

**ON THE COMPREHENSION OF THE CAUSE-EFFECT RELATIONSHIP  
BETWEEN ASPERGER SYNDROME AND PRAGMATICS LANGUAGE  
DETERIORATION IN A BILINGUAL CHILD WITH SOCIAL COMMUNICATION  
DISORDER: A PILOT CASE STUDY**

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**ABSTRACT:** *Asperger Syndrome (AS) is often associated with social, cognitive, motor, and language problems, but an estimated number of AS bilingual individuals with this syndrome; especially those with social communication disorders (SCD) typically receive the diagnosis of autism spectrum disorder (ASD). Consequently, such inaccurate diagnosis has negative effects not only at the linguistic level, but also at the level of treatment method where AS is merely a subgroup of ASD just like higher-functioning autism (HFA) or pervasive developmental disorder not otherwise specified (PDD-NOS). Utilizing Peabody picture vocabulary test (PPVT-3) in Arabic and then in English to test an AS bilingual 12 year-old boy with SCD, the first aim of the current pilot case study was to investigate the cause-effect relationship between AS and pragmatics mechanism where these children, the researchers hypothesize, fail to crystallize implied meaning of the target language (L2), not the source language (L1), which will help identify what language and which of its aspect (s) is affected more. The study also compared two ASD diagnostic methods: Autism diagnostic observation schedule (ADOS) and Australian scale for Asperger's syndrome (ASAS). The purpose was to specify which of these two assessment tools suits more AS individuals with SCD where, again, the researchers claim the former to be more accountable than the latter as it depends on the explanatory approach unlike the latter that follows the exploratory approach. The tests were administered in light of the diagnostic and statistical manual of mental disorders (DSM-V) and international classification of diseases and related health problems (ICD). To ensure the reliability and validity of the study, the researchers analyzed all case's monthly and yearly school exams of both English (Case's L1) and Arabic (Case's L2) language courses starting with the 1<sup>st</sup> grade and culminating with the 7<sup>th</sup> grade in addition to an intelligence quotient (IQ) test that has been given prior to the tests. In addition, series of interviews were held with the parent along with related individuals to the case. Of the two languages, outlined results show significant deterioration in meaning comprehension in both L1 and L2. Compared with ASAS, ADOS found to be more accountable as it provides specific authentic data of the social behavior, cognitive and motor functions and linguistic and communication abilities of AS bilinguals with SCD in standardized and well-documented contexts. Further research on multilingualism and other ASD subgroups using large number of population, different methods and additional clinical resources is needed to turn the study from individuality into commonality; therefore, replicate its findings and generalize its outcomes.*

**KEYWORDS:** Bilinguals, English, Arabic, AS, SCD, HFA, PDD-NOS, PPVT-3, ADOS, ASAS, IQ, DSM-V, ICD.

## INTRODUCTION

### Background

Characteristic features of AS were well predicted by scientists in the field to understand the cases they face. In combination, assessment threshold measurements might be used to quickly provide important clinical information for both case and the type of syndrome and/or disorder. These measurements could be supplemented by other means at other levels, if time permits. However, AS researchers in the 20<sup>th</sup> century realized that it might be possible to plan initial intervention strategies based on data for better understanding of the social communication disorder (SCD) as a psychological phenomenon at that time. According to Asperger, his primary interest was not in symptoms and treatment methods only but in the child who was suffering, his or her environment, and the interplay between constitutional and environmental factors, which led him to coin the term ‘autistic psychopathy’ (Asperger, 1938).

The aim of some studies in the second half of the 20<sup>th</sup> century was to predict correlational level of similarity between two syndromes to be able to study the SCD features when the assessment is absent (Asperger, 1944, 1950; Robinson & Vitale, 1954; van Krevelen & Kuipers, 1962). The accuracy of such prediction was reasonably ineffective, because it overestimated the degree of seriousness in moderate and severe impairments. Such reason made comparative studies more important as a way through which the correlation between two syndromes and/or disorders could be understood (Rutter, 1972; Bartak, et al., 1975; Minskoff, 1980a, 1980b; Langdell, 1980; Palkowitz &

Wiesenfeld, 1980).

In his study on AS child with SCD, Gillberg (1985) found that the current odes of lethargy the boy experienced when he was eight (8) took on a more dramatic form and became more reminiscent of cycloid/manicdepressive psychosis, notably at the onset of puberty. When analyzing such influences and effects on AS individuals with SCD, clinicians were often interested in the identification of AS distinctive features (Volkmar, et al., 1985) as a practical tool for the diagnosis of issues like violence affecting the AS behavioral system (Mawson, et al., 1985). In this context, the aim of some researches was to expand the idea of understanding behavior by speaking of the construction of a self (Flavell (1985), development of verbal and non-verbal aspects (Scott (1985), cognitive disturbances (Miles & Capelle, 1987; Littlejohns, et al., 1990), etc.

In response to such trend, some researchers in the field started to implement diagnostic tools and assessment methods including imaging techniques (Berthier, et al., 1993; Ehlers & Gillberg 1993) for better understanding of this psychological phenomenon (Bauman & Kemper 1994). Neuropsychologists, speech language pathologists/ therapists (SLP/Ts), psycholinguists and other experts in the field of language and cognitive neurosciences were also mesmerized by the neuroimaging outcomes which, in turn, inspired some of them to develop psycholinguistic tests and strategies (Delfos 1994; Bowler & Worley, 1994; Davies, et al., 1994; Szatmari, et al., 1995) to help them diagnose autistic individuals with different kinds of impairments and disorders.

Such tests were undertaken and administered in light of guidelines and frameworks of international standards that were included within the diagnostic and statistical manual of mental disorders (DSMV), international classification of diseases and related health problems (ICD)

and world health organization (WHO) (Willcox & Mogford-Baven, 1995) guidelines of ICD were also updated (Shtayermman, 2011a, b; Ghanizadeh, 2011).

The first decade of the 21<sup>st</sup> century witnessed tremendous development in the disorders' research, whereby psycholinguistic researchers were attempting to document their progress and formulate target goals for individualized education programs (IEPs). Focus on how to be more specific led them not only to monitor behavior, but also to determine whether or not certain types of behavioral disturbances are seen in autism spectrum disorder (ASD) (Myles & Hagiwara, 2001; Gilliam, 2001; Huang, et al., 2002; Krug & Arick, 2003; Campbell, 2005; Matson, et al., 2008). Former outcomes of imaging techniques (Oktem, et al., 2001; Liu, 2009) as well those of intelligence quotients were all considered (Baron-Cohen et al., 2001; Smily & Meredith, 2003).

Starting from 2011, psycholinguistic researchers started to pay a great attention towards benefiting from previous research findings, notably in matters relating to symptoms' similarities and differences between AS and other syndromes. They consider all related factors including syndrome's history in the family, genetic factors, neuropsychological profiles, etc. (Rutter, 2011) that encouraged others like Reisinger, et al. (2011) to focus on differing ASD from pragmatic language impairments (PLI).

Furthermore, AS researchers applied neuro-psychophysical analyses based on cognitive functions in order to separate abilities-dependent changes from those accounted by social skills and interactive contributions. Frameworks of DSM-V and what appeared to be a challenge for researchers was how to limit the similarities and differences within the spectrum of autism to see how their distinctive features are interacting with each other. This involves undertaking comparative studies among them thus that certain conclusions ought to be drawn out of them. For example, in spite of the fact that some probable effects of visual spatial attention on audiovisual speech perception could be clearly seen in AS individuals (Saalasti, et al., 2012) and could also be used as determiners for the syndrome, this did not stop Planche & lemonnier (2012) from attempting to specify the similarities and dissimilarities between AS and HFA to conclude that "Not only differences in language abilities, but also other developmental markers differ in HFA and in AS ." (Planche & lemonnier, 2012: p. 946).

Such outcomes received highly support by some researchers who recommended using the same treatment strategies for all ASD types (Woods, et al., 2013; Grzadzinski, et al., 2013). Other researchers did not agree with such findings justifying that some physiological differences do exist between AS individuals and those with other ASD subgroups and these differences can be clearly seen in view of the DSM-V and ICD frameworks (Duffy, et al., 2013).

Accordingly, new era of designing programs and developing tests has started. This time, questionnaires were also introduced whereby researchers have unanimity that parents, SLP/Ts, neuropsychologists, children's psychochiatrists, case's friends and other related parties should all be involved.

Some of these tests and questionnaires include: Autism diagnostic interview-revised (ADI-R), autism diagnostic observation scale (ADOS) (Maxwell, et al., 2013), social communication questionnaire (SCQ), broad autism phenotype questionnaire (BAPQ) (Sasson, et al., 2013) and Freiburg questionnaire of linguistic pragmatics (FQLP). Criteria of

world health organization (WHO) were also present to guarantee accurate diagnosis and better assessment (Volkmar, et al., 2014).

Literature has received increasing attention over the past few years in the life of AS children with SCD. Implementing literature in different aspects including stories, pictures, and different arts genre provide appealing opportunities to view AS children with SCD taught in well-established practical environment (Lerner & Levine, 2014). These children perform well academically throughout their elementary education in public school system, but by the time they enter higher grades, they begin suffering emotional problems such as anxiety, depression, and distress when dealing with peers in the classroom (Sawyer, et al., 2014).

Findings on problems face AS children with SCD have opened the door for more focus on recommended practices to support students with AS, teachers, parents and schools (Reyes, 2014). The relative success of this trend allows speculating that therapeutic processes altered by teaching these children communicative social skills communication to help them later make friendship warning at the same time from the consequences. Also, copy number variations from similar experiments may be a way for treating at least a small proportion of cases of these presumably incurable conditions.

For some researchers, examining genes in the AS children remains an alternative strong choice and could be of importance even than that being paid to the effectiveness of their emotions, social communication and behavioral interactions (Graham, et al., 2014; Steeb, et al., 2014; Durdiaková, et al., 2014; Di Napoli, et al., 2015; Warriar, et al., 2015). Commenting on the significance of genetic studies as a means through which behavioral disturbances of AS children with SCD could be understood, Hua, et al., (2015) have rightly observed: “Not surprisingly, most of the known genetic changes alter neural function, and particularly affect neurodevelopment.” (Hua, et al., 2015: p. 933).

In contrast to other disorders, issues like genetic effects on the behavioral performance or social functions were not rare in the literature of AS. Consequently, AS children with SCD were occasionally subjected to neuronal findings where researchers like Hill, et al., have found in 2015 that a sort of association of difficulties between verbal memory and verbal working memory, while visual memory and processing speed were not robustly associated with the presence or severity of language impairment in these children.

In spite of the fact that bilingualism is a milder expression of the SCD seen in AS children even though prior studies characterized the language impairments in some aspects of pragmatics, the relationship between AS and bilingualism symptomatology remains poorly understood not only in AS literature but also in the literature of ASD. In this regard, Drysdale and his colleagues admit that “there is still little known about the course and pace of bilingual language development in children with ASD.” (Drysdale, et al., 2015: p. 36) regardless how promising is the research.

Researchers now have realized that a comprehensive evaluation of the programs and tests developed for AS children with SCD (Wong, 2015) to see how it could help them effectively (Volkmar, 2015) when they grow up (Ratto & Mesibov, 2015). Such estimation, according to these researchers, should be undertaken with reference to the previous findings (Sacco, et al., 2015), especially those relating to language (Field, et al., 2015) and communication (Allen & Lewis, 2015).

Outlined results from studies mentioned earlier suggested that AS in children are obviously associated with social, language, cognitive, and behavioral symptomatology. This result extended to certain aspects like metaphor comprehension (Whyte & Nelson, 2015), attentional problems (Mostert-Kerckhoffs, et al., 2015), which necessitates the use of tests like ADOS (Salley, et al., 2015). With the help of such findings along with those of imaging techniques (Jan Van Baldo, et al., 2016; Clarke, et al., 2016a) and autism tests (Bucaille, et al., 2016), researchers started to believe that AS children never meet criteria for a full diagnosis of ASD (Gillberg, et al., 2016) and that attention should be paid to benefit from older AS individuals to help researchers understand problems in AS children Clarke, et al., (2016b).

Regarding the social and behavioral features of AS and the effects they make on the life of the child, studies show that of 100%, 73% AS adolescents with SCD have romantic relationship experience while 7% indicated no desire to be in a romantic relationship (Strunz, et al., 2017). Since it is unclear, however, whether the presence of these features in AS adolescents confers an increased liability for AS children, Goji, et al., (2017) found a lower anterior cingulate cortex neuronal density in AS children with SCD, which helps other researchers to find legitimate explanation why these individuals have more aggressive behavior and lower school achievements (Billstedt, et al., 2017).

Strictly, AS children with SCD have problems relating not only to social or behavioral responses or even communicative interactions; rather, these problems extend to include challenges of negative thoughts, anxiety-provoking social situations and tactics of coping (Spain, et al., (2017). These problems, psychoneurologically, further our understanding of the importance of the motor functions (Setoh, et al., 2017) and the pivotal roles they play in controlling aggression, directing behavior and more importantly monitoring social communication.

## **Rationale**

Evidently, the cause-effect relationship between AS and bilingualism in children with SCD is important, which makes this study of worthy-investigation, especially if we take into account how rare is it to find an AS bilingual child with that developed SCD. Also, focusing on two major ASD tests being used for evaluating AS will help remove the vague about the ‘usability’ of the tests as it will specify of the ASD subgroups, which one is more accountable, trustable, valid and reliable for accurate diagnosis.

In light of related linguistic and psycholinguistic theories, the outcomes of the current study are expected to open the door for series of investigation on the relationships between AS and multilingualism from different languages, sex, age, etc. Likewise, researchers in the field of language and cognitive neuroscience will be able to examine such relationship individually with each autism type and disorder.

## **Objectives**

The current study has two (2) major aims that are drawn based on the researcher’s hypothesis along with other related-existing theories in the field and these themes can be broadened and formulated as follows:

**H1:** There is a cause-effect relationship between AS and pragmatics mechanism in bilingual children with SCD where these children, the researchers hypothesize, fail to comprehend

word's implied meaning in the target language (Second or foreign language, also known as L2) if they are not familiar with the literal meaning of that word in their source language (mother tongue or first language, also known as L1), which will help identify what language and which of its type

(s)/aspect(s) is/are affected more.

**H2:** The autism diagnostic observation schedule (ADOS) that follows explanatory approach is more trustable for AS bilingual with SCD than the Australian scale for Asperger's syndrome (ASAS) that adopts exploratory approach; therefore, it provides experts in the field with accurate diagnosis.

### **Methods Participant**

A single case study of MY, a 12yr. old American-Yemeni bilingual (English- Arabic) boy who exhibits AS with that developed SCD. MY experienced only limited improvement during therapy received in private school, according to his father and the SLPs.

### **Measurement Tools**

IQ, PPVT-3 (Two forms in Eng. and Arabic), ADOS, ASAS, tagging tests, DSM-V and ICD.

### **Procedures**

The case was subjected to an IQ test that has been undertaken prior to other tasks. Three (3) forced psycholinguistic tests were used to assess his AS along with SCD categorization. Namely, these are: PPVT-3, ADOS, and ASAS and all were administered in decided to the DSM-V and ICD criteria.

B form standardized Arabic (Case's L2) version of PPVT-3 was given in the first day and then A form in English (Case's L1) was given in the second day. The purpose was to test the researchers' hypothesis that AS children with SCD fail to comprehend word's implied meaning of the target language if they are not familiar with the literal meaning of that word in their source language. ADOS and ASAS were administered the day after. Again, the reason behind using the two tests was to in/validate the researchers' claim that explanatory-based assessment method followed by ADOS is more accountable than the exploratory-based diagnostic method adopted by ASAS.

IQ score was analyzed based on a criterion-reference scale, not norm-reference scale because other class children suffer from different types of disorders. Research-wise, IQ score plus all those of the case's English and Arabic languages' tests (monthly and yearly school-tests starting from the 1<sup>st</sup> grade and culminating with the 6<sup>th</sup> grade), were used to ensure the validity and reliability of the study's first objective. The same thing applies to DSM-V frameworks and ICD guidelines that were implemented to serve the same research goal of the study's second objective.

Scores of PPVT-3 and those of both languages were statistically analyzed before they were interpreted. They were first estimated against 100 as a full mark then were visualized through Ms. excel program for better understanding of the results' analysis. Other tests' results were psycholinguistically analyzed in light of the observations of the related parties being interviewed including the case's parent, SLPs and school psychochiatrists.

## DISCUSSION

Psychoneurolinguists and other experts in the field recognized that AS children with SCD have difficulty expressing their emotions, sentiments, feelings and also in the way of understanding others' which creates a social, behavioral and communicative divorce between them and other community members. These characteristics, however, do not have a detrimental effect on the intelligence of these children (Baron-Cohen, 2002; Baker & Welkowitz, 2005). In this study, a standardized Arabic version of Stanford–Binet Intelligence Scale (SB-IV) was used to measure the intelligence of the case in question before other linguistic and psycholinguistic tasks are administered. Having the test undertaken, the results show that the case's intelligence fell on the average level wherein he got ninety (90) scores on the SB-IV scale. Such mark, according to the scale measurement criteria, indicates that the case's intelligence is in-between low and high average.

### AS and Language Comprehension

AS children with SCD have also significant difficulty developing different language aspects and are developmentally delayed in knowing what word should be used and when, why and how should it be effectively and properly said and/or implemented in response to what others might be thinking or feeling. Some also have a conspicuously limited ability to have discourse techniques and tactics in terms of comprehension intensity or meaning focus. Such linguistic difficulties affect the ability of these children acquiring relationship tactics due to the defining characteristics of the AS they exhibit resulting in big failure in their expectations of the partner be it in short and/or long-term relationships.

The present study examined the linguistic weaknesses in addition to the social, behavioral and communicative factors causing the misunderstanding between AS children with SCD and the environment around them in terms of who misunderstands who? Answering such question, the researchers believe, will help avoid inhibiting relationship skills at each stage/phase of life's situations, providing them with strategies to improve their relationship with their community. Such aim-goals were formulated into two hypotheses, of which the first investigates the linguistic part while the second tackles the non-linguistic one.

In order to meet the requirements of the answer to the first part of the study's aims, PPVT-3 was used, as is mentioned earlier, twice: The first time was in Arabic whereby Arabic standardized version of the test was used. Twenty (20) random answers of the case to the test's items were selected by the researchers whereby each one of them was given five (5) scores; thus, the total score is 100. The aim of using the PPVT-3 was to measure the case's understanding of implied meaning by investigating the way he interprets what he reads by visualizing the events or actions in the pictures he sees and chooses the right one as per the instructions he listens to.

Likewise, the researchers included most suspicious weak linguistic disciplines and language skills and components that the case in this pilot study might suffer from. Items that represent each category were randomly taken from the case's monthly and yearly school tests from the 1<sup>st</sup> grade to the 6<sup>th</sup> grade. The number of items from each category was twenty (20), each of which was given five (5) scores; hence, the total score is, again, 100. Linguistic disciplines included: Phonetics, phonology, morphology, syntax, semantics, text analysis and discourse skills. Note here that pragmatics has not been mentioned because it was included within comprehension through implied meaning tasks of the PPVT-3 items. While language skills

included productive and receptive skills, language components covered sound system, grammatical structure and vocabulary building.

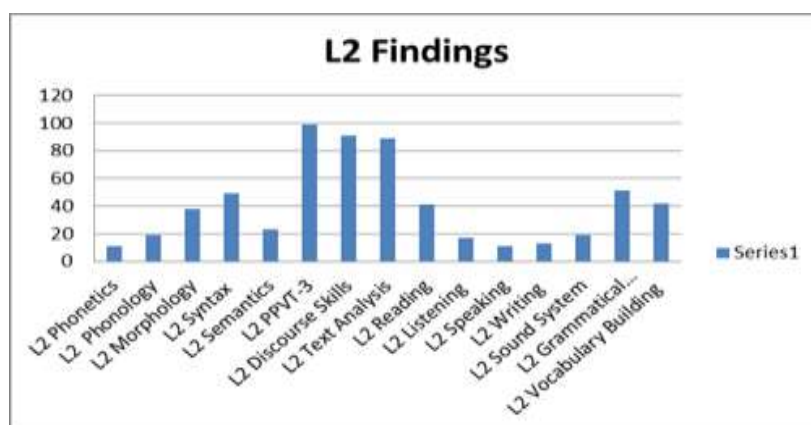
L2 results show no differences between the linguistic discipline of phonetics and the language productive skill of speaking where the case at hand scored eleven (11) in each one of them and the same thing applies to the linguistic discipline of phonology and the language component of sound system (19 scores, each). This could be due to that such linguistic domains share the same categorization like in the oral speech where the person can acquire it from native speakers with no problem. Less deterioration in the performance has also been recorded between the productive skill of writing and the receptive skill of listening where slightly significant differences occurred between the case's scores in them (13,17, respectively).

Significant deterioration was observed in the linguistic discipline of semantics where the case seems to have a problem with understanding the surface meaning of the word; that is why, he scored twenty-three (23) in this section. Such claim was supported by the case's performance not only in the linguistic discipline of morphology, but also in the language skill of reading and the language component of vocabulary building (38, 41, and 42, respectively), where he clearly showed lack at the strategy to derive and inflect the Arabic word and also insufficient knowledge of the rules of diacritic marks and declination, which affects his syntactic performance (49 scores).

Deterioration began with the grammatical structure of the language component where the case under investigation scored fifty-one (51) which is, roughly, normal due to that Arabic grammar is difficult to be understood especially with the abundant use of colloquial words, dialectal speech, idiolects, redundancy and slang. Obvious deterioration was noticed in linguistic disciplines like in the text analysis and discourse skills (89 and 91, respectively) which reflect the lack of comprehending meanings of written language. This lack was serious in linguistic disciplines like pragmatics that was included in PPVT-3 items where the score of the case in question was close to full mark (99).

The researchers expected to see such deterioration occur in the pragmatics aspects of implied meaning in L2. What was not expected to be seen, to some extent, was this extension of conceptual knowledge deterioration that covered the way AS children with SCD interpret the oral or written texts they hear or read. These findings, however, are better be visually illustrated as is done in the chart 1 below. Consider:

**Chart 1 L2 Findings**





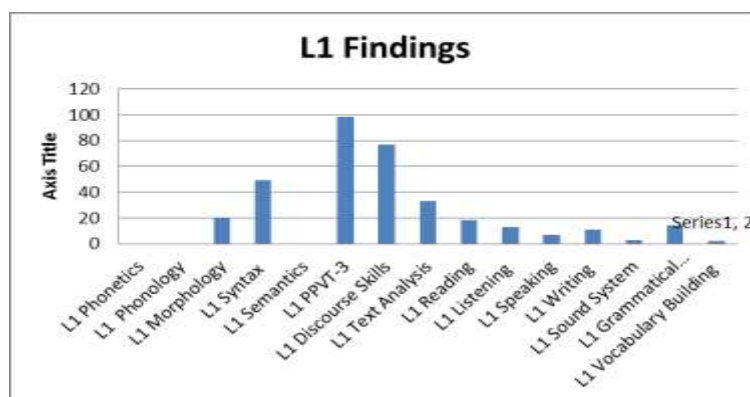
As can be seen in Chart 1, there is a significant deterioration in the way the case under investigation interpret the interlocutor's implied meaning be it spoken or written in case if the language used is L2. This was clearly seen in the outcomes of PPVT-3, discourse skills and text analysis. These findings, however, could be read again in light of the second test being administered for the L1. Looking at his scores in his mother tongue, it seems that the case at hand does not have problems in phonetics, phonology, or semantics.

Deterioration that is not significant was seen in his performance in the vocabulary building and sound system of the language component where he scored two (2) and three (3), accordingly and the same thing applies to his performance in speaking and writing of the language productive skills wherein he scored seven (7) and eleven (11), respectively. These results confirm each other and are not surprising as we are talking here about the L1 of the child.

Reasonable, not serious deterioration started to be seen in the performance of the case at hand, notably in language receptive skills like listening and reading (13, 18, respectively) and language component like grammatical structure (14 scores). This "mild" deterioration also expanded to include a linguistic discipline like morphology (20 scores) which is normal because if the child has some problems in language skills and language components, it will be natural to find him face related problems in the derivative and inflexive words.

Significant and/or serious deterioration started to be clearly seen in the performance of the case in question wherein he scored badly in linguistic disciplines like text analysis, syntax, and discourse skills (33, 49, 77, respectively). Such results were also confirmed by his performance in PPVT-3 wherein he scored ninety-eight (98). The case performance will better be understood if it is visualized in illustrative forms as has been done in Chart 2 below. Consider:

**Chart 2 L1 Findings**



Taken together, the deterioration in the pragmatics discipline as well as in syntax and discourse analysis was not expected to occur in the case's L1. Syntactic deterioration was, roughly, normal due to the difficulty of syntactic rules and parsing. What was not expected was the language comprehension deterioration that was significant in the case performance as is seen in Chart 2 above.

### Usability of ADOS and ASAS: Comparison

ADOS was administered the third day whereby the child was asked some questions to answer as per module three (3). While the subject was taking the structured and semistructured tasks

throughout thirty (30) minutes, the examiner was writing notes on the case's behavioral segments to assign them to predetermined categories that were combined later to produce quantitative scores for analysis. Multiple tasks' questions targeted social interaction abilities, play, imagination, communication skills and behavioral mannerisms. Focus was giving more on eliminating HFA symptoms in the case simply because of the mild ASD he has which makes it difficult to detect as he (the case) showed fewer obvious signs of ASD which caused him miss early diagnosis of ASD in critical time of development.

Age of the case and the ability to speak were considered during the test to ensure the best assessment. The case was observed not being able to tell the examiner what task to be performed next in a daily routine. He was also observed not being able to respond to the vocalization of the examiner without focusing on the environmental noise around him. Restricted repetitive behavior was not seen in the case's behavior due to the fact that he was able to speak. Since the parents had to be added as per ADOS, DSM and ICD's criteria, the opinion of the father was estimated.

The case was asked to form a story based on pictures he sees using his imagination before the examiner runs a conversation with him about social activities, annoyance, emotions and reports that. He did well in both imaginative task and conversation. A demonstration task was also undertaken whereby the case was asked to explain the process of teeth brushing based on available materials given to him. He also did well in both pantomime and authentic acting to practically show these processes. He has been given a break to do whatever he wants while the examiner was taking notes, notably on the free play to see his initiation and reaction toward the toys in front of him.

Having done so, it was found that the case's reaction was and exploratory, not creative.

Again, with the help of parents, namely the father, the deficit was quantified and identified whereby researchers could list the distinctive features of the AS they have seen and then identified which intervention to be recommended. Furthermore, with such help, many things were taken into account including the case's responses to his name when the examiner and his father were calling him, his response to joint attention, bubble play, responsiveness social smile, anticipation of social routine, functions and symbolic imitation (pantomime with language), snack, stereotype behavior and restricted interests and all what relates to social interaction.

Questions on friends and relationships he has with other children be it classmates or neighbor were asked. His answers showed how conventional is his relationship with community members and how close he is to domestic animals like his cat that he truly likes. Giving him some pictures, the case was finally asked to create a story, which he did by correctly narrating its events.

ASAS has been administered the day after ADOS. Two copies of the scale were given to the parent and as well as to psychochiatrist who was in charge of the case in the rehabilitative institution. Both parent and psychochiatrist confirmed that the case rarely pays attention to the oral/spoken rules of social play (5, 4, respectively) although he always, the psychochiatrist reports, prefers more to go lock/isolate himself in the games' room and enjoy new toys than to visit certain places (3) vs.5 to parent. Again, both parent and the psychochiatrist agreed that the case views the world around him in a different way to others (6, 5, respectively) that he never cares of what he says/does, how that affects others or what others' emotional limits

he should/not cross; therefore, he neither apologizes nor feels sorry about it (6, 6, respectively). He is always responsive to any change (3) according to the parent. To the psychochiatrist, he is hesitated and always needs time to get self-confidence toward any upcoming change or any other challenge that might goes in a way (4). Such answers on social and emotional abilities generally put the case in the frequent category (4-6) for being conspicuously above the average.

The parent claims that the case is of normal speech in conversation and that no delay has been noticed in his response or his comments (3). Importantly, no word or an idiomatic expression, the parent adds, can grasp his attention or scares him no matter how “odd” is that word or expression (3). However, this is not what the psychochiatrist believes because, to her, the case is less interactive in the dialogue than he should be

(6). Also, he pays a great attention to any “semi-scary words” and always turns to the interlocutor to seek for an interpretation even though without asking (6). Likewise, the case role in a conversation can present with a variety of characteristics, however, some distinctive features which he demonstrates a deficiency in is the responsive aspect of what the interlocutor says, whereby he, according to the psychochiatrist, turns to change the subject (6) vs. 5 to the parent.

Describing the case’s discourse skills during the conversation, the parent confirms that he does not notice this kind of “avoidance” from being involved in a topic. Rather, he (the case) responses but in a limited way (4). Again, the parent claims that the case’s vocabularies may be extraordinarily rich and the way he uses them is normal (4) while the psychochiatrist confirms that these vocabularies are extremely literal, and formal (5) and that he (the case) has difficulty emphasizing key words in a communicative context (6). Obviously, commenting on the performance of the case in communication skills, parent’s responses are not significantly different from those of the psychochiatrist; thus, they generally fall in between 4-6 (frequent) as per the scale.

The parent believes that in explicit talking with the case about the stories he likes, he (the case) tends to make up his own stories forming them with all aspects of oral language he has within the context of the scientific fiction as is seen in the Harry Potter’s style (6) whereby past memories from neighborhood will be helped to construct the events and narrate them through instructions what his imaginative characters (3) follows naturally (6). The psychochiatrist shares these opinions on the case’s cognitive skills, notably those relating to informative imagination (6) and memory (6) although she is not sure about involving others in the writings he compose (4). Furthermore, she emphasizes that such imaginative mentality can only have a positive effect on his learning as to better understand oral language and be able to express and receive it effectively, which will enhance achievements in all aspects of his life. Again, it seems that the merits of the case in this part as per both parent and the psychochiatrist are also frequent.

The case, according to the parent, has specific interest of showing what he knows and this can be seen in his informative knowledge (6). The psychochiatrist agrees on that (6), adding that social context should be taken into account in which we are seeking for information and children like the case at hand receive our message and try to provide us with that information to show how familiar they are with it. This does not mean, the parent continues, that the case is interested in study in general; otherwise, he would not be upset when going to school (3). Psychochiatrist disagrees with this viewpoint (5), claiming that it involves the many factors

necessary to make relationship between the case and the school successful. The parent justifies the way the case is attached to his toys before sleeping as a way of expressing silent emotions and feelings (4). Again, psychochiatrist believes that such relationship requires understanding home's rules of social interaction and the way the case accepts them and follows them in addition to his willingness to share his problems with others and ask for solutions to these problems (6). With such range of responses, the scale, again, categorizes both parent and psychologist's answers as frequent.

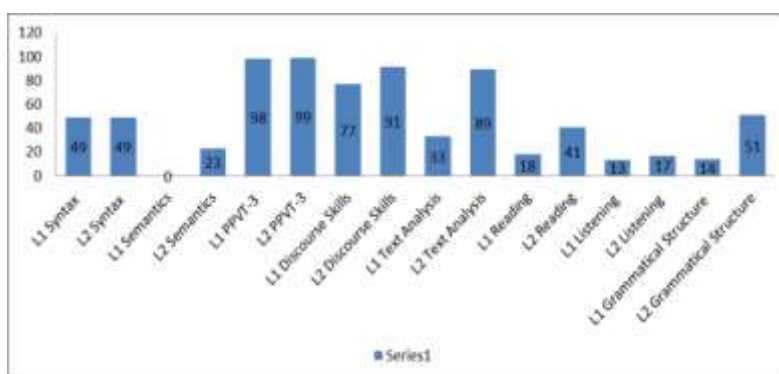
Commenting on the case's movement skill, the father thinks it is normal and that there is nothing to worry about it (3) as the case has no problem be it in his own movement or his feedback toward the movement of the world around him at different levels (4). The psychochiatrist disagrees with the parent's observation emphasizing that based upon what she has noticed, the case had odd steps (6) and most often fails to catch balls during play with other children (6). With such differences in the answers between the parent and the case's psychochiatrist, the general assessment of the case's movement skill as per ASAS remains frequent. Finally, according to the parent and the psychochiatrist, the case is observed to be comfortable with "anything unusual" like strong smell, bothering noise, etc. The answers of the two are also slightly different in matters concerning sensitivity, facial expressions and distressing, which confirms the average of the results to fall into the category of frequent.

## CONCLUSIONS AND RECOMMENDATIONS

Understanding speech helps AS bilinguals with SCD provide suitable feedback, share ideas, negotiate, manage interactions (e.g., initiating, replying, maintaining, summarizing and concluding spoken exchange for various purposes), learn how others communicate and also how to communicate their feelings, emotions, sensations, sentiments and active and passive intentions. The present study shows that the case in question lacks language comprehension to be modified depending on the context in which it is being used. This can be evidently seen in the outcomes of the PPVT-3 in both L1 and L2 along with those of other language disciplines and language skills and components. However, the picture will be clearer if we see the areas of obvious deterioration in both languages. Chart 3 summarizes this deterioration. Consider:

### Chart 3

#### L1 & L2 Findings: Comparison



Except for syntax (equal scores), the L2 deterioration was more in all other linguistic disciplines, language skills and language components than L1 (41,17 and 51 vs 18, 13 and 14, respectively). Surface structure of L2 is more difficult to be understood by the case than that of his L1; that is why, it was not surprised that the case scored twenty-three (23) in L2

semantics for intact (0 score) surface structure of the meaning in his L1. Again, compared to language component of grammatical structure, L2 witnessed significant deterioration more than that of L1 (51 -14, respectively) most often due to the ramifications of L2 grammar along with the interference of dialectal speech that plays negative role as language hindrance.

Seriousness in deterioration started to float on the surface of text analysis where the case shows failure in the interpretation of the text presented be it visual (written) or oral (spoken) and this can be obviously seen in his scores in L1 and L2 (33 vs. 89, respectively). Such kind of serious deterioration was also evidently seen in his performance in discourse skills (91 for L2 and 77 for L1).

Conventionally, we can see that his failure in the way he analyzes the texts led to failure in the way he communicates and runs communicative discourse with community members around him which creates a divorce in the relationship between the two parties as a result of this big misunderstanding. It is for this reason, however, PPVT-3 outcomes were not surprising wherein deterioration in language comprehension and/ or understanding scored the worst in both L1 and L2 (98 and 99, respectively).

Compared to ASAS, ADOS found to be more accountable as it provided us not only with specific authentic data of the social behavior, cognitive and motor functions but also with linguistic and communication abilities of AS bilinguals with SCD in standardized and well-documented contexts. It reveals how AS bilinguals with SCD can express themselves in a number of ways, using language that ranges from familiar to formal, depending on the relationship to the other interlocutor and the context in which the exchange is taking place during conversations. More importantly, ADOS demonstrated that AS bilingual children with SCD are able to reach a point in their development when they are learning both how some behaviors are appropriate in particular contexts and also how to transfer what they know to other situations and these aspects are well explained in DSMV and ICD.

On the other hand, ASAS has often been firstly taken for granted by many SLP/Ts and psychochiatrists in some rehabilitative institutions that the information collected from those related to the AS individuals are sufficiently enough as a result of their immersion in the AS individuals' every day's life. What was found is that information obtained from ASAS are not enough, especially with bilingual cases and/or those with many skills and this is because the experiences of these experts are based upon what they observe either at home or during therapeutic assessment which has not in most cases been important and/ or effective due to the shortage of time the child being observed. The problem becomes worse if the child lives alone with his parent (s) as in the case of the child under investigation. This deprives him from talking to his siblings at home (for instance to get things done and take responsibility for initiating topics and for developing these in ways which interest them) which affects the observation of the parent and make the input he provides insignificant and inconsequential. This explains the slight contraction we have seen in the responses of both the case's parent and his psychochiatrist.

We can use this case to recognize similar relationships between other ASD subgroups and multilingualism in children or adults with/out SCD and provide extra clarification, explanation and scaffolding. Finally the study highlights the most focused areas and its outcomes, where most of the researches have been conducted but still need to do further research using more specific tests and different methodological designs, and unexplored areas

to ensure best assessment and treatment. This pilot case study will be helpful for moving the nature of such kind of studies from individuality into commonality.

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