

# Standard Properties of Parental Competence Scale for Children with Autism Spectrum Disorder According to the Two-Parameter Logistic Model

M. S. S. Alnasraween<sup>1,\*</sup>, A. Khazaleh<sup>2</sup>, H. O. Abzakh<sup>3</sup>, I. J. Shawareb<sup>1</sup> and S. A. Ajeely<sup>1</sup>

<sup>1</sup>Department of Educational Psychology, College of Educational and Psychological Sciences, Amman Arab University, Amman, Jordan

<sup>2</sup>Department of Psychological Sciences, Faculty of Educational Psychological Sciences, Al al-Bayt University, Almfraq, Jordan

<sup>3</sup>Department of Psychological Sciences, Faculty of Educational Psychological Sciences, Al-Balqa Applied University, Amman, Jordan

Received: 28 Jul. 2023, Revised: 14 Aug. 2023, Accepted: 25 Aug. 2023.

Published online: 1 Sep. 2023.

**Abstract:** Given the scarcity of valid and reliable scales this study aimed to find out the standard properties of parental scale competence for children with autism spectrum disorder according to the two-parameter logistic model. The study sample consisted of 795 parents. The instrument for the study was developed after reviewing previous literature. The factor analysis revealed that there was one trait behind the performance on the study scale; the results also revealed that the data fit the two-parameter logistic model; an item information function was extracted for the items, and the highest and the lowest values were revealed. Moreover, results of the study showed that there were statistically significant differences according to the gender variable in favor of females. In addition, statistically significant differences were found between the arithmetic means of the level of parental competence according to the educational qualification variable in favor of those parents with post graduate studies. The study suggested using the related scale and conducting more studies regarding parental competency using other variables.

**Keywords:** Parental Competence, Autism Spectrum Disorder, Two-Parameter Logistic Model.

## 1. Introduction

Parental competence is a multidimensional construct that refers to parents' ability to meet their children's developmental and emotional needs effectively, it encompasses a broad range of skills, knowledge, and attitudes that parents need to provide a nurturing and supportive environment for their children, research has identified several factors that contribute to parental competence, such as parental warmth and sensitivity, consistent and appropriate discipline, effective communication, and parental self-efficacy.

Parental competence has been linked to positive child outcomes, including better social-emotional development, improved academic performance, and fewer behavioral problems. Conversely, low parental competence has been associated with a range of negative outcomes, such as child abuse and neglect, poor mental health, and academic underachievement [25, 37].

Parental competence for children with ASD includes understanding their specific needs, communicating with them in a way that they can comprehend, managing challenging behaviors, and creating a structured and predictable environment, providing appropriate emotional and social support for the child. Parental competence for these parents includes the ability to understand the individual needs of the autistic child, develop enhanced communication skills, and enhance their social abilities. Parental competence also includes the ability to deal with behavioural challenges resulting from autism disorder and achieving a balance between meeting the child's needs and developing his skills and independence, parents need to learn strategies to promote their child's social communication skills, such as using visual aids and modelling appropriate behaviour, they also need to work closely with healthcare providers and educators to ensure that their child's needs are met, overall, parenting competence for children with ASD requires patience, flexibility, and a willingness to learn and adapt to the child's needs over time [30].

Parents' own experiences of being parented, their mental health status, and their level of stress and social support can all impact their parental competence, similarly, children's age, temperament, and developmental stage can influence the parenting strategies that are most effective for them, furthermore, cultural and contextual factors can also play a role in shaping parental competence, as parenting practices and expectations can vary across different cultures and social

\*Corresponding author e-mail: [mueen@aau.edu.jo](mailto:mueen@aau.edu.jo)

contexts [26].

To be an effective parent, a range of talents and tactics are necessary, including as emotional support, setting clear limits and expectations, active listening, and positive reinforcement. Positive reinforcement encourages positive behavior while discouraging negative behaviour by rewarding children for good behavior. Setting clear limits and expectations entails creating regular rules and penalties that might assist youngsters in understanding what is expected of them and feeling safe in their surroundings. Finally, offering emotional support entails being empathetic to and supportive of the emotions of children, paying attention to and validating children's thoughts and feelings is one example of active listening, which may promote good communication and trust between parents and children [29].

Parenting competence is an essential component of supporting children's healthy development and well-being. A variety of abilities and techniques that consider the specific requirements and developmental stages of each child are essential to effective parental competence. Interventions that attempt to enhance parental competence may be very beneficial for both parents and children, promoting good family bonds, improving children's outcomes, and generally creating a healthier home environment [15].

[6] introduced the concept of parental competence through his theory of social learning as the individual's ability to perform a behaviour that achieves positive and desirable results in a particular situation, control life stresses that affect the individual's behaviour, and make self-expectations about how he performs the tasks and activities he performs. In addition, predicting the effort, activity, and perseverance necessary to achieve the work to be done and self-efficacy has a great impact on human development and its compatibility.

Parental competence refers to positive parenting practices, which include responsiveness, stimulation, non-punitive care, increased sensitivity to the child's needs, active parental orientation towards the child, evaluation of the child with fewer behavioural problems, and a higher level of parental competence that may cause parents to spend a great deal of effort in educating themselves while it is related to raising their children, especially those with disabilities, and motivate parents to adapt to the child's behaviour, which will have a positive and important impact on the development of children and their sense of comfort and satisfaction in their presence in terms of parental warmth, external support, equality, independence, reinforcement, and active participation during interaction with children in different life situations [32].

[19, 20] emphasized that parental competence is an expression of parents' awareness of their responses to behavioural situations that are characterized by stimuli of care, direction, positive support, equality and non-discrimination between children, while giving them the opportunity to participate effectively. There are many concepts related to the concept of parental competence. A third they called parental support, and despite these names, all of them focus on the positive aspect of parental treatment of fathers.

Many theoretical models that concern with the parental competence have been greatly affected by three elements that may have a different effect on the formation of parental competence, which are: [17,18].

First: Personal growth and psychological happiness of parents. Second: Characteristics of the child. Third: social support and the developmental history of parents' personality in addition to their feelings of happiness, are the most important elements in shaping parents' self-efficacy. Mothers of children with disabilities may generally go through a lot of negative experiences such as anxiety, depression, sadness, pessimism, negativity, and low self-esteem, which may reduce parental efficiency among them, and here they may find it difficult to face those challenges and problems the disabled child suffers from [23,27,36].

### *1.1 Requirements to achieve parental competence*

Parental competencies require a mix of elements such as knowledge, skills, attitudes, and social support. Understanding of child development, parenting practices, and successful communication, among other things, are examples of knowledge. Parents must have access to accurate and trustworthy information based on scientific evidence and suited to their child's specific requirements. The capacity to use this information successfully in daily interactions with children, such as active listening, positive reinforcement and setting appropriate limits, is referred to as skills [10].

Parent training programs, peer support groups, and home visiting programs are among the interventions that have been created to increase parental competence. These treatments use a variety of tactics, including as role-playing, group discussions, and modelling, to improve parents' knowledge, abilities, attitudes, and social support. Parent training programs, for example, focus on educating parents' evidence-based parental methods while also giving feedback and support. Peer support groups allow parents to share their experiences and learn from one another, whereas home visiting programs give one-on-one support and counselling to parents in their own homes [20].

Achieving parental competence requires a multifaceted approach that addresses parents' knowledge, skills, attitudes,

and social support. Interventions that promote parental competence can have significant benefits for parents and children, such as improved child outcomes, reduced parental stress, and increased parental satisfaction and confidence [24].

### *1.2 Some of these requirements are listed below.*

#### *1.2.1 Having a high level of awareness and experience:*

If the parents have a high level of awareness and understanding based on knowledge, training, and experience and they do what they should towards their children, this will help the children achieve psychological compatibility on a personal and social level, thus the parents will enjoy a healthy child [33, 22].

#### *1.2.2 Adopting new methods of raising children that parents are not accustomed to:*

Parents should adopt new methods that help them deal with their children with autism spectrum disorder [18].

#### *1.2.3 Good interaction between parents and children:*

The development of a child's personality in a healthy manner depends to a high degree on the extent of good interaction in his relationship with his parents, because parents' attitudes towards treating children differ from one family to another, and the children's responses differ as a result [25, 26].

[37] pointed out that having a child with an AUSD in the family can lead to psychological trauma for parents, causing them to suffer from many negative emotions such as anxiety, depression, and guilt.

This was confirmed by [13] where they indicated the high level of psychological burnout among parents of a child with autism spectrum disorder and what it includes: a feeling of emotional stress, dulling of feelings, and a lack of a sense of achievement as a result of their lack of ability to help their son, who suffers from this disorder, in addition to the economic burdens, and having to spend most of the time with this child to help him and meet his needs, which he cannot do alone because of how he suffers from this disorder [14].

[5] describes individuals with high self-efficacy as attributing failure to insufficient effort, and this serves to guide success, while those with low self-efficacy attribute failure to low self-efficacy; Therefore, they believe that the work is more difficult than it is in reality, which always exposes them to falling under pressure, and that the person who feels a high degree of self-efficacy will exert more effort and perseverance than the one who feels a lower degree of self-efficacy, and has confidence that his endeavours will lead to success no matter how difficult the situation. When parents reach the required level of parental competence, their awareness, consciousness, and response to the needs of their children will increase, taking into account their children's problems and challenges [36].

### *1.3 Item Response Theory*

The item response theory (IRT), also known as the latent response theory, is a family of mathematical models that aim to explain the link between latent traits (unobservable characteristics or attributes) and their manifestations (observed outcomes, reactions, or performance), They create a connection between the qualities of items on an instrument, the responses of individuals to these objects, and the underlying feature being assessed. IRT presumes that the latent construct (e.g., stress, knowledge, attitudes) and measure items are structured on a latent continuum. As a result, its primary goal is to determine the individual's place on the continuum [4].

IRT proposed many models to aiming to provide several advantages such as: including the ability to estimate item parameters, using partial credit models, the ability to handle missing data and unequally spaced response categories, and finally the ability to model item dependencies [9,17].

#### *1.3.1 Assumptions of item response theory:*

A- Unidimensionality: Which posits that the test measures a single construct or trait. This assumption is critical because IRT models assume that all items in the test are measuring the same construct and that the construct is being measured consistently across different items. Violation of this assumption can lead to inaccurate estimates of item parameters and may affect the reliability and validity of the test [4].

B- Local independence: Which states that, the response to one item is independent of the response to other items in the same test [9].

D- Characteristics curve: Which indicates the existence of a mathematical function that links the probability of the correct answer to the item with the examinee's ability that was measured by a set of items in the scale that was built for that purpose.

E- "Speediness" implies that the speed factor does not play a role in correctly answering the test item, meaning that the

failure of individuals to answer the item is due to their low ability, not to the effect of the speed factor [12,11].

### 1.3.2 Two-parameter logistic model:

This model assumes that the probability of an individual with latent ability level  $\theta$  to endorse an item with two item characteristic parameters: the difficulty and the discrimination parameters of the item, the two-parameter logistic model equation takes the following form:

$$p(\theta) = \frac{e^{Da_i(\theta-b_i)}}{1 + e^{Da_i(\theta-b_i)}} \quad [8]$$

There are many criteria that have been used to select the items of measurement tools in general and attitude measures in particular, and the vast majority of these criteria stem from the concepts of the Classical Theory of measurement (CTT). While Anastasi, as cited in [11], stated that Item Response Theory (IRT) constitutes a new and documented scientific framework for selecting items at the present time, it addresses many educational and psychological issues more effectively than traditional theories.

[26] Carried out a study to assess the psychometric properties of a culturally relevant instrument which Iranian practitioners could use as part of their assessment process, and which would assist them with devising family-center supports to parents of children with autism. The instrument developed in this study demonstrated acceptable psychometric properties. Content validity and face validity were assured, factor analysis led to the development of a 2-factor solution accounting for 71.4% of the observed variance. Reliability of the instrument using the calculation of the [Cronbach's alpha coefficient](#) was reported as 0.98 for the entire instrument. The parental competence scale demonstrated acceptable [psychometric](#) properties.

[16] conducted a study that aimed to know the relationship between parental self-efficacy and psychological stress and physical complaints among fathers of children with developmental disorders in the Bedouin society in Palestine. The research used five scales, and the results of the study found a negative relationship with statistical significance between parental self-efficacy and psychological stress among the study participants.

The study of [7] aimed to find out about parental stress and parental self-efficacy and their relationship to marital satisfaction and attention disorder accompanied by hyperactivity in children. The sample consisted of (182) fathers with children in the first to ninth grades; (63) parents have children with attention deficit hyperactivity disorder; (199) parents have normal children, and a measure of parental self-efficacy, parental stress, and marital satisfaction was used. People with attention deficit hyperactivity disorder have a high level of parental stress and a low level of parental self-efficacy and marital satisfaction.

[2] conducted a study that aimed to reveal the parental practices and their relationship to emotional regulation among students with learning difficulties the study sample consisted of 300 female students in secondary education, aged between 14 and 17 years, from some government schools affiliated to the Directorate of Education in Helwan Educational Administration, Cairo Governorate. The results of the research showed that there were statistically significant differences between the arithmetic means of student emotional regulation attributed to student with normal families, also the findings showed that the level of parental practices was high.

[35] conducted a study to find out the level of parental self-efficacy and parental practices of parents of children with physical difficulties compared to parents of normal children. The parental trust test was used to measure parental self-efficacy, as well as a parental practices test, and a demographic questionnaire. The results of the study showed a high level of parental competence. Furthermore, the results indicated no statistically significant differences between the means of the parental competence attributed to the child's situation (normal, with physical difficulties).

[31] conducted a study aimed at knowing the relationship between quality of life and parental competence among mothers of intellectually disabled children who can be taught. The study sample consisted of (235) mothers in Egypt, the questionnaire was adopted as a study instrument. According to the study's findings, there is a positive, statistically significant correlation between quality of life and parental competence, and there are no differences in parental competence due to age.

[34] conducted a study aimed at examining the relative contributions of each of the self-esteem and the perceived parental competence of the sons in predicting the self-disability of the mathematically gifted adolescents, in addition to examining the differences between the athletically gifted in individual and group games, as well as between the athletically gifted and the ordinary in self-disability. The study sample included 90 mathematically gifted adolescents (average age of 14 years; standard deviation 1.258); and 90 mathematically gifted adolescents (average age of 26.15

years; standard deviation 1.047). The presence of self-perceived parental competence on the one hand and self-disability on the other hand, as well as the ability of each of them to predict it, and the presence of statistically significant differences in self-disability between the mathematically gifted in individual games and group games, favor the gifted in individual games.

[10] conducted a study aimed at measuring the extent to which parents adapt to children with learning difficulties using the Rasch model. The study sample consisted of 220 parents of children with learning difficulties in India, where the percentage of fathers and mothers was (15%) (85%). The study tool consisted of 45 items on the Likert scale. The results of the study showed that the scale conformed to the assumptions of the Rasch model, and that it had appropriate psychometric properties.

[1] conducted a study that aimed to find out the ASD and its relationship to parental styles. The study sample consisted of 100 students, to whom the ADHD scale was applied, and the parental styles scale was applied to 50 parents. The results of the study showed a significant correlation between parental styles and the high degree of turmoil index.

The study of [3] aimed to reveal the relationship between parental competence and the dimensions of the cognitive competence scale. The study sample consisted of (252) first-year middle school students from some government schools in the West Mansoura Educational Administration in Egypt. The results of the study showed that there is no correlation statistically significant between parental competence as perceived by students and their cognitive competence.

#### 1.2.4 Commenting on previous studies

By reviewing previous studies, it is noted that they varied in their objectives, the variables they addressed, the methodology and the participants as some of the studies dealt with the parental competency variable and its relationship with other variables such as cognitive efficiency, marital satisfaction, and other variables. While some studies such as the study of [10] which sought to use the Rasch model to measure the extent to which parents adapt to their children with autism spectrum disorder. What distinguishes this study from the other previous studies is its quest to build a scale using the item response theory characterized by psychometric properties that researchers and the workers in this field may use.

## 2. Statement of the study problem

Parents of children with autism spectrum disorder face many problems that may affect the interaction between them and their children. They may feel embarrassed by the presence of a disabled child in the family, some parents may engage in violent behaviour towards their children with autism spectrum disorder. Expressing the frustration, they feel when they are unable to deal with them. The problem of the current study is to highlight the need for a measure of parental competence scale, as the existing measures in this framework measure some parental treatment methods or parents' attitudes in general using the classical test theory.

One of the important additions by item response theory in the field of constructing and developing psychological and educational measures and various tests is the possibility of avoiding the effects of contradictory responses by respondents, which is the phenomenon that occurs when participants tend to choose sequential or similar answers in the context of the questionnaire. This theory is also based on the idea that participants in studies or questionnaires, respond to a group of statements or items that constitute a context that should not be separated from each other, which means that understanding and responding to the items requires looking at the context represented by the entire paragraph, which contributes greatly to ensuring the quality and accuracy of the data. Using the item response theory to construct this scale, will enable us to reach a scale with appropriate psychometric properties and objectivity in measuring parental competence allowing researchers and interested people to use this scale. In light of this, the following questions can be asked:

*The first question: How well are the assumptions of the two-parameter model satisfied?*

*The second question: What are the estimations of the item's parameters of each item of the parental competence scale for children with autism spectrum disorder according to the two logistic parameter model?*

*The third question: Are there statistically significant differences at ( $\alpha = 0.05$ ) in the level of parental competence for children with autism spectrum disorder attributed to (gender and educational qualification)?*

### 2.1 The significance of the study:

This study has theoretical and practical significance as follows:

#### 2.2 Theoretical significance:



The theoretical importance of the current study lies in addressing the issue of parental competence for children with autism spectrum disorder, as it is considered one of the topics directly related to the good interaction between parents and their children, especially those with ASD. It has to do with the upbringing and success of the child, and it is expected that this study may add important theoretical frameworks for researchers and those interested in the issue of parental competence.

### 2.3 Practical importance:

The practical importance of this study stems from proposing a scale of parental competence for children with autism spectrum disorder, which has appropriate psychometric properties through the use of the two-parameter logistic model under the framework of IRT, which may provide us with accurate estimation. Moreover, the findings of the current study may contribute to planning programs to improve parental competence.

### 2.4 Terminology of study

#### 2.4.1 Parental competence:

Parents' awareness of the practices they make towards their children with autism spectrum disorder, which have a positive impact on the behaviour of their children, and which lead to parents' feelings of satisfaction and comfort in terms of parental warmth, external support, equality, independence, and parental reinforcement through the interaction of parents in different life situations [36].

#### 2.4.2 Autism spectrum disorder (ASD)

The American Autism Society ASA (2016) defined autism spectrum disorder as a type of developmental disorder that has signs and indicators in the first three years of a child's life, as it appears as a result of a blood chemical defect or brain injury, which affects various aspects of growth, in which behaviour, communication, and thinking are disturbed. It is procedural defined that autism spectrum disorder children are diagnosed and enrolled in special education centers in the capital Amman governorate for the academic year (2022–2023).

#### 2.4.3 Item response theory

### 2.5 Study limitations:

The study is determined within the following limits and limitations:

The study was limited to parents of children diagnosed with autism spectrum disorder.

Spatial boundaries: the study was conducted in the capital, Amman.

Time limits: The current study was conducted during the academic year (2022–2023).

## 3. Methodology

### 3.1 Study population:

The study population consisted of all parents of children with learning difficulties in the capital Amman governorate, whose number is 1371, according to the statistics of the Ministry of Social Development.

### 3.2 The study sample

The study sample consisted of (800) parents who were chosen by the available method, as **Table 1**. display.

**Table 1:** Study individuals according to the study variables

Gender	N
Male	405
Female	395
total	800
B.A.	591
Post Graduate studies	209
total	800

### 3.3 The study Instruments

To achieve the study objective a scale was developed after reviewing the previous literature and previous studies such as [3, 35] it consisted in its previous form of 30 items with 5- point rating scale based on Likert's type. The scoring procedure for the tool with the option Strongly Agree as 5, Agree as 4, Undecided as 3, Disagree 2 and Strongly

Disagree as 1, for positive statements. For negative statements it is reversed as strongly disagree is given 5, disagree is given 4, Undecided score as 3, agree score as 2, and strongly agree 1.

### 3.4 The instrument validity

The instrument validity was assured by conducting the content validity through exposing the scale to a group of faculty members specialized in educational psychological sciences in a different Jordanian university. The amendments were carried out according to their notes and finally the scale consisted of 29 items. The minimum degree on the scale amounted to 29 while the maximum degree reached 145.

### 3.5 The Instrument Reliability

Reliability was assured by extracting Cronbach Alpha after applying the scale to pilot sample consisting of 25 participants, were value reached 0.89 which considered accepted for the study purposes.

## 4. Study Findings

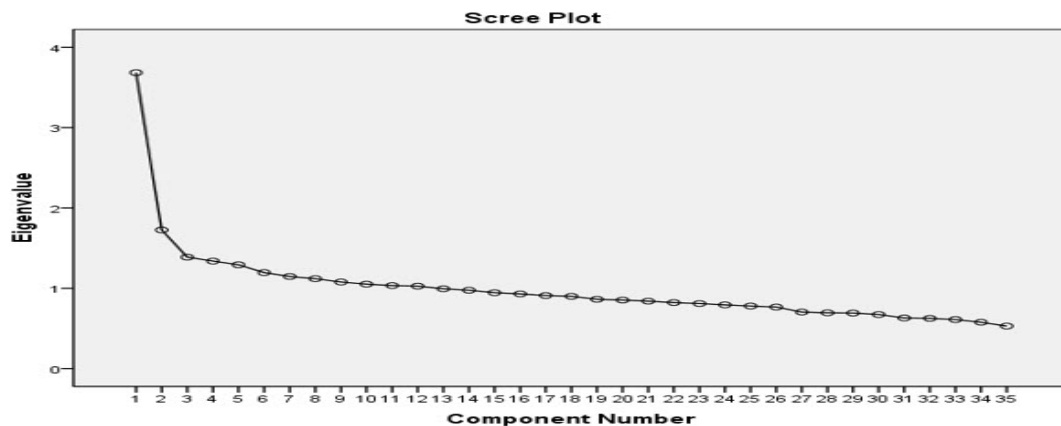
### 4.1 The findings of the first question state: To what extent are the assumptions of the two-parameter model fulfilled?

#### Unidimensionality

The one-dimensional hypothesis of the test was verified through SPSS software, by performing principal components analysis with orthogonal rotation of the Varimax axes for the data obtained by the researchers by applying the scale to the study participants. To perform the exploratory factor analysis the adequacy of the study sample was checked using the Kaiser-Mayer-Olkin KMO index for the test was 0.75. The sample size adequacy index should be at least 0.50 to be acceptable, Table 2 display the results of this analysis.

**Table 2:** Eigenvalues, the explanatory variance and the cumulative variance of the factors that make up the parental aptitude test

factor	Eigenvalues	The percentage of explained variance	The percentage of accumulated explained variance
1	3.684	10.526	10.526
2	1.726	4.931	15.456
3	1.387	3.964	19.421
4	1.338	3.824	23.245
5	1.293	3.693	26.938
6	1.195	3.416	30.353
7	1.147	3.277	33.630
8	1.119	3.198	36.829
9	1.078	3.080	39.909
10	1.052	3.005	42.913
11	1.034	2.954	45.867
12	1.027	2.933	48.800



**Fig. 1:** Graphic representation of the Eigen Values of the factors that make up the parental competence scale

It is evident from Table 2. that there are only twelve factors, which are greater than (1) explaining a total variance of

48.800%. The first factor amounted 3.684 with explained variance 10.526%, while the latent root of the second factor reached 1.726 with explained variance 4.931%, moreover the ratio of the latent root of the first factor to the latent root of the second factor is greater than 2, which indicates one-dimensionality for the trait measured by the parental competence scale test. Figure 1 shows the graph (Scree Plot) of the latent roots of the factors that make up the parental competence scale.

It is noted from Figure1, that the value of the eigenvalue of the first factor is large compared to the second factor, and that there is a shift in the slope at the third factor while it remains close to the rest of the factors, which also suggests the presence of a dominant factor indication the existence of one-dimensionality.

#### 4.1.1 Local independence:

Since the one-dimensional assumption has been fulfilled, this guarantees the fulfillment of the local independence assumption, as indicated by [12].

#### 4.1.2 Discrimination Equality Indices:

The equality of discrimination was verified by calculating the item correlation coefficients with the total score on the test; That is, the bivariate correlation coefficient, where the inequality of the discriminant indices was checked using the Bilog-MG3 program through the outputs of the first stage in it, where the results indicated that the discrimination indicators are not equal for all items, and this is evidence of the inadequacy of the one parameter logistic model for the data.

#### 4.1.3 Fitting the IRT models to the data

By fitting one of the item response theory models with the results of applying the parental competence scale, the data obtained was analyzed using the BILOG-MG3 program three times and independently, in order to determine the least number of items that do not fit the used model in each case.

The two-parameter logistic, the one parameter logistic model, the three-parameter logistic model. The number of items that were excluded from the one model reached 15 items, from the two parameter model 9 and from the three parameter model 13 items, thus the number of items for the parental competence scale test according to the two parameter model reached 26 items, and the results also showed 5 Individuals unfitting the two parameter logistic model where the statistical significance value of the probability amount was less than 0.05 and their responses were deleted and 795 responses were kept checked after verifying their conformity.

The result of the first question may be attributed to the objectivity of the procedures followed for building the competence scale and verifying its validity by extracting the needed procedures such as: validity of the content, then the construction validity indicators, in addition to the clarity of the items of the scale and its commitment to the recommended standards in the formulation of the scales items.

#### 4.2 The second question: What are the estimations of the item's parameters of the parental competence scale for children with autism spectrum disorder according to the two logistic parameter model?

To answer this question, the parameters of each item of the parental competence scale for children with autism spectrum disorder were extracted through Bilog-MG-3.0 software after deleting the items and individuals that did not fit the two logistic model, Table 3 shows the parameters of each item of the parental competency scale, and item information function according to the two-parameter logistic model.

**Table 3:** Values of the parameters of difficulty (b), discrimination (a) and standard error (SE) for each of these values for the parental competence scale according to the two logistic model

item	a	SE(a)	b	SE(b)
1	0.538	0.008	1.613	0.291
2	0.562	0.089	1.563	0.275
3	0.297	0.066	1.161	0.354
4	0.751	0.101	0.223	0.108
5	0.624	0.095	-0.249	0.123
6	0.203	0.053	3.868	1.569
7	0.254	0.066	3.223	1.630
8	0.770	0.104	0.494	0.188
9	0.460	0.081	0.754	0.208
10	0.570	0.088	2.250	0.358
11	0.830	0.110	0.853	0.142



12	1.006	0.127	1.064	0.140
13	0.900	0.116	0.727	0.122
14	1.00	0.120	1.076	0.142
15	0.655	0.096	1.144	0.196
16	0.823	0.105	0.218	0.099
17	0.246	0.058	2.577	0.659
18	0.466	0.081	0.990	0.234
19	0.542	0.087	1.232	0.237
20	0.608	0.089	1.054	0.186
21	0.889	0.106	0.706	0.116
22	0.378	0.075	2.346	0.498
23	4.81	0.100	0.601	0.144
24	0.392	0.079	3.496	0.710
25	1.004	0.119	0.387	0.091
26	0.690	0.098	1.032	0.176
27	0.542	0.087	1.232	0.237
28	0.608	0.089	1.054	0.186
29	0.889	0.106	0.706	0.116

The lowest and highest values, the arithmetic mean and standard deviation of the values of the difficulty and discrimination parameters of the items were calculated according to the item response theory as shown in Table 4.

**Table 4:** The lowest and highest value, arithmetic mean and standard deviation of the values of the difficulty and discrimination parameters of the items according to the item response theory

Parameter	Maximum Value	Lowest Value	Mean	Standard Deviation
Difficulty	3.87	-0.249	1.312	1.467
Discrimination	4.81	0.203	0.637	0.241

Table 4, shows that the value of the difficulty parameter ranged between -0.249-3.868 with an arithmetic mean 1.312, in addition the value of the discrimination parameter ranged between 0.203-4.81 with an arithmetic mean 0.637. This result may be attributed to the goodness of the taken procedures of building the study instrument and adhering to the correct methodology by verifying the validity and reliability of the scale, especially during the applying of the scale on the exploratory sample. The finding of this question agreed with the results of [26] study which demonstrated an acceptable psychometric property of the study scale.

*4.3 The results of third which states: Are there statistically significant differences at ( $\alpha = 0.05$ ) in the level of parental competence for children with autism spectrum disorder attributed to (gender and educational qualification)?*

To answer this question, the arithmetic means, standard deviations, and t-test of independent samples were extracted to reveal the significance of the differences between the arithmetic averages of the level of parental competence for children with autism spectrum disorder according to the gender variable and educational qualification, and table 5 shows these results.

**Table 5:** Arithmetic means, standard deviations, and the t-test results for the level of parental competence for children with autism spectrum disorder according to the gender variable

	Gender	N	Mean	Standard Deviation	t	Sig.
Total	male	400	3.43	0.87	4.89	0.000
	female	395	3.67	0.85		

Table 5 shows that there are statistically significant differences in the level of parental competence, total score, due to gender in favour of female. This result may be attributed to the females' ability to tolerate the behaviour of the children and deal with them. The mother spends more time with the children, which drives her to develop many skills and abilities to deal with her ASD child, and thus she can and meet his requirements, unlike fathers who spend most of their time at work. The finding of this question agreed relatively with the results of the [35] study which showed a high level of parental competence. In addition, this finding may be coherent with [31] study which showed a there is a positive, statistically significant correlation between quality of life and parental competence, and there are no differences in parental competence due to age.

#### 4.3.1 Second, the Academic Qualification:

**Table 6:** Arithmetic means, standard deviations, and t-test results for the level of parental competence of children with autism spectrum disorder according to the educational qualification

Total	Academic Degree	N	Mean	Standard Deviation	t	Sig
	B. A	591	3.33	4.56	-4.86	0.000
	Postgraduate	204	3.77	5.80		

It is noticed from Table 6, that there are statistically significant differences at ( $\alpha = 0.05$ ) in the level of parental competence for children with autism spectrum disorder on the total degree and dimensions due to scientific qualification in favor of those with academic qualifications "post graduate studies". This may be attributed to the fact that both parents or one of them have high academic degrees and have developed many of their competencies due to the educational experiences that were acquired during higher studies, which were positively reflected in their competence and their dealings with their children with autism spectrum disorder.

## 5. Conclusion

Parental competence and caring skills of children with ASD are acquired and learned things that may be affected by instinct or inheritance from education. It is an educational practice that is guided by a series of goals, objectives, and principles. Normal parental interactions with children make them more integrated into the family and society. The home environment affects the behaviour of children at different age levels. Therefore, the matrix of childcare is linked to the development of aspects of cognitive, emotional, and motor behavior in children. The family is a psychological, social, and educational environment, which makes parental competence a decisive variable in its impact, in all aspects of the children's personalities and the development of their ability to communicate and interact with others. Item response theory is an essential framework element in improving psychological and educational measures, as it enhances the accuracy of responses and reduces the influence of error and bias. Moreover, IRT contributes to deepening researchers' understanding of participants' opinions and perceptions, which enhances the value of the results drawn from these measures and questionnaires and contributes to the development of scientific knowledge in general. The item response theory is considered capable of giving consistent and stable estimation, with the logistic models it provides as the one used in this study. The results of parental competence revealed a moderate level of parental competency, which means there is a need for more attention to developing parental competence because of its great role in children's life and future.

## 6. Recommendations

- Developing parental competence for through holding workshops and seminars
- Using the parental competence scale that was developed in this study as it had acceptable psychometric properties.
- Conducting more studies using variables other than those used in the current study.

## 7. Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

## 8. Data Availability Statement

The raw data supporting the findings of this article can be obtained by contacting the correspondence authors, without undue reservation.

## 9. Acknowledgement

The researcher in this study would like to thank all the participants for their valuable time in responding to the study scale.

## References:

- [1] Al-Hussein, M. (2015). *Attention Deficit Hyperactivity Disorder and its Relationship to Parental Treatment Styles (A descriptive study on the fathers of first-cycle children in Khartoum East locality, unpublished master's thesis, Sudan University of Science and Technology.*
- [2] Al-Jabari, R. (2018). Parental practices and their relationship to emotional regulation among students with

- learning difficulties, *Palestine University Journal*, 8(3), 58-87.
- [3] Al-Shami, E, Khairallah, S, and Gabriel, F.(2012). Children's perception of parental competence and its relationship to cognitive competence among middle school students. *Journal of the College of Education at Mansoura University*, 87(1), 141-177.
- [4] Baker, F. B., & Kim, S. H. (2017). *The Basics of Item Response Theory Using R*. New York, NY: Springer.
- [5] Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: wh, Freeman.
- [6] Bandura, A. (2001). Social Cognitive Theory: an agentive Perspective. *Annual Review of Psychology*, 52 ,1- 26.
- [7] Ben-Naim,S, Gill,N & Laslo-Roth,R.(2019). Parental Stress and Parental Self-Efficacy as Mediators of the Association Between Children’s ADHD and Marital Satisfaction, *Journal of Attention Disorders*,5( 23).
- [8] DeMars C. *Item Response Theory*. Cary, NC, USA: Oxford University Press, USA;
- [9] Embretson, S. E., & Reise, S. P. (2013). *Item response theory*. Psychology Press.
- [10] Gothwall, V., Bharani, S., & Reddy, S.(2015).Measuring Coping in Parents of Children with Disabilities: A Rasch Model Approach. *Plos One*, 10(3), 1-17, | DOI:10.1371/journal.pone.0118189.
- [11] Gruijter, D., & Kamp, L. (2005). *Statistical test theory for education and psychology*. Retrieved December 30, 53 2017 from: [www.leidenuniv.nl](http://www.leidenuniv.nl).
- [12] Hambleton RK, van der Linden WJ, Wells CS. (2011).*IRT models for the analysis of polytomous scored data: Brief and selected history of model building advances*. In: Nering ML, Ostini R, editors. *Handbook of Polytomous Item Response Theory Models*. New York: Routledge; p. 21–42.
- [13] Iadarola, S., Oakes, L., Shih, W., Dean, M., Smith, T. & Orlich, F (2016). Relationship among anxiety, depression, and family impact in adolescents with autism spectrum disorders and average-range IQ. *focus on autism and other developmental disabilities*, 33(3), 15-19.
- [14] Illias, K., Cornish, K., Kummar, A., Park, M. & Golden, K. (2018). Parenting stress and resilience in parents of children with autism spectrum disorder (ASD) in Southeast Asia: A systematic review. *Frontiers in Psychology*, 9, 280-285.
- [15] Jenaro, C., Flores, N., Gutiérrez-Bermejo, B., Vega, V., Pérez, C., & Cruz, M. (2020). Parental stress and family quality of life: Surveying family members of persons with intellectual disabilities. *International Journal of Environmental Research and Public Health*, 17(23), 9007.
- [16] Kabiyea, F., & Manor-Binyamini, I. (2019). The relationship between stress and stigma, somatization and parental self-efficacy among fathers of adolescents with developmental disabilities in the Bedouin community in Israel. *Research in Developmental Disabilities*, 90, 31–40. <https://doi.org/10.1016/j.ridd.2019.04.004>.
- [17] Kean, J., & Reilly, J. (2014). Item response theory. *Handbook for clinical research: Design, statistics and implementation*, 195-198.
- [18] Lin, Y.- N., Iao, L.-S., Lee, Y.-H., & Wu, C.-C. (2020). Parenting stress and child behavior problems in young children with autism spectrum disorder: transactional relations across time. *Journal of Autism and Developmental Disorders*, 51(7), 2381–2391.
- [19] Marsack-Topolewski, C. N., & Maragakis, A. (2021). Relationship between symptom severity and caregiver burden experienced by par-ents of adults with autism. *Focus on Autism and Other Developmental Disabilities*, 36(1), 57–65.
- [20] Marsack-Topolewski, C. N., Samuel, P. S., & Tarraf, W. (2021). Empirical evaluation of the association between daily living skills of adults with autism and parental caregiver burden. *PLoS One*, 16(1), e0244844.
- [21] Martínez, I.; Cruise, E.; Garcia, O.F.; Murgui, S.(2017).English Validation of the Parental Socialization Scale—ESPA29.*Front. Psychol.*, 8, 1–10. <https://doi.org/10.3390/ijerph17072370>.
- [22] Martinez, I.; Garcia, F.; Veiga, F.; Garcia, O.F.; Rodrigues, Y.; Serra, E. (2018).Parenting styles, internalization of values and self-esteem: A cross-cultural study in Spain, Portugal and Brazil. *Int. J. Environ. Res. Public Health*, 17, 2370, <https://doi.org/10.3390/ijerph17072370>.
- [23] McGuire, A. (2016). *War on autism: On the cultural logic of normative vio-lence*. University of Michigan Press.
- [24] Mello, C., Rivard, M., Terroux, A., & Mercier, C. (2019). Quality of life in families of young children with autism

- spectrum disorder. *American Journal on Intellectual and Developmental Disabilities*, 124(6), 535– 548.
- [25] Mohamed, M. (2013). Psychometric properties of the parental effectiveness scale for blind children in Minya. *Journal of Research in Education and Psychology, Faculty of Education, Minia University*. 26(1). pp. 187-206.
- [26] Mohammad, F., Sani, N., Oshvandi, K., Masoumi, S. Z., Khazaei, S., Bashirian, S., Jenabi, E., Barati, M., Rezaei, M., & Borzou, S. R. (2022). Care burden, coping styles and involvement in care in mothers of autistic children in pandemic of COVID-19. *Nursing Open*, 9, 2409– 2417. <https://doi.org/10.1002/nop2.1256>.
- [27] Mohammadi, F., Rakhshan, M., Molazem, Z., & Zareh, N. (2018). Parental competence among parents with autistic children: A qualitative study. *Nursing and Midwifery Studies*, 7(4), 168.
- [28] Mohammadi, F., Rakhshan, M., Molazem, Z., Zareh, N., & Gillespie, M. (2020). Development of parental competence scale in parents of children with autism. *Journal of pediatric nursing*, 50, e77-e84.
- [29] Ohan, J. L., Leung, D. W., & Johnston, C. (2000). The Parenting Sense of Competence scale: Evidence of a stable factor structure and validity. *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement*, 32(4), 251–261. <https://doi.org/10.1037/h0087122>.
- [30] Orelove, F. P., Hollahan, D. J., & Myles, K. T. (2000). Maltreatment of children with disabilities: Training needs for a collaborative response. *Child Abuse & Neglect*, 24(2), 185-194.
- [31] Rankin, J. A., Paisley, C. A., Tomeny, T. S., & Eldred, S. W. (2019). Fathers of youth with autism spectrum disorder: A systematic re-view of the impact of fathers' involvement on youth, families, and intervention. *Clinical Child and Family Psychology Review*, 22(4), 458 – 477.
- [32] Reparaz C, Rivas S, Osorio A, Garcia-Zavala G. A Parental Competence Scale: Dimensions and Their Association With Adolescent Outcomes. *Front Psychol*. 15;12:652884. doi: 10.3389/fpsyg.2021.652884. PMID: 33935914; PMCID: PMC8082951.
- [33] Salam, I, Abdel-Gawad, W, and Hussein, R.(2016). Quality of life and its relationship to competence among mothers of mentally handicapped children who are able to learn. *Journal of Educational and Social Sciences at Helwan University*, 22 (3) pp. 709-748.
- [34] Salvador, Á., Crespo, C. & Barros, L.(2019). The Benefits of Family-Centered Care for Parental Self-Efficacy and Psychological Well-being in Parents of Children with Cancer. *J Child Fam Stud* 28, 1926–1936 . <https://doi.org/10.1007/s10826-019-01418-4>.
- [35] Samadi, S. A. (2020). *Parental coping styles of individuals with autism Spectrum disorders: A report from Iran. In Parenting-Studies by an Ecocultural and Transactional Perspective*. IntechOpen.
- [36] Shaheen, H.(2015). The relative contribution of self-esteem and perceived parental competence in predicting self-disability among mathematically gifted adolescents, *Journal of Arab Studies*, 14(2), 255-298.
- [37] Sur, M. H. (2017). *Parental Self-Efficacy and Parenting Practices in Parents of Young Children with and without Disabilities in Physical Development* (Doctoral dissertation, Northern Illinois University).
- [38] Yuan, R Xu,Cui-cu, Q.,Chun-yan, x., Xie, l., Ge, Q., & Shao, Y..(2020). Psychological status of parents of hospitalized children during the COVID-19 epidemic in China , *Psychiatry Research*, 288, <https://doi.org/10.1016/j.psychres.2020.112953>.
- [39] Zarafshan, H., Ahmadi, F & Arsalani, A (2013). Job Burnout among Iranian Elementary School Teachers of Students with Autism: a Comparative Study. *Iran J Psychiatry*, 8(1), 20-27.