Perception Of Autistic Behavior: A Gender Comparison Among Lebanese University Students

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Abstract

The purpose of this paper is to analyze if the perception of autistic behavior is influenced by gender from both toddlers and adults perceiving the behavior. Also, if the difference in the number of diagnoses between females and males is significantly explained by the difference in perception of autistic behavior depending on gender. To answer these questions, we administered autistic screening tool: The Modified Checklist for Autism in Toddlers (M- CHAT) with small alterations (inserting typical male and female name in order to assess if there is a bias in perception) that did not change the internal validity of the scales. We administered paired t-tests to analyze the results and confirm or not our hypothesis. The results showed that the gender of toddlers significantly affects a difference in perception, however the data regarding gender of the examiner was not enough to formulate a conclusion. Hence, this hypothesis was partially confirmed. The findings indicate that gender roles and expectations can contribute to different perceptions of autistic or toddler behaviors.

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Introduction

What is autism and how does it correlate with mental health?

Autism spectrum disorder (ASD) is a disorder that affects an individual's interpersonal and intrapersonal relationships. The 2 main symptoms are: difficulty with social interactions and communication, and the presence of repetitive and restrictive behavior (repetitive movements, restrictive routines and/or interests), (American Psychiatric Association 2013. Also, their high levels of inflexibility can negatively affect their abilities to adapt to change, enter the workplace and tolerate frustration.

Individuals with autism may face low levels of life satisfaction due to lack of social skills. They may avoid unscripted activities such as hanging out with friends in a mall, limiting their circle of relationships and activities that they engage in. Furthermore, people with autism usually face difficulty understanding and expressing their emotions and the emotions of others. This happens because around 50% of people with autism have alexithymia: the inability to understand emotions (Brewer et al., 2015). People with autism are more likely to be perceived as having odd or unnatural facial expressions when compared to neurotypical peers. This in turn can difficult even more the integration of the person with ASD into society and negatively affect their life satisfaction, identity formation and self-esteem. Cooper, Smith and Russell, (2017), discussed how people with ASD usually face great psychological functioning, lower self-esteem, and higher levels of depression and anxiety.

When it comes with issues regarding repetitive behavior, the literature has shown that people with ASD tend to struggle with workplace environments, sensory stimuli and high inflexibility. The difficulty in workplace environments comes from 3 main reasons: first, high

difficulty with adapting to change and high adherence to routine. Second, the presence of high interest topics that sometimes may not align with realistic career paths. And third, due to sensory difficulties. Many, but not all, people with ASD show difficulties with processing of sensory stimuli (Grapel, Cicchetti, & Volkmar, 2015). Hence, people with ASD can be easily get distracted or annoyed by everyday noises, lights, smells or textures that are usually irrelevant for neurotypical peers. Hence, this can negatively affect people with ASD performance in workplace due to impairments in attention and productivity (Chen et al., 2015). Similarly, Bury et al., (2020) has shown how unemployment rates are higher in people with ASD when compared to typical peers.

Gender differences in ASD

Within the ASD there are differences between males and females. ASD has been considered a males disorder due to higher prevalence in males when compared to females (approximately 4 males to 1 female), (Baldwin & Costley, 2016; Hull et al., 2020). When it comes to the age of diagnosis, the current mean age of diagnosis of autism spectrum disorder (ASD) is 60,48 months (Hot et al., 2021). Many factors have been proven to influence the age of diagnosis, including gender. For instance, the literature has shown that females tend to be diagnosed with ASD later than males (Baldwin & Costley, 2016; Begeer et al., 2013; Lai et al., 2011; Lehnardt et al., 2016). Although these differences are clear, the reasons that explain them are still inconsistent.

When it comes to cognition, research has been effective to prove some differences between male and females in the ASD. First, males have more verbal abilities than females (Estrin et al., 2021; Lehnardt et al., 2016). While females showed to have better executive

functioning skills which helps explain why it is easier for them to develop compensatory behaviors such as masking (Estrin et al., 2021; Lai et al., 2011; Lehnardt et al., 2016).

Masking

Masking are a set of behaviors and techniques that people may use to camouflage their symptoms/behaviors in order to blend in social situations. For instance, forcing oneself to look into someone's eyes, restrict repetitive behaviors, mimic other behaviors and rehearse social situations are examples of masking autistic symptoms. Females tend to present more masking behaviors than males (Baldwin & Costley, 2016; Estrin et al., 2021; Hull et al., 2020; Lai et al., 2011; Lehnardt et al., 2016). This has been hypothesized to be one of the behavioral reasons that may explain the delay in diagnosis of female autism. The high levels of masking in females with ASD may be because of societal pressure and gender roles expectations imposed on woman to be social, nurturing and emotional.

One can argue that there is a clear distinction between female and male presentation of autism. And that the female presentation does not fit well with the current diagnostic criteria presented on the DSM, consequently, delaying diagnosis. However, the literature on this topic has been inconsistent. For instance, although there are gender differences inside of the ASD, some studies have argued that there is no unique manifestation of autism in males or females (Baldwin & Costley; Begger et al., 2013; 2016, Lai et al., 2011). On the other hand, Hull et al., (2020) argues the opposite, presenting a unique female autistic phenotype.

Because cognitive and behavioral differences between genders in the ASD were not enough to explain the ratio and difference in timing and diagnosis between genders, one can argue that there is a difference on assessment depending on gender. For instance, females tend to present more "female appropriate" (relational interests) while males tend to show more

mechanical and “uncommon” interests (Hull et al., 2020; Lenhardt et al., 2016; Lai et al., 2011). This can affect diagnosis when psychologists take account of the interest itself instead of the level of focus and details the person puts into their interest. Other studies have shown that females need to show more autistic behaviors in order to be diagnosed on the ASD (Beggiato et al., 2017; Estrin et al., 2021; Hull et al., 2020).

The present study

It has been proven that individuals with one mental health diagnosis are more prone to a second diagnosis or other mental health issues (Wais., 2017). Due to the impairment that the ASD symptoms may provoke, having an early diagnosis of autism is crucial, and has been proven, to positively affect the development of one’s skills and improve life satisfaction (Hof et al., 2021). However, after analyzing gender differences in ASD discussed above it is clear that there is a difference comparing males to females. More specifically, females tend to be diagnosed later and therefore face greater psychological impairment. The reasons for this difference can be explained by different factors.

Along with cognitive and behavioral differences that may account for the ratio and difference in diagnosis of ASD between genders, we hypothesize that there is a bias in assessment and perception depending on gender. This study aims to understand if gender roles and expectations create a bias in perception which can lead to the overlooking of female presentation of autism. Psychologists are the last ones to analyze a person’s behaviors. Initially, friends and family are responsible to observe a person behavior and decide if they should search for an assessment. If individuals have bias when perceiving someone’s behavior, their chances of reaching a formal assessment may vary. Hence, we hypothesize that people may have biases

when examining autistic behavior depending on the gender of the examinee and the examiner. In order to evaluate this issue, this paper is going to test the following hypothesis:

H1: Autistic behavior is significantly affected by the gender of the child being examined.

H2: Perception of autistic behavior is affected by gender of the examiner.

Methods

Participants

In total 101 participants were recruited through online spread of the survey. Participants ages ranged between 18 and 60 years old. All participants were Lebanese, fluent in either English or Arabic. Majority of participants were females (75%) and 25% were males.

Instruments

The participants completed the autism screening tool: M- CHAT. The M-CHAT is a screening tool composed of 20 items that can be given to parents in order to screen a toddler's behavior and measure if there is a necessity of further assessment for autism. Some questions found in the checklist are: "Does your child look you in the eye when you are talking to him or her" or "Is your child interested in other children?". The questions are designed to measure joint attention, repetitive behavior and social interactions in toddlers between 16 and 30 months. Some questions were asked twice with the name of the child being changed (from typical male to typical female). This served as a base to compare if there were any significant changes in responses depending on the gender of the child. In total 4 questions were doubled. Participants were required to rate the behavior in a scale (1-not desirable and uncommon behavior, 2-uncommon, 3-neutral, 4- common and 5-desirable and normal behavior).

Although the scale is validated and useful for screening of autism, clinical psychologists are advised to administer other assessment tools in order to confirm diagnosis.

Procedures

This research adopts a qualitative, non-experimental and correlational design with 3 categorical variables: gender of the examinee, gender of the examiner and the perception of the behavior. The 2 genders: male and female are independent variables that affect the perception of autistic behavior (dependent variable).

The questionnaire was spread through online platforms such as social media and email-s. Participants were informed about the study before signing consent. They were informed about the purpose of the study, estimated time of completion of the questionnaire, the lack of known risks of harm and also that their identity is anonymous. After the data was collected, we used Statistical Package for the Social Sciences (SPSS) to store and analyze the data.

Results

In total, 101 Lebanese adults (between 18 and 60 years old) answered the questionnaire. 75% identified themselves as females and 25% identified themselves as males. In order to measure the same sample answering different questions the statistical test used was a paired t-test. As stated earlier, 4 questions of the survey were doubled, and each question had a typical male and female name. Also, after the file was split between males and females, paired t-test was used to analyze if the difference in answers between males and females (examiners) was significant when comparing difference in means of genders of the examinees. Some questions that were not identical, however measured the same concept, were also considered as pairs for the t- tests. The results are:

Pair 1: "Anna/David likes climbing on things"

As shown in Figure 1 the degree of freedom is 101, therefore the critical value to be used in a 95% confidence interval is 1.96. Since the t value (0.517) is smaller than the critical value

and the level of significance (0.303) was bigger than 0.05, we can consider that the difference between means is not statistically significant. When it comes to analyzing the data after the file was split between males and females, in order to assess HS, as clearly seen in Figure 2: the results were also not significant.

Pair 2: "Karim/Anna points with one finger to show you something interesting"

The difference in means was statistically significant. For the same degrees of freedom (101) and 95% of confidence interval, the critical value to be used as reference is 0.05. Since the t value is bigger than the critical value (3.243 > 1.96) and the level of significance was smaller than 0.05 (0.01 < 0.05), we can conclude that the difference in means is statistically significant. When it comes to analyzing gender of examiners (H2), only males has a statistical difference when answering both questions, hence their answers were more inconsistent when compared to females.

In pair 3: "David/Maria likes movement activities"

The t value was smaller than the critical value, also the significance value was bigger than 0.05. Hence, the difference in results was not significant, including in the second paired t-tests (analyzing gender of examiners). Both hypothesis were rejected.

In pair 4: "Anna/Karim plays pretend or make believe"

Since the t value was bigger than critical value (3.181 > 1.96) and the significance level was smaller than 0.05, we can conclude that the difference in means was statistically significant. When it comes to gender of the participants (as stated in figure 2) no significant difference was found. Hence, H1 was supported while H2 was rejected.

In pair 5: "Anna tried to copy what you do" and " If you turn your head Karim looks around to see what you are looking at"

The difference in means was statistically significant. As it is clearly shown in Figure 1, the T value is (3.200) bigger than the critical value (1.96). Also, significance level (0.01) is smaller than 0.05. However, when it came to analyzing if the gender of the participants was significant to predict any changes, it was not significant.

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	One-Sided p	Two-Sided p
Pair 1	23 David likes climbing on things - 4 Anna likes climbing on things	.049	.958	.095	-.139	.237	.517	101	.303	.607
Pair 2	20 Anna points with one finger to show you something interesting - 8 Karim points with one finger to show you something intesresting	-.225	.702	.070	-.363	-.088	-3.243	101	<.001	.002
Pair 3	22 David likes movement activities - 6 Maria likes movement activities	.137	.797	.079	-.019	.294	1.740	101	.042	.085
Pair 4	14 Karim plays pretend play or make-believe - 3 Anna plays pretend or make believe	-.235	.747	.074	-.382	-.089	-3.181	101	<.001	.002
Pair 5	16 Anna tried to copy what you do - 17 if you turn your head, Karim looks around to see what you are looking at	.255	.805	.080	.097	.413	3.200	101	<.001	.002

Figure 1 : Results from paired t-tests analyzing the sample as a whole.

gender			Paired Differences Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	Significance One-Sided p	Two-Sided p
2	Pair 1	23 David likes climbing on things - 4 Anna likes climbing on things	.014	.958	.111	-.208	.235	.121	73	.452	.904
	Pair 2	20 Anna points with one finger to show you something interesting - 8 Karim points with one finger to show you something intesresting	-.176	.690	.080	-.335	-.016	-2.191	73	.016	.032
	Pair 3	22 David likes movement activities - 6 Maria likes movement activities	.135	.799	.093	-.050	.320	1.454	73	.075	.150
	Pair 4	14 Karim plays pretend play or make-believe - 3 Anna plays pretend or make believe	-.189	.788	.092	-.372	-.007	-2.065	73	.021	.042
	Pair 5	16 Anna tried to copy what you do - 17 if you turn your head, Karim looks around to see what you are looking at	.243	.824	.096	.052	.434	2.538	73	.007	.013
1	Pair 1	23 David likes climbing on things - 4 Anna likes climbing on things	.174	1.072	.224	-.290	.638	.778	22	.223	.445
	Pair 2	20 Anna points with one finger to show you something interesting - 8 Karim points with one finger to show you something intesresting	-.478	.730	.152	-.794	-.162	-3.140	22	.002	.005
	Pair 3	22 David likes movement activities - 6 Maria likes movement activities	.217	.850	.177	-.150	.585	1.226	22	.117	.233
	Pair 4	14 Karim plays pretend play or make-believe - 3 Anna plays pretend or make believe	-.304	.559	.117	-.546	-.063	-2.612	22	.008	.016
	Pair 5	16 Anna tried to copy what you do - 17 if you turn your head, Karim looks around to see what you are looking at	.304	.822	.171	-.051	.660	1.775	22	.045	.090

Figure 2 - Results for paired t-test with the split between gender.

1 corresponds to "males" and 2 corresponds to "females"

Discussion

Our first hypothesis was confirmed, it was seen from the results that a simple change in the name of the child affected the scores in a significant way. Only one pair of question supported H2, hence we will consider H2 as partially supported.

Movement activities and climbing

Questions from pair 1 and pair 3 aimed to assed participants perception of children interest in movement activities or being bounced and swung. Usually, children around 16-30 months should be interested in these activities, if not it could be a sign of autism. Our participants had similar responses to the 2 pair of questions, which means the difference between males and females was not significant. To elaborate, the gender of the examinee or examiner was not enough to elicit significant differences in the perception of autistic behavior in our sample. In this case, our first and second hypothesis were not supported.

Pretend play and theory of mind

Pair 4 focused on assessing pretend play or make believe. Pretend play is a type of game where children pretend to be another person. This activity is crucial to develop theory of mind and social skills. Theory of mind is the ability to understand that others have a mind of their own, with their own desires, emotions and thoughts. It is crucial to develop social skills and empathy. Once children understand that each person has their own mind this sets a base to learn about social skills and how to communicate with others. Several studies have shown that children with ASD tend to not engage in pretend play and this can help explain their issues with theory of mind, empathy and communication. (Charman et al., 1997; Weis., 2017).

The results of our study showed that there is a significant difference in perception of pretend play regarding gender. Hence, H1 was supported. Females were significantly rated

higher when compares to males. This mean that females engaging in pretend play are considered as a more normal and more desirable behavior when compared to males. Male pretend play was rated lower, this mean that it is considered as a less desirable and less normal behavior when compared to females. In other words, although pretend play it's a healthy developmental task across all genders, females are more expected to engage in pretend play than males. This is consistent with our first hypothesis which states that perception of behavior is influenced by the child's gender. This difference may be accounted by traditional gender norms and expectations, women are generally expected to be more social than men. The results were significant to explain that gender norms can influence perception of autistic behavior. Also, the results can help explain why woman tend to engage in higher masking behavior when compared to men. As young females grow older, they realize that their environment expects them to be social and play in a specific way. Although they may lack the skills to play pretend, young females may develop masking behaviors in order to fit in with what their environment expects from them. And this can help explain why sometimes female autism is late diagnosed and tend to portray more masking behaviors. In this case, we found no support for H2. Which means that both males and females perceive pretend play consistently across genders. Also, the statistical difference found related to H1 was not explained by the gender of the examiner, but by gender expectations.

Joint attention

Joint attention is one of the main ways infants learn about their environment and interact with people around them (Mundy, 2016). It involves accepting and/or initiating sharing attention with people around them. Typical examples of joint attention are following one's eye gaze, looking at the same direction someone else is looking or bringing toys to share with their

caregivers. The lack of joint attention is a major risk factor for development and diagnosis of autism. Hence, this topic was assessed in the M-CHAT as a reliable topic to be screened.

The results regarding H1 are: Pairs 2 and 5 measured joint attention and in both cases the difference in scores was significant. However, each pair showed different results. Pair 2, showed higher means for males, insinuating that participants expected males to engage in pretend play more when compared to females. In contrast, pair 5 showed a tendency towards higher expectation from females when compared to males. Hence, the results were inconsistent. A possible explanation of the results is that gender roles and expectations are complex concepts that would be difficult to assess with a short survey. On the other hand, specific forms of attention sharing behaviors may be associated with each gender and can be analyzed by future research.

When it comes to H2, as clearly shown in figure 2, males had a significant difference when analyzing male and female toddlers behaviors in pair 2. In comparison, females had similar scores for both males and females. On other words, males are more inconsistent, across genders, when analyzing toddlers behavior related to shared attention. However, male toddlers had higher rates when compared to female toddlers. Indicating that, when perceived by males, males initiation of shared attention are more expected than from females. Also, when perceived by females, both males and females have same expectations when it comes to shared attention. When it comes to pair 5 regarding H2 the hypothesis was denied.

Conclusion, limitations and future research

Our study showed that there is indeed a bias in perception of toddlers and autistic behavior in regard to the gender of toddlers engaging in pretend play and joint attention. When it came to our second hypothesis only one of our pairs supported the idea that the gender of the

examiner affects perception. Although the study adds to the literature regarding perception of autistic behavior and gender, further research should be done in order to better understand specific behavior and factors that may influence these results.

Our study had several limitations. First, the number of participants was small and not representative of the Lebanese population since all participants were university students that may have a theoretical background regarding autism. As stated earlier, caregivers, teachers and extended family are the closest to the child and responsible to consider the need for further assessment or not. In the current Lebanese population not all people have access to a high education. Hence, further research examining a bigger and more diverse sample may provide more accurate results.

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NOTICE OF IRB EXEMPTION DETERMINATION

To: Ms. Samia Ghannoum
Dr. Rudy Abi Habib
Assistant Professor
School of Arts and Sciences

NOTICE ISSUED: 28 February 2024
EXPIRATION DATE: 28 February 2025
REVIEW TYPE: EXEMPT CATEGORY B

Date: February 28, 2024
RE: ***IRB #:*** *LAU.SAS.RH11.28/Feb/2024*
Protocol Title: *Perception Of Autistic Behavior: A Gender Comparison Among Lebanese Adults*

Your application for the above referenced research project has been reviewed by the Lebanese American University, Institutional Review Board (LAU IRB). This research project qualifies as exempt under the category noted in the Review Type.

This notice is limited to the activities described in the Protocol Exempt Application and all submitted documents listed on page 2 of this letter. **Final reviewed consent documents or recruitment materials and data collection tools released with this notice are part of this determination and must be used in this research project.**

APPROVAL CONDITIONS FOR ALL LAU APPROVED HUMAN RESEARCH PROTOCOLS - EXEMPT

LAU RESEARCH POLICIES & PROCEDURES: *All individuals engaged in the research project must adhere to the approved protocol and all applicable LAU IRB Research Policies & Procedures. PARTICIPANTS must NOT be involved in any research related activity prior to IRB approval date or after the expiration date.*

EXEMPT CATEGORIES: *Activities that are exempt from IRB review are not exempt from IRB ethical review and the necessity for ethical conduct.*

PROTOCOL EXPIRATION: *The LAU IRB approval expiry date for studies that fall under Exemption is 2 years after this approval as noted above. If the study will continue beyond this date, a request for an extension must be submitted at least 2 weeks prior to Expiry date.*

MODIFICATIONS AND AMENDMENTS: *Certain changes may change the review criteria and disqualify the research from exemption status; therefore, any proposed changes to the previously approved exempt study must be reviewed and approved by the IRB before implementation.*

NOTIFICATION OF PROJECT COMPLETION: *A notification of research project closure and a summary of findings must be sent to the IRB office upon completion. Study files must be retained for a period of 3 years from the date of notification of project completion.*

IN THE EVENT OF NON-COMPLIANCE WITH ABOVE CONDITIONS, THE PRINCIPAL INVESTIGATOR SHOULD MEET WITH THE IRB ADMINISTRATORS IN ORDER TO RESOLVE SUCH CONDITIONS. IRB APPROVAL CANNOT BE GRANTED UNTIL NON-COMPLIANT ISSUES HAVE BEEN RESOLVED

If you have any questions concerning this information, please contact the IRB office by email at irb@lau.edu.lb

The IRB operates in compliance with the national regulations pertaining to research under the Lebanese Minister of Public Health's Decision No.141 dated 27/1/2016 under LAU IRB Authorization reference 2016/3708, the international guidelines for Good Clinical Practice, the US Office of Human Research Protection (45CFR46) and the Food and Drug Administration (21CFR56). LAU IRB U.S. Identifier as an international institution: FWA00014723 and IRB Registration # IRB00006954 LAUIRB#1

Dr. Joseph Stephan
Chair, Institutional Review Board

DOCUMENTS SUBMITTED:

LAU IRB Exempt Protocol Application	Received & Amended 16 February 2024
Research Protocol	Received 16 February 2024
Informed Consent Form	Received 16 February 2024
Questionnaire	Received 16 February 2024
Link to online survey	Received 16 February 2024
IRB Comments sent: 16 February 2024	**PI response to IRB's comments dated:** 16 February 2024
CITI Training – Rudy Abi Habib	Cert.# 40567007 Dated (25 January 2021)
CITI Training – Samia Ghannoum	Cert.# 54269407 Dated (28 February 2023)