Feeling of loneliness and its correlation to self-esteem in children with Asperger's disorder in Riyadh, Saudi Arabia

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ABSTRACT

Asperger's Disorder (AS) and feeling of loneliness (FOL) are related to low self-esteem (SE) in children as many autistic children do not participate in society. However, there was a need to further explore the correlation between the feeling of loneliness (FOL) and self-esteem in children with AS in the Saudi context. This study aimed at investigating the type of correlation between FOL and SE in the sample of children with AS and typically developing children from primary school pupils in Riyadh. It drew a comparison between the study sample individuals regarding psychological loneliness as well as SE according to the sex variable (male/female) and developmental disorder variable (children with AS and typically developing children). It further discussed the prevalence of psychological loneliness, low self-esteem, and negative social perception in individuals with an autism spectrum disorder. It adopted the descriptive approach (correlative/comparative). The data were statistically analyzed using Pearson's correlation coefficient, two-direction variance analysis (2x2), and T-Test. This is a pioneering study in terms of emphasizing the importance of early detection and intervention to identify children with AS and taking precautionary measures and treatment in the Saudi context. The findings indicated that FOL is negatively correlated to SE in children with AS and typically developing children of both sexes. This result is consistent with the findings of the previous studies. It was also found that male children with AS demonstrated more FOL and less SE than female children with AS. The study also provided some educational recommendations and proposed further research in this area. It also recommended developing training programs and courses for parents to optimally deal with the mentally retarded child.

1. Introduction

Autism was given considerable attention from researchers in the field of special education, where an autistic child loses the ability to communicate with others and has a neurological disorder (Yahya, 2007). AS is considered as a developmental disorder associated with child autism, which is diagnosed by a lack of social interaction that is characterized in two ways: The perceived weakness in reciprocal non-verbal behaviors such as (visual communication, facial expressions, and gestures) as well as stereotypical behavior (Yahya, 2007).

FOL is an AS and painful emotional experience resulted from a lack of quality and quantity of social correlation (Weeks and Asher, 2012). This painful feeling results in a desire to avoid others because of a sense of inferiority and lack of self-confidence. With a sense of inability to have a social relationship with others, the child is dominated by shyness and tension in the presence of others.

Some scholars indicated that FOL mediates the correlation between loss and separation of friends and depressive symptoms in adolescents of both sexes (Baker and Bugay, 2011). The results of previous studies have also indicated high FOL and depressive symptoms in individuals with AS syndrome and child autism (Whitehouse et al., 2009; Jobe and White, 2007; Kalyva, 2010; Schneider et al., 2014; Locke et al., 2010; White and Roberson, 2009). In addition, SE is considered an important concept which grants an individual strength and flexibility for his/her human behavior. It is associated with self-reliance, feelings of self-confidence, competence,

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and a sense of happiness and complacency. Moreover, SE is regarded as one of the most important and influential drivers of the individual's motivational system, as reported by Maslow in the Hierarchy of Needs (Al-Otaibi, 2006). Furthermore, SE is the gateway to all kinds of other successes. No matter how an individual learns the ways to success and self-development, his/her SE must be high and positive. Therefore, SE has a deep impact on aspects of an individual's life, level of performance at work, ways of interacting with others, and level of psychological health (Domitrovich et al., 2008).

Some scholars indicated that SE is negatively associated with a sense of FOL in individuals at various age levels (Brage et al., 1993; Civitci and Civitci, 2009; Creemers et al., 2012; Rokach, 1990; Wheeler et al., 1983). SE was also confirmed to be negatively correlated with FOL in adolescents of both sexes and adults with ASD (McWhirter et al., 2002; Van-Baarsen, 2002).

From the above discussion, it is clear that there is a need for research aiming at investigating the kind of correlation between the variables of the study, namely, a sense of FOL and its correlation to SE. Then conducting comparisons between the individuals in the light of the sex variable (male/female) and the developmental disorder variable that is between typically developing children and children with AS primary school pupils in Riyadh city. The results may help in early indicative intervention to reduce the aggravation of the problem by developing appropriate mentoring programs to address and reduce the exacerbation of some negative variables and to avoid incompatibility at later age stages.

Considering the theoretical background of FOL and its correlation to SE in individuals with child autism, Autism Spectrum, and AS, the following results have been drawn. First of all, some scholars indicated that children with apparent child autism, i.e., those with accompanying physical symptoms, people with autism spectrum, and people with AS have a high sense of FOL, isolation, and problems in the interpersonal relationship (Bauminger and Kasari, 2000; Bauminger et al., 2003; Lamport and Zlomke, 2014). Secondly, the FOL has also been shown to be negatively correlated with SE in individuals with ASD at various stages of age (Mazurek, 2014; McWhirter et al., 2002; Van-Baarsen, 2002). Finally, there is a negative correlation of FOL with SE in typically developed individuals who are at different stages of age and social segments (Brage et al., 1993; Civitci and Civitci, 2009; Creemers et al., 2012; Rokach, 1990; Wheeler et al., 1983; Zhao et al., 2013).

The following questions were formulated to address the problem of the study:

1. What kind of correlation between FOL and SE exists among the study sample individuals of children with AS and typically developing children from primary school pupils in Riyadh?

2. Are there any differences between the study sample individuals regarding the FOL due to sex variable (male/female), and developmental disorder variable in children with AS and typically developing children?

3. Are there any differences between the study sample individuals regarding the SE due to the sex variable (male/female), and developmental disorder variable in children with AS and typically developing children?

The objectives of the study are:

1. To investigate the type of correlation between FOL and SE in the sample of children with AS and typically developing children from primary school pupils in Riyadh.

2. To conduct comparisons between the study sample individuals regarding psychological loneliness according to the sex variable (male/female) and developmental disorder variable (children with AS and typically developing children).

3. To conduct comparisons between the study sample individuals regarding SE due to the sex variable (male/female) and developmental disorder variable (children with AS and typically developing children).

The study is significant in terms of theoretical and applied aspects. The importance of the human segments studied are children with AS who represent an important age and educational segment. This study is also significant in terms of highlighting a number of important psychological variables: FOL, SE, and AS. These all are significant psychological variables that require further research.

This study is also significant as the results and recommendations of the study may assist in early indicative intervention to reduce the aggravation of some psychological problems. In addition, the results will help in avoiding incompatibility in the next stages of life, and to make the best use of their energies to the maximum possible extent. Interventional mentoring programs can also be prepared for parents of children with AS to help them optimally deal with their children who have developmental disorders.

Objective limitations included the study variables –AS, FOL, and SE, and the study determines the final sample of the study of children with AS and typically developing children who are male and female pupils in primary schools, in Riyadh. The spatial limitations of the study were a number of primary schools for male and female children under the educational department of Riyadh. The study tools were applied in the second semester of the academic year 1441-1442 H.

The functional definition has been adopted to measure FOL in children which defines it as the individual's sense of lack of acceptance, harmony, love, and attention from those around him. In addition to missing many social skills which enable

him/her to satisfy his/her need to be engaged with others (Abdel and Maksood, 2005).

SE is defined as "the individual's image of himself, the extent to which the individual is proud of himself or the level of his assessment of himself" (Mousa and Desouki, 1991). It is procedurally demonstrated by the score which the being tested receives on the scale.

AS has been defined as "a developmental disorder that includes a lack of social interaction skills, non-verbal communication, limited activities and interests and some sensory and motion problems, with at least an average level of intelligence and a suitable level of time in terms of linguistic growth" (Frye, 2018). The term is procedurally defined by the score which the being tested receives on the scale.

They are meant to be the study sample of male and female individuals at primary school pupils in Riyadh, KSA who are between the age of 8 and 14.

2. Theoretical framework

2.1. Asperger disorder

AS is regarded as an age group of developmental disorders, characterized by significant difficulties in social interaction and specific and unfamiliar patterns of behavior and interests (Awdah and Al-Papatin, 2014). Wilkinson defines AS as "a lack of social skills, limited activities, and interests, with an average or higher than the intelligence level, and a level of linguistic growth commensurate with the child's age" (Al-Shakhes, 2015). Children with AS show aggressive and anti-social behavior, and have high levels of social anxiety (Kalyva, 2010; Hong, 2014).

The characteristics and symptoms of AS have been summarized as follows:

1. Poor social understanding, low ability to communicate linguistically with others, limited interests and concentration on specific topics which capture their thinking most of the time, delayed social maturity, and lack of non-verbal communication.
2. There is an imbalance in their ability to understand emotions and reactions while dealing with others, and some children have difficulty concentrating in the classroom.
3. The majority of these children need more help from their mothers in terms of Self-Care skills than expected from those at their age and mental capacity.
4. Some of these individuals have problems with balance and motion consistency, and some are highly sensitive to certain sensory effects.
5. Some parents of these children may experience these symptoms, so some believe that in this case, the disorder may be due to more genetic or neurological causes than psychological or environmental causes and factors (Awdah and Al-Papatin, 2014). It has been indicated that

individuals with AS and ASD have a lack of number and quality of friendships, as well as a lack of ability to communicate and interact successfully with others (Bauminger and Kasari, 2000; Bauminger et al., 2003; Locke et al., 2010; Qasim and Obeid, 2000; Yahya, 2007).

2.2. Feeling of loneliness

FOL is considered one of the most important psychological problems faced by individuals with Asperger's syndrome and child autism (Schneider et al., 2014). FOL represents a negative experience in which the individual lacks the presence of another important person in his life, and the individual misses the presence of a friend, feeling loss accompanied by the feeling of sadness and loss of hope (Rokach, 2019).

The causes of FOL include developmental disorders which are the lack of affection and intimacy in the house where a person lives such as a cold house, family rifts, superficial relationships between fathers and children, and accidental childhood trauma/disease (Rokach, 2019).

Others have stated that FOL can be transmitted from parents to children of both sexes (Junttila and Vauras, 2009). As for the individuals with AS and autism spectrum. They were found that FOL was negatively associated with SE (Mazurek, 2014; McWhirter et al., 2002; Van-Baarsen, 2002).

2.3. Self-esteem

High SE is regarded as one of the most powerful tools used by the individual to obtain a state of psychological compatibility so that he can accept new challenges in which s/he is at risk without losing his courage while individuals with low SE tend to feel frustrated and defeated even before breaking into new or difficult situations (Mousa and Desouki, 1991; Nezlek, 2002).

The individual's SE affects the way of life, way of thinking, work, and feelings towards others. With an individual's self-respect and SE, his/her productivity and effectiveness increase in his work and social life (Malla, 2008). SE is made up of the individual's self-image which means self-assessment and vision. (Mousa and Desouki, 1991).

High SE plays a significant role in overcoming FOL, as the child begins to form a self-portrait of himself through his/her relationships with others. The child earns his SE by going through successful experiences in his/her life which supports his self-confidence (Al-Faraati, 2012). Low SE, social anxiety, and social skills disability are outputs of FOL experience (Margalit, 2012; Ginter and Dwinell, 1994).

For individuals with mental disabilities, SE is negatively associated with both FOL and life satisfaction in individuals with AS and child autism (Mazurek, 2014; McWhirter et al., 2002; Van-Baarsen, 2002).

3. Previous studies

Mazurek (2014) conducted a study that aimed at investigating the relationship between FOL and friendship, depression, anxiety, SE, and life satisfaction in adults with Autism Spectrum. The study sample consisted of 108 adults with Autism Spectrum disorders. After statistically analyzing the data, the results indicated that FOL was positively associated with depression and anxiety and negatively with SE, life satisfaction, social interaction and the ability to make friends with adults with Autism Spectrum disorder, and the ability to make friendships in the correlation between FOL and psychological well-being have not been mediated.

Bossaert et al. (2012) studied the FOL of middle-class pupils with special needs in the 7th grade. The study also aimed at investigating the relationship between FOL and a number of other variables including the number of friends, the quality of friendship, and the concept of social-self. The study sample consisted of 108 middle-class pupils, including 58 pupils with an autistic spectrum and 50 pupils with motion and sensory difficulties. After statistically analyzing the study data, the study ended up with results indicating widespread FOL in all individuals of the sample with Autism Spectrum, motion, and sensory difficulties. FOL has been negatively associated with the concept of the social self in people with AS.

Zhao et al. (2012) also studied the role of social support and SE concerning shyness and FOL. The study sample consisted of 399 university students of both sexes. Their ages ranged from 18 to 30 years. After statistically analyzing the data, it concluded that social support and SE represent the role of psychological intermediary between shyness and FOL. FOL was also shown to have a negative association with SE and positively associated with shyness among university students of both sexes. Further, the males were also found to be more negatively assessed than their female counterparts.

In another effort, Whitehouse et al. (2009) studied the correlation between friendship, FOL, and depressive symptoms in adolescents with AS. The study sample consisted of 35 adolescents with AS who had been homogenized in terms of time and school life. After statistically analyzing the study data, the results indicated that adolescent sample individuals with AS were found to have fewer friendships in number and quality than their typically developing adolescent counterparts. It has been shown that adolescents with AS have less motivation to develop their friendships or make new friendships. It has also been found that adolescents with AS have high levels of FOL and depressive symptoms, which are predictable, and its increase is positively associated with few and lower quality social relationships.

McWhirter et al. (2002) also conducted a study that aimed at investigating the relationship between FOL, social skills, and SE. The study sample consisted of 75 adolescents, including 43 males and 32 females, with an average age of 17. After statistically analyzing the study data, the researchers ended up with results indicating that FOL was negatively associated with both SE and social skills in all adolescent sample individuals of both sexes. The researchers also sought to identify forms of FOL and found forms of FOL including emotional and social kinds.

Van-Baarsen (2002) also studied the role of SE and social support incompatibility and FOL in the elderly and those who lost their mates. The study sample consisted of 101 individuals, aged 55 to 89. After statistically analyzing the data, the researcher ended up with results indicating that mates' loss leads to low SE and that FOL is negatively associated with SE in individuals whose mates passed the way. The loss of a mate by death has also been associated with the onset of emotional FOL. The loss of a sense of social support, the presence of supportive persons, and the relationship between FOL and SE have also been shown to be negative.

The previous studies can be summarized in the following points:

1. There is a negative association of FOL with SE as well as the concept of the social self in individuals with Autism Spectrum disorder, and individuals with AS of both sexes (Bossaert et al., 2012; Mazurek, 2014), and in teenagers and university students of both sexes and the elderly (McWhirter et al., 2002; Van-Baarsen, 2002; Zhao et al., 2012).
2. FOL prevails in individuals with Autism Spectrum disorder as well as in people with motion and senses, and people with AS (Bossaert et al., 2012; Mazurek, 2014; Whitehouse et al., 2009).
3. FOL is positively associated with depression in individuals with Autism Spectrum disorder and those with AS (Mazurek, 2014; Whitehouse et al., 2009).
4. FOL is negatively associated with social skills, the ability to interact socially, making friends, and choosing a good friend (Bossaert et al., 2012; Mazurek, 2014; McWhirter et al., 2002; Whitehouse et al., 2009).
5. Low SE leads to the formation of a negative social concept in individuals with Autism Spectrum disorder and people with AS (Mazurek, 2014; Whitehouse et al., 2009).

4. Hypotheses of the study

There is a statistically negative and significant correlation between the scores obtained by the overall sample individuals of children with AS and typically developing children on the FOL children scale and the scores that the same individuals receive on the "child self-esteem" test.

There is no effect on both sex variables (male/female) and developmental disorder variables (children with AS and typically developing children), and their interaction with the varied scores obtained by the study sample individuals of the subgroups on the child FOL scale.

There is no effect on both sex variables (male/female) and developmental disorder variables (children with AS and typically developing children), and their interaction with the varied scores obtained by the study sample individuals subgroups on the child self-esteem test.

The study adopted the descriptive (correlation/comparative) approach where the correlations between the variables of the study were investigated in primary schools in Riyadh by finding a statistical correlation coefficient between the two variables of the study included in the research problem.

The sample of the study was taken from Riyadh Primary School (male and female pupils with AS). Typically developing children (male and female) were also selected from primary school and were homogenized with male and female children with AS in terms of age and mental capacity. The two groups of male children were selected from 6 primary schools in Riyadh, and the two groups of female children were selected from 8 primary schools in Riyadh.

The overall sample of the study consisted of 128 children of both sexes with AS, and typically developing primary school children in KSA. The study sample was homogenized in terms of mental capacity and age in months. The final sample of the study was divided into four subgroups:

- First group F: Male children with AS include primary school pupils from Riyadh primary school consisting of 32 children.
- Second group F: Typically developing male children include primary school pupils from Riyadh primary schools with 32 children.
- Third group F: Female children with AS include 32 primary school pupils from Riyadh.

- Fourth group F: Typically developing female children include primary school pupils from Riyadh consisting of 32 children.

The four subgroups have been homogenized in terms of age (in months) and mental capacity, as shown in Table 1.

The previous table shows that the calculated value of "F" did not reach the required marginal value to become significant at either level (0.99), (0.95) of confidence for statistical significance, indicating the homogeneity of the sample individuals (the four subgroups) in terms of the variable of age (in months).

The study also made confirmed that the four subgroups, which make up the study sample, are homogenous in terms of mental capacity variable, as evidenced in Table 2.

The previous table shows that the calculated value of "F" did not reach the required marginal value to become significant at either level (0.99), (0.95) of confidence for statistical significance, indicating the homogeneity of the sample individuals (the four subgroups) in terms of mental capacity.

5. Study tools

To achieve the objectives of the study, the following psychological tools and measures were used to collect data:

1. Scale (FOL of Children), Prepared by Abdel and Maksood, (2005).
2. Scale (Children's SE), Prepared by Mousa and Desouki (1991).
3. Scale (AS Diagnosis), Prepared by Owen-Smith et al. (2015).
4. Test (mental capacity), (Oates-Lyon) 6-10 years (5th edition), prepared by Kamel (2000).

Table 1: Results of two-directions contrast analysis (2x2) for homogeneity of individuals of the four subgroups in terms of age (in months), F=128

Contrast source	Total squares	Score	Average squares	F calculated	Statistical. sig
Sex (male/female)	43.5	1	43.5	0.62	
Developmental disorder (AS/ normal)	30.4	1	30.4	0.43	They are all non-significant at either level of confidence from statistical significance.
Reaction (sex/ disorder)	67.7	1	67.7	0.96	
Mistake	8662.7	124	69.86		
Overall	8804.3	127			

Table 2: Results of two-way contrast analysis, according to model (2X2) for homogeneity of the members of the four subgroups in terms of mental capacity, (F=128)

Contrast source	Total squares	Score	Average squares	F calculated	Statistical. sig
Sex (male/female)	81	1	81	1.12	
Developmental disorder (AS/ normal)	67.4	1	67.4	0.93	They are all non-significant at either level of confidence from statistical significance.
Reaction	94/8	1	94.8		
Mistake	8969.3	124	72.3		
Overall	9212.5	127			

5.1. Children FOL scale

Abdel and Maksood (2005) prepared the FOL scale for children, and the researcher collected the vocabulary of the tool from two main sources. The first is represented by the theoretical background of FOL, its definitions and components, and its dimensions, while Arab and foreign standards represent the second source, which measures the FOL. It has already been shown that the FOL contains four basic components:

- Relationships, affection, love, and the extent of losing it
- A sense of isolation and social avoidance
- Social skills and the extent of losing them
- Fear and mistrust, meaning a child's sense of self-confidence and despises others' opinions

The test was formed in the light of 51 items that the child answers by choosing one of the three options (always, sometimes, never) with the allocation of the scores 1, 2, and 3 to positive items and the allocation of the scores 3, 2 and 1 to negative items. To calculate the validity of the test, the tools' preparer performed the validity of the arbitrators to modify or delete some items, and the test in its final form consists of 48. In addition, the tool's preparer verified the internal consistency of the tool, which resulted in positive correlations for each dimension of the tool, after the tool was applied to 50 primary school pupils.

As for the stability test, the test preparer used the test and re-test approach and applied the tool twice in a two-week time difference to a group of 50 fourth and fifth-grade primary pupils. She calculated the correlation coefficient between the scores obtained by the group individuals in the first procedure, and the scores obtained by the same individuals in the second procedure, for each dimension of the tool, as well as for the test as a whole. Sub-dimension correlations coefficients reached 0.555, 0.561, and 0.754, the tool correlation coefficient score reached 0.936, both positive correlations and significance at 0.01 indicating the stability of the tool.

The current study sought to verify the validity of the tool for the procedure for the study sample individuals in Saudi environment of primary school pupils of both sexes. The tool was verified in a procedure manner and returned to a random sample of 90 pupils and 90 primary school pupils in Riyadh, with a three-week time difference between the two procedures to identify the correlation coefficient between the two procedures. The correlation coefficient reached 0.861 for male pupils and 0.794 for female pupils, which are statistically significant positive correlations. It indicates the stability of the tool and its ability to measure this variable.

5.2. Children's SE scale

Mousa and Desouki (1991) prepared a child SE test based on Cooper Smith's foreign scale entitled Cooper Smith SE Inventory, which he localized in accordance with the Arab environment. The test consists of 25 items against two options: applicable and not applicable and is used to self-assess the person's SE.

For tool stability verification, the testers calculated by applying the Qedder-Richardson Equation (No. 21 KR21), with a stability coefficient for the male group 0.742, for the female group 0.773, and the overall sample individuals (male and female) 0.797. The test stability was also calculated in a half-segmentation manner, which resulted in positive and statistically significant correlations for the male group showing a correlation coefficient of 0.918, and for the female group showing a correlation coefficient of 0.938. The overall sample (male and female) showed a correlation coefficient of 0.972. All of them were positive and statistically significant correlations, indicating the stability, ability, and validity of the test.

As for the tool validity, the testers verified by offering test copies to a number of field specialists to assess the tool, and a large number of arbitrators agreed on the tool validity for the procedure and approval of the terms contained in the test. The testers also verified the validity of the tool through experimental validity, calculating a correlation coefficient between sample scores on the prepared scale and the same individuals on another scale that measures the same variable to serve as a tester to verify the tool validity. The concept of self-determination for adults was tested and resulted in a correlation coefficient of 0.864 in the male group, 0.911 in the female group, and 0.878 in the overall (male and female) group.

The current study sought to verify the validity of the tool for the procedure for the current study sample individuals of the Saudi environment of primary school pupils of both sexes in Riyadh city. The stability of the tool was verified by the method of testing and retesting, on a random selection of a sample of 90 pupils and 90 primary school pupils in Riyadh schools, with a time difference of three weeks. In order to calculate the correlation coefficient between the two procedures, the correlation coefficient is 0.703 for the male group and 0.817 for the female group, which are statistically significant positive correlations. This indicates the stability of the tool and its ability to measure this variable and its suitability for the procedures for the current study sample individuals of primary school both sexes pupils in Riyadh.

5.3. Asperger's disorder diagnosis scale

Al-Shakhes (2015) prepared AS Diagnosis Scale. He followed a number of steps in his way to prepare it. Reviewing the related literature and theories of AS concept until he reached a definition of this concept as well as how to evaluate the diagnosis of this disorder until he reached four axes identified by the tool's preparer and used in the construction of the current scale: verbal and non-verbal communication,

social interaction, behaviors and interests, and mental and cognitive abilities.

A set of items were formulated under each of the four axes, with 105 items in their initial form, which include symptoms and behavioral manifestations, which are indications of the presence of this disorder in the child. Then the scale was presented in its initial form to a group of specialists to arbitrate the tool through the validity of the arbitrators. The opinions of the arbitrators were reviewed and the terms that did not receive the agreement ratio of 90% were excluded, so the number of items on the scale after arbitration was 97.

The tool's preparer also verified its validity by calculating internal consistency, and the results indicated that all correlation coefficients were significant at 0.01 indication level. The stability of the scale was calculated using the Alpha-Cronbach method, which explained that the values of the measurement stability coefficients range between 0.86 and 0.97, which are high, indicating that the scale has a high level of stability, and the published measure also included T-Test and standards for scale scores.

The stability of the tool was verified by the method of testing and retesting on a random selection of sample 90 pupils and 90 primary school pupils in Riyadh schools. This is a three-week time difference for the coefficient of correlation between the two procedures, with a coefficient of 0.694 for the male group and 0.617 for the female group, which are positive correlations and statistically significant. This indicates the stability of the tool and its ability to measure this variable and its powers to measure the current study sample individuals of primary school pupils in Riyadh.

5.4. Test (mental capacity), (Oates-Lyon) (6-10) years

The test consists of 80 items divided into three parts. The first part consists of 20 items to find similarities between sets of images or drawings and the second part consists of 20 items requiring the child to infer, and the third part consists of 40 items, in which the child is directed to respond to instructions to answer the test. To calculate the stability of the tool, the tool's preparer calculated stability using the half segmentation manner and showed a stability coefficient (R=0.89), as well as the Qedder Richardson equation (R=0.88), and the stability in the test and retest method was calculated using the three-week time difference, showing a correlation coefficient 0.69 as well as the half segmentation manner on the same sample with a correlation coefficient 0.67.

The tool's preparer assessed the validity of the test by examining the data is provided with evidence related to the test's ability to measure the behavior, which was designed to measure it. The test preparer used content testing. She also calculated the validity of the test by estimating the correlation between the tool on the test and the tool on another test that measures the same functions, an internal test that resulted in correlational coefficients of instrument validity ranging between 0.540-0.774.

The current study sought to verify the validity of the tool for the procedure on the current study sample individuals in the Saudi environment of primary school pupils in Riyadh, so the stability of the tool was verified by the method of testing and retesting on a random selection sample 90 male pupils and 90 female pupils of primary school in Riyadh schools. This is a three-week time difference for the correlation coefficient between the two procedures, with a coefficient of 0.833 for the male group and 0.656 for the female group, which are positive correlations and statistically significant. This indicates the stability of the tool and its ability to measure this variable and its powers to measure the current study sample individuals of primary school pupils in Riyadh. This test was used in the current study aiming at homogenizing the overall study sample individuals in terms of mental capacity.

5.5. Statistical methods

A number of descriptive statistical methods have been used:

1. Pearson correlation Coefficient.
2. Spearman and Brown Correlation Coefficient.
3. Two-direction statistical data analysis (2x2).
4. T-Test.

6. Results of the study

To verify the first hypothesis, which states that "there is a statistically negative and significant correlation between the scores obtained by the study's overall sample individuals of children with AS and typically developing children on the "child psychological loneliness" scale and the degrees that the same individuals receive on the "Child's SE" test. To verify the hypothesis, Pearson's coefficient between the children's scores with AS was found on the scale of "child's FOL", and the scores of "child SE", and Pearson's coefficient between typically developing children's scores were found, the measure of "Child's FOL" and the "Children's SE" scale, as shown in Table 3.

From Table 3, a negative and statistically significant correlation is evident at 0.99 statistical indications, with the calculated value of R= -69. It exceeds the required marginal value for the level of statistical significance, which confirms that FOL is negatively associated with SE in the study sample individuals of children with AS of both sexes.

Table 4 illustrates a negative and statistically significant correlation at 0.99 statistical indications, as the calculated value of (R) was -57, which exceeds the required marginal value for the level of statistical significance, confirming the negative correlation of FOL to SE in the study sample individuals of typically developing children.

The second hypothesis states, "There is no indicative effect for both sex variables (male/female) and developmental disorder variables children with AS and typically developing children". The interaction between them on the varying scores obtained by individuals of the study subgroups on "Child's FOL" scale, statistical contrast analysis (2x2) was used for the scores obtained by the individuals of the four subgroups of the study, as evidenced in Table 5.

Table 3: Scores correlation coefficient obtained by study sample individuals of children with AS on the scale of child FOL and the scores obtained by the same individuals on the child SE test (N=64) male and female children

Number of sample individuals of children with AS	Correlation coefficient	Statistical significance
64	-69	Significant at (0.99) level of confidence for statistical indication

Table 4: Scores correlation coefficient obtained by typically developing child sample individuals on the "Child Feeling Loneliness" scale and the scores obtained by the same individuals on the "Child SE" test, "N=64" (male and female) children.

No. of typically developing sample individuals children	Correlation coefficient	Statistical significance
64	-75	Significant at (0.99) level of confidence for statistical indication

Table 5: Results of two-direction contrast analysis (2x2) for the scores obtained by the four subgroups on the "Child Feeling Loneliness" scale (N=128)

Contrast source	Total squares	Score	Average squares	F calculated	Statistical. Sig
Sex (male/female)	199.4	1	199.4	3.9	
Developmental disorder (AS/ normal)	263.1	1	263.1	5.2	They all indicate a 0.99 level of confidence from statistical significance.
Reaction	111.6	1	111.6	2.2	
Mistake	6258.9	124	50.5		
Overall	6833	127			

Table 5 illustrates that there is an effect of the indicative sex variable (male/female) on the variation of the four subgroups of the current study, on the "Child's FOL" scale, as the calculated value of "F" was 3.9 and exceeds the required marginal value to become indicative at the level 001 of statistical significance. There was also an effect indicating the developmental disorder variable "Children with AS" and typically developing children on the variation of the four subgroups of the study on the FOL scale.

The calculated value of "F" (5.2) exceeding the required marginal value of "F" to become indicative at a level of 0.99 of confidence for statistical significance.

There was also an effect on the "sex x developmental disorder" reaction variable on the individuals' varying scores of the four subgroups on the "Child's FOL" scale.The calculated value of "F" 2.2, exceeding the required marginal value of "F" to become indicative at a level 0.99 of confidence for statistical significance.

T-test was used to verify the differences between the average scores of the four subgroups on the "Child Psychological Loneliness" scale, and Table 6 illustrates the results:

Table 6: The differences between the average scores of the four subgroups of the scores obtained by individuals on the "FOL of children" scale using the "T" test

Comparison groups	No. of individuals	Group 1	Group 2	Sample 1	Sample 2	Calculated T value	Statistical Sig
1) Group of male children with AS	32	55.7	-	8	-	8.6	
2) Group of typically developing male children	32	-	403	=	6.1		
1) Group of female children with AS	32	44.8	7.6	-	-	6	
2) Group of typically developing female children	32	-	-	5.2	6		They are all indicative at a level (0.99) of statistical significance.
1. Group of typically developing male children	64	48.4	-	7.8	-	6	
2. Group of typically developing female children	64	-	41.1	-	6		
1. A group of children (male/female) with AS	64	43.7	-	7.2	-	5.6	
2. A group of children (male/female) normal	64	-	36.5	-	5.6		

Table 6 illustrates that there are statistically significant differences between the average scores of the following groups on the "Child Feeling Loneliness" scale:

1. The group of male children with AS, and the group of typically developing male children with a calculated T value reached 8.6, exceed the required marginal value to become indicative at level 0.99 of confidence for statistical significance, in favor of the higher average group, the group of male children with AS. This indicates that male children with AS with FOL more than their typically developing male children counterparts.

2. The group of female children with AS and the group of typically developing female children, with a calculated value of 7.2, exceed the required marginal value to become indicative at level 0.99 confidence for statistical significance, in favor of the higher average group. It is a group of female children with AS, indicating that female children with AS are more FOL than their typically developing male children counterparts.

3. A group of male children with AS and typically developing children together, and the group of female children with AS and typically developing together are with a calculated T value (6). It exceeds the required marginal value to become indicative at a level 0.99 of confidence for statistical significance, in favor of the higher average group, the group of male children with AS and typically developing children together. This indicates that both male children with AS and typically developing male children are FOL more than their counterparts female children with AS and typically developing female children together.

4. The group of children (males and females) together with AS, and the group of typically developing children (males and females) together,

with the calculated value of "T", exceed the required marginal value to become indicative at level 0.99 of confidence for statistical significance, in favor of the higher average group, the group of children (both male and female) with AS. This indicates that both children (male and female) with AS are more FOL than their typically developing counterparts (male and female) children.

To verify the validity of the third hypothesis, which states that "there is no indicative effect for both sex variables (male and female) and developmental disorder variables (children with AS and typically developing children). The interaction between them varied the scores obtained by individuals of the study subgroups on the test (child SE), the statistical contrast analysis method (2x2) was used, and these scores were obtained by individuals of the four subgroups of the current study.

Table 7 illustrates that there is an indicative effect of the sex variable (male and female) on the variation of the four subgroups of the current study, on the "children's SE" test, as the calculated value of "F" was 11 which exceeds the required marginal value to become indicative at 0.99 level of confidence for statistical significance.

It also illustrated an effect on the variable of developmental disorder children with AD and typically developing children on the variation of the four subgroups of the study on the "children's SE" test, with a calculated value (9.8), which exceeds the required marginal value of "F" to become indicative at level 0.99 of confidence for statistical significance.

Table 7: Results of two-way contrast analysis (2x2) for scores obtained by individuals of the four subgroups on the "Children's SE" Test (N=128)

Contrast source	Total squares	Score	Average squares	F calculated	Statistical. sig
Sex (male/female)	1250.3	1	1250.3	11	
Developmental disorder (AS/ typically developing)	1110.6	1	1110.6	9.8	They all indicate a 0.99 level of confidence from statistical significance.
Reaction	860	1	860	7.6	
Mistake	14000.6	124	113		
Overall	17221.5	127			

The effect of the interaction variable (sex x developmental disorder) was also shown to vary the scores of the individuals of the four subgroups on the "children's SE" test, with a calculated value (7.6 P), which exceeds the marginal required value of "F" to become indicative at level 0.99 of confidence for statistical significance.

T-test was used to verify the differences between the average scores of the four subgroups on the "Children's SE" test, as illustrated in Table 8.

Table 8 shows that there are statistically significant differences between the average scores of the following groups on the Children's SE Test:

• A group of male children with AS, and the group of typically developing male children, with a

calculated T value (4.6), which exceeds the required marginal value to become indicative at level 0.99 of confidence for statistical significance and that is in favor of the higher-average group, the group of typically developing male children. This indicates that normal male children have a higher SE than their counterparts male children with AS.

• A group of female children with AS and the typically developing female children's group, with a calculated T value (6.3), which exceeds the required marginal value to become indicative at level 0.99 of confidence for statistical significance. This is in favor of the higher-average group, the typically developing female children's group, which indicates that typically developing female children

have a higher SE than their female counterparts with AS.

- A group of male children with AS and typically developing children together, and the group of female children with AS and typically developing children together, with a calculated "T" value (8), which exceeds the required marginal value to become indicative at level 0.99 of confidence for statistical significance. This is in favor of the higher-average group, the group of female children with AS and typically developing female children who have a higher SE than their counterparts male children with AS and typically developing male children together.

- A group of children (male and female) with AS, and the group of typically developing (male and female) children, with a calculated T value (7.8), which exceeds the required marginal value to become indicative at level 0.99 of confidence for statistical significance. This is in favor of the higher-average group, the typically developing group of children (male and female), indicating that typically developing children (male and female) have a higher SE than their counterparts (male and female) with AS.

Table 8: Indications of the differences between the average scores of the four subgroups of the degrees that individuals received on the "children's SE" using the T-Test

Comparison groups	No. of individuals	Group 1	Group 2	Sample 1	Sample 2	Calculated T value	Statistical Sig
1) A group of male children with AS	32	198.2	-	18.8	-	4.6	
2) A group of typically developing male children	32	-	221.7	=	21.5		
1) Group of female children with AS	32	170.3	191	11.1	-	6.3	
2) Group of typically developing female children	32	-	-	-	14.3		They are all indicative at the level (0.99) of statistical significance.
1. A group of typically developing male children and with AS	64	172.4	-	18.1	-	8	
2. A group of typically developing female children and with AS	64	-	199.6	-	20.4		
1. A group of children (male/female) with AS	64	166.7	-	19.3	-	7.8	
2. A group of typically developing children (male/female)	64	-	195.7	-	21.8		

7. Summary of results

After statistically analyzing the study data, the results indicated:

1. FOL is negatively correlated to SE in the study sample individuals of children with AS in both sexes, and this result is consistent with the findings of Mazurek (2014), McWhirter et al. (2002), and Van-Baarsen (2002).
2. Male and female children with AS have FOL more than their typically developing male and female counterparts, and this result is consistent with the findings of Whitehouse et al. (2009), Bauminger and Kasari (2000), Bauminger et al. (2003), Hong (2014), Jobe and White (2007), Kalyva (2010), Locke et al. (2010), and White and Roberson (2009).
3. Male children with AS have FOL more than their counterparts, female children with AS, and this result is consistent with the findings of Junttila and Bauras (2009).

8. Educational recommendations

The study emphases the importance of early detection and intervention to identify people with developmental disorders and various mental disabilities to be able to help them prepare interventional mentoring programs to increase linguistic and social communication and test their effectiveness in children with AS and autistic children, as well as groups of mentally retarded, hyperactivity and attention disorder (ADHD).

It also recommends developing training programs and courses for parents to optimally deal with the mentally retarded child. Depending on the type of disability and disorders, guidance programs should be prepared for parents of children with special needs to address FOL and stress and to achieve an appropriate level of psychological compatibility.

The study also recommends having a psychologist and social worker in schools at different educational stages as well as universities to help the individuals facing some potential psychological and social problems.

Following research studies have been proposed to be conducted:

- The effectiveness of rational cognitive-behavioral guidance (CBRT) in reducing psychological loneliness in children with developmental disorders.
- The effectiveness of religious guidance in reducing psychological stress in mothers and fathers of autistic children with AS.
- Depression and its relationship to aggressive and hostile behavior and anxiety in children with AS and autism of both sexes.

- Depression and its relationship to aggressive and hostile behavior and anxiety in children with AS and autism of both sexes.

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Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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