agreeableness, openness, and responsibility. These results are coincident with other previous studies on trait emotional intelligence and emotional competence [7,44]. All dimensions of the CDE\_9-13 maintain intense correlations with agreeableness. However, the emotional regulation dimension correlates more intensely with neuroticism, although this correlation is negative. Personality has an impact on how emotions are regulated, and may influence the presence of psychopathology indicators and affect different components of subjective well-being [80]. This would make sense as children strive to regulate the expression of their negative emotions to protect the relationship with and acceptance from their peers, which may lead to increased symptoms of anxiety and depression [81].

Regarding criterion validity, which was our fifth objective, the results show that emotional awareness and social competence predict prosocial behavior, while emotional regulation, autonomy, and life competence predict adjustment difficulties. Emotional regulation and autonomy, in turn, are predictors of self-esteem. Thus, this implies that trait emotional intelligence has a direct impact on cognitive life appraisals and on adaptive behavior, as noted in other studies [44].

In response to the last objective, the incremental validity of the CDE\_9–13 over the five main personality dimensions was explored. In this study, social competence and autonomy contribute predictive value to prosocial behavior and adjustment difficulties above each of the subject's personality dimensions. These results are consistent with other recent studies [82,83] and support the proposition that the CDE\_9–13 has predictive capacity for socially relevant variables. People who possess socioemotional competencies are more aware of their emotions and the needs of others, maintaining more positive and satisfactory relationships and developing more likely prosocial behaviors [84].

Some limitations of the present study should be considered. First, it is deemed pertinent to replicate with new studies the findings obtained with partial samples. Such studies could expand the number of participants and include representation from different educational, socio-, and health contexts. In the future, it could be valuable to carry out longitudinal studies to investigate the instrument's stability over time. Additional studies can also help to better understand the possible relationships between trait emotional intelligence, the five major dimensions of personality, and the variables that predict prosocial behavior. Likewise, it would be interesting to study the relationship of emotional intelligence with other variables to predict clinical symptomatologies such as anxiety or depression and, consequently, to develop prevention and intervention measures. In addition, it would be enriching to complement the CDE\_9–13 data with other assessment techniques such as interviews, focus groups, participant observation, etc.

Scientific productivity in the evaluation of emotions has been enhanced over the years [85]. However, although most of the measurement instruments have been elaborated and published in English, there are few instruments aimed at children and adolescents [24]. Therefore, there is a need for assessment instruments adapted to the Spanish context that are valid and reliable enough for use by children of school age [24]. This study provides enough evidence to consider the CDE\_9–13 a suitable tool for the evaluation of emotional competencies in children in terms of reliability and validity. At the same time, it is also suitable to help design and develop emotional education interventions for health prevention and improvement of the essential competencies necessary to better face the challenges that arise in life [14,17].

# 5. Conclusions

The assessment of emotional competencies requires specific, reliable, valid, and rigorously tested instruments. The contribution of instrumentation that measures the emotional dimension in the field of education is highly relevant given that novel instruments are

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rare and often lacking in rigor. The theoretical foundation implemented and the empirical evidence obtained in this study demonstrate that the CDE\_9–13 is a suitable instrument, adjusted to Bisquerra and Perez's model of emotional competence, with appropriate psychometric properties, and adequate to measure the emotional competence of children aged 9 to 13 years in primary education. Its applications in the field of education are novel and useful to measure the level of emotional development of children and contribute to the design and evaluation of educational programs that promote the health and emotional well-being of students.

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